PARTICIPANT'S HANDBOOK 2014

သင်တန်းသားလက်စွဲ ၂၀၁၄

NATIONAL TRAINING ON

MAINSTREAMING DISASTER AND CLIMATE RISK MANAGEMENT INTO DEVELOPMENT PLANNING IN MYANMAR

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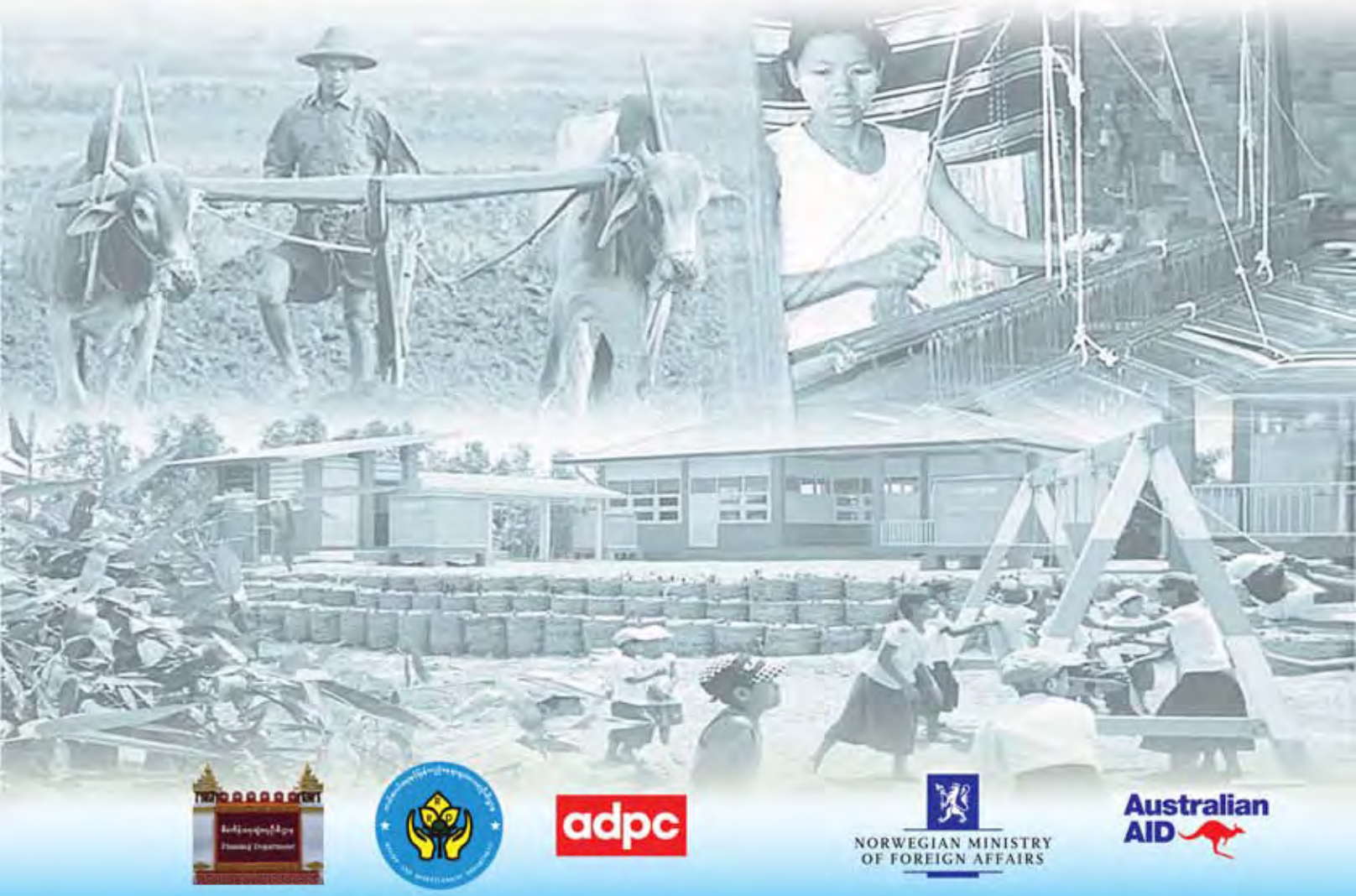

adpc

NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

Australian AID

ISBN 978-616-91716-5-2

Citation: Participant's Handbook on National
Training on Mainstreaming Disaster and
Climate Risk Management into Development
Planning in Myanmar, 2014

This document has been developed under the guidance
of Planning Department, Ministry of National Planning
and Economic Development, and Relief and Resettlement
Department, Ministry of Social Welfare, Relief and
Resettlement, Myanmar

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Cover Photo:
Farming, Nay Pyi Taw, Myanmar, 2013
Livelihood, Bagan , Myanmar, 2013
Model School at Kungyangone, Myanmar (photo credit to UNICEF)
The cover photos represent all three sectors of economy;
Agriculture, Industry and Services.

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NATIONAL TRAINING ON MAINSTREAMING DISASTER AND CLIMATE RISK MANAGEMENT INTO DEVELOPMENT PLANNING IN MYANMAR

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List of Acronym

AEC	ASEAN Economic Community
ASEAN	Association of South East Asian Nations
DRM/CRM	Disaster Risk Management/Climate Risk Management
EM-DAT	The International Disaster Database
GHG	Green House Gas
IPCC	Intergovernmental Panel on Climate Change
MAPDRR	Myanmar Action Plan on Disaster Risk Reduction
MDG	Millennium Development Goals
NSDS	National Sustainable Development Strategy
UNDP	United Nations Development Programme
UNISDR	United Nations Office for Disaster Risk Reduction
AADMER	ASEAN Agreement on Disaster Management and Emergency Response
DM Law	Disaster Management Law
HFA	Hyogo Framework for Actions
NAPA	National Adaptation Programme of Action to Climate Change
NCDP	National Comprehensive Development Plan

Introduction

Myanmar is undergoing transition and a number of developmental activities are underway. The developmental interventions are not risk neutral as they are either reducing risk or increasing risk. As Myanmar is prone to a number of hazards including earthquake, floods, cyclone and tsunami, it is important to capitalize on the current momentum in Myanmar and integrate disaster and climate risk considerations into on-going and future developmental interventions, which will contribute to sustainable development.

In this context, the Ministry of National Planning and Economic Development and the Ministry of Social Welfare, Relief and Resettlement have identified mainstreaming disaster and climate risk management into development planning as a focus area. Mainstreaming disaster and climate risk management has also been articulated as one of the seven components for prioritized actions in the national DRR action plan of Myanmar, titled 'Myanmar Action Plan on Disaster Risk Reduction 2012'.

Thus, it is essential that the process of development planning identifies and analyzes the underlying causes of risk and possible impacts, and factors in measures to reduce the risk. This is best achieved by mainstreaming disaster risk reduction within the development framework: planning (at all levels; national, sectoral and sub-national), programming and in the design and implementation of all development projects in hazard-prone countries.

it is important to build the capacities and enhance the understanding on mainstreaming Disaster and Climate Risk Management (DRM/CRM) in the development planning process among the different government officials who get involved in their departmental planning. Therefore, Relief and Resettlement Department of Ministry of Social Welfare, Relief and Resettlement and Planning Department of National Planning and Economic Development and ADPC have jointly developed a national training course on Mainstreaming Disaster and Climate Risk Management into Development Planning in Myanmar.

The training course has 3 modules namely Introduction to Development and Risk, Mainstreaming Disaster and Climate Risk Management into Development Planning, and Preparing for Mainstreaming Disaster and Climate Risk Management.

This Participant's Handbook is part of the National Training Course Package on Mainstreaming Disaster and Climate Risk Management into Development Planning in Myanmar. This document contains content of each session and could be used as handbook for training participants as well as reference document for training facilitators in conducting the sessions along with the power point presentations and case studies.

This National Course Package has been developed through consultations conducted over 2012-2013 and has been pilot tested in March 2013. However, as the development planning process in Myanmar is evolving, the course package will also evolve over times.

National Training on
Mainstreaming Disaster and Climate Risk Management into Development Planning in Myanmar

Course Schedule

Session	Topic	Time	Facilitator
	Day 1		
	Inaugural Session	09:00-10:30	RRD/PD
	Coffee Break	10:30-10:45	
	Module 1: Introduction to Development and Risk		
Session 1.1	Revisiting Development Case study	10:45-12:15	RRD
	Lunch	12:15-13:30	
Session 1.2	Linkages between Development and Disaster Lecture and Group Work	13:30-15:00	RRD
	Coffee Break	15:00-15:15	
Session 1.3	Understanding Hazards in Myanmar Lecture	15:15-16:45	RRD
	Wrap up of Day 1 Session	16:45-17:00	Participants/RRD
	Day 2		
Session 1.4	Understanding Exposure and Vulnerability Lecture, Group Work and Case Study	09:00-10:30	RRD
	Coffee Break	10:30-10:45	
Session 1.5	Application of Risk Information Lecture, Group Work and Case Study	10:45-12:15	RRD
	Lunch	12:15-13:30	
	Application of Risk Information (Contd.) Lecture, Group Work and Case Study	13:30-15:00	RRD
	Coffee Break	15:00-15:15	
Session 1.6	Measures to Address Disaster Risk Lecture and Group Work	15:15-16:45	RRD
	Wrap up of Day 2 Session	16:45-17:00	Participants/RRD
	Day 3		
	Module 2: Mainstreaming DRM/CRM into Development Planning		
Session 2.1	Overview of Development Planning Process in Myanmar Lecture and discussion	09:00-10:30	PD
	Coffee Break	10:30-10:45	
Session 2.2	Overview of Disaster and Climate Risk Management in Myanmar Lecture and discussion	10:45-12:15	RRD and DMH
	Lunch	12:15-13:30	
Session 2.3	Framework for Mainstreaming DRM/CRM into	13:30-15:00	PD

	Development Lecture and Group Work		
	Coffee Break	15:00-15;15	
Session 2.4	Mainstreaming DRM/CRM into National Development Policies and Plans Lecture and Group Work	15:15-16:45	PD
	Wrap up of Day 3 Session	16:45-17:00	Participants/PD

Day 4

	Mainstreaming DRM/CRM into National Development Policies and Plans (Contd.) Lecture and Group Work	09:00-10:30	PD
	Coffee Break	10:30-10:45	
Session 2.5	Mainstreaming DRM/CRM into Sectoral Development Planning Lecture and Group Work	10:45-12:15	PD
	Lunch	12:15-13:30	
	Mainstreaming DRM/CRM into Sectoral Development Planning (contd.) Lecture and Group Work	13:30-15:00	PD
	Coffee Break	15:00-15:15	
Session 2.6	Mainstreaming DRM/CRM into Regional Development Planning Lecture and Group Work	15:15:16:45	PD
	Wrap up of Day 4 Session	16:45-17:00	Participants/PD

Day 5

Session 2.7	Mainstreaming DRM/CRM into City Development Planning Lecture and Group Work	09:00-10:30	City Development Committee
	Coffee Break	10:30-10:45	
Session 2.8	Mainstreaming DRM/CRM into Programs and Projects Lecture and Group Work	10:45-12:15	PAPRD
	Lunch	12:15-13:30	
	Module 3: Preparing for Mainstreaming Disaster and Climate Risk Management (DRM/CRM) into Development		
Session 3.1	Creating Enabling Environment for Mainstreaming DRM/CRM into Development Lecture	13:30-15:00	PD
	Coffee Break	15:00-15:15	
Session 3.2	Development of Action Plan by Participants	15:15-16:45	Participants
	Course Evaluation and Closing Remarks	16:45-17:00	RRD/PD

DMH: Department of Meteorology & Hydrology
PD: Planning Department
PAPRD: Project Appraisal and Progress Reporting Department
RRD: Relief and Resettlement Department

Module 1 : Introduction to Development and Risk

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Session 1.1: Revisiting Development

Session Objectives:

At the end of this session, the participants would have better understanding on:

- Concept of Development/ Sustainable Development and its three main pillars: Economic, Social and Environmental

Duration: 1 hr and 30 minutes

Training methods: Case Study and Group Work

What's Development?

Development is a complex issue, with many different and sometimes contentious definitions. A basic perspective equates development with economic growth measured by a set of economic indicators such as domestic products value, private investment index, exports indices, income level, private consumption, etc.

UNDP defined development as *'human-centered and a process of enlarging peoples choices by expanding human capabilities and functioning to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community.*[1]This encompasses not only economic aspect, but also covers socio-political and environmental dimension, and self –esteem.

As such, economic aspect is not the sole component of development. However, often that emphasis on economic side has outdone social and environment aspects and tends to create problems in the long run. *Economic growth based development failed to provide basic needs to all and it created many problems in itself and could not cater long-term goal of development. This leads to the notion of 'Sustainable Development'.*

Sustainable Development and its components: social, economic and environmental

Sustainable development is defined by World Commission on Environment and Development (WCED) or Brundtland Commission in 1987 as "**the development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs**".[2]

Figure 1.1.1shows the three pillars of development- economic, social and environmental - and illustrates how they interact.

Figure 1.1.1 Sustainable Development at the confluence of the three pillars
Source: Adams, 2006

[1]UNDP. Human Development Report. *http://hdr.undp.org/en/humandev/glossary/*

[2]Report of the World Commission on Environment and Development: Our Common Future *http://www.un-documents.net/ocf-02.htm*

Economic: Economic development policies typically seek to increase gross domestic product (GDP), and provide more efficient production and consumption of goods and services. Unrestrained economic growth is unsustainable. Research and experience is showing that sustainable economic growth must include both environment and social safeguards.

Social: Sustainable social development relies on reducing vulnerability and increasing capacity to withstand shocks to social systems. This can be achieved by improving and maintaining healthy values, systems and institution of society.

Environmental: Human welfare relies on ecological services. The natural and managed environment provides food, energy and shelter as well as many other resources. For development to be sustainable, the management of these systems must be adhered to so that ecological limits are not exceeded and sacrificed for short term financial gain.

The development focused on one pillar will prove unsustainable unless all three pillars progress in unison and trade-off among them is minimized.

In the course of development, competing demands or development objectives seem to conflict with each other in the short term. For example, certain livelihood options to serve community economic needs may generate income, but leads to deteriorating local resources and severe impact to the environment. However, in the long run, wise management of environmental services would enhance diversification of livelihoods and promote sustainable development of the community. *Hence, it's important that the three components of development: social, economic and environmental* should receive equal attention, progress in integrated manners and not competing with each other.

Development Agenda at Global, Regional and National Level

Development agenda has evolved through time corresponding to the prevailing development context, challenges faced in the specific time frame, and also addressing human basic needs. Some of the key *'Development Agenda'* are as follows:

Millennium Development Goals

The Millennium Development Goals (MDGs) indicate eight ambitious goals for tackling poverty alleviation to be achieved by 2015. It's a globally agreed framework for monitoring human development and the achievement of time-bound and measurable targets. The MDGs focuses on the fundamental dimension of development with 8 Goals addressing *human basic need* (eradicate extreme poverty, universal primary education, and health by reducing child mortality, combating HIV/AIDs & other diseases and improve maternal health), social-equity (gender equality) and environmental sustainability. Myanmar has made significant progress to achieve the MDGs especially on poverty reduction and increase school enrollment rate.

Box 1.1.1 Country Progress on MDGS

Myanmar has adopted the MDGs and achieved significant progress to meet each target. As per the statistics on Millennium Development Goals of the UNDP and relevant departments, the indexes of poverty of Myanmar were declining, falling from 32 percent in the fiscal year 2004-05 to 26 percent in 2009-10. Overall net enrolment in primary education increased from 84.7% to 87.7% between 2005-2010,

with the upward trends in most state/regions. Women with a live birth attended by skilled health personnel have considerably increased from 72.5% in 2005 to 77.9% in 2010.
(Source: *UNDP Integrated Household Living Conditions Survey in Myanmar 2009-2010, MDG Data Report, http://mm.undp.org/ihlca/03_MDG-Data/index.html*)

At the completion of the MDGs in 2015, development agenda for post-2015 is under preparation to address various emerging challenges in development. *United Nations Conference on Sustainable Development (UNCSD),* organized in June 2012 in Rio de Janeiro or Rio+20 has objective to reinvigorate commitment for sustainable development. Though the precise goals and actions towards achieving sustainable development are still to be defined, the tendency of development momentum looks forward *to balancing socio-economic growth with responsible environmental oriented value.*[3]

Figure 1.1.2 Millennium Development Goals

The ASEAN Vision 2020

The ASEAN Vision 2020, adopted by the ASEAN Leaders on the 30th Anniversary of ASEAN, agrees on a shared vision of ASEAN as a concert of Southeast Asian nations, outward looking, living in peace, stability and prosperity, bonded together in partnership in dynamic development and in a community of caring societies.

Significant progress has been made on the economic integration adopted in ASEAN Economic Community (AEC) Blueprint in the Roadmap 2009-2015 that envisions a region of free movement of goods, services, investment, skilled labor, and free flow of capital (ASEAN, 2011). All member countries could benefit from the economic diversity of the region. Through regional adoption and implementation of AEC, ASEAN countries will be able to complement and mutually support one another to fulfill their economic endeavor, i.e. expanding market, flow of goods/products, investment, labor mobility, etc. However, the economic development at regional level could have social and environmental implications in the same fashion as it does at domestic level. Demand over certain resources or skills might be required due to regional economic conditions. As well, increasing competitiveness could probably differentiate those who have or possess certain resource/skills with the have not. Utilization of natural resources and environmental management governed by economic reason might neglect local voice, fail to cater local needs, and may exceed natural capacity to maintain its balance.

[3] United Nations Conference on sustainable Development Website *http://www.uncsd2012.org/?Issues.html*

Myanmar Development Agenda

The economy, international trade and foreign investment has accelerated in the past several years;*poverty reduction and rural development has also gained its momentum.*About 70% of the country population belongs to the rural sector, hence it is essential that development policy and intervention advocate to the rural sector. Planning Department, Ministry of National Planning and Economic Development (MNPED), has set an objective, among others, *to achieve poverty reduction ratio2% per annum.*[4] Development interventions aligned to this specific objective primarily targets at *boosting income level of rural communities especially on rice growing and other land-based economic activities as well as improving quality of living.*

The National Sustainable Development Strategy (NSDS) serves as a framework for integrating environmental considerations into future national development plans as well as for sectoral development programmes. It is also a guiding document to fully implement development interventions in environmental, economic and social sectors in harmony. The NSDS is comprehensive in incorporating environmental consideration into social and economic development to ensure the achievement of Sustainable Development. NSDS articulates the vision - 'well being and happiness for Myanmar people with 3 overarching goals: i) Sustainable management of natural resources, ii) Integrated economic development and iii) Sustainable social development.

The Myanmar NSDS proposes the preventive measures, besides traditional reactive policies, to address the emerging environmental issues, human-induced disasters and the climate change.

The fundamental objectives of Myanmar's sustainable development are:

- to establish harmonious integrating of a sound and viable economy, responsible governance, social cohesion and harmony, and also ecological integration;
- to ensure that development is a life enhancing process, which centered to the human development for the present and future generations.

It is important to note that the development agenda in Myanmar is going under transition (2013) with planning instruments in place including Framework for Economic and Social Reforms (FESR) - the National Comprehensive Development Plan (20-year plan), 5-Year Plans, Annual Development Plan, Regional Development Plans, etc.

Disaster and Climate Risk as Development Challenges

Sustainable development recognizes importance of the social, economic and environmental domains and to minimize trade-off among them. Many recent disasters manifest themselves as negative forces and a threat to development, destroying years of development gains and impeding attainment of development targets. Impacts of climate change, from anthropogenic force, has been observed with increased tendency, which will contribute to more frequent, more extreme and less predictable hazard events such as severe storms, prolong droughts, and flood. This emerging risk has adverse impacts on development to be sustained.

Hence, it's important that development should be protected from such negative forces. Equally important, serious attention should be given to ensure that development

[4] MNPED Website *https://www.mnped.gov.mm*

interventions would not, intentionally or unintentionally, create or exacerbate unsafe conditions, which increase risk in different settings. For example, multi-storey buildings constructed in earthquake prone areas without earthquake-resistant construction techniques, could result in severe structural damage and mass casualty, similarly, transforming rain-fed areas to settlements without proper drainage system could possibly aggravates severe inundation in the densely populated areas.

Overall, the two broad approaches for risk reduction in development are:

- To protect development gains from potential disaster risk and climate change impacts, and
- To ensure that development actions are not introducing new risk or intensifying the existing ones.

It's essential that disaster and climate risk is considered in the course of development process from policy making, planning to implementation and monitoring. A risk sensitive development (development inclusive of disaster and climate risk related issues) will significantly contribute to 'sustainable development'.

References and Supplementary Readings

1. 7 Critical Issues at Rio + 20. United Nations Conference on Sustainable Development Website. http://www.uncsd2012.org/7issues.html
2. Adams, W. M. (2006). "The Future of Sustainability: Re-thinking Environment and Development in the 21st Century". Report of the IUCN Renowned Thinkers Meeting, 29-31 January 2006.
3. ASEAN (2008) *ASEAN Community Economic Blueprint.* http://www.asean.org/archive/5187-10.pdf
4. Camp, R. (2007) *Sustainable Development – what's in a name?.* PPT.
5. Cuny, F. (1983) *Disasters and Development.* Oxford University Press.
6. Ministry of Forestry (2009) *National Sustainable Development Strategy for Myanmar.* http://www.rrcap.ait.asia/nsds/uploadedfiles/file/Publication%201-NSDS%20Myanmar.pdf
7. *U Myint (2011) Paper presented at Workshop on Rural Development and Poverty Alleviation in Myanmar, Nay Pyi Taw. May 20-21, 2011.* http://www.mizzima.com/edop/commentary/5314-poverty-in-burma-economist-u-myint.html
8. United Nations (2010). *The Millennium Development Goals Report.*http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2010/MDG_Report_2010_En.pdf
9. United Nations. *One: What does the world really want from the next global development goals? Ensuring that the world's poor define the post-2015 framework.* http://one-org.s3.amazonaws.com/us/wp-content/uploads/2012/11/ONE_MDGs_Report.pdf
10. UNDP (2010) *Integrated Household Living Conditions Survey in Myanmar 2009-2010- MDG Data Report*http://www.mm.undp.org/ihlca/03_MDG-Data/PDFs/02%20MDG%20Data_Introduction.pdf
11. UNDP Bureau of Crisis Prevention and Recovery (2004). *Reducing Disaster Risk: A Challenge for Development.*http://www.preventionweb.net/english/professional/publications/v.php?id=1096

Note

Session 1.2: Linkages between Development and Disaster

Session Objectives:

At the end of this session, the participants would have better understanding on:

- Intricate linkages between Development and Disaster
- Importance of 'risk reduction' for sustainable development

Duration: 1 hr and 30 minutes

Training methods: Lecture and Group Work

Development and Disaster Model

The world has witnessed some of the costliest disasters in the recent past which includes the Great East Japan Earthquake 2011, Sichuan Earthquake of China of 2008 and Cyclone Karina of USA of 2005. These disasters have immediate as well as long-term impact on development on a large scale. It is important to investigate the linkages between development and disasters.

Figure 1.2.1 presents multi-faceted relationship between development and disaster. The following sections discuss these linkages in details.

Figure 1.2.1 Development and Disaster Linkages
(Source: UNDP DMTP, 1994)

Disasters set back development

Disasters impact communities and nations, and the immediate impact is often traumatic with loss of human life and assets. Disaster can totally or partially cause physical damage to different sectors: damage of farm, crops, seed stock, fishing gears, agricultural equipments, and structural damage of houses, roads and bridges, infrastructures, schools, health facilities, etc. This leads to economic shock and results in economic loss:

- Supply chain interrupted and production operation stopped
- Rising of transportation costs
- Trade and market system impacted
- Closure of industrial estates/factories, etc.

Box 1.2.1 Cyclone Nargis of Myanmar and its Impacts

The Cyclone Nargis in 2008 hit both urban and rural areas in the Ayeyarwady and Yangon Divisions. The Townships of Labutta, Pyapon and Bogale were the hardest hit. It resulted in enormous physical damage and losses, including the destruction of homes and critical infrastructure such as roads, jetties, electricity, water and fuel supplies and sanitation systems. It also had a significant, long-term impact on people's livelihoods. According to the Post-Nargis Joint Assessment (PONJA), damage caused on productive sectors including agriculture, livestock, fisheries, industry and commerce, was estimated at 736 Billion Kyats, while approximated loss was as high as 2,352-2,475 Billion Kyats.

(Sources: http://www.aseanpostnargiskm.org/about/cyclone-nargis-overview)

Impacts on social and environmental sector might be difficult to measure in monetary value. However, such impacts are obvious in discontinued education and failure of health-service functions in affected areas, deteriorating health conditions of affected population especially children and elderly, poor sanitation and spreading of disease and infections. It is also to note that women, people with disability, children, and aged, are impacted more during most of the disaster. Impacts on environmental services from the Nargis Cyclone, 2008 includes 35,000 ha of natural and planted mangroves and other trees damaged; pollution of surface and groundwater sources with 43% of ponds damaged, salination and erosion of agricultural lands with 63% of paddy flooded, and sedimentation of rivers (UNEP, 2009).

Disaster can provide development opportunities

Thought disaster causes immense damage and loss, it can provide a window of opportunity for social, economic and environmental development.

- ***generate and raise collective awareness*** of the populations, concerned authority and stakeholders and lead to joint collaboration and effort on preparedness activities and capacity building to better cope and reduce disaster impacts in the future

- ***lead toimprovement in policy*** to reduce risk such as enforcement of building codes for multi-hazard resistant structure, regulations over land use to avoid physical alteration that make the land susceptible tohazard, and legislation such as Disaster Management Law, National Action Plan on DRR (MAPDRR in Myanmar).

- ***promote proactive interventions for risk reduction*** by integrating measures to reduce risk when undertaking recovery and reconstruction activities such as reconstructing of houses with more durable materials after earthquake or storms, relocation to safer areas and introducing sustainable development plans that include consideration to reduce future risk.

- ***create positive changes in social and technological development*** such as community-inclusive policy that recognizes community as key actors for risk reduction, effective preparedness actions, improved technology for timely and accurate early warnings and risk communication to wider public.

Figure 1.2.2 Kungyangone reinforced concrete model school built during Post Nargis recovery & reconstruction
Source: Guidance on Mainstreaming Disaster Risk Reduction in the Education Sector, Myanmar – Rural Settings, 2011

Disaster provides opportunity for the '**building back better**'. During Myanmar Cyclone Nargis recovery, a number of multi-hazard resistant schools and hospitals were constructed, livelihoods support program were implemented and this enhances resilient conditions.

Development can increase risk

Rapid and poorly planned development projects can increase disaster risk. As development entails transforming of the existing entity, this probably, intentionally or unintentionally, causes unsafe conditions if planning fails to address disaster risk issues.

Increased development and competition for space may lead to development in hazardous zone such as storm surge or earthquake zone, construction of houses or roads on unstable slopes, etc.

Not only physical structure, unplanned development could also induce susceptibility in social and environmental domain. Development interventions that create advantage on certain population groups might put others into disadvantage condition, and hence expanding development gaps. Poor communities are seen as the most vulnerable groups since they are not capable to absorb the impact of disaster.

Figure 1.2.3 Rapid city expansion to give more attention on improving conditions and maintenance work of old structures

Environmental mismanagement that is often associated with unsustainable development could result in fragile ecosystem and thus, intensify disaster risk. For example, *extensive land clearing* for cropping in steep areas may induce land instability and landslides since natural vegetation that retains soil particles are lost, *logging and deforestation* reduce soil humidity and natural water retentions capacity, hence result in surface water runoff and flash flood, *scarcity of natural resources* after decades of heavy exploitation will create livelihoods stress for local communities and poverty.

Development can reduce risk

Ways in which development can reduce disaster risk can be observed by examining the three interlinked elements of sustainable development: Economic, Social and Environmental.

Figure 1.2.4 City planning and infrastructure development to serve dynamic economic activities and investment

Economic Development: Economic development, and the wealth it generates, provides better opportunity to mitigate and prepare for disasters. Increased income that comes with economic development allows people to have greater access to self-protection methods and healthcare. Development of roads and other transportation systems enable better access to emergency services, and facilitate delivery of relief and recovery operations.

Social Development: This could include education, health and social welfare services. Such program could promote well-being of the population and safety net for the people especially the poor, children, elderly, and disables.

Higher education attainment helps achieve better employment, income earning and livelihoods, and thus allow for better self protection from disasters as well as ability to recover after disaster events. Also, through education and training, raising awareness could be enhanced among wider population, improving understanding on environmental and natural hazard, how to prepare oneself and families to cope with disaster situation, and other life skills.

Social capital such as self-help groups, community-organized groups, cooperative groups, civil volunteer groups, strong kinship and neighbourhood allow for improved emotional and financial support to affected people. In addition, they can act as effective communication network in conveying early warning messages and jointly undertake preparedness actions to reduce potential impacts.

Social welfare distributes funding, necessary items (food, cloth, shelters, medicine, etc) or access to public services to individual or family in need. Social welfare programs/schemes are, for example, monthly subsistence allowance for elders, the ills or the disabled. Provision of social welfare helps improve living condition of the disadvantage population in the normal time and serve immediate needs in disaster events to alleviate sufferings of affected people.

Environmental Development: Environmental services could directly and indirectly reduces disaster risk. Environmental services are sources of livelihoods, hence contributing to the socio-economic well-being of the people and increase their capacity to cope with difficulties in disastrous event. Mangrove forest could protect coastal communities from storm surge and strong wind of cyclones. Reforestation stabilizes the hydrological process and prevents flood intensity. On the other hand, unsustainable farming methods lead to soil degradation, reducing livelihood opportunities, and therefore increasing susceptibility of the people.

Considering the intricate link between development and disaster, it's essential that we should try to be *in the positive realm that is 'Development can reduce risk' and 'Disaster can provide development opportunity'*. As development is basically human-driven, greater attention to include risk management into development activities, both at normal time and in post-disaster stage, could contribute to risk reduction and enhance disaster resilient development.

Group Work

1. Participants are divided into groups of 5-7 members in each group.
2. Participants think about current development activities in different sectors and how they could be affected by the given hazards:
    - Agriculture – Drought
    - Housing & Infrastructures (roads/bridges) –Earthquake
    - Education & Health –Cyclone
    - Forestry – Fire
    - City development – Flood
    - Industry – Earthquake
1. Each group provides examples of development-disaster linkage.
2. Each group makes presentation.

References and Supplementary Readings

1. ADPC (2012) *Mainstreaming DRR into Development Training Handbook.*
2. Cuny, F. (1983) *Disasters and Development*. Oxford University Press
3. UNDP (2004) *Development At Risk* (Chapter 1). http://www.undp.org/cpr/disred/documents/publications/rdr/english/chapter1
4. UNDP Bureau of Crisis Prevention and Recovery (2004). *Reducing Disaster Risk: A Challenge for Development.* http://www.preventionweb.net/english/professional/publications/v.php?id=1096
5. UNDP DMTP (1994). *Disasters and Development*. 2nd ed. http://www.untj.org/docs/Disaster_Management/Resources%20Page/disaster_development.pdf
6. UNEP (2009) Integrating Environment Perspectives into Recovery: Experiences from Cyclone Nargis IRP Special Event, Global Platform Geneva, 17 June 2009.
7. UNISDR (2009) *2009 UNISDR Terminology on Disaster Risk Reduction.* http://www.unisdr.org/we/inform/terminology

Note

Session 1.3: Understanding Hazards in Myanmar

Session Objectives:

At the end of this session, participants will be able to understand:

- What is hazard? and difference between 'hazard' and 'disaster'
- Major hazards in Myanmar: Characteristics, Prone areas, and Impacts
- Climate Change Impacts

Duration: 1 hr and 30 minutes

Training methods: Lecture

Disaster risk comprises three elements namely hazard, vulnerability and exposure. It is important to understand these three elements in the context of Myanmar. This session focuses on **hazard**, one of the elements of disaster risk.

Myanmar is exposed to multiple natural hazards including cyclone, earthquake, floods and fire. *Hazard could turn into disaster when it co-occurs with exposure and vulnerable components, causing harmful effects beyond coping capacity of the affected areas.*

A number of studies and models highlights that the 'intensity' of hydro-meteorological hazards is increasing due to climate change. Some of these have been observed in Myanmar and discussed in this session.

Figure 1.3.1 Components of Risk
(Adapted from CDKN, 2012)

What is Hazard?

Hazard could be any phenomenon or situation, which has the **potential** to cause disruption or damage to people, their property and their services and environment. Figure 1.3.1 illustrates hazards as one component of disaster. Disaster risk is the combination of hazard, exposure and vulnerability. Disaster is a serious disruption of the functioning of society, causing widespread human, material or environmental losses, which exceed the ability of the affected people to cope using their own resources.

Types of Hazards

There are different ways of classifying hazards. EM-DAT, the global disaster database, has classified disasters into 5 groups:

Table 1.3.1 EMDAT Hazard Classification
(Source: EMDAT website http://www.emdat.be/classification)

Geophysical	Events originating from solid earth, ground shaking, soil displacement, slope movement such as earthquake, earthquake-induced landslides, tsunami
Hydrological	Events caused by deviations in the normal water cycle and/or overflow of bodies of water caused by wind set-up such as flood, storm surge/coastal

	flood and flood-induced landslides
Meteorological	Events caused by short-lived/small to meso-scale atmospheric processes (in the spectrum from minutes to days) such as tropical cyclone, local storm.
Climatological	Events caused by long-lived/meso-to macro-scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability) such as heat waves, cold waves, extreme winter conditions, drought and wildfire
Biological	Caused by the exposure of living organisms to germs and toxic substances

Countries may adopt their own system of hazard classifications according to specific purposes. To understand hazard, hazard characteristics that determine occurrence and nature of their effects are as follow:

Predictability: Geological hazard are quite random and hence not predictable, while storm/cyclone could be forecasted using meteorological technology, satellite image, observation, climate pattern of the location, etc. Recent knowledge and technology has been developed for improved forecast of tsunami.

Seasonality: Storm, cyclone, flood and drought normally recur in somewhat the same pattern/cyclical period over a year. Landslides, as a result of seasonal rainfall could be considered as seasonal. Volcanic eruption or earthquake, on the other hand, is non-seasonal in nature.

Rate of onset: Duration of drought could last in many months causing chronic aridity, lack of soil humidity and water shortage. Cyclone/storm, in contrast, may strike at its peak force for only few hours to few days, and weaken or move out of the affected locations in few days to a week. Earthquake could take seconds to minutes to last, followed by a series of aftershocks within hours or days.

Magnitude: Magnitude refers to power of the hazard to cause certain level of damage. For earthquake, the system developed for magnitude measurement is Richter scale. Cyclone is measured on Saffir-Simpson hurricane wind scale (SSHWS) under 5 categories. However, other hazards such as floods do not have standardized rating system. The criteria for flood scale could probably be measured in term of depth of water, volume of water passing through a given area and size of areas covered by water.

Frequency: The frequency is measured in terms of a hazard's recurrence interval. Majority of hazards have return periods on a human time-scale such as five-year flood, fifty-year flood and a hundred year flood. This reflects a statistical measure of how often a hazard event of a given magnitude will occur.

Major Hazards in Myanmar

There are 9 major hazards in Myanmar listed in the table 1.3.2. Fire is the most frequent hazard in Myanmar and accounts for 73 percent of the total hazard incidents in the country. Storms and floods account for 11 percent and 10 percent respectively, while other hazards including earthquake, landslide, etc. accounts for 8 percent. Processes such as urbanization, environmental degradation and climate change, are reconfiguring hazards, which mean it is becoming increasingly difficult to disentangle their natural and human attributes.

Among the most alarming hazards are earthquake, cyclone and storm, and flood which have recurred and caused major disaster in the past recent years:

- Floods in Southern Myanmar in July-September, 2013 due to heavy rainfall in Karen, Mon, Rakhine States and other locations.
- Thabeikkyin Earthquake in November, 2012 in Mandalay Region (M:6.8 RS), claiming 18 lives and damage to 400 houses, 65 schools and 100 religious buildings
- Tarley Earthquake in March, 2011 (M: 6.8 RS) in Shan State, with more than 70 casualties and damage to 390 houses, 14 Buddhist monasteries and 9 government buildings
- Cyclone Giri, 2010
- Cyclone Nargis, 2008 which led to the loss of 84,537 human lives, 53,836 persons missing and damage to property to the tune of approximately 4.1 billion USD. (Tripartite Core Group, 2008)
- Cyclone Mala, 2006 led to loss of 37 lives

Table 1.3.2 Major Hazards in Myanmar
(Source: Hazard Profile of Myanmar)

Hazard	Areas/prone location	Period/ Season	Cause	Characteristics	Major Incident/ Remarks
Fire hazard	Yangon, Mandalay, Ayeyarwady, Sagaing and Bago.	n/a	Kitchen related fire and negligence accounts for 85%, with other causes such as arson and electrical fire.	Spread out due to construction materials, such as thatched roof, bamboo and wood planks, which are highly flammable	The number of fire case is decreasing while the losses show the increasing trend.
Forest fire	Forest area	Dry season starting from December till May	Manmade cause: shifting cultivation, burning of the forest for hunting purposes, careless use of fire, purposeful burning of fodder ground, and Natural cause: severe aridity in dry season, lightning or frictions of tightly packed trees	Mainly surface fires that can spread over a large area but do not turn into intensified burning.	18 March 2004 along the border of Myanmar and 22 February 2009 at Myanmar-China border, damaging about 300 hectares of forest areas in 4 days.
Flood	Major cities and towns, economically strategic places, situated along the major rivers	June, August and late September to October with most critical time in August as the peak monsoon rains	Intense rainfall in monsoon season	Riverine Floods, Flash Floods, Localized Floods, and Flooding due to cyclone and storm surge occurs in the coastal areas	Department of Meteorology and Hydrology under Ministry of Transport has main responsibility for flood monitoring, weather forecasting and issuance of early warning
Storm surge	Coastal areas: the Rakhine Coast, the Ayeyarwady Delta and the Tanintharyi Coast	Monsoon season	Storm surge is generally created by waves generated by the strong wind in tropical revolving storms when it moves over water body.	An abnormal rise of water generated by a storm. It hits coastal areas and moves inland causing severe flood.	The maximum surge at 4-meter height in the landfall point was experienced.
Earthquake	North-western region, western part, and areas along fault line	n/a	Seismic-sensitive fault line such as Sagaing Fault, and the Kyaukkyan Fault, Fault situated west of Naung Cho, and Kabaw Fault along the Kabaw Valley in western part	Ground shaking or slides causing structural damage	Earthquake at Taungdwinggyi in 2003 Tarlay in 2011 Thabaikkyin in 2012 at magnitude 6.8 Richter scale

Landslides	Hilly region, areas with unstable soil		Landslides either trigged by heavy rain, flood, earthquake, and excavation as man-made factor.	Down-slope movement of soil, rock and debris or earth with three distinct physical events: the initial slope failure, the subsequent transport, and the final deposition of slide materials.	2003 in Taung-dwingyi 2004 inPalewa-Kale road 2008 in Mogok 2009 inKyauktaw-Ann road 2010 in townships of Maungdaw and Buthidaung
Tsunami	the Rakhine Coast in the northwest, the Ayeyarwady Delta in the middle, and the Tanintharyi Coast in the south.	n/a	Tsunami is a tidal wave caused by an earthquake underneath the deep sea.	The pressure released from the earthquake creates massive tidal power which is uplifted to tidal wave when it reaches coastline.	2004 Tsunami caused moderate damage in the Ayeyarwady Delta, Rakhine State and Tanintharyi Region, with 61 death: 31 in Ayeyarwady Delta, 22 in Rakhine State and 8 in Tanintharyi Region.
Cyclone	Rakhine Coast and Ayeyarwady Deltaic areas	April, October and November accounts for 18 percent each and May accounts for 30 percent of the cyclones	Severe cyclones formed in the Bay of Bengal during the pre-monsoon period in April - May and post-monsoon period in October-December.	Accompanied by three destructive powers: (1) strong winds (as high as 120 mph), (2) heavy rains (more than 5 inches in 24 hours) and (3) storm surge	Cyclone Giri, 2010 Cyclone Nargis, 2008 Cyclone Mala, 2006 Cyclone has increased in number since 2000 with a cyclone making landfall every year.
Drought	Central part in Magway, Mandalay and Sagaing (lower) Regions		Reduced rainfall over an extended period of time and a climatic aberration, compared to aridity which is a permanent feature of climate coupled with man-made factors such as high consumption of fodder, and deforestation.	Drought could be slow onset with characteristics such as greater spatial extent, impacts spread over large geographical area, long duration, core area affected, changes over time, and cumulative impacts.	Drought prone area covers approximate 10 percent of total area of the country.

Climate Change and impacts

Box 1.3.1 Climate Change

According to IPCC, Climate Changes refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.

(Source: http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html)

The earth's climate is determined by many factors, processes and interactions at a global scale. Important elements include the biosphere, the ocean, sea ice, clouds, and the ways in which these interact. Today, human beings have also become a component in the earth's system, *driving and accelerating global warming through the intensive release of Green House Gas (GHG)*

into the atmosphere. The climate change hence could be induced by natural cause or human being (anthropogenic origin). (GTZ, 2009)

Increase in GHG emission from human activities could contribute to green house effect and global warming (a rise in temperature of earth surface).[1] *Climate change impacts could be varied such as increase rate for glacier ice melting, prolonged drought, extreme weather events, and impacts on plants and animal species.*

Climate change is affecting disaster risk in two ways.

- Firstly, through increasingly extreme and frequent weather events such as out-of season flood, severe drought and frequent storm.
- Secondly, through lessening the ability of the communities to cope with arising impacts as the existing coping mechanisms might not adequately address new forms of risk shaped by climate change.

The observed changes in climate related hazards and extreme weather events in Myanmar include:

- *An increase in the prevalence of drought events*- Severe droughts have increased in frequency from 1990 onwards. In 2010, severe drought diminished village water sources across the country and destroyed agricultural yields of peas, sugar cane, tomato, and rice.
- *An increase in intensity and frequency of cyclone and strong winds*- In the past (before 2000), cyclones made land fall along Myanmar's coast once every three years. Since 2000, cyclones have made landfall along Myanmar's coastline every year. This is probably influenced by climate change impacts.
- *Rainfall variability including erratic and record-breaking intense rainfall events*- Rainfall patterns in Myanmar have become unpredictable with regular reports of record-breaking rainfall:
    - Over the period 1960-2009, shorter rainfall seasons in combination with erratic and intense rainfall resulted in numerous flooding events.
    - In July 2009, 434 mm of rainfall was measured in a single day in Launglon breaking the highest 24-hour rainfall record in the country.
    - In August 2009, the Bago Division experienced its highest 24-hour rainfall in 45 years, resulting in severe flooding throughout the town.
    - From July to October2011, heavy rain and flooding in the Ayeyarwady, Bago, Mon and Rakhine Regions/States resulted in losses of ~1.7 million tons of rice.

(Source: Myanmar's National Adaptation Programme of Action (NAPA to Climate Change (2012)

[1]The green house gases are such as Carbon Dioxide (CO_2) from fossil fuel burning, deforestation, power plants, Methane (CH_4) from rice cultivation, cattle & sheep ranching, decay from landfills, mining, livestock farming, and Nitrous oxide (N_2O) from industry and agriculture (fertilizers) http://academic.engr.arizona.edu/HWR/Brooks/.../lectures/2-6-2003.ppt

References and Supplementary Readings

1. Climate and Development Network (2012) *Managing Extremes and Disasters in the Water Sector: Lessons from the IPCC SREX Report.* www.cdkn.org/srex
2. GTZ (2009) *Climate Change Information for Effective Adaptation: A Practitioner's Manual.* http://www.preventionweb.net/english/professional/publications/v.php?id=11886
3. Htwe Nyo Nyo. Land, Water, Forests, Biodiversity, and Climate Change in Myanmar. Myanmar NAPA (draft). 2012
4. IPCC (2012) *Glossary of terms. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.* http://www.ipcc.ch/pdf/special-reports/srex/SREX-Annex_Glossary.pdf
5. Relief Web. Impact of the tsunami on the lives and livelihood of people in Myanmar with special focus on Labutta Township, Ayeyarwaddy division.
6. RRD (2009) *Hazard Profile of Myanmar.*
7. SEED ASIA (2012).*The 2012 Thabeikkyin Earthquake (GLIDE: EQ-2012-000190-MMR) Situation Report 1.* http://reliefweb.int/sites/reliefweb.int/files/resources/Thabeikkyin%20earthquake%20-%20Situation%20Report%201%20%28Immediate%20damage%20Assessment%29%20SEEDS%20Asia.pdf
8. Tripartite Core Group (2008) *Post-Nargis Joint Assessment Report.*
9. UN-HABITAT Myanmar. *Manual on Earthquake: Causes, Effects and Preparedness.*
10. UN-HABITAT Myanmar. *Manual on Fire: Causes, Effects and Preparedness.*

Note

Session 1.4: Understanding Exposure and Vulnerability

Session Objectives:

At the end of this session, participants will be able to:

- Develop common understanding of exposure and vulnerability
- Discuss various dimensions of exposure and vulnerability

Duration: 1 hr and 30 minutes

Training methods: Lecture, and Group Work

Disaster Risk as Combination of Hazard, Exposure and Vulnerability

Most of the time when we see news report on damaged and collapsed structures (buildings, houses, bridges, roads, etc.) in earthquake or coastal communities swept away by destructive power of storm, we perceive such disastrous event as purely natural phenomena. If the structures are not located in earthquake prone areas or away from the coast line, *it will be less likely for them to get* ***exposed*** to the hazards.

Besides exposure, there are certain attributes of the elements that make them ***vulnerable***. These are such as non-hazard resistant construction, poor construction materials, and/or the construction process not complying with building codes or safety standard. This makes physical structures vulnerable-th*at is they are unable to stand the intensity of hazard (shake or wind speed of storm) and likely to get severely affected.* Poor maintenance and lack of safety measures will also increase susceptibility to hazard.

This changes the typical perception that 'disaster' is just a natural phenomenon, rather it's the result of a natural phenomena interacting with society and human activities. *People could select choices that make themselves less exposed and less vulnerable to hazard.* However, there are many underlying factors (economic demand, distribution of limited resources, culture, etc.) that govern and influence society and human activities, which should be taken into account for better understanding of exposure and vulnerability.

The Disaster Risk *is the potential loss in lives, health status, livelihoods, assets and services, etc. which could occur to a particular community or a society over some specified future time period.* Disaster risk results from the interaction of three factors (Figure 1.4.1) and represented by simple equation:

Disaster Risk = (Hazard) x (Exposure of element at Risk) x (Vulnerability)

Figure 1.4.1. Components of Disaster Risk

Exposure

Exposure can be said to be "People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses" (UNISDR, 2009). Measures of exposure can include the number of people or types of assets in an area that are exposed to hazards. For example, in earthquake prone location, exposed elements to earthquake hazard could be number of buildings, infrastructure, houses, government offices, public places such as markets, stadiums, telecommunication system, electric generating system, etc. Another example is that a community on the river bank could be more exposed to river flood compared to community located on upper ground. Settlements on steep and unstable land are exposed to high landslide risk, compared to those located in plain areas.

Human livelihoods are often established in locations that combine opportunities with hazards. Flood plains provide flat land for settlement and businesses; fishing communities settle in coastal areas for the means of their livelihoods (but at the same time highly exposed to storm, tsunami and storm surge); city slum dwellers have no other choice, but to live in unoccupied areas on river banks or adjacent to the channels, which are prohibited areas purposely kept for drainage systems of the city and highly flood prone.

Figure 1.4.2 Exposure and Vulnerability in urban setting
Source: http://thewatchers.adorraeli.com/2011/08/07/floods-and-landslides-in-myanmar/

Vulnerability

Vulnerability is the conditions determined by physical, social, and environmental factors which increase the susceptibility of a community to the impact of hazard.

Box 1.4.1 Vulnerability

Vulnerability is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

Comment: There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time. This definition identifies vulnerability as a characteristic of the element of interest (community, system or asset) which is independent of its exposure. However, in common use the word is often used more broadly to include the element's exposure. (UNISDR, 2009)

Vulnerability is characteristics of elements at risk (or exposed elements) that make them susceptible to potential impacts of hazard - unable to cope with or withstand negative consequence of hazard.

On the reverse side of vulnerability, capacity is referred to the ability of people, organisations and systems, using available skills and resources, to face and manage adverse conditions such as hazards, emergencies or disasters. Coping capacities contribute to the reduction of disaster risks (UNISDR, 2009).

Vulnerability is the apparent weakness or the potential to suffer harm or loss. Vulnerability is characteristics of elements at risk (or exposed elements) that make them susceptible to potential impacts of hazard - unable to cope with or withstand negative consequence of hazard.

While, hazard is natural phenomena which is somewhat beyond human control, 'the progression of Vulnerability' is dynamic human-induced process. It's viewed that hazard is just a trigger event and disaster will occur only if vulnerability is exposed to hazard.

Different Dimensions of Vulnerability

There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors:

Physical/Structural Vulnerability is the potential for damage to structures that cause death toll, injuries, damage of property and the physical landscape, and disruption of infrastructure services. The following factors could increase physical vulnerability:

Figure 1.4.3 Damaged road and bridge structure(Source: http://globalvoicesonline.org/2011/03/25/myanmar-photos-of-earthquake-disaster/economic)

- Proximity to hazards (exposure) – Due to higher demand for settlement and limited space available, people might settle community in hazard prone.
- Unsafe construction of buildings and infrastructure (poor design and building materials) – Design and material used for construction could not withstand the potential impacts such as shake or strong wind/cyclone.
- Lack of proper maintenance of buildings and infrastructure - Old structures require periodic inspection, proper maintenance, retrofitting, and repair. Lack of maintenance works may leave structure in fragile conditions and hence, could be severely damaged.
- Improper land use planning – Zoning and land use pattern without risk considerations could increase vulnerability such as industrial estate and power plants constructed in highly earthquake prone area, land utilization activities that block natural water way causing severe inundation as it prevents water runoff.
- Degradation of the environment – Mangrove forests are natural wind break and could protect coastal community from destructive power of storm. Mangrove forest clearing could make the community more susceptible to forces of strong wind.
- Remoteness of settlement that unconnected to social services such as health care service.
- Extent and quality of infrastructure and basic services: roads, health facilities, schools, electricity, drinking water, communications, transport, etc. - These critical facilities could suffer from disaster impacts and intensify vulnerable conditions especially when its service are discontinued and failed to support affected people in disaster situation. For example, electric power system damaged and system failure causing no electricity supplies in affected areas, road network destroyed and unable to be used as evacuation route, health facilities partially or fully damaged and health care service get interrupted.

Economic Vulnerability is the susceptibility of an economic status/system (of individuals, communities, private and business sector or public) to impacts of disastersand to cushion economic shocks in the aftermath of disasters. The following describes examples of economic vulnerability:

- Poor individual/household with no saving and/or no access to financial source (such as micro-credit, borrowing, remittance, etc.) to cope with shocks during disaster
- High indebtedness with little access to external finance could lead to more pressure and constraint during and in post-disaster period
- Potential damage to businesses and industries –Manufacturing and production operation (with no backup system, or contingency plan) disrupted or completely stopped due to power failure, lack of raw materials, and interrupted supply chain, delivery of goods stopped or continued with high cost during flood, etc.
- Capacity of economic systems to cushion the impacts of disasters - Community dependent on limited income earning activities and livelihood choices is more vulnerable compared to those with diverse options.
- Income levels, GDP, domestic savings - Availability of financial reserve to boost economic activities in post-disaster will help regain development momentum; lack of financial reserve, on the other hand, creates vulnerable condition.

***Social* Vulnerability** - the most complex of the three dimensions. It is multi-faceted and cross-cutting, and can vary between individuals based on a multitude of influencing factors.

Social vulnerability is characterized as follows, among others:

- Marginalized people in social, economic or political terms are likely to suffer harm in disasters. It includes women, children, aged and people with disabilities.
- Weakness in social and organizational institutions (formal or informal) increases susceptibility of social systems to hazards. Such social tends to suffer serious loss or harm. For example, absence of organized civil network, lack of social cohesion, no volunteer spirit and public mind among social members, or social discrimination could undermine people's capacity to cope with hazard events. Due to these conditions, public awareness raising, effective risk communication, preparedness activities and precautionary measures tend to fail.
- Lack of means for self-protection among poor population- Poor households are unable to improve living conditions to withstand or reduce negative consequences of hazard such as house retrofitting or affording land in safer locations.
- Policy unfavorable to social inclusiveness and lack of people's participation will push people to more vulnerable condition.
- Social conflict could increase vulnerability, such as conflict over land use and utilization of public resources, e.g. water, forest and coastal resources. Absence of mechanisms to compromise different demands of different population groups over limited resources could intensify social vulnerability.

Box 1.4.2Vulnerability and human actions

Vulnerability can be further complicated by man's actions. Areas of environmental degradation are increasingly susceptible to landslides and mudslides at times of heavy rainfall. Socio-economic factors, especially rapid urbanization and improper land use increase community vulnerability to flood disasters. Overcrowding increases the secondary risks of such disasters, including water-borne disease such as cholera and dysentery, and exacerbates the impact of water-borne vectors such as malaria and dengue fever. Vulnerability analysis must therefore also review social and economic factors, not just proximity or direct exposure to the hazard.

(Source: OCHA. Disaster Risk Analysis. http://ocha.unog.ch/virtualotl/PRisk/Analysis.html#Vulnerability)

Key considerations on vulnerability

1. Vulnerability is a complex web of interlinked conditions and factors.
2. Vulnerability is specific to locations, sectors, stakeholders, etc.
3. Vulnerability is dynamic and changing through time.
4. Vulnerability and poverty are strongly linked, but are not the same.

As vulnerability is originated from human actions (i.e. choices people made on development activities) and shaped by transformation of society, economy and environment in particular localities, hence it could be controlled and reduced, which will help reduce disaster risk. Government, as authorized entity that guides and shapes country development, could adopt development actions (strategies, policies, plans, programs, projects) that contribute to reducing vulnerable conditions of the society such as raise basic level of human development, improve healthcare and education, increase living standard, ensure proportionate distribution of wealth, and promote environmental conservation for sustainable resources to meet people basic needs, etc.

Group Work

1. Participants are divided into 4-5 groups.
    - Each group selects one sector:
        - Mining
        - Agriculture
        - Livestock & Fishery
        - Transportation
        - Social (Education/Health)
2. Given that each sector has been impacted by following hazards:
    - Mining: Landslide
    - Agriculture : Drought
    - Livestock & Fishery : Cyclone
    - Transportation : Earthquake
    - Social (Education/Health) : Flood
3. Each group discusses and lists out possible impacts to the selected sector.
4. For each impact, each group identifies factors related to vulnerability and exposure and summarizes into sentences:
   Example: The roof of the house is blown away by strong wind during storm (impact) due to house located in storm prone location (exposure) and the roof is made of weak materials (vulnerability).

Impact	Vulnerability factor	Exposure factor

References and Supplementary Readings

1. Anderson, M.B. (1995) *Vulnerability to Disaster and Sustainable Development: A General Framework for Assessing Vulnerability.*
2. Blaikie, P. et al. (1994)*Disaster Pressure and Release Model in At Risk: Natural Hazards, People's Vulnerability and Disasters*. Routledge London, pp 21-61
3. Climate and Development Knowledge Network (2012) *Managing Climate Extremes and Disasters in the Water Sector: Lessons from the IPCC SREX Report*. www.cdkn.org/srex.
4. ESCAP & UNISDR (2012) *Reducing Vulnerability and Exposure to Disasters: The Asia-Pacific Disaster Report 2012.*
5. Global Crisis Solutions. *Understanding Vulnerability.* *http://www.globalcrisissolutions.org/libraries/understanding_vulnerability.pdf*
6. OCHA.*Disaster Response Preparedness Toolkit.* *http://ocha.unog.ch/drptoolkit/PRiskAnalysis.html#Vulnerability*
7. UNISDR (2009) *2009 UNISDR Terminologyon Disaster Risk Reduction.http://www.unisdr.org/we/inform/terminology*

Note

Session 1.5: Application of Risk Information

Session Objectives:

At the end of this session, participants will be able to:

- Have an overview of risk assessment process and outputs
- Apply risk assessment outputs in development interventions

Duration: 1 hr and 30 minutes

Training methods: Lecture, Case Study and Group Work

Risk is the potential loss suffered by a given entity (human, community, organizations, system, etc.) over a given timeframe. When discussing 'disaster risk', it's the potential loss caused by disaster. This session will explore how disaster risk could be understood better through risk assessment, which comprises identifying, assessing and evaluating risk; and how result of risk assessment could be applied in development interventions.

Risk Assessment

Risk assessment is a process to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability and exposure that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend. (adapted from UNISDR, 2009)

Risk assessment is based on the recognition ***that risk is the result of the link between hazard, exposure and vulnerability***. *The goal of risk assessment is to estimate and evaluate the possible consequences and impacts of extreme natural events on a population group and their basis for life.* This involves the impacts at the social, economic and environmental level. Hazard and vulnerability (including exposure) analysis are parts of risk analysis, and they are inseparable activities, that is vulnerability analysis is not possible without hazard analysis, and vice versa.

The outputs of risk assessment are quantifiable probabilities and the estimation of damage/loss to life, property and the environment. Based on certain criteria, risk measurement can then be summarized into categories such as severe, moderate and minor risk, though there are many other ways of categorization of risk.

The objectives of risk assessment

- to identify possible hazards and vulnerabilities of population groups to natural events
- to analyze these possible hazards and vulnerabilities, and to estimate and assess both the probability of occurrence and potential damage of such natural events
- to identify and study the possible weakness and gaps in existing protective and adaptive strategies
- to formulate the realistic recommendation to overcome weaknesses and reduce the identified and assessed disaster risks. and to agree these recommendations with those who are affected, and
- to ensure and enhance the feasibility, effectiveness and efficiency of protective measures by working from the risk analysis to balance the various interests, consider various workable measures and make possible social agreements on strategies to reduce disaster risks.

Risk Assessment Process

Methods for assessment of risk used by different agencies may differ and key steps include:

Table 1.5.1 Steps of Risk Assessment
(Adapted from UNISDR, 2004)

Identification of Risk Factors	
Hazard	**Exposure/Vulnerability(& Capacity)**
Determines characteristics geographical location, intensity, and probability of hazard	Determines susceptibilities & capacities/analyzes the consequences
Estimates level of risk	
Evaluate risks	
Socio-economic cost/benefit analysis Establishment of priorities Establishment of acceptable levels of risk Elaboration of scenarios and measure	

Hazard Assessment: to identify hazards (possible threats), their characteristics (nature and behavior), geographical coverage, and frequency of the hazards that the area is exposed to. The identification of hazards is usually the starting point for a systematic assessment of risk. (UNISDR, 2004)

This step heavily relies on collecting hazard data, knowing and accessing to reliable sources and skills to gather information.

Detailed analysis should be carried out to determine *hazard characterization* which includes origin, geographical extent, impact characteristic, level of severity, period or time of occurrence (or seasonality), and trigger events. Range of information to be collected for the analysis should include geological or geographical, hydrological and meteorological conditions through observation and investigation using geo-informatics survey technology, study of maps, field survey, satellite image, modeling, etc.

Frequency Analysis should determine a probability of occurrences and related return period. Quantitative and qualitative estimation could be adopted as methodology for the analysis. For examples, an earthquake will occur periodically at approximately same place (such as the areas located on the fault lines), and if an area has been affected by seasonal flood or monsoon annually, it has high possibility to be affected again in coming years.

The result of analysis is usually presented in the form of maps portraying the intensity and probability of hazards in a given geographical location.

Exposure Analysis: This aims at identifying what elements are at risk of the hazards in particular location. This includes demographic, social, economic and environmental condition. To quantify elements exposed to hazard, comprehensive data is required including census, statistics of sectoral data such as *physical assets* (schools, hospitals, transportation facilities, crops, agricultural lands, etc.); *environmental systems/entities* (coastal area, forest, ecological system/services, wetland, watershed, forage, gazing land, mangrove forest, etc.); and *socio-economic components* such as market system, community organization, association, supply chain, production sectors and production value, etc. This improves understanding of the *stock of elements that is prone to damage and loss caused by various hazard intensities.*

Elements of interest for exposure analysis could perhaps vary as per hazard type. For earthquake, physical assets (such as houses, buildings, roads, bridges, infrastructure, hospitals,

schools, etc) are under consideration, whereas agricultural sectors and livelihood activities could be key interest for flood and drought hazard.

Vulnerability Assessment: Vulnerability assessment is to assess vulnerable conditions or, in other words, what make the exposed elements susceptible to potential impacts of hazards. Elements at risk derived from exposure analysis should include the population, households, houses, property, crops, livelihoods, community facilities, economic activities, and even the environment, which may be damaged by the hazard. During vulnerability assessment, the elements at risk are detailed and why these can suffer damage and loss are studied. Different aspects of vulnerability should be considered (see details in session 1.4 for dimensions of vulnerability). As well, cause of vulnerability will be assessed to understand the underlying factors that contribute to such vulnerability. Capacity could also be considered as existing ability to cope with or lessen the impacts of potential hazards such as strong social ties, life skills to survive, self-help groups, community networks, institutional supports, ability to access additional resources or support, etc.

Basically, exposure and vulnerability assessment answers the questions:

- Who are at risk or can incur damage and loss?
- What are other elements at risk? (assets, physical elements, sectors, etc.)
- What damage or loss can these people or elements at risk suffer/incur? (physical damage, deaths, injuries, disruption of economic, flow of supply and products, market or business activities, social disruption, environmental impact, etc.)
- Why will these people and elements suffer or incur damage and loss?

Table 1.5.2 Major Hazard Consequences in Urban Settings

Setting	Elements at risk (EAR)	Effects on Different EARS	Characteristics of EAR that contribute to Vulnerability
Urban	People	Injured, died, starvation, trauma	Age, gender, physical health, social, economic and demographic
	Buildings (houses, others)	Partial damage/full damage	Construction materials, design, location, height
	Infrastructure (roads, bridges, telecommunications, electricity)	Partial damage/full damage	Size, height/depth, design, materials, level of exposure
	Industry	Damage to building, products, raw materials, machinery (labor, management)	Size, type of products, type of raw materials

Consequences analysis: Range of vulnerable factors (physical, social, economic, environmental, etc.) and impacts to potential hazard will be analyzed under different circumstances (varying intensity of hazard, different exposure levels, and characteristic and extent of vulnerable conditions) *to determine possible consequences (negative/positive impacts), their likelihood (high to low probability with regards to occurrence and extent of impact), and other attributes of the risk* (seasonal-specific risk or certain vulnerable household/population determined).

Consequences can be expressed in terms of tangible impacts - the cost of impacts measurable in monetary term, calculated based on market values; and intangible impacts -costs of natural hazards which are not, or at least not easily measurable in monetary terms such as casualties, health, effects or damage to ecological systems. The evaluation of the effectiveness of

prevailing and alternative coping capacities in respect to likely risk scenarios should also be assessed.

Risk Estimation: This involves the assimilation of the results of the hazard, exposure and vulnerability assessment and consequences analysis to derive an overall measurement of risk. (based on risk equation: Risk = Hazard x Exposure x Vulnerability) In this step, risk values are combined to develop tools that provide information of probability and intensity of occurrence such as risk maps and risk zone maps. These tools can be used for development purposes such as land use planning, site selection and project design for urban development.

Figure 1.5.1 Flood Hazard Map
Source: UNDP (2010)

Each color of flood inundation area represents different levels of flood depth

Color	Flood Depth
Dark Green	Less than 0.3 meter
Light Green	Between 0.3 and 1.0 meter
Light Blue	Between 1.0 and 2.0 meters
Dark Blue	More than 2.0 meters

The outcomes of risk assessment depict *the expected hazard intensity* associated with a fixed time horizon (for example, 100-year, 50-year, 20-year return period, etc.), *the elements at risk* from the potential hazard impacts and *the likely consequence from the interaction of hazard, exposure, and vulnerability.* The maps spatially highlight areas within a study region that will be prone to future disasters.

Each agency may employ or develop different risk assessment methods for their specific purposes. However, steps of risk assessment will be more or less the same as discussed above. The top-down *quantitative approach* driven by hard data and scientific information could be complemented by participatory approach to seek a more *qualitative and in-depth analysis* of vulnerability, consequences and people's perception of risk. Ideally both should be undertaken to validate assessment results.

Risk Evaluation: This step assists in making decision, based on risk estimation, about which risks need treatment (to avoid the risk, mitigate the impacts of the risk, or transfer the risk, see details in session 1.6). Risk evaluation is the step that government, concerned agencies, communities and stakeholders make decisions on whether the risk are acceptable or needs to be treated and which risk should be prioritized.

Table 1.5.3Risk level identified using matrix of Probability and Consequence
(Individual project or agency may use different categories for probability and consequence as per specific purposes, e.g. consequence can be categorized as minor, moderate, major, disastrous, and catastrophic)

Probability / Consequences	Frequent	Probable	Occasional	Unlikely
Catastrophic	Very high	Very high	Very high	High
Critical	Very high	High	High	Medium
Moderate	High	Medium	Low	Low
Minor	Medium	Low	Low	Low

However, from the estimated levels of risk to the determination of acceptable levels of risk, a different range of value judgment is usually taken into account. Socio-economic cost/benefit analyses usually lead to the establishment of priorities that in turn help to draw levels of acceptable risk. These levels will depend largely on government, community perception, priorities, interests and capacities.

Carrying out a risk assessment requires usage of a wide range of data sets for each steps involved using a mix range of tools which depends on the scope of the project, area, population, etc. It requires technical professionals such as geologists, hydro-meteorological experts, social scientists, engineers, economists, urban planners, etc as well as representatives of affected sectors and communities.

As well, risk assessment is an ongoing process. Updating risk assessment is necessary to keep up with change of hazard characteristics, emerging of new hazards, and changes of vulnerable conditions shaped by socio-economic and environmental trend.

Application of Risk Information

Risk assessment could help decision makers/planners estimate and evaluate *the likelihood and possible impacts of hazard events* on the population group and their basis for life present in the hazard-prone location (exposure) with vulnerable attributes (vulnerability). Risk assessment could be either for a particular hazard or multiple hazards. Multi-hazard risk assessment presents comprehensive overview of risk in particular location. Risk assessment provides necessary risk information that determines designing, prioritizing and implementing of risk reduction measures.

Risk assessment information could be used extensively in development processes from formulation of national policy and plan to design and implementation of development projects. As well, the region/state and development concerned authorities at all levels could use risk information, including risk maps, to identify high and low risk areas, before making informed decision on selecting appropriate locations for development interventions and public investments and to consider adopting appropriate measures for effective treatment of the risks. This will enhance sustainable development by avoiding or minimizing potential impacts of the hazards on development interventions.

Risk Information can also improve disaster preparedness and response planning of the areas. Knowing risk level and likely consequences is crucial for determining preparedness actions as well as response and contingency planning to cope with negative effects. In context of detailed risk information, the early warning system can also be set up, reviewed and revised. Regulations and legal enforcement such as city or municipal law, building bye-laws, zoning regulations, etc. could be updated taking risk information into account.

Group Work 1

1. Participants are requested to form 4-5 Groups.
2. Report on Multi Hazard Risk Assessment in Rakhine State of Myanmar is given to each group.
3. Each group is assigned to undertake a development project in Rakhine State in different sectors: housing project, business area development project, road construction project, coastal aquaculture project, livestock project, school/health facilities project, rural livelihoods project, etc.
4. Discuss in group how risk map and information provided in the report could help in making informed decision on design of the project.
5. Presentation

References and Supplementary Readings

1. ADPC (2013) *Handbook 4th Regional Training Course on Mainstreaming Disaster Risk Reduction into Development.*
2. GTZ (2004) *Guidelines Risk Analysis – a Basis for Disaster Risk Management*http://www.gtz.de/de/dokumente/en-riskanalysis-chs1-6.pdf
3. UNDP (2010) *Multi Hazard Risk Assessment in Rakhine State of Myanmar.*
4. UNISDR (2009)*2009 UNISDR Terminology on Disaster Risk Reduction.* http://www.unisdr.org/we/inform/terminology
5. UNISDR (2004) *Living with Risk: A global review of disaster reductions initiatives.* http://helid.digicollection.org/en/d/Js2653e/6.3.html

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Session 1.6: Measures to Address Disaster Risk

Session Objectives:

At the end of this session, participants will be able to:

- Understand various measures that could be adopted for addressing risk: measures *to reduce risk* and *to manage residual risk*
- Appreciate key consideration in selection and application of the measures

Duration: 1 hr and 30 minutes

Training methods: Lecture and Group Work

Once disaster risk has been assessed, as a next step, measures to treat the risk (the solution) will be identified. Key considerations involved in the decision includes whether the risk should be completely avoided, mitigated, or managed (in case residual risk remains), and how it should be treated (in other words, what are the measures or combination of various measures to be adopted for risk treatment).

Addressing Disaster Risk

When risk is identified by adopting risk assessment methods to assess hazard, exposure, vulnerability and likely consequences or negative impacts (see details in session 1.5), decision will be made by concerned authorities, agencies, communities and stakeholders on whether the risk should be treated, and how it can be done.

Figure 1.6.1 Addressing risk
(Source: Climate and Development Knowledge Network, 2012)

Risk could be addressed by:

- *actions to avoid the risk* – This would include not allowing the element that could be at risk to be located in the area of potential hazard such as relocation of power plant from tsunami-prone coastal areas to in-land location.
- *actions to reduce* or mitigate the risk – This would include taking actions that would:
    - reduce the likelihood such as construction of dam, dyke or levee to reduce occurrence of flood
    - reduce the consequences or negative impacts of the hazard by reducing exposure and vulnerabilities to ensure that population, assets, structures, or other subjects are able to withstand such impacts and protected, such as earthquake resistant retrofitting techniques and land use planning
- *actions to manage residual risk and uncertainties:* This entails:
    - preparedness to help people to avoid impending disaster threats and to put the plans, resources, and mechanisms in place to ensure that those who are affected receive adequate assistance. Preparedness has three main elements 1) forecasting events and issue warnings, 2) taking precautionary measures in response to warnings, 3) improving response by organizing and strengthening capacity to delivery timely and effective rescue, relief and assistance. (Twigg, 2004)

- sharing or transferring impacts to other parties, contingency and risk transfer. This would entail shifting the risk-bearing responsibility to another party.
- adaptive learning and management and flexible decision making systems to enhance adaptive capacity to cope with uncertainty and make alternative options available.

Box 1.6.1Residual risk
The risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.
Comment: The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery together with socio-economic policies such as safety nets and risk transfer mechanisms. (UNISDR, 2009)

Risk Reduction Measures

Ranges of measures could be applied for risk reduction[9]including structural man-made measures, non-structure measures and ecosystem-based measures. ***Structural measures*** could be engineering works (bridges, protective dykes, and embankments), retrofitting, and hazard-resistant construction materials. ***Non-structural measures*** could be hazard resilient building codes, risk sensitive land-use planning, relocation, risk assessment, legislation, strengthening institutions and organizations. Ecosystem-based measures, which can be structural or non-structural, include coastal wind breaks or shelter belts, mangrove forestation, and environmental management. More examples of risk mitigation measures are:

Structural measures
- Engineering works such as protective dykes, embankments, levee, dam, reservoir
- Safe building design and construction with earthquake/cyclone resistant elements, structures with elevated floor above flood level, etc.
- Retrofitting
- Water way and drainage system
- Check-dam to reduce flood velocity
- Coastal wind breaks or shelter belts by planting standing crops (such as coconut trees) along the beach or mangroves reforestation (ecosystem-based)
- Vetiver grass with deep root system to retain soil particles and reduce soil erosion (ecosystem-based)
- Diversifying vegetation to stabilize slope and reduce soil erosion and landslide (ecosystem-based)
- Mountain forest preservation to reduce landslides (ecosystem-based)

Non-Structural measures
- Urban planning
- Density control to reduce population and infrastructure density in seismic prone locations
- Land use planning and zoning
- Relocation
- Legislation and enforcement such as building code, restrictions for land use
- Strengthening institutions and organizations
- Strengthening community health

[9]Disaster Risk Reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. (UNISDR, 2009)

- Nutrition improvement and food security
- Literacy program
- Livelihood diversification
- Farming practices such as opt to low water consumption crops in drought prone areas, adjust cultivation period according to onset of monsoon season

Box 1.6.2 Local Wisdom applied for Flood Risk Reduction in Myanmar
The traditional technique to prevent the earthen dyke collapsing, called "Yaing Khway", is made by using locally available natural resources, such as bamboo or mangrove poles, bamboo matting and sand, and it controls the flow of water through a hole in the dyke by keeping the water inside a ring of bamboo matting and sand. This technique functions as natural infrastructure to reduce vulnerability to floods, using the available ecosystem services. The technique prevented flooding during the monsoon season of 2004 in the Hinthada District of Ayeyawady Division, saving 5 million people and 500,000 acres of farmland from the ravages of flooding.
(Source: ADRC, 2008)

Measures for managing residual risk and uncertainties

Preparedness and risk transfer are the measures to manage the residual risk and uncertainties. The ***preparedness*** measures include the knowledge and capacities developed by governments, professional, response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions (UNISDR, 2009).

Example: Preparedness measures
- Setting up systems for early warning
- Risk communication and public awareness
- Evacuation drill and simulation exercises
- Establishing evacuation center
- Stockpile of supplies and logistics
- Contingency planning and emergency plans
- Hospital preparedness for emergency
- Training on search and rescue
- Training on emergency operations center management
- Strengthening coordination and institutional arrangements

Risk transfer is the process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party. Insurance is a well-known form of risk transfer[7] (UNISDR,2009). Other examples of risk transfer or risk sharing are micro-saving, micro-credit, micro-finance, and reserve funds.

The measures to reduce risk and manage residual risk and uncertainties could be done at different levels including household level, village level, township, district, regions/state and national level. However, one measure or the other is not sufficient. Hence both risk reduction

[7]Insurance is a well-known form of risk transfer, where coverage of a risk is obtained from an insurer in exchange for ongoing premiums paid to the insurer. Risk transfer can occur informally within family and community networks where there are reciprocal expectations of mutual aid by means of gifts or credit, as well as formally where governments, insurers, multi-lateral banks and other large risk-bearing entities establish mechanisms to help cope with losses in major events. Such mechanisms include insurance and re-insurance contracts, catastrophe bonds, contingent credit facilities and reserve funds, where the costs are covered by premiums, investor contributions, interest rates and past savings, respectively. (UNISDR, 2009)

as well as residual risk management is important and combination of various measures could be undertaken to complement each other.

Group Work

1. Participants form groups of 6-8 members.
2. Each group will be provided list of projects indicated in the MAPDRR (National DRR action plan).
3. Each group identifies projects that contribute to:
   - Reduce risk:
     - Reduce vulnerability (or increase capacity)
     - Reduce exposure
     - Reduce hydro-meteorological hazards
   - Manage residual risks and uncertainties:
     - Transfer or share risk
     - Preparedness measures for response and recovery
   - Each group makes presentation.

References and Supplementary Readings

1. ADRC (2008) *Total Disaster Risk Management Good Practices.* http://www.preventionweb.net/files/9052_TDRM08.pdf
2. IPCC (2012)*Summary for Policymakers. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.* A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 1-19.
3. OECD. *Chapter 17 Policy Options for Disaster Risk Financing and Transfer and Issues in Quantification of Disaster Losses and Exposures: An OECD Perspective.*
4. Twigg, John (2004) *Good Practice Review: Disaster risk reduction: Mitigation and preparedness in development and emergency programming. UN/ISDR (2009) 2009 UNISDR Terminology on Disaster Risk Reductionhttp://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf*
5. UNISDR (2009) *2009 UNISDR Terminology on Disaster Risk Reduction.* http://www.unisdr.org/we/inform/terminology
6. UNISDR (2011) *GAR 2011: Insurance-related for Disaster Risk Reduction.* http://www.preventionweb.net/english/hyogo/gar/2011/en/bgdocs/Suarez_&_Linnerooth-Bayer_2011.pdf

Note

Module 2 : Mainstreaming Disaster and Climate Risk Management into Development Planning

အခန်း ၂ - ဖွံ့ဖြိုးရေးစီမံကိန်းများတွင် ဘေးအန္တရာယ်နှင့် ရာသီဥတုကြောင့် ဆုံးရှုံးနိုင်ခြေ စီမံခန့်ခွဲမှုကို ထည့်သွင်းပေါင်းစပ်ဆောင်ရွက်ခြင်း

Session 2.1: Overview of Development Planning Process in Myanmar

Session Objectives:

At the end of this session, participants will have better understanding of:

- An overview of planning process in Myanmar

Duration: 1 hr and 30 minutes

Training methods: Lecture and Group Work

Government guides and shapes development agenda and actions to achieve country endeavors. Government and the authorized entities (ministries, departments, region/stage government, etc.), by legislative power, formulates public policy and plans (socio-economic development plan, investment plan, sectoral plan, etc.), and make decision to do or not to do something, with specific to development goals. This will then be adopted at the operational level and translated into actions. The development planning processes, hence is the mechanism thatset goals, objectives, and directs the implementations to materialize development targets.

As discussed in module 1, development and disaster has intricate linkages. Disaster risk is not natural phenomena, but the interactions of natural hazard (as trigger event) and the vulnerable conditions of exposed elements. While natural hazard is somewhat beyond human control, development, which is primarily human interventions, could significantly reduce exposure and vulnerability; and hence minimize the adverse impacts of the hazards. Within the development processes, the responsible agencies at all levels are the key actor to plan and implement safer development practices with integrated disaster and climate risk considerations. Hence, it's important to clearly understand how development actions are derived from (i.e. steps involved in development planning processes) so as to further identify the appropriate areas or entry points where risk issues could be made part of it.

Overview of Myanmar legal provisions pertaining to development

The Republic of the Union of Myanmar has 14 Regions and States which include Kachin State, Kayah State, Kayin State, Chin State, Sagaing Region, Tanintharyi Region, Bago Region, Magway Region, Mandalay Region, Mon State, Rakhine State, Yangon Region, Shan State and Ayeyarwady Region. There are also 6 Self-Administered Division and Zones namely, Naga Self-Administered Zone, Danu Self-Administered Zone, Pa-O Self-Administered Zone, Pa Laung Self-Administered Zone, Kokang Self-Administered Zone, and Wa Self-Administered Division.

The Union Government is the supreme authority that has overall control of development agenda including policy formulation, national plans, and budgeting. State Government and region/state Hluttaw are authorized agency for the same at region level. ***There are planning related sessions mentioned under different sub-heading in the Constitution as follow:***

Under the sub-heading of Submission of the Union Budget Bill

Session 100 (b)

Bills relating to **national plans, annual budgets and taxation**, which are to be submitted exclusively by the Union Government shall be discussed and resolved at the Pyidaungsu Hluttaw in accord with the prescribed procedures.

Under the sub-title of Submission of Bill
Session 190 (b)
Bills relating to **regional plans, annual budgets and taxation** of the Region or State, which are to be submitted exclusively by the Region or State government, shall be submitted to the Region or State Hluttaw in accord with the prescribed procedures.

Under the sub-title of Executive Power of the Union Government
Session 220
The Union Government shall promulgate its policies in accord with the provisions of the Constitution. The necessary projects have to be drawn in accord with the said policies and shall be implemented with the approval of the Pyidaungsu Hluttaw.

Under the sub-tile of Executive Power of the Regional or Sate Government
Session 251
The Region or State Government shall, subject to the policies adopted by the Union Government and Union Laws, implement projects that are to be undertaken in the Region or State with the approval of the Region or State Hluttaw concerned.

Development Planning Processes of Myanmar

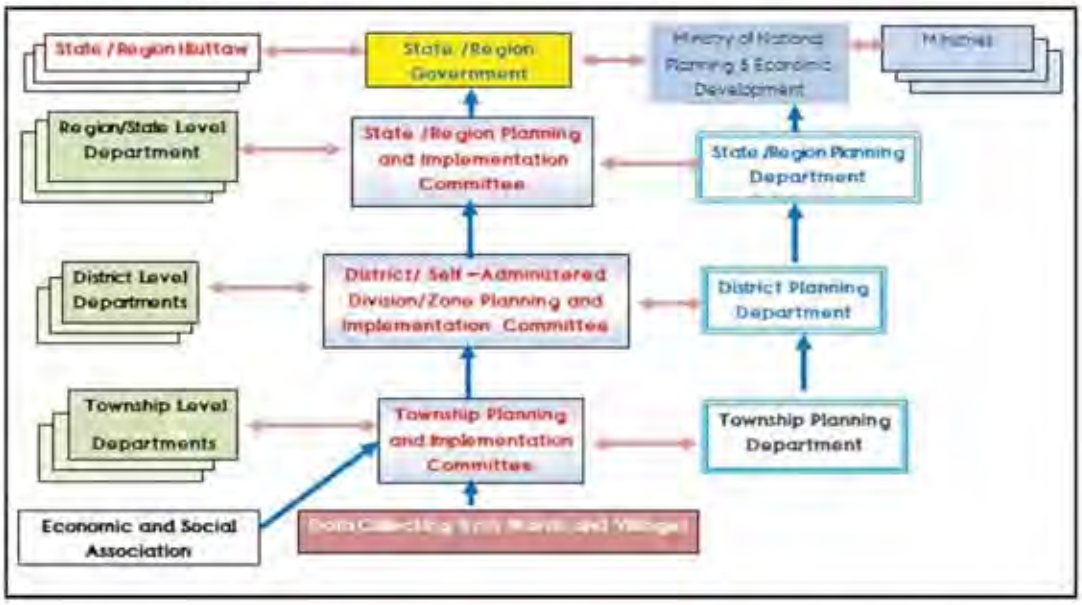
Development planning is a continuous cyclical process of analyzing the context, setting objectives, formulating, adopting and implementing the plan, and evaluating the implementation. The evaluation will form the context of the next planning cycle.

Figure 2.1.1 Overview of Development Planning Process

Development planning process entails broad steps as shown in figure 2.1.2. Each stage is responsible by authorized agencies, appointed committee(s), and/or specialized working group(s) on specific issues, who will perform range of tasks to complete the process within the given timelines.

In Myanmar, *the Ministry of National Planning and Economic Development* is the nodal agency for formulating the national plans within the policy framework, evaluating the implementation of the plans, and submitting sound suggestion to the government. One of the major functions of Planning Department (PD), of the Ministry of National Planning and Economic Development, is to formulate long term, short term, and annual development plans for national level (by sector), ministerial level, state/regional level (by sector), district level, and township level by coordinating and cooperating with the respective ministries and regional authorities. When formulating the sector plan, it has to look into 14 sectors namely Agriculture, Livestock and Fishery, Forestry and Environmental Conservation, Energy, Mining, Processing and Manufacturing, Electric Power, Construction, Transport, Communications, Trade, Investment and Finance, Social and Administrative Sector, and Services sector.

Figure 2.1.2 Planning agencies at different administrative levels of Myanmar



The data are collected from wards and villages and also from Economic and Social association at ward/village level. The data collected will be used to assess current situation, changing development context, development achievements and challenges. The assessment will help in identifying problems and establishing convincing argument for development agendas and actions for the next round of planning process.

The collected data are sent to Township Planning and Implementation Committee where the discussion and coordination are taken place with township level departments and Township Planning Department. After that, the collected data are sent to District/Self-Administered Division/Zone Planning and Implementation Committee. The discussion and coordination among the Committee, the other departments and Planning Department at District/Self-Administered Division/Zone level are also taken place.

The compiled data are again sent to State/Region Planning and Implementation Committee.There are discussion and coordination among the State/Region level departments and Planning Department at the same level. After the data confirmation through these steps, the plans are submitted to the State/Region Government where there will be discussion and coordination with the Ministry of National Planning and Economic Development and other ministries and State/Region Hluttaw Session. Finally the plan is submitted to the Union Government and discussion will be taken place both in Planning Commission and in the Pyidaungsu Hluttaw, before the final approval. Once being effective, the plan will be adopted by concerned government agencies for implementation.

Key Development Plans of Myanmar

The key development plans of Myanmar include Myanmar National Comprehensive Development Plan (NCDP), Regional/State Plans, Sector Plan (such as Industrial Development Plan, Education Plan, Agricultural Plan, etc.), Investment Plan, Monetary and Financial Development Plan, Human Resources Development Plan, Rural Development and Poverty Reduction Plan, and Town/Village Development Plan.

Figure 2.1.3 Key Development Plans of Myanmar

Myanmar National Comprehensive Development Plan (NCDP): A Twenty-Year Development Perspective (2011-2030)

The plan establishes national development visions to guide social and economic development of Myanmar over 20 years. The plan outlines long term goals and country endeavors for progression. It is adopted as master blueprint that other plans will align to.

Vision

- To build a modern industrial country by developing the agricultural sector and to have the comprehensive development of the country
- To have the equal development both in the Regions and States
- To have the accurate statistics
- To reduce the differences between the rich and the poor
- To upgrade the living standard of the people
- To evolve the clean government and good governance

NCDP goals for people-centred development

1. To improve the living standard of entire population
2. To increase per capita GDP
3. To promote public utilities and social sector development such as transportation, water and sanitation, electric power, education , health and social security, etc
4. To create job opportunities
5. To conserve natural resources
6. To achieve MDGs and other human development objectives by 2015 and full implementation of economic integration with ASEAN in accordance with its AEC 2015 schedules

Regional Development Plans

Planning and Implementation Committees have been formed at region/state, district and township levels to help formulate the regional development plan. The regional planning starts with the collection of data from village/ward through bottom-up approachup to district, regions/states and Union level step by step. Please refer to the figure 2.1.2.

The Regional Plan includes four chapters namely, title and definition, aims, planned targets, policies, objectives and programs of all 14 sectors.

Sector Development Plans

In Myanmar, there are 14 development sectors which include agriculture, livestock and fishery, forestry and environmental conservation, energy, mining, processing and manufacturing, electric power, construction, transport, communications, trade, investment and finance, social and administrative sector, and services sector.

In sector plan, the goals, objectives and planned activities of respective sector will be described in detail. Sector plan lays out sector-specific scope of actions that contribute to achieving national aspiration as articulated in national socio-economic policies and plans. The

Ministry of National Planning and Economic Development is central agency responsible for assessing, supervising and evaluating the projects and the budget used.

Planning Process for Sector Development Plan

1. Collecting the objectives of the allocated projects as per the potential of the regions from the responsible sector Union Ministries for state own sector
2. Collecting the objectives of projects per sector undertaken by the Ministry of Cooperative and other agencies for co-operative own sector,
3. Collecting the data on the registered businesses at Development Affairs Committee, Internal Revenue Department, General Administration Department at township level, and field survey to the village/ward Administrators on the businesses which applied for the registration for private own sector
4. Collecting the confirmation on the project objectives per region and the status on monthly, quarterly and annual implementation through Township Planning and Implementation Committee, District Planning and Implementation Committee and Region/State Planning and Implementation Committee
5. Sector-wise and region-wise ownership are categorized into 3 groups (state own, cooperative own and private own) and separate calculation on the values of production/services by constant prices and current prices have been carried out.

Institutional set up for Development Planning at different levels

Planning Commission

The government has a well-established institutional set up for the development planning in Myanmar. The highest institution is *the Planning Commission*, which is the key mechanism for policy level decision making on national policy formulation and developing of national plans. The Planning Commission is chaired by the President along with the Vice-Presidents as Vice Chairpersons. The members of the Planning Commission are the Union Attorney-General, Union Auditor-General, Union Ministers, the Chief Ministers of the Regions and States, and the Chairman of Nay Pyi Taw Council while the Union Minister for National Planning and Economic Development acts as the Secretary of the Commission.

To support the Planning Commission, working groups or special task forces of academia, professionals, experts, stakeholders, etc. on particular development agenda could be formed for detailed study on wider ranges of related issues, implications, comparative benefit and/or negative consequences. Recommendation based on this will be provided to the decision making level for consideration on finalization of the plans.

Planning and Implementation Committees

Inter-agency Planning Committees are appointed to take responsibility on planning processes at various levels. In April, 2012, the Planning and Implementation Committees are instituted at different administrative levels, namely Township Planning and Implementation Committees, District Planning and Implementation Committees and Regions/States Planning and Implementation Committees. The Planning and Implementation Committees are chaired by the respective Administrators and the Planning Officers act as the secretary. The composition of Township and District Planning and Implementation Committee are as follows:

Institutional Set up for Township Planning and Implementation Committee

1.	Township Administrator (General Administrative Department)	Chairman
2.	Representative from Agricultural Department	Member
3.	Representative from Livestock and Fishery Department	Member
4.	Representative from Environmental Conservation and Forestry	Member

	Department	
5.	Representative from Industrial and Mining Department	Member
6.	Representative from Services Sector	Member
7.	Elders of the Community	Member
8.	Representative from Economic and Social Association	Member
9.	Township Planning Officer	Secretary

Institutional Set up for District Planning and Implementation Committee

1.	District Administrator	Chairman
2.	Gov. Representative for Agriculture Sector	Member
3.	Gov. Representative for Fishery Sector	Member
4.	Gov. Representative for Forestry Sector	Member
5.	Gov. Representative for Industry and Mining Sector	Member
6.	Gov. Representative for Services Sector	Member
7.	Town Elders	Member
8.	Representative from Economic and Social Association	Member
9.	District Planning Officer	Secretary

Group Work

1. Participants form group of 6-8 members.

- Each group has to select one sector and discuss the planning process of the respective sector
  - Industry
  - Forestry
  - Mining
  - Construction
  - Energy
- Each group will make a short presentation

References and Supplementary Readings

1. Government of the Republic of the Union of Myanmar (2011) *Myanmar National Comprehensive Development Plan: A Twenty-Year Development Perspective (2011-2030)*

Note

Session 2.2: Overview of Disaster and Climate Risk Management in Myanmar

Session Objectives:

At the end of this session, participants will have better understanding on:

- Myanmar's global and regional commitment on Disaster and Climate Risk Management
- Institutional set up and framework on *Disaster Risk Management* in Myanmar
- Institutional set up and framework on *Climate Risk Management* in Myanmar

Duration: 1 hr and 30 minutes

Training methods: Lecture and Group Work

Disaster and climate risk is the cross-cutting issue to all development spheres be it rural development, industrial development or social well-being. Disaster and Climate Risk Management polices and plans are put in place to strengthen developmental interventions as a whole by providing frameworks that indicate set of actions towards reducing disaster and climate risk, and hence contributing to resilient development.

This session will explore fundamental concept of DRM/CRM framework and discuss DRM/CRM plans and frameworks adopted by Myanmar.

Why do we need DRM Framework?

DRM frameworks (at global, regional, and national levels) have the following commonality:

- Articulate sound and meaningful visions and goals (what is the ultimate desirable condition), which reflect commitments of responsible agencies, within specific entity and specific timeframe.
- Set direction to take and indicate what needs to be achieved to attain the vision and fulfill the commitment.
- Outline, list and define set of actions and activities (normally grouped under priority or major components) that contribute to key strategy along with guidance on how to implement it (translate the plan into actions).
- Set out roles and responsibilities of the agencies/countries. This also creates mandate of concerned agencies to undertake the expected roles and functions, institutional capacity, budgets and rules/regulations as tools to achieve the actions indentified.
- Ensure that the actions/activities to be implemented by respective authority and agencies align with the framework.
- Used as a tool to gauge whether the strategy delivers expected results upon certain period of time as indicated in the framework or at the mid-term period of the strategic timeframe, monitoring and evaluation of at what extent actions and results have achieved, whether or not the plan/framework should be revised to reflect the changing context, emerging issues or new plan could be formulated.

Myanmar's Commitments to Global and Regional DRM Frameworks

Hyogo Framework for Action

During the World Conference on Disaster Reduction in January 2005 held at Kobe, Japan, 168 countries committed to *the Hyogo Framework for Action 2005-2015*: Building the resilience of nations and communities to disasters by *achieving substantial reduction of disaster losses, in lives and in the social, economic, and environmental assets of communities and countries.*

HFA comprises 3 Strategic Goals:

- The integration of disaster risk reduction into sustainable development policies and planning
- Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards
- The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programme.

Five HFA Priorities Actions:

Priority 1 Making disaster risk reduction a priority with a strong institutional basis for implementation
Priority 2 Improving risk information and early warning
Priority 3 Building a culture of safety and resilience
Priority 4 Reducing the risks in key sectors
Priority 5 Strengthening disaster preparedness for effective response

The Hyogo Framework for Action has indicated time period up to 2015. The Post-HFA Framework (also called HFA2) would be formulated through highly consultative processes in a series of discussion, meetings, consultations with countries and stakeholders. These will help obtain and share diverse perspectives from countries to define, redefine and refine which direction DRR could take, what have been achieved so far, at what level countries' action have contributed to advance HFA, what are seen as emerging issues and what priority areas to pursue for post 2015. This will be collectively considered to finalize strategic actions and time frame. The consultation process for HFA2 has already started.
(*http://www.preventionweb.net/files/25129_posthfatimeline.pdf*)

ASEAN Agreement on Disaster Management and Emergency Response (AADMER)

AADMER is the agreement for the ASEAN member states that set regional framework ***for cooperation, coordination, technical assistance, and resource mobilization in all aspects of disaster management***.

All ten Member States of ASEAN, including Myanmar, have ratified the AADMER with Myanmar singing on the agreement in July, 2005. AADMER has entered into force on 24 December 2009. The AADMER affirms ASEAN's commitment to the Hyogo Framework for Action (HFA) and is the first legally-binding HFA-related instrument in the world.

National Disaster Risk Management Framework and other key documents

Myanmar Action Plan on Disaster Risk Reduction –MAPDRR

Recognizing the need for national framework, Relief and Resettlement Department had drafted *'Myanmar Action Plan on Disaster Risk Reduction –MAPDRR'* with technical support from the Asian Disaster Preparedness Centre (ADPC), through an inter-agency Task Force mechanism.*The MAPDRR is adopted as the National DRR Strategic Action Plan comprising 7 components and 65 sub-components.*

Component1: Policy, Institutional Arrangements and further Institutional Development
Component 2: Hazard, Vulnerability and Risk Assessment
Component 3: Multi-hazard Early Warning Systems
Component4: Preparedness and Response programs at National, State/Region, District and Township Levels
Component5: Mainstreaming of Disaster Risk Reduction into Development
Component 6: Community-based Disaster Preparedness and Risk Reduction
Component7: Public Awareness, Education and Training

Activities outlined under the seven components are on-going to achieve MAPDRR Goal - *'To make Myanmar safer and more resilient against natural hazards, thus protecting lives, livelihood and development gains'*.

The table below summarizes the goals/expected outcome, prioritized areas, and 'how to implement' as indicated in the HFA, AADMER and MAPDRR. The table doesn't cover details described in each framework, but presents certain linkages and area of aligning actions on DRR (indicated by the asterisk)

Table 2.2.1 HFA, AADMER and MAPDRR aligning actions

HFA: Hyogo Framework for Action 2005-2015 (Global)	**AADMER:** ASEAN Agreement on Disaster Management and Emergency Response (Regional)	**MAPDRR:** Myanmar Action Plan on Disaster Risk Reduction (National)
Expected Outcome: *The substantial reduction of disaster losses, in lives and in the social economic and environmental assets of communities and countries*	Objectives: *To provide effective mechanisms to achieve substantial reduction of disaster losses in lives and in the social, economic and environmental assets of the Parties, and to jointly respond to disaster emergencies through concerted national efforts and intensified regional and international cooperation (Article 2)*	Goal: *To make Myanmar safer and more resilient against natural hazards, thus protecting lives, livelihood and development gains*
5 Priorities for Action Priority 1 Making disaster risk reduction a priority with a strong institutional basis for implementation* Priority 2 Improving risk information and early warning** Priority 3 Building a culture of safety and resilience*** Priority 4 Reducing the risks in key sectors**** Priority 5 Strengthening disaster preparedness for effective response*****	**36 Articles** Article 3 Outreach and mainstreaming**** Article 5 Disaster risk identification, risk Assessment, early warning and monitoring** Article 6 Prevention and Mitigation**** Article 7 Early Warning Article 8 Preparedness and emergency response***** Article 9 ASEAN Standby arrangements for disaster relief and emergency response***** Article 17 Rehabilitation Article 18 Training, technical cooperation	**7 Components** Component 1: Policy, Institutional arrangements and further Institutional Development* Component 2: Hazard, Vulnerability and Risk Assessment** Component 3: Multi-hazard Early Warning Systems** Component4: Preparedness and Response programs at National, State/Region, District and Township levels ***** Component5: Mainstreaming of Disaster Risk Reduction into

Cross Cutting Issues Multi-hazard approach, gender perspective and cultural diversity, community and volunteers participation, capacity building & technology transfer	& knowledge management systems***	Development**** Component 6: Community based Disaster Preparedness and Risk Reduction***** Component 7: Public awareness, Education and Training***
Implementation Identify Actors to ensure implementation and follow-up including States, Regional and International organizations, in collaboration with civil society and other stakeholders	**Implementation** Article 21-30 Regional/institution arrangement for operationalization and protocol	**Implementation** 65 Sub-components (specific activities) detailed out with activities, expected outcome, duration, lead agencies, and level of priority (high, mid, low)

Standing Order (2009)

Standing order is the legal document that determines specific actions and functions of concerned agencies to follow to ensure preparedness in the face of unexpected natural disasters in order to minimize losses. Based on Cyclone Nargis experience, National Disaster Preparedness Central Committee has released *'Standing Order for Natural Disaster Management in Myanmar (2009) with the aim of ensuring that once disaster strikes, emergency relief and rehabilitation work is carried out according to the prepared plan and that the people are mobilized at the national level for participation in such efforts.*

The Standing Order identifies national level institutions and other sub-national committees and their functions for preparedness and response, and precisely indicates assigned roles/responsibilities/tasks to be carried out by respective authorities for the pre, while and post disaster to ensure effective and timely operationalization of the emergency plan.

Hazard Profile of Myanmar

Hazard Profile of Myanmar describes nine key prevailing hazards in Myanmar, namely Cyclones, Drought/Dry Zones, Earthquake, Forest Fires, Floods, Fires, Landslides, Storm Surges and Tsunami. The information was drawn mainly from existing disaster data, studies and research on characteristics and frequency of occurrence, causes, impacts, geographical distribution and suggested areas for further study.

Multi-hazard Risk Assessment in Nargis Affected Areas

This document provides comprehensive information of multi-hazard risk assessment in Nargis affected areas. The Assessment focuses on the Ayeyarwady delta region including Yangon and Bago Regions of Myanmar. It identifies the key physical, socio-economic and economic elements at risk, strategically assesses the vulnerabilities of these elements and provides recommendation based on the assessment results.

Multi-hazard Risk Assessment in Rakhine State

The document attempts to form understanding on the vulnerability of communities to various natural hazards and provides comprehensive picture of the impact of natural hazards as well as the determined degree of future hazardous events. Incorporating risk assessment into national planning and development process as well as development project and program design is among key recommended action towards sustainable development. Promoting use of the document among disaster risk management practitioners and development planners at all levels will help in making informed decision on risk-sensitive development; for example, committees under the leadership of the Ministry of Construction could use the assessment report in describing the standards and the codes of practices during the reviewing process of existing laws and regulations related to buildings.

Institutional Framework for Disaster Risk Management in Myanmar

Myanmar has multi-layered institutional arrangements for disaster management from National to Village Tract levels. National Natural Disaster Preparedness Central Committee (NDPCC), under the chairmanship of Vice President(2), is the apex body. National Natural Disaster Preparedness Management Work Committee and 10 Sub-committees have been constituted under NDPCC. Ministries and departments have been involved, in varying degree, in disaster management activities. Department of Meteorology and Hydrology is the nodal department for warning related to all disasters except fire which is mandate of the Fire Services Department. Relief and Resettlement Department undertakes relief distribution and organizes Disaster Management Courses. It is also a focal point for ASEAN Committee on Disaster Management (ACDM) for Myanmar. Other key ministries involved in disaster management are Ministry of Agriculture and Irrigation, Ministry of Education, Ministry of Health, etc.

Constitution of National Natural Disaster Preparedness Central Committee

On May 14, 2013, **National Natural Disaster Preparedness Central Committee** was constituted by **Notification. No 45/2013** from the Office of the President, with the chairmanship by the Vice President (2) and the Deputy Chairpersons are Minister for Home Affairs and Minister for Social Welfare, Relief and Resettlement. The Deputy Minister for Social Welfare, Relief and Resettlement is the Secretary and the Director General of Union Government Office is the Joint-secretary with the membership of other sixteen Union Ministers from line Ministries and Chief Ministers of all Regions and States.

Duties and Responsibilities of National Natural Disaster Preparedness Central Committee

The NDPCC is the supreme agency for strategic guidance, decision making, plan formulation and oversees monitoring and supervision of Disaster Risk Management in Myanmar. NDPCC is responsible for forming committees needed for implementation of the work procedures of the central committee, to outline polices on important tasks among various stages of works and to give necessary guidelines after reviewing the work progress, laying out of policies and directives for the use of domestic forces in the face of natural disaster as necessary, formulation of basic principles of coordination for the decisions that calls for international assistance, distribution of state funds and state resources to places which are in need of help, and issuing orders and directives, if necessary, in the aftermath of natural disaster in order to

perform relief and management works without having any difficulties and obstacles, to avoid malpractices on relief supplies and to ensure the rule of law, community peace and tranquility.

For the effective disaster management mechanism, National Natural Disaster Preparedness Management Work Committee and (10) sub-Committees have been organized.

National Natural Disaster Preparedness Management Work Committee

The 10-member Management Work Committee under the chairmanship of Union Minister for Social Welfare, Relief and Resettlement is constituted to supervise the implementation of disaster management activities in accordance with guidelines of NDPCC and also to coordinate the activities of NDPCC. The Deputy Minister for Home Affairs and Deputy Minister for Social Welfare, Relief and Resettlement are Vice Chairmen and the Director General, Relief and Resettlement Department and the Director General, General Administration Department are Secretary and Joint-Secretary of the committee respectively.

The 10 sub-committees to support operationalization under the NDPCC are Information Sub-committee, Hotline Sub-committee, Search and Rescue Sub-committee, Collecting of preliminary damages news and emergency aids Sub-committee, Confirmation of damages and losses Sub-committee, Transport and Route Clearance Sub-committee, Disaster Risk Reduction and building of emergency tents Sub-committee, Health Care Sub-committee, Rehabilitation Sub-committee, and Security Sub-committee.

Relief and Resettlement Department is the department for Disaster Management in Myanmar. Under the Ministry of Social Welfare, Relief and Resettlement (MSWRR), Relief and Resettlement Department (RRD) works together with Social Welfare Department with the aims to support relief assistance to disaster affected people and to reduce loss of human lives and property by disaster impact.

Besides RRD, there are key government agencies with mandates relevant to disaster risk management who have led, coordinated, complemented or supported various disaster management activities. This includes *General Administration Department* under Ministry of Home Affairs, which is involved in identifying the location of relief camps, arrangement for disaster management training, dissemination of early warning to grass-root level at district and township levels; and *Department of Public Works*, under the Ministry of Construction, which is responsible for the construction of hillocks, storm-shelters and renovation of roads and bridges, which are important part of mitigation and preparedness activities.

Global Framework on Climate Change

Anthropogenic cause is considered as significant cause of today global warming. Most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic GHG concentrations.[8] With the tendency of increasing meteorological hazard with influence of climate change, global community has called for proactive actions in response to climate risk. The UNFCCC highlights two fundamental strategies to address climate change: [9]

- *Mitigation: to mitigate climate risk by controlling GHG emission from human activities* such as cut down energy consumption and reduce green house gas emission in transportation, industry, and residential use, develop technology for alternative energy such as wind power, solar power, etc) and

[8] IPCC, 2007 Synthesis Report http://www.ipcc.ch/publications_and_data/ar4/syr/en/spms2.html

[9] Adaptation and Mitigation http://know.climateofconcern.org/

- Adaptation: to *enhance adaptive capacity to cope with climate extreme events and uncertainty, i.e. promoting ability of natural or human system to adjust to climate change, to moderate potential damage, and take advantage of opportunities or cope with the consequences.*

DRM and CRM overlap a great deal through the common factor of weather and climate, and the similar tools used to monitor, analyze and address adverse consequences. As well, actions that reduce impacts of climate change will contribute to reduce disaster risk. The prevailing CRM Frameworks are described as follow:

United Nations Framework Convention on Climate Change (UNFCCC)
It is an international environmental treaty established in 1992 at the Earth Summit in Rio de Janeiro. *The objective of the UNFCCC is to stabilise greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system.* The UNFCCC is not legally binding and it has no enforcement mechanisms. It instead provides updates (or 'protocols') which set mandatory emission limits.

Kyoto Protocol
It is a protocol within the UNFCCC. Under the Kyoto Protocol, *37 countries committed themselves to reducing greenhouse gas (GHG) emissions.* Countries collectively agreed to reduce GHG emissions for the period 2008-2012. The protocol incorporates some flexible mechanisms, such as emissions trading, the clean development mechanism (CDM) and joint implementation to allow countries to realistically meet GHG emission limitations.

Regional Framework on Climate Change

ASEAN Multi-Sectoral Framework on Climate Change (AFCC)
It is an integrated framework (finalised in 2009) to facilitate ASEAN to respond to climate change threats and food security. The AFCC has a cross-sectoral approach for effective policy-making and implementation. It provides an arena for ASEAN to coordinate the support it receives. The AFCC aims to minimise the risk and impacts of climate change to contribute to food security through sustainable, efficient and effective use of land, forest, and water resources.

National Framework on Climate Change

In Myanmar, *Department of Meteorology and Hydrology of Ministry of Transport* is the lead department in Climate Change Adaptation. The Climate Information Center has been established at the office of the Academy of Forest Science in Yangon where the information materials covering technical, educational, legal, financial and institutional aspects in environmental conservation and climate change can be accessible to the public.

National Environment Policy
The Policy was adopted by the Government in 1994 to establish sound environmental policies for regulating the utilization of water, land, forests, mineral, marine, and other natural resources. The overarching objective of the policy is to achieve harmony and balance between Myanmar's people, cultural heritage, environment, and natural resources. ***The policy works towards sustainable development in Myanmar by prioritizing environmental protection within economic development.*** *One of the basic principles under the policy focuses on climate change.* This section indicates that economic sectors should be climate-adaptive and resilient to secure national economic growth. The policy forms the basis for developing environmental strategies, plans and programmes, which provide sound legislative basis to ensure that

environmental concerns are integrated into development planning to support sustainable development.

Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change

The government of Myanmar has drafted Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change. The concept of NAPAs emerged from multilateral discussion on adaptation within the UN Framework Convention on Climate Change (UNFCCC). The overarching goal of Myanmar's NAPA is *'To identify and communicate immediate and urgent adaptation needs (Priority Adaptation Projects) for implementation in Myanmar that will assist the country adapt to climate change impacts by enhancing resilience of vulnerable communities'.*

The objectives of the NAPA are to:

i) Communicate observed and projected climate change impacts in Myanmar;
ii) Prioritize adaptation projects for eight main sectors/themes, namely Agriculture, Early Warning Systems, Forest, Public Health, Water Resources, Coastal Zone, Energy and Industry, and Biodiversity;
iii) Assist Myanmar in achieving its national development goals and strategies, including the Myanmar Agenda 21, the National Sustainable Development Strategy (2009), and the Millennium Development Goals; and
iv) Communicate NAPA Priority Adaptation Projects for implementation in Myanmar for addressing immediate climate change adaptation needs and thereby building the climate change resilience of vulnerable communities.

It also includes 32 Priority Adaptation Projects for implementation in the country for eight main socio-economic sectors or themes mentioned above. The Priority Adaption Projects identified in the NAPA target at areas where communities are considered most vulnerable to climate change. Priority Projects have been identified using existing research on the impact of climate change as well as in-country Participatory Rural Appraisal (PRA). The NAPA target audience includes individuals in government institutions, International Agencies, NGOs and the private sector.

References and Supplementary Readings

1. ASEAN AADMER Work Programme
http://www.preventionweb.net/files/globalplatform/entry_presentation~aadmer2011.pdf
2. ASEAN Regional Cooperation on Disaster Management. PPt. Slide.
http://www.theecentre.net/resources/workshop/materials/349/ ASEAN%20AADMER%20AHA.pdf
3. GTZ (2009) *Climate Change Information for Effective Adaptation: A Practitioners' Manual.*
4. Jessica Mercer. Journal of International Development. J. Int. Dev. 22, 247-264 (2010) Policy Arena: Disaster Risk Reduction or Climate Change Adaptation: Are we reinventing the wheel?
http://web.mit.edu/jcarmin/Public/For%20Nina/Mercer-DRR-CC-Reinventing%20the%20Wheel.pdf
5. Tackling Climate Change: Mitigation and Adaptation. http://www.unep.org/publications/ebooks/kick-the habit/ Default.aspx? bid=ID0EWHAC
6. Towards a new post -2015 framework for Disaster Risk Reduction: Building the Resilience of Nations and Communities to Disasters. http://www.preventionweb.net/posthfa/about
7. UNISDR. *Climate Change Adaptation and Disaster Risk Reduction Institutional and Policy Landscape in Asia and Pacific.*
http://www.unisdr.org/files/17250_t0236000045500climatechangeadaptatl.pdf

8. UNISDR. *Hyogo Framework for Action*
http://www.preventionweb.net/files/8720_summaryHFP20052015.pdf

Note

Session 2.3: Framework for Mainstreaming DRM/CRM into Development

Session Objectives:

At the end of this session, the participants will be able to:

- Understand the concept, approach and comparative advantage of mainstreaming DRM/CRM into development
- Discuss broad aspect of development planning framework and identify entry points for incorporating DRM/CRM

Duration: 1 hr and 30 minutes

Training methods: Lecture, Case Study and Group Work

There has been an increasing recognition on the need to mainstream DRM/CRM into development as it helps in protecting development gain and enhancing resilience. Mainstreaming DRM/CRM into development essentially describes development processes (policy formulation, planning, institutional structures with planning mandates, sectoral strategies, design and implementation of individual program/project, evaluation and monitoring, etc.) that takes into account disaster and climate risk considerations (what are the risks, what is the extent of the impact, whether it's acceptable or need treatment, what are viable and effective measures to reduce the risk) as its part and parcel. By doing so, the likely impacts of anticipated risk could be reduced, zero return of public investment could be avoided or minimized, and development actions could continue in progressive direction with minimum set back from adverse impacts. Equally important, applying mainstreaming DRM/CRM will ensure that development interventions will not create new risk or exacerbate the existing ones.

Why mainstreaming is necessary?

Disasters and development has close linkages. Disaster impacts various sectors of development like agriculture, housing, health, education and infrastructure. *This results in a serious social and economic setback to the development and poverty reduction priorities of the developing countries.*

Countries need to create better protection of the population (especially the most vulnerable and poor people), key infrastructures and development activities. However, ad hoc responses (short-term responses, uncoordinated processes, isolated projects, etc.) are NOT a solution. *More integrated approach to tackle disaster and climate risk as part and parcel of development processes and interventions is required.*

The main objective of disaster and climate risk mainstreaming into development planning and implementation is *to integrate or institutionalize comprehensive and up-to-date risk information and wide range of disaster and climate risk reduction measures/practices into development planning processes.* It is important to note that:

- Mainstreaming is a 'process'… to make it a **'normal process'**
- Not a one-off exercise… but rather **continuous** from short to long term
- It is not an end in itself… rather a **strategic approach**

Concept of Mainstreaming DRM/CRM into Development

The intricate link between disasters and development form basic rationale for mainstreaming DRM/CRM. Disasters have enormous impact on development and it is important to bear in mind that development choices sometimes could also create disaster risks (intentionally or unintentionally). With this interrelationship, there should be a systematic and conscious way to consider risk reduction in development.

Mainstreaming DRM/CRM into development means *'significantly expanding and enhancing DRM/CRM so that it becomes normal practice, and fully institutionalized within the national, sector, and local development agenda of nations at risk from natural hazards'*. (adapted from La Trobe and Davies, 2005). It comprises three key purposes:

- To make certain that all national and sectoral development programs and projects are designed with evident consideration for potential disaster risk and to resist hazard impact
- To make certain that all national and sectoral development programs and projects do not inadvertently increase vulnerability to disaster in all sectors: social, physical, economic and environmental
- To make certain that all national and sectoral development programs and projects are designed to contribute to developmental aims and to reduce future disaster risk

Mainstreaming process should result in *'appropriate measures being taken to reduce disaster risk and ensuring that development programmes and projects do not create new forms of vulnerability'* (ProVention Consortium, 2009). Mainstreaming is not an end in itself but an approach or a mean to achieve resilient development by reducing risks to natural disaster.

How to mainstreaming DRM/CRM into Development

The development planning process provides the backdrop for mainstreaming DRM/CRM. It covers planning, investment programming, budgeting, implementation, monitoring and evaluation. *Mainstreaming DRM/CRM is essentially to integrate disaster and climate risk consideration- that is to embed each stage of DRM/CRM process into each stage of the relevant processes for managing development.*

By doing so, DRM/CRM will become essential part of usual practice to formulate development policies and strategy, long, medium and annual planning, designing, implementing, monitoring and evaluating programmes and projects in the context of disasters. This will take the two fundamental points of view:

- whether the development interventions (policy/plan/programme/project/development goal, etc) are affected by disaster, if so what are doable and effective DRM/CRM measures to avoid or minimize the impacts, and better management of impacts
- whether development interventions increase either the likelihood of a disaster or increase the potential damaging effects of a disaster (exposure and vulnerability to hazard increased), if so what are the doable and effective measures to ensure exposure and vulnerability will be avoided or limited

Following is framework for mainstreaming DRM/CRM into development:

Step 1 - *Understand* ***the elements of national development planning process***

List out the elements of national development planning processes followed in the country. For example:

- Development policy (macro-economic policies, sector policies, local development policies)

- Socio-economic development plans (national, state/region, city, township, long-term, medium-term, etc)
- Physical plans/land use plan, spatial plan
- Annual plans and budgeting process
- Development programs and projects
- Monitoring and evaluation of plans and programs

Step 2 -Understand the elements of ***DRM/CRM***

List out the elements of disaster and climate risk management framework in the country

- Legislation related to DRM/CRM such as Disaster Management Law
- Strategies related to DRM/CRM such as Myanmar Action Plan on Disaster Risk Reduction 2012 (MAPDRR), Myanmar's National Adaptation Programme of Actions (NAPA) to Climate Change (2012)
- Natural hazard profile, Up-to-date and comprehensive multi-hazard risk assessment (at various scale), Climate projection
- DRM/CRM projects/programs undertaken in the country and range of measures for DRM/CRM

Figure 2.3.1 DRM/CRM elements integrated into Development Planning Tools

Step 3- **superimposing** the DRM/CRM into the development planning processes (at all levels). *Identify in which steps of development planning processes DRM/CRM considerations need to be integrated and what steps and measures to be undertaken for doing so.*

The development planning process of the Philippines incorporates Disaster Risk Assessment.

Figure 2.3.2 the Philippines Framework for Development Planning and Implementation *(Source: NEDA, 2008)*

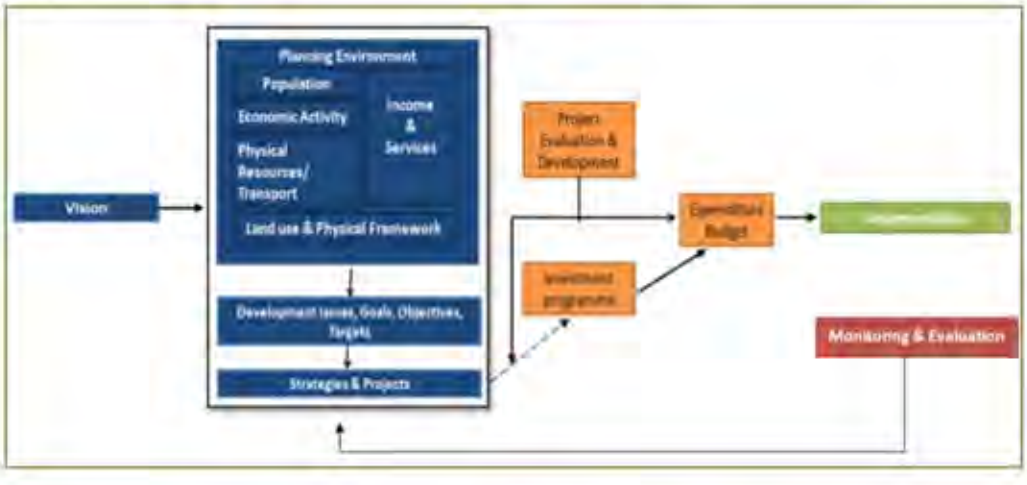
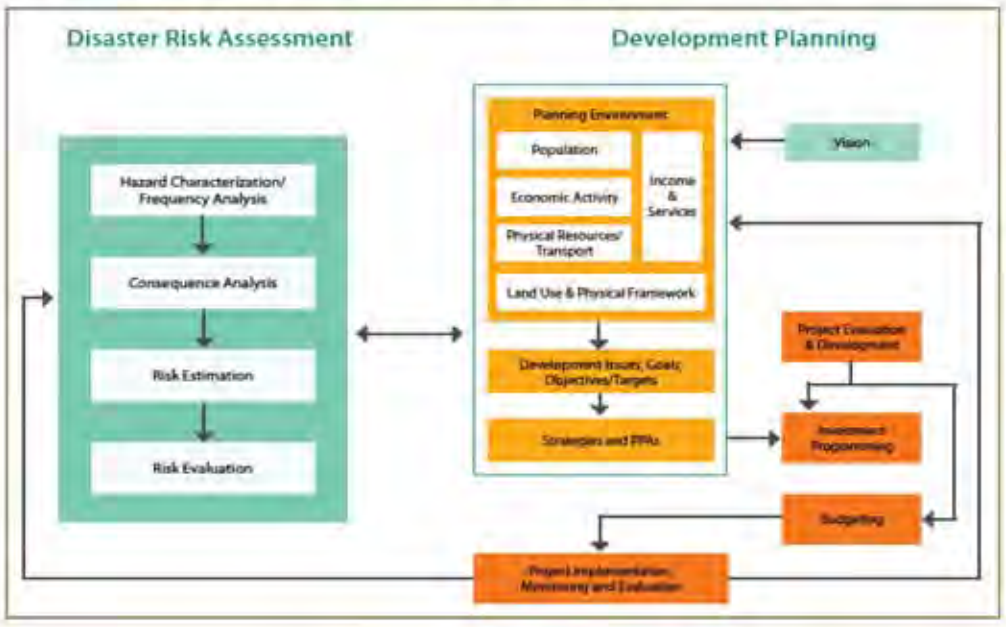


Figure 2.3.3 the Philippine Framework for Development Planning and Implementation with Mainstreaming Disaster Risk Assessment *(Source: NEDA, 2008)*



For each of the elements of development planning process, we need to *understand the importance of integrating* relevant elements of DRM/CRM framework and accordingly *take action for institutionalizing* such integration.

Identifying entry points in the development frameworks for mainstreaming DRM/CRM

Each of the stages in the planning framework as well as development instruments serves as an entry point for mainstreaming DRM/CRM. This would include:

- National Development Policy and Poverty Reduction Strategy Papers
- Socio-economic development plans
- Physical framework and Land use plans
- Development plans at sub-national levels
- Processes related to implementation of plans- Investment Programming, Budgeting and Financing
- Project appraisal, Implementation, Monitoring and Evaluation
- Project management cycle of individual project
- Environmental policies and plans such as mangrove deforestation, soil conservation, water management
- Sectoral policies, plans and programmes such as Industrial Policies, Special-Industrialized Zone Plan, Industrial Promotion Programmes, Irrigation Infrastructure Development Plan, Livestock Promotion Programmes, Public Health Policies, etc.

Group Work

1. Participants form 5-6 groups of 6-7 members.
2. Each group lists down development frameworks of Myanmar (policy, planning, programmes, project, budgeting at national, region/state, township, village or sectoral level) on one side and DRM/CRM frameworks on the other side.
3. Each group to identify certain DRM/CRM frameworks that are highly relevant for integration into development frameworks listed. Draw the arrow to indicate the integration.
4. Group presentation and discussion on why such DRM/CRM frameworks should be integrated and what are the added value.

References and Supplementary Readings

1. ADPC (2013) *Integrating Disaster Risk Management into the Development Process*. Disaster Risk Management Practitioner's Handbook Series. Bangkok.
2. Benson, Charlotte (2009) *Mainstreaming Disaster Risk Reduction into Development: Challenges and Experience in the Philippines*. Provention Consortium.
3. Benson, Charlotte & Twigg, John (2007) *Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisation*. Provention Consortium.
4. GIZ (2011) *Climate Proofing for Development Adapting to Climate Change, Reducing Risk*. http://www.preventionweb.net/files/globalplatform/entry_bg_paper~giz2011climateproofing.pdf
5. La Trobe, Sarah & Davis, Ian (2005) *Mainstreaming Disaster Risk Reduction: a tool for development organisations*. Tearfund. http://www.tearfund.org/webdocs/Website/Campaigning/Policy%20and%20research/Mainstreaming%20disaster%20risk%20reduction.pdf
6. NEDA (2008) *Guidelines on Mainstreaming Disaster Risk Reduction in Sub-national Development and Land Use/Physical Planning in the Philippines*. http://www.preventionweb.net/english/professional/publications/v.php?id=11433

Note

Session 2.4: Mainstreaming DRM/CRM into National Development Policies and Plans

Session Objectives:

At the end of this session, the participants will be able to:

- Understand the need of mainstreaming DRM/CRM into national development policies and plans
- Explore the examples from other countries in the region
- Identify DRM/CRM inclusion in the national development plan of Myanmar

Duration: 3 hr

Training methods: Lecture and Group Work

Development policies and plans are instruments which communicate the actions that government intends to take in order to improve the socio-economic conditions of the population, achieve desired development outcomes, address specific challenges (e.g. poverty, illiteracy, unmanaged urbanization, detrimental health conditions, etc.), and maximize utilization of existing resources (human, physical, natural resources, etc.) in sustainable way.

Mainstreaming DRM/CRM into Policy Formulation and National Planning Processes

As development factors such as society, economics and environment, are ever changing aspects of daily life and developmental growth, the formulation and implementation of policy and plans must evolve to make sure that it does not become outdated and able to well address the current critical issues. With this in mind, decision makers and policy developers, while creating policy and national plan, often use a cyclical process with clearly defined steps to ensure policy does not become outdated. These steps include:

- Select and define issue (by critically review the socio-economic context and results from monitoring and evaluation of the previous policy and plan)
- Set objectives
- Forecasting
- Develop options
- Options analysis
- Policy decision
- Policy adoption
- Monitor and evaluation
- Iteration

The formulation and implementation of policy offers a starting point for mainstreaming DRM/CRM. The macro national or sectoral policies set the vision, goals or country endeavors and major scopes of intervention, while national development plans (long and medium term) indicate details around specific actions to achieve concrete outcome as articulated in the policy by the indicated timeline.

In policy formulation and national planning process, policy makers, Planning Commission(s), Committees, and concerned authorities take up the steps as mentioned above. However, if

any decision made on policy options is oblivious of the importance of DRM/CRM, the goal of sustainable and resilient development may not be fully achieved.

Comparative benefits of mainstreaming DRM/CRM into Development Policy and National Planning

Helps to highlight long term concerns: Mainstreaming DRM/CRM in the medium-term national planning process helps to ensure that longer-term concerns such as risk reduction are not overshadowed by more immediately pressing issues, and relative political stability, implying the potential ability to sustain long-term programs and initiatives. (Benson, 2009)

Political commitment on DRM/CRM expressed: Countries have a number of competing development agenda with resource constraints for implementation. Political commitment on DRM/CRM expressed through policy and plans affirms the institutional, legislative, resource and funding support on DRM/CRM interventions.

More systematic and proactive risk reduction: It is an established fact that risk-sensitive development planning and implementation mechanisms at the national level and within sectors significantly contribute to reducing impacts of natural hazard, minimizing the potential of future risks and enhancing people's capacities vis-à-vis DRM in a more systematic manner rather than 'managing' disaster events with a reactive approach.

Enhance institutionalized participation of all sectors: Disaster and climate have implications on the performance across all sectors. Hence, integrating DRM/CRM into national development policy and plan will help outlining DRM/CRM as the cross-cutting development themes which needs to be addressed in respective sectors. For example, transportation policy foreseeing and attempting to minimize loss caused by natural disaster in transportation investment, decentralization governance will promote local risk management.

Lay a strong basis for interdepartmental cooperation: Although disaster and climate risk effects are felt across all socio-economic development spheres, DRM/CRM mandates are assigned to quite limited number of agencies. With government taking lead by articulating DRM/CRM issues in national policy and plan, such policy instruments will lay a strong basis for all concerned government bodies to recognize the roles they can play towards pursuing risk-sensitive development, and work in more cooperative and integrated manners on risk reduction.

Entry points for mainstreaming DRM/CRM into National Socio-Economic Development Policy and Plans

A review of current national development plans in some of the countries in the region shows typical sections of the national development plans where DRM/CRM concerns can be integrated. *It is to be noted that typically all national development plan consists of these sections:*

- Review of previous policy/plan, current context, and achievements
- Analysis of socio-economic status, poverty analysis, opportunity and challenges
- Vision, Goals and Objectives
- Sectoral Development: Education, Infrastructure, Social Welfare, Industry, Tourism, etc.

Each of these sections provides an entry point to integrate DRM/CRM.

1) DRM/CRM in Section on 'Review of Previous Plan'

Typically all development plans include a specific chapter/section on the performance of the previous plan or challenges which have been hindering the process of development in the country. This analysis covers all the major sectors, individual sub-sector plans, the parameters and/or indicators by which they were based on, as well as internal and external factors that may have affected the implementation of the plan. The analysis normally includes:

- Actual accomplishments vs. targets – macro-economic statistics, sectoral performance, etc.
- Actual performance vs. international benchmarks – country performance vis-à-vis countries with similar resources and economy
- Institutional failures and/or policy mistakes – bureaucratic over-regulation, over deregulation, open-market vs. protectionism, subsidies extended, etc.

In this context it is important that plan (wherever applicable) must identify disasters as a factor potentially hindering the achievement of economic and development goals and hence the need to treat risk reduction as an integrated cross sectoral objective. Moreover, if the country has been impacted by large scale disaster/s during the implementation period of the previous plan, the impact of the disaster on the respective sectors and overall performance of the economy should be captured.

Maldives's the 7th National Development Plan reviewed Tsunami 2004 impacts on tourism

In the case of Maldives, the tourism sector alone contributes close to 30% of the country's GDP and was also strongly impacted by the Indian Ocean Tsunami of 2004. Accordingly, after the tsunami in 2004, the 7th National Development Plan outlines the policy of *"Strengthening the preparedness of the tourism industry to resort-specific crisis and industry-wide disaster situations"* for tourism sector. Similarly, if the country is situated on specific hazard-prone area, integration of disaster risk reduction becomes important for all sectors. Such is the case of Bhutan and India which lie in seismic zone V, and accordingly the policies and strategies in the development plan include the importance of *'seismic data generation for earthquake studies'* for all sectors.

Disaster impact in Myanmar Development Plan

Review of the Financial, Economic and Social Conditions for 2008/2009 of Myanmar mentioned

Part 1: Introduction

National Economic Situation

- Cyclone Nargis of 2008....led to loss of lives of human, animals and draught cattle and devastating houses, buildings and cultivated lands.
- Damages were especially in cultivated land of agriculture sector, loss of fish and prawn ponds of livestock and fishery sector.
- The performance of 2008/2009 plan had achieved the target except for a slight fall in the growth rate.

With the varying impact of disasters and climate change on different sectors, *the integration of DRM/CRM becomes important in the case of sectors which are frequently impacted by natural hazards, such as agriculture and tourism.*

DRM/CRM can also be integrated in the National Development Plan by Strengthening DRM/CRM elements in existing development policy instruments and regulatory frameworks such as Environmental Impact Assessment, Strategic Environmental Assessment, Physical Planning Frameworks, Building and Construction Codes, Insurance, etc.

2) DRM/CRM integrated as separate chapter/section

DRM/CRM can be integrated by having a separate chapter on Disaster Management. This chapter lays out clear overarching risk reduction objectives and strategies for enhancing resilience. These objectives should be translated into specific sectoral goals, measures and activities, and tied into relevant projects and programs. Targets for monitoring performance should be set for both overarching DRM/CRM objectives and more specific sectoral goals. Development policies should also be assessed to ensure that they do not create new forms of risk and to determine their own vulnerability to natural hazards, making adjustments where necessary to enhance resilience. It is essential that this section while detailing out the initiatives on DRM/CRM remains in synergy with the National Action Plans/Frameworks/ Strategies on DRM/CRM.

3) DRM/CRM integrated as cross-cutting issues in other sections/chapters

DRM/CRM can be integrated as key considerations under other sections/chapters in development policy and plans such as urban planning, infrastructure development, agriculture, environment and social welfare since these sectors are either the most likely to suffer disaster and climate negative impacts, or demonstrate high potential for risk reduction and reducing vulnerability of the people.

12th Five Year Plan, (2012-2017) of India, Chapter 5 on 'Sustainable Management of Natural Resources', has a specific section on 'Climate Change' (Section 9.3). It mentions that the 12th Plan strategy will be so designed that there are significant co-benefits from climate along with inclusive sustainable growth. Actions for specific sectors namely Power, Transport, Industry, Buildings, and Forestry, adapting agricultural practices, State(Province) Action Plan for Climate Change, Land use policy, ground water management, etc have also been identified.

More examples of mainstreaming DRM/CRM into Development Policy and Nation Plan from Asian Region

Seventh National Development Plan (2006 -2010), Maldives

Seventh NDP identifies 12 goals for achieving the vision of the Plan. One of the goals (Goal 5) under *Spatial Development* is to *'Protect the natural environment and make people and property safer'*. Goal identifies *'Disaster preparedness and disaster risk reduction' as a key priority*with four policies and specific strategies:

- Policy 1: Institutionalise disaster management and mitigation and enhance national disaster management capacity
- Policy 2: Make Maldivians safe and secure from natural disasters through information dissemination and, planning and coordination of national response actions
- Policy 3: Alleviate and eliminate risks to life and property from natural or manmade hazardous events
- Policy 4: Deliver prompt and efficient relief and support in the event of a hazard

"Unlocking the Potential: National Strategy for Accelerated Poverty Reduction", Bangladesh

Poverty Reduction Strategy (PRS) stated in the document has *identified DRM and environmental sustainability as one of ten indicators*

*on which the success of PRS will be judged.*DRM is *one of the 16 policy matrices developed as instruments through which the PRS will be operationalised.* Various DRM goals and actions are also included in other policy matrices including flood protection, strengthening of flood forecasting and warning systems and predictive capacities for other natural hazards; and various programmes to support those affected by disasters, for example through the provision of humanitarian relief, loans for small businesses and housing.

DRM/CRM into National Policy and Long-term Development Plan of Myanmar

Myanmar National Comprehensive Development Plan: A Twenty-Year Development Perspective (2011-2030)

Myanmar has started drafting the *Myanmar National Comprehensive Development Plan: A Twenty-Year Development Perspective (2011-2030)* as the long-term national master development plan. The NCDP has a separate sub-heading on Disaster Risk Reduction under the heading of Development Governance. Other key development policies and plans of Myanmar includes Regional Plan, Sector Plan, Industrial development Plan, Investment Plan, Monetary and Financial Development Plan, Human Resources Development Plan, Rural Development and Poverty Reduction Plan, Township/Village Development Plan.

Group Work

1. Each group will be provided with Table of Content of NCDP.
2. Each group lists out *three prioritized sections* in the NCDP where DRM/CRM shall be included and why.
3. Each group selects *one section*(out of the three) and identifies key DRM/CRM considerations (5-7 points) that could factor in and the reasons.

References and Supplementary Readings

1. ADPC (2013) *Participant's Handbook of 4th Regional Training Course on Mainstreaming Disaster Risk Reduction into Development.*
2. Government of the Republic of the Union of Myanmar (2011) *Myanmar National Comprehensive Development Plan: A Twenty-Year Development Perspective (2011-2030)*

Note

Session 2.5: Mainstreaming DRM/CRM into Sectoral Development Planning

Session Objectives:

At the end of this session, the participants will be able to:

- Explore various development sectors of Myanmar
- Discuss how DRM/CRM considerations could contribute to the sectoral development goals and interventions
- Discuss and identify DRM/CRM inclusion into sectoral policy, planning and implementation in Myanmar

Duration: 3 hr

Training methods: Lecture, Case Study and Group Work

Government might, overtime, shift specific focus on different development sectors, which is influenced by the broad country development strategy of certain period as well as external environment such as global trend, international trade, foreign relationship, etc. Change in development focus is also governed by internal factors including socio-economic, demographic and geographic characteristics, strategic location, availability of land and natural resources, and increase in domestic demands over certain skills, products, service, etc. Counties with limited land resources may emphasize its development on non land-based activities such as industry, commercial and services, while those with abundant land like Myanmar, agriculture is one of key development sectors. Sectors which provide basis for development such as energy and transportation sectors have been increasingly important.

Why mainstreaming DRM/CRM in Sectoral Development Processes?

Sector development interventions contribute to achieving the broader socio-economic vision and goals set by the government (such as increase of income per capita by so and so percent, expanding international trade, reducing child mortality, eradicate illiteracy, etc.). Development interventions in particular sector have to serve domestic and external demands, which are shaped by different driving factors such as global economy, power shortage, migration of people to urban areas, international demands over certain products, etc.

Disaster and climate risk is one of many factors that could impede sector development. Beyond physical damages and huge spending on repair works and reconstruction, disruption of sector functioning and discontinuity of sectoral development will have profound impacts on overall socio-economic development of the country, pushing the country into economic recession and years to resume growth. Disaster and climate risk could undermine sector capacity in attaining desired goals and objectives, and delay achievements of the set targets.

For example, one of the expected outcomes of energy sector development in Myanmar is *making electricity available, accessible and sufficient to be used at all time for households across the country.*[10] To achieve the outcomes, DRM/CRM is an essential element to bring on broad. Various impacts caused by disaster could possibly disrupt sector activities and functioning

[10] Presentation on Sectoral Development of Myanmar at the1st National Training on Mainstreaming DRM/CRM into Development Planning in Myanmar, 4-8 March, 2013 by Planning Department

such as power failure in cyclonic or earthquake events, due to electric wire or power plants damages or explosion caused by electric shock circuit, etc. Hence, serious attention should be given to address vulnerable conditions and possible impacts. Certain characteristics that make the sector vulnerable have to be considered such as risk assessment not undertaken prior to system design, construction of electrical infrastructures not taking hazard-resistant element into account, spare systems not available to support operation in case of main system failure, responsible agencies lacking capacity to manage emergency situation, no preparedness plan in place, and fragile conditions due to lack of appropriate and regular maintenance.

It's crucially important for all sectors to consider direct and indirect impacts that might be triggered by different types of hazards with different intensity.

Table 2.5.1 Impact (Direct and Indirect) of disasters on sectors
(Source: Integrating DRR into the CCA and UNDAF: A Guide for UN Country Teams, United Nations, 2009)

Sector	Direct Impacts	Indirect Impacts
Education	• Damage to education infrastructure • Population displacement interrupts schooling	• Reduced household assets make schooling less affordable, girls probably affected most
Health	• Damage to health, water and sanitation infrastructure • Injury and illness from disaster weakens immune systems	• Household asset depletion makes clean water, food and medicine less affordable
Housing, Urban Development and Infrastructure	• Damage to housing, water management and other infrastructure • Slum dwellers/people in temporary settlements often heavily affected	• Disaster induced migration to urban areas and damage to urban infrastructure increase the number of slum dwellers without access to basic services and exacerbate poverty

At the same time, the way in which sectoral development takes place also lead to increase in disaster risk. Table 2.5.2 provides some examples of risk induced by development activities of specific sector and how DRM/CRM could contribute to sector goals.

Table 2.5.2 Disaster risk by sector and how integrating DRM/CRM contribute to sector goals
(Source: Integrating Disaster Risk Reduction into the CCA and UNDAF: A Guide for UN Country Teams, United Nations, 2009)

Sector	How can sector activity increase disaster risk	How can DRM/CRM contribute to sector goals
Education	• Poorly constructed infrastructure in earthquake zones can substantially increase levels of exposure.	• In hazard prone areas, the case of building schools and encouraging attendance becomes much stronger if buildings are safe and students and teachers are trained on emergency preparedness.
Health	• Poor planning in the health sector can result in those affected by disasters not having access to essential medical care in the aftermath of a disaster.	• Disaster risk reduction will reduce direct deaths and injuries during hazard events and will lower mortality from diseases related to malnutrition and poor water and sanitation following disasters. • Improved household livelihood and food security will lower women's workloads and improve family nutrition.
Housing, Urban Development and Infrastructure	• Absence of effective regulations and documentations supporting land/property ownership can result in disputes in post-disaster, e.g. boundaries are washed away.	• Risk reduction partnerships that include community level actors and concerns will offer more substantial infrastructure planning and enable expansion of private sector contributions to reducing disasters • Housing is a key livelihood asset for the urban poor. Disaster risk reduction programmes that prioritize housing will also help preserve livelihoods.

Hence, disaster and climate risk considerations could be made an integral part of the sectoral development so as to ensure that potential impacts of disaster and climate risk on development, and vice versa are addressed in comprehensive manner, as oppose to ad-hoc response. Integrating DRM/CRM into various steps of sectoral development planning and implementation stages would significantly contribute to reduce the direct damage and financial loss, enhance capacity of the sector for fast recovery, ensure continuation of the sector development, and maximize resource utilization.

DRM/CRM considerations for key development sectors

In order to identify entry points for mainstreaming DRM/CRM in key development sectors the basic approach would include:

- Undertaking risk assessments on the sectors
- Based on the results of the risk assessment, identify actions/interventions/measures to reduce the risk
- Integrate the proposed actions in the sector development plans
- Implementation of the measures
- Monitoring and evaluation of the measures

It is important that DRM/CRM integration should be applied into all sectors. The following paragraphs provide brief description on ways of integrating DRM/CRM in some of the key sectors - agriculture, housing, infrastructure, health and education.

Agriculture

Agriculture depends significantly on the natural resource base and suffer several effects of natural hazards and climate change especially flood, drought, storm and seasonal variation. Natural hazards and disasters impact agriculture on three aspects: 1) input systems (weather, soil, natural vegetation, equipments, money, machines and biological inputs), 2) services (such as processing, marketing infrastructures) and 3) management practices (such as water use and disease control).

In turn, negative agricultural practices exacerbate risk. For example, promoting rice cultivation without considering irrigation capacity and seasonal constraint could increase vulnerability to drought. Therefore, mainstreaming DRM/CRM in agriculture should aim to reduce the impact of disasters on the sector and the negative effects of sectoral practices on disaster and climate risks.

Following are the guiding questions for identifying information needed for the mainstreaming process in agriculture sector:

- What natural hazards affect agriculture?
- What are the likely effects of climate change on agriculture?
- What agricultural practices adversely affect environmental and natural resources and contribute to disasters?
- How do policies and programmes for agriculture take into account issues of hazards and disaster risk that negatively impact the sector?
- How resilient is agricultural infrastructure to disasters?

Following are some examples of possible approaches for initiating the mainstreaming process in agriculture sector:

- Promote effective programs of crop diversification including the use of hazard resistant crops. For example, Government of Myanmar is developing flood and salinity resistant crop.

- Ensure sustainable livelihoods in areas of recurrent climate risks (i.e. arid and semiarid zones, flood and cyclone prone areas) by promoting livelihood diversification, supplementary income generation from off-farm (e.g. animal husbandry) and non-farm activities (e.g. handicrafts)
- Promote effective insurance and credit schemes (Self Help Groups) to compensate for crop damage and losses to livelihoods due to natural hazards

Housing

As it is evident from countless historic disasters, a large proportion of disaster related deaths can be attributed to the collapse of buildings, both public and private owned. Often structural collapse is due to inappropriate use of building materials, insufficient knowledge or foresight in building design, location of structures on hazard prone land and lack of or poor enforcement of construction standards and regulations. The housing sector has suffered different damages of different extent caused by disasters such as houses on river bank washed away by flash flood, collapsed by force of earthquake or landslides, or blown away in storms.

Mainstreaming DRM/CRM in the housing sector means incorporating risk reduction measures into housing development policy and practice. It means radically expanding and enhancing the attention to DRM/CRM so that it becomes normal practice and fully institutionalized within a state/country's housing development agenda. This is critical when there is a large section of the population vulnerable to disasters with majority of them from the low income groups.

Following are the guiding questions for identifying information needed for the mainstreaming process in housing sector:

- How susceptible is the settlement to hazard events?
- Is there adequate understanding of the major natural hazards that pose a risk to the settlement?
- What housing practices contribute to disasters?
- How do policies and programmes for housing take into account issues of hazards and disaster risk that negatively impact the sector?

Following are some examples of possible approaches for initiating the mainstreaming process in housing sector:

- Promote the increased use of hazard-resilient designs (e.g. flood proofing, or seismic safety) in housing programmes in hazard-prone areas
- Promote utilization of national building codes that have special provisions for enhanced design standards for buildings in areas affected by natural disasters
- Regular 'inspection' during and after construction
- Institutionalize Risk Assessment and Environmental Impact Assessment (EIA) within Housing Development Authority
- Strengthen existing buildings (retrofitting)

Infrastructure

Infrastructure is part of the physical asset base of people's livelihoods. However, the increasing size, complexity and interconnectedness of infrastructure, particularly those providing critical services, pose challenges for reducing risks to them from disasters. Critical infrastructures are those physical and information technology facilities, networks and assets whose disruption or destruction from natural hazards or other causes would seriously impair people's lives and livelihoods.

Since complete security or assurance is neither feasible nor affordable, the priority task in reducing the risk of disaster to infrastructures is to ensure the protection and safety of these critical services. However, this must consider the links between critical and non-priority infrastructure.

Integrating risk reduction in infrastructure development and management helps to prevent the potential for disruption of reliable services from the impact of natural hazards. However, it is also necessary to prevent physical failure of infrastructure installations from causing disasters, such as upstream dam failure resulting in downstream flooding.

Following are the guiding questions for identifying information needed for the mainstreaming process in infrastructure sector:

- How susceptible are various infrastructure systems to hazard events?
- Is there adequate understanding of the major natural hazards that pose a risk to infrastructure?
- What is the disaster survivability of key and critical infrastructure? Is there a national critical infrastructure assurance programmes, including protection and emergency preparedness measures?

Following is an example of possible approaches for initiating the mainstreaming process in infrastructure sector:

- Incorporate disaster risk impact assessments as part of the planning process before the construction of new roads, bridges, power plants, transmitters, etc.
- Promote use of risk information in land-use planning
- Infrastructure recovery should include DRM/CRM features.

Health

Typically the health sector constitutes of structural, non-structural and functional elements. For example, the function of health facilities (which comprises of structural and non-structural elements); hospitals and healthcare units are to provide specialized services (which constitutes the functional aspects), and accordingly the planning, design and construction process of these facilities should cater to such services. Health facilities affected by natural hazards cannot provide healthcare services during the hour of emergency. Thus, unless planning, design and construction standards take hazard resilient factors into consideration, the chances of impact of disasters on health facilities would continue. DRM/CRM, therefore, needs to be integrated in the planning, design and construction process of health facilities at all levels in the country. Equally important for health facilities, is to have preparedness plans in place.

Following are some examples of possible approaches for initiating the mainstreaming process in health sector:

- Increase hazard resilience of hospitals and facilities
- Retrofitting of vulnerable hospitals
- Location of future hospital in safer areas (reduce exposure)
- Hospital design to include multi-hazard resistant features
- Non–structural elements of hospital to be considered from risk angle
- Formulate a Hospital Preparedness Plan
- Train hospital staff to deal with emergencies of rare cases

Education

Education is critical in the advancement of human and sustainable development. Yet the education of children is continuously threatened by disasters. Children are most vulnerable to disasters, especially those who are attending schools when disasters strike. In addition,

teachers who are mostly women are among those hardest hit by disasters. It is estimated that 100 out of the estimated 134,000 who perished when Cyclone Nargis hit Myanmar were teachers.

The vulnerability of children in the face of disasters turns us towards education as a potent instrument in reducing the impacts of disasters to children and to communities. With education, children may no longer be the passive victims of disasters as society normally views them to be. Children must be equipped with the appropriate knowledge about disasters, life-skills to protect themselves, and respond appropriately when disasters hit.

School buildings are one of the major infrastructures that normally cave in during disasters. The design and construction of schools need to consider the various hazards that are prevalent in the area. The construction of new schools and the repair of old ones would have to incorporate hazard resilient features and the addition of facilities as schools are also often used as shelters during and after disasters. This consideration is to ensure that the disruption of student learning would be minimized, if not totally avoided.

Following are the guiding questions for identifying information needed for the mainstreaming process in education sector:

- What natural hazards affect the area and hence knowledge of it should be imparted to the children?
- How susceptible are various education facilities to hazard events?
- Is there adequate understanding of the major natural hazards that pose a risk to education facilities?
- How do policies and programmes for education take into account issues of hazards and disaster risk that negatively impact the sector?

Following are examples of possible approaches for initiating the mainstreaming process in education.

- Incorporate knowledge on risk and hazards in the national curriculum
- Promote physical safety plans for disaster preparedness
- Promote a 'culture of safety' through schools
- Building and reconstruction of schools should have multi-hazard features

It should be kept in mindthat the development sectors link, complement to and rely on one another. Impacts on one sector (e.g. power sector) could lead to complete or partial failure, or disrupted functions of other sectors (e.g. industry, hospital operations, transportation, etc.) Hence it's crucial that such multi-facet issues that constitute vulnerability across different sectors should be taken into account while considering DRM/CRM.

Equally important, more attention should be given to avoid or reduce negative consequences induced by sector development activities. Often that this aspect of development is overlooked, despite the high price to pay i.e. city expansion blocks water flow causing severe flood in adjacent areas, losing of soil stability due to slop cutting and land clearing could cause severe landslides. Given competing demand on land and resources, such risk might not be completely avoided. However, with sufficient considerations on DRM/CRM, and applying combination of various mitigation measures, the adverse impacts could be lessened or better coped with.

Development sectors of Myanmar

In Myanmar, 14 key development sectors have been identified and list along with ministry is below:

- Agriculture - Ministry of Agriculture and Irrigation
- Livestock and Fishery - Ministry of Livestock Breeding and Fisheries
- Forestry and Environmental Conservation - Ministry of Forestry and Environmental Conservation
- Energy - Ministry of Energy
- Mining - Ministry of Mine
- Processing and Manufacturing - Ministry of Industry and Myanmar Industrial Development
- Electric Power - Ministry of Electric Power 1 and 2
- Construction - Ministry of Construction
- Transport - Ministry of Transport and Ministry of Rail Transportation
- Communications- Ministry of Communication, Posts and Telecommunications
- Trade - Ministry of Commerce
- Investment and Finance - Ministry of Finance and Revenue, Ministry of National Planning and Economic Development
- Services - Ministry of Hotel and Tourism and Ministry of Cooperative
- Social and Administrative Sector - Various Ministries

Planning Process for Sector Plan

The planning process for sector plan has been identified as follows:

1. Collecting the objectives of the allocated projects as per the potential of the regions from the responsible sector Union Ministries for state own sector
2. Collecting the objectives of projects per sector undertaken by the Ministry of Cooperative and other agencies for co-operative own sector
3. Collecting the data on the registered businesses at Development Affairs Committee, Internal Revenue Department, General Administration Department at township level, and field survey to the village/ward Administrators on the businesses which applied for the registration for private own sector
4. Collecting the confirmation on the project objectives per region and the status on monthly, quarterly and annual implementation through Township Planning and Implementation Committee, District Planning and Implementation Committee and Region/State Planning and Implementation Committee
5. Sector-wise and region-wise ownership are categorized in 3 groups(state own, cooperative own and private own) and separate calculation on the values of production/services by constant prices and current prices have been carried out.

Some samples of Sector Plans

Myanmar National Health Plan (2011-2016)

This plan has been drafted and implemented in line with the objectives of third 5 year plan of Long-term Health Plan for 30 Years (2001-2030) as well as in line with fifth 5 year plan of the country in order to identify and resolve the priority health issues of the nation intended to be strong, healthy and long life citizens.

The Goals of National Health Plan (2011-2016) are as follows:

(a) Resolving the priority health issues of the nation

(b) Development of rural health

(c) Meeting the objectives of MDGs
(d) Special attention to strengthening of health system
(e) Sound development of social, economic and environmental conditions which have impact on health

The objectives of National Health Plan (2011-2016) are as follows:
(a) to ensure quality health care service are accessible equitably to all citizens and the behaviors conducive to health are aware and followed
(b) to undertake preparedness measures for avoiding diseases and health conditions become public health issues, and to lessen the existing public health issues of diseases and health conditions
(c) to ensure basic/essential medicines, vaccines and traditional medicine adequately available, and to undertake safe food and drugs available for public
(d) to train and produce required human resources eligibly as per types of health care services and to manage fine balance for effective utilization of the resources
(e) to strengthen health information system in order to get valid and accurate facts and evidence for the formulation and implementation of health policy and plans, and to promote basic research, applied research and research on health policy and health system in balance
(f) to continuously analyze, suggest and undertake the enforcement of existing laws on health practically, the revision of existing laws and drafting of new laws in the changing context
(g) to promote the collaboration among related departments, organizations and individuals on health according to the real situation of the nation in escalating the standard of public health
(h) to lead for the evolvement of health system which is complied with real local situations and international health programs

(Source: National Health Plan (2011-2016) of Ministry of Health)

Objectives of Agriculture Sector

- to prioritize to fulfill the needs of local consumption
- to export of surplus agricultural products for increase of foreign exchange earnings
- to assist to rural development through agricultural development

Main objective of Ministry of Agriculture and Irrigation is to increase the production of crop.

There are five strategies for agriculture development namely the development of agriculture land, provision of sufficient water for irrigation, support for agricultural mechanization, application of modern agro-technologies, and development and utilization of modern varieties.

(Source: http://www.myanmarworld.info/ministry-of-agriculture-and-irrigation-277.html)

Group Work

1. Participants form 4-5 groups.
2. Each group selects one development sector
    - Education
    - Health
    - Agriculture
    - Construction
    - Industry
3. Policy, Objectives and Programs of each sector will be provided to the participants of each group.
4. Each group identifies entry points to integrate DRM/CRM elements in the policy, objectives and programs of selected sector.
5. Groups will make presentations.

References and Supplementary Readings

1. ADB (2013) *Investing in Resilience: Ensuring a Disaster-Resistant Future* http://www.adb.org/sites/default/files/pub/2013/investing-in-resilience.pdf
2. ADB (2012) *Myanmar in Transition: Opportunities and Challenges.* http://www.adb.org/sites/default/files/pub/2012/myanmar-in-transition.pdf
3. ADPC (2012) *Guidelines on Mainstreaming Disaster Risk Reduction in Housing Sector.*
4. Benson, Charlotte & Twigg, John (2007) *Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations.* http://www.preventionweb.net/files/1066_toolsformainstreamingDRR.pdf
5. MSWRR and Ministry of Education (2011) *Guidance on Mainstreaming Disaster Risk Reduction in the Education Sector, Myanmar: Rural Setting*
6. MSWRR and Ministry of Health (2011) *Guidance on Mainstreaming Disaster Risk Reduction in the Health Sector, Myanmar- Rural Setting.* http://www.adpc.net/2011/Category/Documents/DocumentDB/Guidance_MDRD_Health_Myanmar_EN.pdf
7. UN (2009) *Integrating Disaster Risk Reduction into the CCA and UNDAF: A Guide for UN Country Teams.* http://www.undg.org/docs/9866/UNDG-DRR-Guidance-Note-2009_DUP_08-07-2009_11-43-02-734_AM.PDF

Note

Session 2.6: Mainstreaming DRM/CRM into Regional Development Planning

Session Objectives:

At the end of this session, the participants will be able to:

- Explore regional development planning processes of Myanmar
- Identify entry points to integrate DRM/CRM considerations into regional development planning processes and discuss steps involved

Duration: 1 hr 30 minutes

Training methods: Lecture, Case Study and Group Work

Region/State Development Planning

Region/State Development Planning- where the socio-economic decisions are to be implemented, the regional problems are to be solved in order to improve the regional development, the disaster affected areas to be rehabilitated, socio-economic policies/programs are to be implemented. In national long-term socio-economic development plans and sectoral plans, different development activities are assigned in specific regions/states based on their strategic location, available resources, existing and prosperoussocio-economic conditions. The Region/State, therefore, sets its policy and objectives corresponding to the policy, goals and targeted outcome as indicated in national and sectoral plans. In other words, region/state is the administrative boundary and geographical location where national and sectoral development actions take place.

Figure 2.6.1 Linkages between key development plans of Myanmar

Administrative boundary responsible for Regional/State Planning

14 Regions and States

1. Kachin State
2. Kayah State
3. Kayin State
4. Chin State
5. Sagaing Region
6. Tanintharyi Region
7. Bago Region
8. Magway Region
9. Mandalay Region
10. Mon State
11. Rakhine State
12. Yangon Region
13. Shan State
14. Ayeyawady Region

6 Self Administered Division & Zones

1. Naga Self-Administered Zone
2. Danu Self-Administered Zone
3. Pa-O Self-Administered Zone
4. Pa laung Self-Administered Zone
5. Kokang Self-Administered Zone
6. Wa Self-Administered Division

Region/State Planning Authorities and Roles

Region/State Planning and Implementation Committee is chaired by Minister for Planning and Commerce and comprises inter-departmental members from different development sector agencies including the Region/State Head of Planning Department as the secretary.

The composition of the *Regional Planning and Implementation Committee* is as follow:

1. Minister for Planning and Commerce	Chairman
2. Representative from General Administration Department	Member
3. Department Representative from Agriculture Sector	Member
4. Department Rep from Livestock and Fisheries Sector	Member
5. Department Rep from Environmental Conservation and Forestry Sector	Member
6. Department Rep from Industry, Mining Sector	Member
7. Department Rep from Services Sector	Member
8. Towns Elders	Member
9. Representatives from Socio-economy Associations	Member
10. Region/State Head of Planning Department	Secretary

The committee, which functions as planning authority at region/state, takes supporting role to Region/State Government in coordinating development planning and implementation at district and township level for higher level planning authority (i.e. Ministry of National Planning and Economic Development, and sectoral ministries). Such functions of the region/state planning authority is key mechanism to link macro-level policy and planning (national and sectoral development) to the ground conditions and implementations of development activities. (See figure 2.1.2). One of the key functions of the Committee is to substantiate planning mechanisms at national level with concrete and accurate socio-economic statistic data and indicators from township and districts for planning and monitoring development outcomes.

Besides this role, the State/Region planning authorities is mandated to take development planning in their jurisdiction, plan and implement Rural Development Projects, and manage region/state owned budget and budget allocated from the union government.

Roles and Responsibilities of State/Region Planning and Implementation Committee are described in details as follow:

a) Region/State Planning and Implementation Committee has to call for at least one regular meeting per month.
b) The committee is *responsible for getting the complete and concrete statistics on the respective area's socio-economic status* which is based on the village/ward.
c) The committee has to *scrutinize the statistics* which are submitted by the various districts to be more accurate.
d) The committee has to *arrange to collect the data on selection basis if required.*
e) If there are projects in the regional plan, the committee has to *check if the projects are cost effective and if they can contribute to the region.*
f) While drafting the regional plan, *the measures for the prioritized activities which are in line with the requirement for the region should be included.*

g) The committee has to *review the socio-economic development plan, human resource development plan, investment plan and regional plansubmitted from the respective districts* and *submit them to the Region/State Government.*

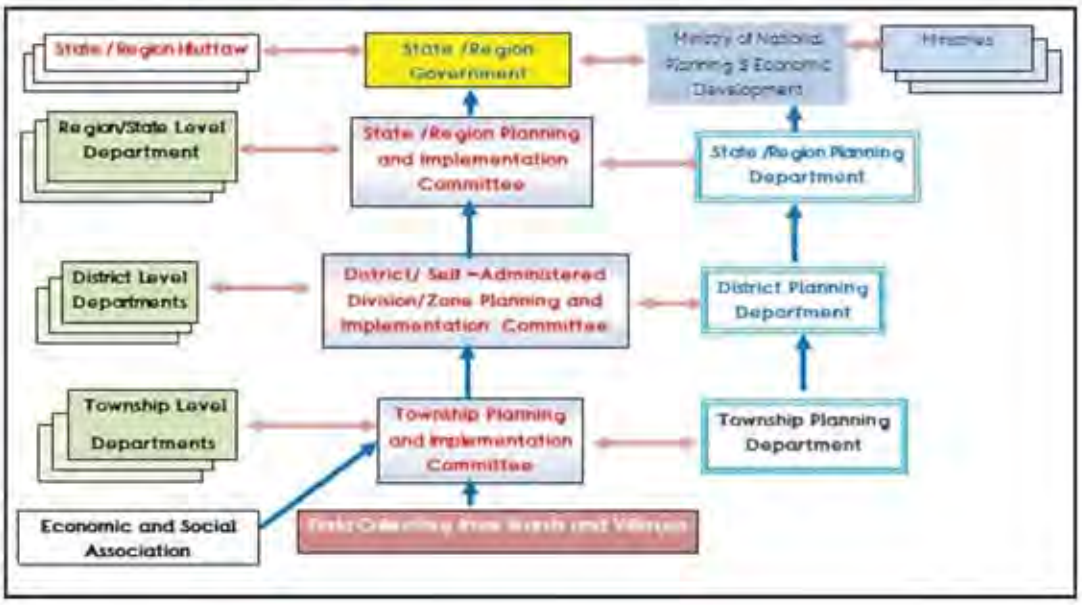
h) The committee has to *undertake measures to get the complete socio-economic indicators*in the respective region/state.

i) The committee is *responsible for the accurate statistics* of the Region/State.

j) The committee has to *submit the statistics of the Region/State to the Region/State Government.*

k) The committee has to *compile every month the reports of the committees who are implementing the 8 tasks for poverty alleviation in the Region/States* and *the evaluations should be compiled and sent to the State/Region Government.*

Process for Regional Planning



Example: Regional Planning Legislation for Tanintharyi Region 2013-14 comprises sections namely 1) Title, period effected and definition, 2) Aims, 3) Planning Targets and 4) Sector-wise Policies, Objectives and programs.

The aims of this legislation are to:

(a) Ensure that reasonable and fair prices are obtained for crops produced in the agriculture sector and to provide the necessary investment and materials for transition from non-mechanized to mechanized farming to the extent possible;

(b) Promote domestic and foreign investment and trade and ensure the socio-economic development of the national people with a view to creating employment opportunities and acquiring technical skills;

(c) Emphasize the development of human resources.

The Plan indicates the target on overall economic growth rate and sector specific growth rate: to achieve growth of 7.0% for the agriculture main sector, 4.9% for the industry main sector and 9.5% for the services main sector. The plan mentioned list of Rural Development Projects to be implemented which is mainly the construction projects (monasteries, hospitals, schools, road, housing for staff) and projects on livelihoods support (irrigation, digging tube well, and livestock promotion).

Entry Points for Mainstreaming DRM/CRM into Region/State Development Planning

Each region/state has unique characteristics with regards to demographic distribution, culture, weather conditions, geographical conditions and strategic location, natural resources, types of livelihood practices or income generating activities, etc. This forms pre-condition on which development planning decision is based. Disaster and climate risk also one of important factors to be considered in region/state planning process. Different states/regions face different challenges with regards to disaster and climate risk. As Myanmar is multi-hazard prone, one region/state may be affected by different hazards in different periods of the year, or by multi hazards in the same period. Hence, considerations on DRM/CRM should be comprehensive in the development stages of the region/state.

Various stages of region/state development planning and implementation should attempt to address disaster and climate risk. The following are simple guiding questions as the basis to integrate DRM/CRM considerations:

- Has the socio-economic condition of the region/state been impacted by disaster and climate risks? If Yes, How?
- Has the physical structure and population of the region/state been impacted by disaster and climate risk? If Yes, How?
- Has the budget system of the region/state been affected by disaster and climate impact? If Yes, How? (i.e. Budget allocation has been shifted from development activities to response and recovery actions? Region/state budget doesn't have provision for disaster and climate actions, etc.)
- What are the disaster and climate challenges faced by the region/state? What are the intensity, frequency, consequences, future trend? (risk assessment)
- What are the potential impacts that impede the region/state to achieve development targets as set in policies and objectives?
- Has any development interventions contributed to increase risk? If Yes, How?
- What should be done to address the risk? What are the alternative options to be adopted to avoid, mitigate, and manage the risk?
- What is the additional cost if DRM/CRM measures are to be adopted? How to reflect such cost in region/state budget?
- What are the technical knowledge/skills required for effective implementation of risk-sensitive development project and program? and How to develop such capacity within the region/state?

Case study: *District Development Planning Process of Nepal* is the process that reviews, approves and integrates village and municipality development plans ensuring compliance to the national and sectoral priorities. *Framework and Recommendations for Mainstreaming Disaster and Climate Risk Management into the District Development Planning Process of Nepal (Draft)* indicates potential entry points for DRM/CRM integration at district level (having District Development Committee or DDC functioning as planning authority). By reviewing the cyclical process of district development processes and activities undertaken in each steps, key DRM/CRM considerations are suggested to be included in these steps.

Table 2.6.2 Key DRM/CRM Considerations and Entry Points for DRM/CRM inclusion in the District Development Planning Process, Nepal

(Adapted from Framework and Recommendations for Mainstreaming Disaster and Climate Risk Management into the District Development Planning Process of Nepal, Draft)

Planning Steps	Activities undertaken	Disaster and Climate Risk Management considerations to include
Step 1 Preliminary State (Yearly Directives and Budgeting)	Preparation of resource map and analysis of district data	District disaster profile, analysis of disaster/climate risk and its impacts especially on development activities in preceding years to be considered
Step 2 Review of Directives and Information	National Planning Commission (NPC) sends national development priorities (directives) to the DDC	
Step 3 District Development Committee Pre-planning workshop	Examination of priorities sent by NPC, DDC to add priority and issue guidelines to Village Development Committees and Municipalities	Guidelines to Village Development Committees and Municipalities to indicate criteria (including DRM/CRM aspects) for project identification and prioritization such as the project should not create risk, should adopt risk resilient features, and disaster risk management programs/projects to be prioritized
Step 4 -7 Village Development Committee (VDC)/Municipality Meeting	Stakeholders and Multi-agency consultations (VDC, Municipality, villages, and DDC) Preparing and filling out Project Request Forms Prioritizing project/program Budgeting and resource estimation	Impacts of disaster and climate risk in the past to be considered, including impacts on vulnerable populations Rationale and need for DRM/CRM is discussed Project Request Form (for VDC/Municipality to fill in) to include DRM/CRM concerns Disaster resilience aspect in development programs/projects to be discussed Prioritized projects submitted from VDC/Municipality to be reviewed to ensure DRM/CRM concerns are included Resource estimation extends to cover the cost of implementing DRM/CRM elements in the prioritized development projects
Step 8-9 Village/Municipal Council Meeting & Workshop	Approval of projects with possible alteration by VDC/Municipality decision	To ensure prioritized projects of VDC/Municipality include relevant DRM/CRM considerations
Step 10-11 Sectoral Planning Meeting and Integrated Plan Formulation Committee Meeting	All projects forwarded to DDC grouped into 4 sector plans, reviewed and prioritized by sectoral committee of DDC Plans of the 4 sectors are integrated	To ensure DRM/CRM issues are well addressed in all 4 sectors and in the integrated plan
Step 12 District Development Committee Meeting	Assess the Integrated District Development Plan in relation to directives, district periodic plan, resource and environmental impacts, etc.	To ensure that DRM/CRM is considered while assessing the plan Rational and benefits for DRM/CRM inclusion communicated to District Council Environmental and social checklist with integrated disaster and climate issues to be considered
Step 13 District Council Approval	The District Council discusses and approves the District Development Plan	To ensure DRM/CRM issues are taken in to account while District Council assessing the plan
Step 14 Implementation	The District Development Plan (approved by District Council) forwarded to the line planning ministry and NPC and sectoral ministries.	Implementation and evaluation of the plan to be fed into step 1 of next planning cycle

Preliminary stage

Step 1 Preliminary Stage (Yearly Directives and Budgeting)

Time	Activities under the Planning Step	Disaster Rand Climate Risk Management Considerations	Supporting System and related Document
Before November	Preparation of resource map and analysis of district data District demographic profile Environmental statistics Resource map	Analysis of disaster and its impact especially impact on development activities in preceding year/s in the district District Disaster Risk profile Impact of disaster on gender and other vulnerable groups Climate change information for region and district	District sector plan (Water Plan, Forestry Plan, etc) Biodiversity strategy District Disaster Management Plan District Preparedness and Response Plan Local Adaptation Plan of Action National Adaptation Plan of Action Multi-hazard risk assessment of Nepal, 2011 Disaster Assessment Reports of GoN, IASC, etc Nepal Climate Data Portal http://www.dhm.gov.np/dpc/

Group Work

1. Participants are divided into 4 groups; each group is provided with a copy of Regional Plan of Tanintharyi Region.
2. Each group has to select one of the sections from the Plan: Policy, Objectives, Programs.
3. Each group identifies key DRM/CRM considerations and entry points for integration in the selected section.

References and Supplementary Readings

1. Benson, Charlotte & Twigg, John (2007) *Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations.*
2. NEDA (2008) *Mainstreaming Disaster Risk Reduction in Sub-national Development and Land Use/Physical Planning in the Philippines.* http://www.neda.gov.ph/references/Guidelines/DRR/Guidelines%20on%20Mainstreaming%20DRR%20in%20Subnational%20Development%20Land%20Use%20Planning.pdf
3. *Framework and Recommendations for Mainstreaming Disaster and Climate Risk Management into the District Development Planning Process of Nepal (Draft).*

Note

Session 2.7: Mainstreaming DRM/CRM into City Development Planning

Session Objectives:

At the end of this session, the participants will have better understanding on:

- Urban risk
- DRM/CRM inclusion in city development activities
- Integration of DRM/CRM in the city development planning and implementation in Myanmar

Duration: 1 hr 30 minutes

Training methods: Lecture, Case Study and Group Work

City Development Planning

City development planning primarily aims to improve quality of life of city population, develop infrastructure and facilities and ensure continuity of necessary systems and services to support city functions.

City development encompasses broad range of activities from developing facilities and amenities such as transportation systems, mass transit (for fast mobility and connectivity), electricity and power supplies, communication network, commercial areas, slum upgrade, improving landscape and public recreation areas, to providing regular public services such as waste management, canals maintenance, cleaning of public roads and places, traffic control, etc.

City development is based on demand driven by heterogeneous groups of city population and socio-economic activities of the city. Given that cities keep growing with increasing number of population, city development has to serve not only current demands, but also take into account projection of future demands at anticipated rate of city expansion, so as to ensure that development today are planned in a way that could cater future scenario.

The following characteristics associated with people, location, climate and socio-economic conditions should be considered for city development:

- Demographic characteristic: number of population, population density, income level, social groups, etc.
- Geographical characteristic: city located in flood plain area, on riverside, in hilly areas, height above sea level, etc.
- Climate characteristic: city in tropical climate zone, semi-arid zone, precipitation and seasons
- Socio-economic activities: the predominant activities in the city (commercial, trades, services activities, etc.), whether the city is a connection hub of transportation or transit route of products/goods, city as center of country administration, tourism destination, industrial estate, etc.
- Settlement: the characteristics of urban settlement such as squatters, temporary or permanent settlement, and proportion
- Spatial distribution and zoning: city comprising economic zone, green zone, semi-urban areas, residential area, market zone, etc. and how land use/spatial planning could be improved to maximize its potential.

Urban setting is dynamic, multi-layer, diverse and complex; and hence balancing competitive demands based on social drive, economic drive and environmental concerns is a challenge.

Disaster and Climate Risk as critical factor for sustainable city development

In many countries, city development is lag behind the fast growing of settlement and city expansion. Rapid growth and a lack of adequate urban management have resulted in urban development taking place in hazard-prone areas. A number of unplanned squatters and encroachment of slum areas to public land such as along the channels, river banks or in high flood prone locations are found in many cities, adding to vulnerability and exposure to local hazards. This is coupled with lack of proactive actions to reduce urban risk such as no proper land use planning that caters risk issues, construction methods and materials not taking into account hazard-resistant aspects, inadequate attention to apply mitigation measures for risk reduction or lack of technical know how to do so.

Disaster and climate risk in complex urban environment could cause more intensified impacts compared to other settings. The following are some examples of urban risk:

- In sufficient maintenance of city canal systems and poor waste management could cause blockage of water way; hence causing flood water retention in longer duration.
- Roads construction with uplifted level could prevent natural flow of flood water; hence causing severe flooding in inner part of the city.
- Reclaiming of low areas for construction might result in flooding in adjacent areas.
- Construction materials that retain or absorb heat would not suit for temperature rise due to global warming.
- Earthquake could cause total or partial damage of buildings and high death toll due to building collapse if provision of building codes is not applied and reinforced in earthquake prone area.
- Disruption of electric supplies or high voltage electric shock might be caused by water leakage to electric generating systems or damage of electric wire by strong wind.

Therefore, it is essential that in the process of formulating city plan, decision made on city development projects and during the implementation period, *risk information (hazard, exposure, vulnerability, hazard maps, prone locations, etc.) and a range of various measures to reduce risk have to be considered to ensure that:*

- *all city development interventions are designed to resist hazard impacts*- such as building constructed with earthquake resistant elements, risk assessment in the city conducted before decision made on site selection of housing project, industrial/commercial project, and transportation project
- *all city development will not increase vulnerability to disaster*- such as turning natural water way to roads without optional arrangements for water drainage could increase vulnerability to flood

Box 2.7.1 Case study – Urban Risk: Dhaka, Bangladesh

The high demand for land in cities has forced migration of urban poor to settle in floodplains, unstable slopes and reclaimed land which are usually prone to natural hazards.

The 1897 Assam earthquake caused extensive damage to Dhaka. The city's population was less than 1 lakh then. Now, it is estimated to be around 1.5 crores.

Many areas surrounding central Dhaka are flood prone during the rainy season and until recently were occupied by natural water bodies and drains, vital to the regulation of floods.

Destroying retention ponds and drain increases risks of seasonal flooding just as building in drained wetlands increase earthquake risk. During an earthquake, sands and silts can liquefy to the point where the soil no longer supports the weight of the buildings and infrastructure.
(Source: UNISDR, 2011)

Box 2.7.2 Case study – Yangon at High Risk
Multinational companies operating in the Asian growth economies will be exposed to spiraling environmental risks over the coming decades, according to Maple croft's 5th annual Climate Change and Environmental Risk Atlas , which identifies Dhaka, Manila, Bangkok, Yangon, Jakarta, Ho Chi Minh City and Kolkata as the cities facing the most risk from the onset of climate change.

Maple croft's Climate Change Vulnerability Index (CCVI), which forms a central pillar of the Atlas, classifies seven cities as 'extreme risk,' out of a list of 50 that were chosen for their current and future importance to global business. Dhaka, Bangladesh, (ranked 1st), Manila, the Philippines (2), Bangkok, Thailand (3), Yangon, Myanmar (4), Jakarta, Indonesia (5), Ho Chi Minh City, Viet Nam (6) and Kolkata, India (7) emerged as the most at risk from the changing temperatures and weather systems that are forecast to take hold in the coming years.

'Extreme risk' cities may see an increase in frequency and severity of key hydrological and meteorological events. Recently, we have seen major flooding in Yangon in 2008, Bangkok 2011 and Manila 2012, and such events could become both more frequent and severe in the future. Long-term changes in temperature and rainfall patterns could have devastating effects on ecosystems, human health, industrial processes, supply chains and infrastructure.

The vulnerability of cities in the growth economies stems not only from their exposure to climate related hazards, but also the sensitivity of their populations and the poor capacity of governments to support local adaptation measures to combat the potential effects of climate change.

Disaster risk reduction programmes, more stringent building regulations, better education and improved communications networks are therefore essential to secure the future stability of these cities.
(Source: Maple croft's Climate Change and Environmental Risk Atlas 2013)

City Development Planning in Myanmar

There are ***3 City Development Committees in Myanmar,*** namely Nay Pyi Taw City Development Committee, Yangon City Development Committee (YCDC), and Mandalay City Development Committee.

The Organization Structure of City Development Committees slightly differs. In Nay Pyi Taw City Development Committee, the Mayor takes a leading role as a Chairman of the Committee. Under the chairmanship of the Mayor, the Vice-Mayor, the Secretary, Joint Secretary and 6 Committee Members supervise the 21 departments of the Committee.

Yangon City Development Committee has been led by the Mayor as a Chairman of the Committee. Under the chairmanship of the Mayor, the Secretary, Joint Secretary and 5 Committee Members supervise the 21 departments of the Committee.

In the organization structure of Mandalay City Development Committee, the Secretary and 5 Committee Members are working under the chairmanship of the Mayor. There are 14 departments in the Mandalay City Development Committee.

The departments under Nay Pyi Taw City Development Committee and Yangon City Development Committee include Administration Department, Budget Department, Inspection Department, Coordination Department, Appraiser Department, Revenue Department, Markets Department, Veterinary and Slaughter Houses Department, Pollution

Control and Cleaning Department, Engineer Department (Road and Bridge), Engineer Department (Building), Engineer Department (Water and Sanitation), Plant and Vehicle Department, Central Equipment Department, Garden and Sports Ground Department, Health Department, Security and Discipline Department, City Planning and Land Administration Department, Public Relation and Information Department, Production Department and Committee Office.

Organization Structure of City Development Committees

Figure 2.7.1 Organization structure of Nay Pyi Taw City Development Committee

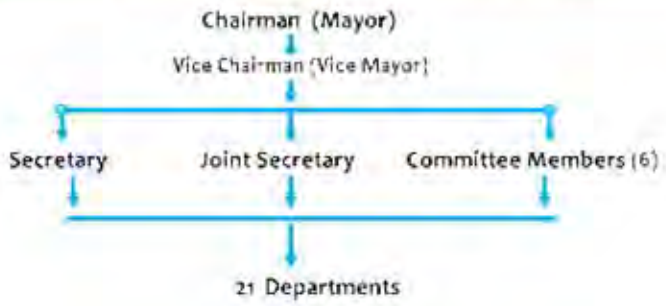


Figure 2.7.2Organization structure of Yangon City Development Committee

Figure 2.7.3Organization structure of Mandalay City Development Committee

Key Functions of City Development Committee

The departments under the City Development Committees (CDCs) have their specific functions. Out of 20 departments under Yangon City Development Committee, the following summarizes some of the key functions of City Planning and Land Administration Department, Engineer Department (Road and Bridge) and Engineer Department (Building).

City Planning and Land Administration Department

- Detailed drafting, reviewing and revising the project for the city development as per city planning
- Drawing the design for city reconstruction and city renovation
- According to the city planning, identifying and modifying the land uses if requires
- Inspecting the city development activities undertaken by either the government department or private organization if they are complied with the city development planning
- Providing decision in land use issues according to city planning
- Issuance of licenses and permits for buildings for human settlement, industry, farming and livestock breeding or for other purposes
- Imposing the taxes according to the prevailing laws
- Amending and altering the types of tax and the rate periodically

Engineer Department (Road and Bridge)

- Renovating the roads and bridges within the city municipal area
- Constructing and extending the new roads
- Constructing, extending and renovating the pavements, drainages and gutters

Engineer Department (Building)

- In preparation of short and long term plan of YCDC, preparing for the Committee's construction sector
- According to the prevailing laws and regulations, inspecting, providing permission, declining and postponing the construction of buildings within the Yangon City area
- Guiding, inspecting and supervising the construction of building within the Yangon City area to be complied with the standard of the city

Planning Tools used for City Development Committees are the Conceptual Plan/Master Plan, 5 Year Plan and Annual Plan. Plans are developed and compiled by the CDCs and submitted to the respective Regional Government.

Yangon City Development Conceptual Plan

To enhance institutional capacity to address the challenges of the mega city such as housing requirements and requirements of basic infrastructure, *the Yangon City Urban Planning Supervisory Committee* was formed by the Yangon Region Government in 2011. The Committee is comprised of the urban experts and the officials of Yangon City Development Committees and Department of Human Settlement and Housing Development of Ministry of Construction. The Committee has drafted *the Yangon City Development Conceptual Plan* and submitted to the Regional Government.

The objectives of the Conceptual Plan are as follows:

a) To present the current sectors pertaining to the housing, communication, transportation and infrastructure
b) To present the works and the programs of YCDC

c) To mention the works which are intended to be implemented during the middle term by YCDC
d) To submit the drawing of the Long Term Plans about all these sectors by YCDC
e) To submit the planned programs in connection with the investors inside the country and abroad

Once the conceptual plan is agreed and approved by the Regional Government, the Master Plan for Yangon City will be drafted.

Key Measures for Risk Resilient City

- Change of land use pattern requires careful considerations of hazard characteristics and explores various options for mitigation.
- Slum and informal settlements upgrading linking with community priorities, incorporating risk information on the current sites and for identification of new sites, and applying alternative low-cost risk treatment measures that affordable and manageable
- Promote strict application of appropriate building codes that integrate hazard resistant elements in construction and standard maintenance procedures for critical infrastructures
- Introduce new tariff systems, etc. for hazard prone areas to discourage development in unsafe areas
- Reduce tax and improve services to encourage settlement and development in safer areas

Table 2.7.1 DRM/CRM considerations for City Development

Specific areas for City Development	Key considerations for DRM/CRM integrated into city development planning/projects
Waste Management	• Avoid flood retention areas being used as dumping grounds • Locate landfills away from flood prone areas • Plan and implement ways of disposing of hazardous waste separately • Plan to reduce un-systematic disposal of solid waste and to implement proper waste disposal means • Explore the potential benefits of converting solid waste into other products such as energy, fertilizer, etc. and take advantage of globally promoted programs such as Cleaner Development Mechanism (CDM) • Promote Cleaner Production (CP) in which reducing waste at source is possible instead of disposing at the end of the pipeline • Promote production of compost fertilizer at the levels of household and communities • Popularize "Reduce, Recycle and Reuse" waste among people • Involve urban communities and their organizations in designing, planning and implementing, and also maintenance of, efficient and hygienic waste disposal (both solid and liquid) facilities • Encourage and promote more private and public sector partnerships • Coordinate with other urban centers and cities to implement such interventions where economies of scale and other complementary benefits could be generated • Strictly enforce existing law against haphazard dumping of waste • Consider providing economic incentives for win-win solutions
Health, Sanitation & Hygiene	• Establish better monitoring and evaluation (M&E) systems to ensure routine health and sanitation functions • Organize awareness programs for prevention of epidemic situations for cases such as dengue, malaria and any other vector born diseases before

	outbreak • Implement prevention programs for controlling outbreaks of seasonal health hazards • Organize mobile clinics, medical assistance with help of health authorities, NGOs etc. after monsoon seasons • Set up maintenance units to help clean polluted water sources after flood events • Lead public-private partnerships and campaigns to promote effective hygienic practices, and making the city free from diseases • Strictly enforce law on hygienic and civic conditions.
Land use planning & control	• Conduct multi-hazard Risk Assessment at city level to build a risk profile of the city to help identifying safer locations for development initiatives • Identify low lying areas and promote schemes to protect the natural environment as a way of retaining the flood retention capacity • Avoid reclamation of flood retention areas • Avoid practices in mountainous areas which will destabilize the slopes such as cutting of slopes, removal of vegetation etc. • Develop a city level spatial database to monitor development in hazard prone areas • Develop zoning regulations and strictly follow zoning guidelines • Deal with environmental issues connected with slums in consultation with residents in poor settlements • Maintain parks, recreation facilities etc. which can be used during emergencies for evacuation and setting up camps for Internally Displaced People (IDPs). • Allocate appropriate area (unused land) for flood ways to drain flood water from city congested area • Land use planning measures to overcome health and sanitation issues
Housing and infrastructure development	• Promote strict application of appropriate building codes that integrate hazard resistant elements in construction • Periodic review and revision of the building laws to integrate hazard related aspects • Train local government officials to supervise, execute controls and restrictions, and ensure building code compliance • Implement certification programs for those who are involved in the construction process (masons, contractors, etc.) • Obtain assistance from qualified professionals for developing guidelines for shelter and infrastructure development in hazard prone areas • Allocate funds for minor infrastructure that reduces flood risk (i.e. for construction of drains for diverting water from stagnated areas) • Practice routine maintenance of infrastructure, government buildings, etc.
Road and Transport System	• Conduct loss estimation surveys for bridges, overhead crossings, terminal buildings etc. and ensure higher safety standards • Make arrangements to locate terminal buildings, central stands etc. for mass transport systems away from high risk areas • Suggest alternative arrangements for continuity during emergencies to relevant authorities • Special maintenance programs for roads located in flood prone areas, landslide prone areas etc. • Make emergency maintenance groups available at all times for speedy action • Execute emergency response guidelines for staff involved in control and maintenance of roads and mass transit services for quick recovery.

Group Work

1. Participants are divided into groups. Each group will be provided city development scenario for specific sector.
2. Each group identifies:
   - Key DRM/CRM considerations in the specific sector
   - What type of support required to include DRM/CRM in the given sector
   - Key challenges

Case 1- Housing Sector

It was found out that at some towns of the developing countries, the population residing at the squatter wards are about 40 per cent of that city population. Although these squatter wards are removed in many cities, they have emerged again at another place. So, they are called as mushroom towns and most of the people of low income are not entitled to have the right of infrastructures such as accessibility of water supplying systems and electricity supply.

Yangon City, if compared with many other developing countries, is found out that the condition of the housing sector is much better than these countries. After 1988, the new land plots are implemented and settled by the ***Site and Service Scheme*** and the squatter wards had much lessened at some big cities throughout Myanmar. But as mentioned above, the population of Yangon City is about 5.14 million in the year 2012 and households will become about 1.05 million.

In Yangon, during 5 years from 2004-2005 to 2009-2010, altogether 36,000 apartments, averaging 7,200 per year were built. If these figures are studied based on the increase of the population of Yangon City, the average increase of the households per year is about 26,000. Thus, the increase of the households is 3.5 times more than the completion of apartments. This factor could be considered as the emergence of the housing problems in Yangon. The new ways of fulfilling the needs for the housing sector should be considered. As a living is the major difficult challenge for the majority of people, the availability of housing for the general public must be carried out with many means from various sectors collectively. For the development of the housing sector, the present housing apartments are to be upgraded and more stories to be built. After collecting the land plots that are allowed land permits or land loan permits but where no settlements have been materialized, the construction of high storey housing complexes should be prioritized and constructed there collectively owned for living, schools, markets, clinics and recreation places at new townships where the population is still scarce. In the townships and wards that have difficulties to build collective housing projects for solving the problem of housing sector to a certain extent, YCDC in cooperation with other organizations should establish a Housing Financing Loan System.

By the current condition after Department of Human Settlement and Housing Development have handed over the lands to YCDC, in accordance with the implementation of the City Planning for the people whose houses were abolished and moved, a lot of apartments could be built in advance for allocating the people in accord with their income, status and racial strata.

Case 2 - Industrial Zones and Development of Industrial Sector

Industrial zones are specified since 1950 in Yangon City. At that time, the surrounding areas of Kha Wei Chan along Yangon-Insein Road are specified as the industrial zones. During 1962 to 1988, there is no special notification of Industrial Zone in Yangon City. But after 1988, in connection with the extension of new towns at Hlaing Thar Yar, Shwe Pyi Thar and Dagon, the special places are allocated as specified locations. But while placing these industrial zones, they are not placed collectively at one place but are different even in one township.

As Yangon City has become more developed, the extensions of industrial zones will be further needed. If the industrial zones are placed collectively in future, the electricity supply systems, water distribution system, and sewage system etc. could be supervised, managed and controlled more efficiently. In accord with the current situation, it would be the best if these emerging industrial zones are to be placed at the territories to be extended in the north of Than Lyin town, in the south of Dalla town, in Kwan Chan Kone and Kaw Hmu townships respectively. As these places are situated in the southeast of Yangon City and millions of peoples living in the city will be free from the air pollution when the monsoon blows from the northeast during the rainy season and when the northeast wind blows during the cold season. The factories that are free from air pollution could be placed at the locations in

the west of Hlaing Thar Yar Township. Formerly, some places at Shwe Pyi Thar Township are notified as the industrial zones. It is essential that these industrial zones must not have the negative impacts of air pollution for Hlaw Gar reservoir which is the key reservoir for distribution of water to Yangon City.

Case 3 - Road Communication Sector

As Yangon city was rebuilt in the mid of 19 century, at that time, the present downtown Central Business District was between Strand Road and Bogyoke Road. Bogyoke Road and Shin Saw Pu Street, Bahan Road and Kan Taw Galay Street are specified as green territories and outskirt areas. After the 19th century, due to the barriers of Hlaing River in the west and Pazun Taung Creek in the east, Yangon could only be extended to the north. Due to these historical facts, Pyay Road, Kaba Aye Pagoda Road and Insein Road which connect south and north of the city is always congested daily with the vehicles. In the 20th century, the new roads that connect east and west were extended. These roads are University Avenue Road, Shwe Gone Taing Road and Parami Road, etc. which become the junctions where these roads intersect. The junction where the roads that connect south and north have sometimes had the traffic blocks.

In connection with the traffic blocks, the traffic flow in Yangon takes a few minutes to wait at most of the junctions while the congested junctions like Hletan, Shwe Gon Taing, Myay Ni Gone, it sometimes takes up to 15 minutes to wait. If compared with the cities in other countries, this condition may not be recognized as a worse situation. But, as the number of vehicles in Yangon is increasing yearly, Yangon City Development Committee had laid down short and long term plans to solve the problem by constructing over bridges of 2 or 3 levels at the important junctions. The current area of Yangon City is 306.73 sq miles and the number of vehicles running in Yangon is about 270,000. Therefore, the vehicle density will be 880 vehicles per sq.-mile.

Analyzing the current issue, we can compare with the Bangkok City of neighboring country Thailand. Bangkok with the area of 605.79 sq miles, has 4 million vehicles and the density of vehicle is 6600 vehicles per sq mile. Thus, it can be seen that Bangkok's vehicle density is 7.5 times of Yangon. According to this comparison, it can be identified that road network and vehicle flow is not in proper condition in Yangon. As the numbers of vehicles used in Yangon increasing more, the problem of traffic congestion at the above mentioned junctions will become worse. Therefore, at the major junctions of Yangon City such as Ba Yint Naung, Hledan, Myay Ni Gone, Shwe Gon Taing, the building of multi level crossings, overhead bridges are required to be constructed. And at the major 6-lane and 8-lane roads where there is no crossing from the branch roads and short-cut roads, the two- storey roads which are accessible directly parallel to these roads should be paved.

In the long term, while solving the problems of the main communication roads in Yangon City, not only the Yangon City circular railway road but also the circular express railway roads that run around Yangon from the outside should also be paved. This task will be implemented as a Long Term Plan by coordinating with the Ministry of Railway Transportation via the Region Government. Moreover, for easier communications to the townships extended from Yangon the river-cross bridges at Bago River, Yangon River and Haling River are needed.

Case 4 - Transportation Sector

Due to the historical data, the present economic zone of Yangon is left in the south and the extension is going towards the north. And most of the people have to come to Yangon City daily because of the occupation or trade. According to the studies by Yangon City Development Committee, the numbers of peoples working in Yangon City are about 2.1 millions and about 40 % or about 800,000 people are going daily to the Commercial Business District. As a result, the traffic is very much congested with commuters during the rush hour in the morning and from 4 to 6 o'clock in the afternoon. To reduce the traffic congestion in CBD, and to improve the transportation sector, the following should be taken into considerations:

1. **Improvement of Public Transportation**
    1) Bus Rapid Transit (BRT) system
    2) Circular railway system
    3) Sky train and mono-rail
    4) Mass Rapid Transit (MRT) system
2. **Constructing Circular Express Railway and Road**
    1) Boundary of the extension area
    2) Developing the road side areas by connecting the circular roads and inner city roads
    3) Distributing the development from the inner city to outskirt area

To implement the above task, the short, medium and long term plans should be carried out as follows:

a) **Short-term Plan**
   1) running regularly and upgrading the current circular railway system
   2) Provide more locomotives
   3) run more trips
   4) individual owned bus lines to public owned bus lines
   5) reduce taxi importing and increase bus importing
   6) establish bus route network by zones rather than the only bus center in CBD
   7) construction of multi-level crossings in congested junctions and planning the road network connected to
   8) Construction of multi-storey car parking posts in the city
   9) Survey and identify circular express road

b) **Medium-term Plan**
   1) Increase more railway lines and the train stations
   2) Construction of circular express road
   3) Construction of bridge and tunnels to cross the rivers

c) **Long-term Plan**
   1) Link circular express road with inner city road networks
   2) Establish a sky train line travelling north to south of Yangon, and also a mono-rail is to be constructed at the environ on Bogyoke Road and Canal Street
   3) Constructing express roads as multi-level roads without crossing and junctions

References and Supplementary Readings

1. ADPC (2013) *Integrating Disaster Risk Management into Urban Management*. Disaster Risk Management Practitioner's Handbook Series. Bangkok.
2. German Committee for Disaster Reduction (DKKV) & EMI (2010) *Risk-Sensitive Land Use Plan: Kathmandu Metropolitan City, Nepal.*
3. GFDRR. *Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century.* https://www.gfdrr.org/urbanfloods
4. Pelling, Mark & Wisner, Ben *(2009) Disaster Risk Reduction: Case form Urban Africa.* http://books.google.co.th/books?id=FdvNNIDEKIIC&printsec=frontcover&hl=th&source=gbsge_summary_r&cad=0#v=onepage&q&f=false
5. UNISDR (2011) *Global Assessment Report.* http://www.unisdr.org/we/inform/gar
6. UNISDR (2012) *How to Make Cities more Resilient: A Handbook for Local Government Leaders.*http://www.unisdr.org/files/26462_handbookfinalonlineversion.pdf
7. UNISDR (2012) *Making Cities Resilient Report 2012.* http://www.unisdr.org/we/inform/publications/28240
8. Yangon City Development Committee. *Yangon City Development Conceptual Plan.*

Note

Session 2.8: Mainstreaming DRM/CRM into Programs and Projects

Session Objectives:

At the end of this session, the participants will be able to:

- Have common understanding on integrating DRM/CRM in development programs and projects
- Identify actions for integration of DRM/CRM in programs and projects

Duration: 1 hr and 30 minutes

Training methods: Lecture, Case Study and Group Work

A Project is 'a series of activities aimed at bringing about clearly specified objectives within a defined time period and with a defined budget'[1]. The development strategies identified by development plans are operations through projects. These projects vary in scope, size, and duration and are implemented across different sectors and on-cross cutting issues.

Developing risk-sensitive programs and projects requires knowledge and understanding of the underlying, highly dynamic factors that determine levels and forms of vulnerability to natural hazards and how they can be addressed (Benson & Twigg, 2007). The focus of this session will be on the incorporation of DRM/CRM into the routine projects and programs planned and implemented by the government agencies.

Why Mainstreaming DRM/CRM into Project Cycle?

In annual plans and fiscal year plans, a number of development programs (a group of related projects)/projects are indicated with specific details on objectives, list of activities, required resources and budget, and timeline. There are always the challenges on prioritizing among various projects and some projects being withdrawn or approved with budget contraction due to limited funding resources.

While financial resources are required for undertaking interventions related to disaster and climate risk management, it is to be kept in mind that a lot of these measures can be undertaken simply at low cost by incorporating disaster and climate risk sensitive considerations in development program and project design and building capacity of technical staff involved in design, implementation and monitoring of projects.

When disaster risk concerns are adequately addressed in development projects (project design, appraisal, budgeting, implementation and monitoring), they provide a strong entry point for integrating DRM/CRM in development processes and for strengthening project beneficiaries' resilience to disasters. Moreover, projects have specific objectives to meet within a defined time period and budget. Thus, it should be ensured that factors having negative impacts on the project outcomes are minimal. This includes, among others, risk emanating from natural hazards.

[1] EuropeAid Website. *http://ec.europa.eu/europeaid/how/delivering-aid/project-approach/*)

Therefore, integrating DRM/CRM related concerns in development projects will ensure:

- Individual projects adopt *measures to reduce risk from natural hazards*(both climatic and non climatic) and also future risk posed by climate change
- Individual projects *does not exacerbate existing levels of vulnerability* in the project area

Project Management Cycle

The 'project cycle' is a way of viewing the main elements the projects have in common, and how they relate to each other in sequence.[12] The precise formulation of the cycle and its phases varies from one country to another, but the basic components are more or less similar as illustrated by Figure 2.8.1.

Figure 2.8.1 the Project Cycle
(Source: EC. Manual: Project Cycle Management. Brussels: European Commission, EuropeAid, 2001)

Disasters and potential climate risk impacts can hinder the attainment of project objectives, delay implementation time, and waste of budget. Development projects especially in the construction sector could significantly bring about spatial changes, and hence adding vulnerability to the hazard. Hence, it is equally important that design of regular programs and projects *factors in disaster and climate risk information and accordingly adopts measures to manage such risk in all phases of project/program management cycle* – e.g. programming, issues identification, appraisal, budgeting, implementation and evaluation. This is because reducing disaster and climate risk contribute to:

- Reducing vulnerability to disaster risk, climate impacts and variability
- Increasing the adaptive capacity of local communities and national activities facing increasing disaster risk and climate impacts
- Ensuring sustainable development and also avoiding the circumstance which creates difficulties in adaptation
- Enhancing convenient and cost effective practices than spending for recovery of the damage caused by future disasters on the projects

Approach for Mainstreaming DRM/CRM Considerations in Project Management Cycle

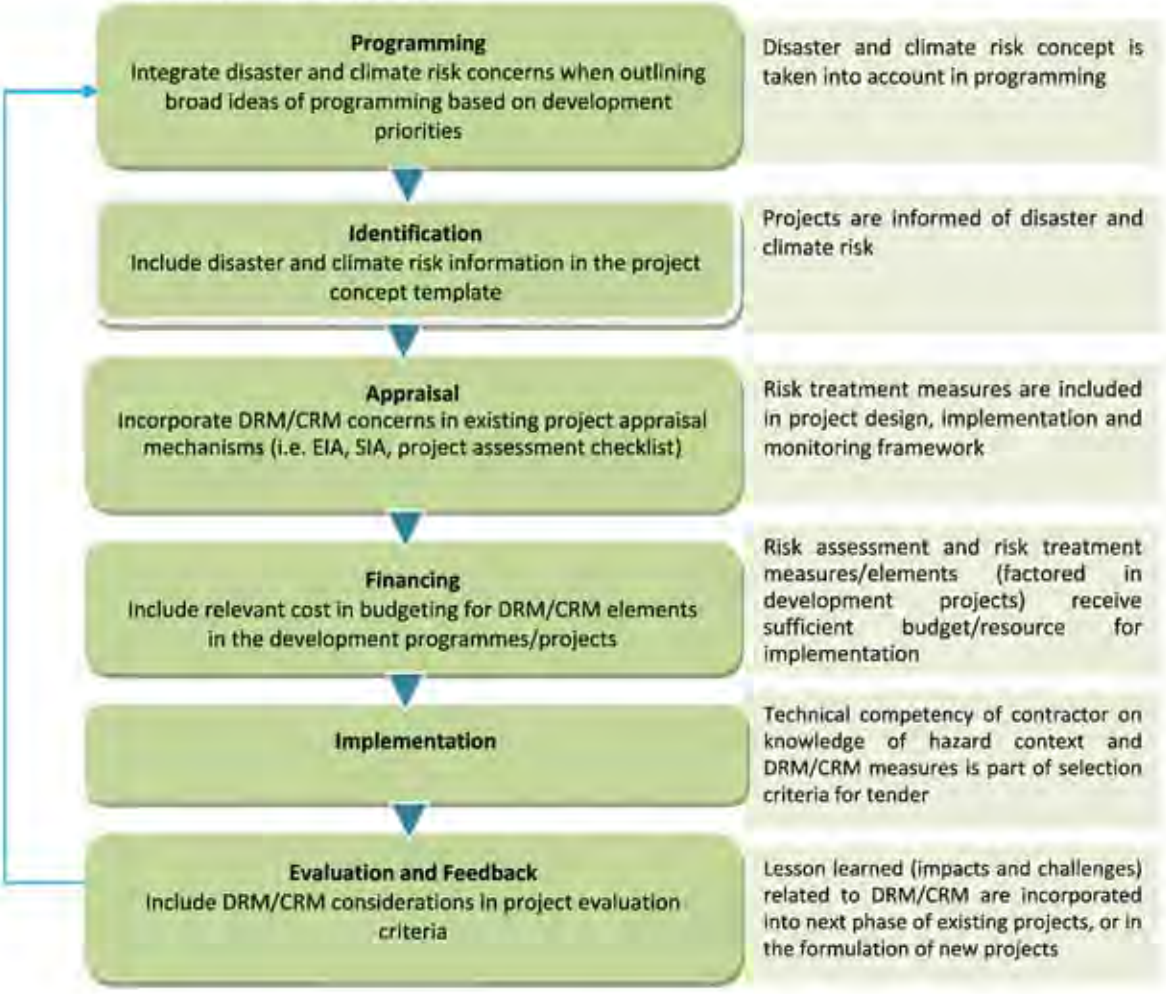
By looking at the individual step that makes up the project management cycle, we can identify various entry points and the specific actions that can be taken related to factoring in DRM and CRM.

Programming: is the process of outlining broad ideas and principle based on sectoral priorities and themes. Programming frameworks are used based on development priorities of

[12]Project Cycle Management (PCM) is a term used to describe the management activities and decision-making procedures used during the life cycle of a project (including key tasks, roles and responsibilities, key documents and decision options). From EuropeAid Website. *http://ec.europa.eu/europeaid/how/delivering-aid/project-approach/*

the countries and identify sectoral or thematic priority area for intervention and support. Broad programming areas are identified based on priorities of development plan. *If disaster risk assessment is integrated in development plan, it provides an opportunity to make sure programming areas are informed of disaster and climate risk.*

Figure 2.8.2 the Basis of integrating DRM/CRM into the Project Management Cycle
(Adapted from Integrating Disaster Risk Management into the Development Process. Disaster Risk Management Practitioner's Handbook Series, ADPC)



Issue Identification: At this stage, problems, needs and interests of stakeholders are analysed, ideas for projects and other actions are identified and screened. This is an important stage where disaster assessment outcomes (risk information) can be integrated so as to add risks and vulnerability factors as an instrumental part of the priority issues being considered for the project and program development. The assessments would essentially provide:

- *Hazard information* (types of hazards, both natural and human-induced, prevalent in project/program area, the intensity, frequency, probability, potential damage within the vicinity, past hazard and their impact, etc.)
- *Information on elements at risk* –people, environment, physical assets, etc. present in the area such as structural elements like building design, non-structural elements like furniture, mechanical and electrical systems, decorative elements and people (city dwellers, rural population, students, teachers, medical staff, etc.)
- *Vulnerability information* linked to physical, social, health, economic and environmental dimensions
- *Capacity and resources* – skilled workforce, materials and financial resources; and

- *Effectiveness* of past and on-going coping mechanisms and capacities

Box 2.8.1Essential Points of Consideration in Preliminary Studies of Identification Phase

While conducting the preliminary studies, following questions should be addressed:

- Are natural hazards capable of creating disaster relevant factors in this project/ program? If so what are the hazards, what are the impacts and which elements are most at risks? Where can this information be found?
- What risks could have a direct impact on the project/ program?
- Could the project/program increase the risk?
- What could be the potential impact of the project/program in reducing the risks?

In seeking answers to these questions, the project/program developers should make sure

- Consultations with relevant organizations are carried out.
- Data on thorough risk analysis and other essential information are carefully studied and taken into considerations.
- Risk management and reduction featured as a specific point in issues brought out.
- In relation to hazards, socio-cultural and institutional policies, management capacity and economic and financial viability are examined against sustainable criteria.

Adapted from RUTA Guidelines for risk management in rural development projects, Unidad Regional de Asistancia Tecnica (RUTA), 2001.

Appraisal: As part of the project formulation process, it is required to undertake project appraisal. In this stage, all significant aspects of the identified project are studied, taking into account stakeholders' views, relevancy to problems, feasibility and other issues. Natural hazards and related risk should be assessed as part of the appraisal process of all projects, by integrating as an explicit component of existing appraisal tools.

Since vulnerability to natural hazards is complex and multi-faceted, and thus requires considerations from all angles – environmental, social and economic. The following describe briefly the most commonly used project appraisal tools that offer entry points for mainstreaming DRM/CRM related issues. (The guidance in this section is adapted from work undertaken by Provention Consortium on Tools for Mainstreaming Disaster Risk Reduction, Guidance Notes for Development Organisations.)

Environmental Impact Assessment (EIA) – in order to examine the potential environmental consequences (both negative and positive) of the proposed projects and to ensure that they are factored in the project's design. The state of the environment is a major factor determining vulnerability to natural hazards (e.g. deforestation leading to increase in floods, poor land use management leading to rising incidence of landslides); and *thus it is essential that environmental impact assessment covers natural hazards.* Also, the environmental setting is the natural place to collate data on natural hazards, magnitude and probabilities of occurrence in the project area to feed into other forms of appraisal an engineering design as relevant (Benson and Twigg, 2007).

The agency responsible for environmental clearance in the country issues standard guidelines describing the types of activities and project for which environmental clearances are required, stages to be followed for undertaking the environmental assessment and the standard template for the final assessment report. For example, Government of Philippines has developed a guideline on how to include DRR and CCA into EIA

Box 2.8.2 Key considerations for integrating disaster risk in environmental assessments

- Include hazard related information as well as information that can increases risk from hazards such as location, slopes and drainage, soil, etc, in the initial project description.
- Undertake an estimation of frequency or probability of hazard events and severity of impacts on project components. Remember, possible shifts in vulnerability and, due to climate change, the frequency and intensity of hazard events over the life of the project.
- Undertake hazard and vulnerability assessment to understand the impacts of natural hazards on the project and the impacts of the environment on the project as part of the screening stage of IEE (Initial Environmental Examination) or EIA
- If disaster risks are significant or the proposed project is likely to have a significant impact on vulnerability to natural hazards, include these topics in the list of issues for investigation.
- Based on the assessment and consultation with stakeholders, decide if the potential risk from natural hazards is acceptable and if not, types of mitigation measures are required
- Ensure the mitigation measures are incorporated in the project design and the monitoring process captures this.

(Adapted from Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations, Provention Consortium, 2007)

Social Impact Assessment (SIA): Benson and Twigg (2007) describe Social Impact Assessment (SIA) *as the process of analyzing, monitoring and managing the social consequences of policies, programmes and projects*. These consequences may be positive or negative, intended or unintended, direct or indirect; they may be short-term impacts or long-term changes. As well as helping to explain how a proposed action will change the lives of people in communities, *SIA indicates how alternative actions might mitigate harmful changes or implement beneficial ones*.

SIA makes it possible to:

- Identify the direct and indirect consequences of risk (i.e. the social impacts which could arise from hazard event)
- Develop appropriate and effective mitigation mechanisms to hazards which harness community resources and recognize community reactions to events

Box 2.8.3 Key considerations for integrating disaster risk in Social Impact Assessments

- Ensure participation of communities who might be exposed to hazard risk as a result of the project.
- Include data on hazard and vulnerability in the baseline study or while developing the community profiles
- Identify the potential hazards and associated risk that might affect the project and communities at any stage in the project cycle, as well as the impact the project itself might have on disaster risk, and their probable impacts through trend and scenario analysis
- Remember disaster events can change social vulnerability and hence factor in hazardous event and their risk or uncertainty while assessing alternative interventions
- Include disaster mitigation strategies in the implementation plan

Note: In many countries SIA is undertaken as part of the EIA process. While hazards and risk are important features of the SIA process, SIA is not specifically a risk assessment but a mean of understanding and measuring human response to situation that may be at risk or threatening.
(Adapted from Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations, Provention Consortium, 2007)

Checklist: In project appraisal stage, *checklist with integrated DRM/CRM related issues could be developed for the planning agency to assess the projects from DRM/CRM point of view* by adopting set of DRM/CRM parameters, along with other parameters used for appraisal.

Box 2.8.4 Incorporating Resilience into Project Appraisal in India (Case Study)

In 2009, the Government of India amended the formats for the Detailed Project Report (DPR) and the Expenditure Finance Commission (EFC) memorandum, both key elements of the public investment project approval process in India, to incorporate resilience concerns. DPRs are prepared after proposed projects have secured in-principle approval from the Planning Commission. Accompanying EFC memorandums are also prepared for all public investment projects costing in excess of Rs1 billion ($18 million) and which therefore require EFC appraisal (Government of India 2010).

Following the 2009 amendment, *DPRs are now required to include a natural disaster impact assessment* (Government of India 2009). EFC memorandums must include an assessment of disaster risk management concerns, should the proposed project involve the creation or modification of structural and engineering assets or a change in land use plans, and must include any related risk reduction costs in the total project cost. All EFC memorandums should also indicate whether the project design is "secured" against natural hazards such as floods, cyclones, earthquakes, and tsunamis.

(Source: ADB, 2013)

Box 2.8.5: Checklist for Integrating DRR in Planning Projects in Pakistan (Case Study)

In 2010, the Planning Commission of Pakistan has issued a circular stating the need to assess, all development projects prior approval, in regard to vulnerability from natural and human induced disasters and to incorporate disaster risk reduction at the project design, planning and implementation stage. Accordingly, it has issued checklist for projects in infrastructure, social and productive sectors and which may be considered as part of PC-I (project appraisal) and PC-II (Survey and Feasibility studies) forms. Each checklist contains a set of 20 questions mostly to be answered in form of Yes or No. Below bullets provides description of the said checklist for infrastructure sector:

1. Which types of hazards have been considered as unavoidable for the project and thus a condition for its planning and design? Indicate the relative order of importance of the hazards related to the project.
2. Has the brief history of the identified hazard(s) in the area included in the PC-I. (Yes No)
3. Is the project prepared keeping in view the Building Codes of Pakistan 2007? (Yes No Partial N/A)
4. Is the project prepared keeping in view the prevailing Building bye-laws? (Yes No Partial N/A)
5. Does the project incorporate the prevailing territorial planning regulations (e.g. hazard zoning, institutional jurisdictions)? (Yes No Partial N/A)
6. Have the components and activities of the project been designed to resist the impact of hazards, prioritized in Q. No. 1 above, and to contribute to the reduction of its vulnerability, and that of its surroundings and beneficiaries? (Yes No Partial N/A)
7. What facilities are available in the area for rescue and emergency relief in case of a hazard?
8. Are there adequate arrangements within the project site for firefighting? Fire alarms, fire hoses fire extinguishers, automatic sprinkler system
9. Are there funds for mitigation and periodical maintenance of its components, incorporated and meant to reduce the vulnerability of the project and its surrounding population? (Yes No Partial N/A)
10. Does the budget and cash flow of the project include items allowing the coverage of structural activities for risk management? (Yes No Partial N/A)
11. Does the budget of the project include provision to respond to emergencies (e.g. alert, contingencies, mitigation, and rehabilitation)? (Yes No Partial N/A)
12. Does the project include a campaign of awareness raising, training and understanding to risk management for planners, workers and beneficiaries? (Yes No Partial N/A)
13. Does the budget and cash flow of the project include items allowing the coverage of non-structural activities for risk management? (Yes No Partial N/A)
14. Do service, transfer, concession and reclamation contracts incorporate provisions for risk management? (Yes No Partial N/A)
15. Does the project incorporate an adequate contingency plan for possible disasters? (Yes No Partial N/A)
16. Does the project incorporate any instruments for its financial protection during execution and after the completion of the project (insurance, indemnity, guarantee, contingency credit arrangements, etc.)? (Yes No Partial N/A)
17. Are there any financial or moral incentives to promote risk management? (Yes No Partial)

18. Is there provision in the budget for the periodic training of workers and staff to use fire extinguishers, first aid kits, and light search and rescue equipment available within the project site? (Yes No Partial N/A)
19. Is the evacuation plan prepared, evacuation routes and safe assembly areas identified? (Yes No Partial N/A)
20. Is the communication system for emergencies established, including a warning system wherever appropriate? (Yes No Partial N/A)
(Source: Planning Commission, Government of Pakistan)

In Myanmar, Project Appraisal and Progress Reporting Department of Ministry of National Planning and Economic Development is taking care of appraising projects using different types of appraisal criteria for the various nature of the projects. The following is the same appraisal criteria used for construction sector.

Box 2.8.6: Project Appraisal Criteria for Construction Sector

(1) Name of Project and Objective for Construction
(2) Type of Project
(3) Project Area
(4) Implementation Agency
(5) Agency Undertaking the Construction
(6) Cost-effectiveness
(7) Date of Project Implementation and Period of Implementation
(8) Estimate of Investment and Program of Investment
(9) Program for Securing Budget
(10) Project Duration
(11) Fuel Requirement
(12) Electric Power Requirement
(13) Planning for Construction
(14) Procurement of Equipment/Equipment Imported
(15) Workforce and Production Status
(16) Social Impact Assessment
(17) Environment Impact Assessment

Budget/Financing: At this stage, a decision is taken by the relevant parties about whether or not to fund the project. This stage of the project cycle is very much linked with annual planning and budgeting, which means vigorous negotiation and competing with other priorities. The inclusion of DRM/CRM issues in national plan, sectoral plan and regional plan will provide a basis for a string argument for the inclusion of DRM/CRM in the project in order to achieve national, sectoral and regional development goals.

In costing DRM/CRM activities, it is imperative to dissect each component into manageable sub-activity and identify the associated costs. Even if the final cost could be merged under a single common activity, for implementation and monitoring purposes, the implementation agency should have a detailed break-down cost structure that include expenditure on inputs required for DRM/CRM.

Implementation: The agreed resources are used to carry out the planned activities and achieve objectives. Contractors should have knowledge on hazard context and DRM/CRM measures. Tender document should include hazard context. It should also emphasize on different needs of vulnerable groups for DRM/CRM. Tender document should insist on staff with knowledge on DRM/CRM. These aspects have to be considered while selecting contractors. Detailed implementation plan should be in conformity with site conditions/hazard context, avoiding activities that are not conducive to the hazard context in the site. Project team should have knowledge on DRM/CRM.

Evaluation: The assessment of the project's achievements and impact should examine the relevance and fulfillment of objectives, efficiency, effectiveness, impact and sustainability. Special attention should be given to the quality aspects of project components that are specially designed to withstand or mitigate disaster and climate impacts. Evaluation should include checking the quality aspects of project components that are specially designed to withstand the disaster and whether the differential impact of disaster has been considered.

The presence of an effective M&E system would feed into the periodic assessment of project achievements throughout the project/program period. In addition, a systematic and efficient documentation system would surely assist the learning process that follows. It is crucial that the stakeholders are actively involved in evaluation, not merely in data collection, and are empowered to make appropriate decisions about future activities as a result (Provention Consortium, 2007).

Critical Factors for Success

In mainstreaming DRM/CRM into project/program cycle management, the following points should be kept in mind (Provention Consortium, 2007):

- Broad coverage of key issues is essential. It's vital not to miss important stages in project planning or components of projects; nor should important aspects of risk and the factors that create it be left out.
- The department/division/unit responsible for the project/program must make its own decisions about how much research is required to identify relevant issues or answer questions for effective decision-making and integration of DRM/CRM into the project cycle. This is likely to depend on its capacities and existing ways of working (i.e. the degree of rigor already required for project design and appraisal).
- The responsible department/division/unit must make it clear to their staff about whether the proposed assessment and appraisal tools are voluntary or compulsory, their purpose, when and where to use them.
- The department/division/unit in charge should be aware that their staff may be reluctant to use additional checklists and guidelines, particularly where the project appraisal process is already extremely lengthy and costly, or if the staffs are overworked. The risk that they may pay only lip service to this or any other new issue should be acknowledged. There may, therefore, be a need for internal advocacy about the benefits of adopting DRM and CRM.
- Support, both political and financial, from the highest decision making level is indispensable to guarantee the realization of mainstreaming objectives in any project and program. At the same time, the understanding and acceptance from the ground level is equally fundamental since they are the ones to make sure the outcomes are maintained and good practices replicated when possible.
- Fostering partnerships with relevant non-government partners: internationally or locally based NGOs and Civil Society Organizations (CSOs), donors, private sector organizations and academic institutions, particularly with the DRM/CRM expertise, would greatly benefit the mainstreaming efforts. It is especially beneficial in two areas: broadening the DRM/CRM know-how in the sector and expanding the resource base.

Group Work

1. Participants are divided into 4-5 groups.
2. Participant discusses in group how to include DRM/CRM into program/project and identifies the following:
    - Program/project cycle of ministry/department
    - Measures for inclusion of DRM/CRM issues in relevant steps
    - Type of support required
    - Challenges

References and Supplementary Readings

1. ADB (2013) *Investing in Resilience: Ensuring a Disaster-Resistant Future* http://www.adb.org/sites/default/files/pub/2013/investing-in-resilience.pdf
2. Benson, Charlotte & Twigg, John (2007) *Tools for Mainstreaming DRR: Guidance Notes for Development Organizations.* Provention Consortium.
3. Government of India, *Checklist for natural disaster impact assessment.* http://ndma.gov.in/ndma/pdf/disasterefcdpr.pdf

Note

Module 3 : Preparing for Mainstreaming Disaster and Climate Risk Management

အခန်း ၃ - ဘေးအန္တရာယ်နှင့် ရာသီဥတုကြောင့် ဆုံးရှုံးနိုင်ခြေစီမံခန့်ခွဲမှုကို ထည့်သွင်းပေါင်းစပ်ဆောင်ရွက်နိုင်ရန် ပြင်ဆင်ခြင်း

Session 3.1: Creating Enabling Environment for Mainstreaming DRM/CRM into Development

Session Objectives:

At the end of this session, the participants will be able to:

- Explore and discuss various factors which can help in mainstreaming DRM/CRM into development

Duration: 1 hr and 30 minutes

Training methods: Lecture, Case Study and Group Work

Enhance Enabling Environment for Mainstreaming DRM/CRM

To establish mainstreaming DRM/CRM as part of normal practices/steps in development planning processes at different levels, enabling factors are required to realize this:

Advocacy – Advocacy on Mainstreaming DRM/CRM would raise collective awareness of all concerned stakeholders (policy level, government authority at all levels, operational officers, development partners, private sectors and people as ultimate beneficiaries) on the significance of mainstreaming DRM/CRM from development perspective. Effective advocacy should lead to greater recognition of the subject and able to make strong arguments on comparative benefits of it, the pressing need for immediate actions and collective effort across sector to start up. It's crucially important that advocacy has to target at the authorized agencies, political figure and high level decision makers, and employ different channels and strategy to make mainstreaming DRM/CRM a prevailing public agenda. Disaster/Climate Risk Management Practitioners and other professionals on the cross-cutting disciplinary are those most capable to advocate for the issue within the broader development agenda. The advocacy will be more powerful and convincing when explicit link is established between DRM/CRM and development such as economic impacts of disasters, future scenario of disaster and climate risk, and how it's perceived as obstacle to socio-economic development aspiration, cost-benefit analysis of mainstreaming DRM/CRM, etc.

Political will and commitment- Given a number of competing development issues and other immediate public demands, mainstreaming DRM/CRM will remain a recognized idea without realized actions if there is no affirmative sign of political will and commitment. The political will and commitment will ensure that the mainstreaming issue will be attentively looked into and received sufficient supports for concrete actions, including sufficient resources, technical knowhow and mechanisms to facilitate fully adoption into development planning process.

Recognition of DRM/CRM in appropriate policies and strategies – In policy formulation stages, where development directions will be decided, enough attention should be given to DRM/CRM issues and different aspects that DRM/CRM interacts with development interventions in respective sector, region, township, etc. It's crucial that appropriate development policies recognize the importance of disaster risk for achieving its objective and accordingly identify strategies to reduce risk through all programmes and projects.

Institutional Capacity – DRM/CRM cuts across all sectors, hence technical competence on DRM/CRM could be further strengthened to create groups of DRM/CRM experts and

professionals. As well, building multi-disciplinary expertise with DRM/CRM cross-cutting will further enhance the integration of disaster and climate risk issues into various development sectors such as macro-economic analysis, urban planning, and engineering. Staff of concerned development agencies could also be trained on applying DRM/CRM into their respective functions and using risk information for planning process.

Legal instruments and enforcement- Legal instruments are essential to realize mainstreaming DRM/CRM into practice. Though a number of initiative on DRM/CRM could immediately start by concerned agencies, having legal provision in place will make a difference. Regulations on settlement restriction in hazard-prone area, enforcement of building codes in densely populated areas in earthquake high risk zone, issuance of Orders/Directives requiring Checklist with DRM/CRM elements for annual project appraisal, or assigning additional mandates to specific agencies to develop climate risk information will significantly contribute to progress mainstreaming DRM/CRM into concrete actions.

Multi-departmental coordination - Mainstreaming DRM/CRM requires multi-departmental coordination at all levels. With development planning as backdrop for mainstreaming DRM/CRM, it's essential that concerned development agencies take effort in concerted manners. If any additional mechanisms, processes, steps be introduced in order to integrate DRM/CRM into the existing development planning practices, all concerned agencies should be consulted and informed, ensuring that the changes is viable and doable for the implementing agencies.

Knowledge and information sharing especially on risk information – Availability of comprehensive hazard data, statistics and risk information is important to determine development decision in particular locations and whether or not additional measures should be put in place to mitigate or manage such risk. The information is usually available with national agencies, specialized agencies, academia or research institutions with specific mandates and expertise on certain hazard such as geological surveys agencies, meteorological offices, or centralized agency managing information and communication on disaster and climate risk. Inventory of risk information and other relevant knowledge products has to be systematically maintained and updated. Platform and protocol for information sharing could be established to promote accessibility and usage of the information for development concerned agencies.

Box 3.1.1 Summary recommendations on integrating disaster risk reduction into development in the Philippines (Case Study)

Establishment of an enabling environment (example from the Philippines)
Objective: Enhanced enabling environment for mainstreaming of disaster risk reduction concerns into development.

Priority action

- *Legislation*- Passage of new, comprehensive disaster risk management legislation.
- *Leadership commitment & institutional capacity*- Establishment of strong national institutional leadership and oversight mechanisms, and related technical capabilities, for disaster risk management, ideally within the National Economic and Development Authority (NEDA).
- *Enhance multi-agency coordination* - Creation of disaster risk reduction focal points in individual line agencies.
- *Development policy & strategy* - Development of a comprehensive, long-term disaster risk management strategy, incorporating individual sectoral strategies, embracing principles of mainstreaming and replete with meaningful monitoring and evaluation indicators.
- *Inclusive of cross-cutting discipline/issues* - Initiation of measures to ensure close collaboration with the climate change adaptation community at different levels of government.

Medium-term measures

- Establishment of permanent LGU disaster risk management bodies or the integration of disaster risk management responsibilities into the duties of pre-existing LGU officers and provision of related technical support to strengthen capabilities.
- Integration of disaster risk reduction concerns into the MTPDP, including specification of overarching risk reduction objectives and strategies, mainstreaming principles and linkages into the MTPDP's key socio-economic goals and more specific sectoral goals, measures and activities.
- Integration of disaster risk reduction concerns into local government development plans and the merger of the recently prepared provincial disaster risk reduction mainstreaming guidelines into the more general PDPFP guidelines.
- Establishment of a tracking system to monitor levels of expenditure on ex ante risk reduction and ex post disaster response.
- Development of an explicit disaster response financing strategy.
- Establishment of dedicated funding lines for disaster risk reduction and, possibly, permanent disaster risk management offices, at each level of government.
- Revision of existing EIA and other project appraisal guidelines and procedures to require comprehensive analysis of both the potential impact of natural hazard events on a project and the potential disaster risk related consequences of the project.
- Revision of land-use regulations and building codes and introduction of judicial and other measures to ensure enforcement.
- Strengthened vertical and horizontal integration of disaster risk reduction plans between different levels of government, between various line agencies and between neighboring LGUs.
- National coordination of sub-national mainstreaming initiatives.
- Documentation, evaluation and replication of successful local mainstreaming initiatives. Strengthened collaboration between the climate change adaptation and disaster risk reduction communities via institutional, policy and research coordination and the development of joint strategies to integrate the two issues into national planning processes, strategies and budgets.

(*Source: Mainstreaming Disaster Risk Reduction Into Development: Challenges and Experience in the Philippines, 2009)*

LGU – Local Government Unit

MTPDP- *the* Medium-Term Philippine Development Plan

PDPFP - The Provincial Development and Physical Framework Plan

EIA – Environmental Impact Assessment

Group Work

1. Participants are divided into four groups:
   - National Development Planning
   - Regional Development Planning
   - Sectoral Ministries
   - City Development Committees
2. Each group is requested to revisit the DRM/CRM entry points related to their group theme identified in Module 2
3. Each group identifies:
   - Key supporting actions required to implement mainstreaming DRM/CRM for identified entry points
   - Probable lead agency/agencies
   - How concerned agencies could enhance supporting actions

References and Supplementary Readings

1. Benson, Charlotte (2009) *Mainstreaming Disaster Risk Reduction into Development: Challenges and Experience in the Philippines.*
2. Benson, Charlotte & Twigg, John (2007) *Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations.*
3. NEDA (2008) *Mainstreaming Disaster Risk Reduction in Subnational Development and Land Use/Physical Planning in the Philippines.* http://www.neda.gov.ph/references/Guidelines/DRR/Guidelines%20on%20Mainstreaming%20DRR%20in%20Subnational%20Development%20Land%20Use%20Planning.pdf
4. Pelling, Mark & Holloway, Ailsa (2006) *Legislation for Mainstreaming Disaster Risk Reduction*. Tearfund. http://www.tearfund.org/webdocs/website/Campaigning/Policy%20and%20research/DRR%20legislation.pdf

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Session 3.2: Development of Action Plan by Participants

Session Objectives:

At the end of this session, the participants will be able to:

- Discuss action plans on mainstreaming DRM/CRM in respective mandates

Duration: 1 hr and 30 minutes

Training methods: Discussion and Individual Work

Upon completion of the training, key learning shall be reflected and consolidated by each individual participant. Given the current mandates and functions of the participants from different line departments, the participants shall explore potential entry points for mainstreaming DRM/CRM and its comparative benefit within their respective functions and scope of responsibilities. This could be at policy, planning, budgeting, as well as project management level in the broad socio-economic and environmental development across various development sectors.

Specific attention should be given to development activities that are highly susceptible to disaster and climate risk (such as those in hazard prone locations) and development practices that could aggravate exposure and vulnerability; hence increasing future risk. To be considered also is the climate change aspect such as increasing uncertainties and deviation of climate pattern, extreme climate events, and vulnerable sectors that could suffer such impacts. As well cost-benefit analysis could help form the rationale and reaffirm necessities for mainstreaming DRM/CRM by considering economic loss in financial terms, cost of public investment that include disaster and climate resilient elements, and long term benefits, etc. Participants should also explore development activities under their mandates and functions that require risk consideration and risk-sensitive investment today to prevent and minimize future loss.

As Mainstreaming DRM/CRM is multi-disciplinary in nature, hence it requires inter-departmental collaboration and coordination. This session provides an opportunity for initial discussion on possible cooperation, areas of shared interest, inter-departmental mechanisms to facilitate mainstreaming process, technical support and competent agencies, complementary role, and possible joint-initiatives, etc.