**Training on Disaster
Preparedness
and Contingency Planning**

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Community
Based Disaster
Risk Management

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Community-Based Disaster Risk Management

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Acknowledgement

Introduction

This Manual was originally published in Filipino in 2009, bearing the title *Pagsasanay sa Disaster Preparedness at Contingency Planning*. The publication in Filipino was intentional. The targeted users of the manual were high-risk communities and local authorities in the Philippines. Moreover, the choice made by CARE and the Corporate Network for Disaster Response to propagate the community-based approach to disaster risk reduction dictated that the manual be published in Filipino.

Much has transpired since the manual's publication in 2009. The manual was a product of the Strengthening Assets and Capacities of Communities and Local Governments for Resilience to Disasters (ACCORD) project. Two follow-up community-based disaster risk reduction projects have since been completed, also supported by the European Commission Humanitarian Aid and Civil Protection department (ECHO). A five-year community-based disaster risk reduction programme was also started in 2011, with funding from the Ministry of Foreign Affairs of The Netherlands. These projects have served to enrich the content of the training manual.

Aside from the foregoing explicit DRR projects, other projects implemented by CARE and partners CNDR, Cordillera Disaster Response and Development Services (CorDisRDS), Agri-Aqua Development Coalition (AADC) and Assistance and Cooperation for Community Resilience and Development (ACCORD Inc.) have used *Pagsasanay sa Disaster Preparedness at Contingency Planning*. Five emergency response projects since Ketsana (Ondoy) and a food security and livelihood project funded by the EuropeAid have used the manual as a means for mainstreaming DRR in emergency response. This experience likewise contributed to the enrichment of *Pagsasanay*.

Over three years of practical experience later, frameworks, approaches and concepts have clarified and evolved. Tools and learning methodologies have vastly improved. These developments required that *Pagsasanay* be updated.

An updated *Pagsasanay* would feature the addition of sessions on climate change adaptation and ecosystem management and restoration. This is in recognition of

present realities – that disasters are becoming more frequent and more destructive because of climate change and environmental degradation. These aspects were not present in the original manual.

Other additions are the sessions on relevant DRR and CCA laws and the organization of functional Disaster Risk Reduction and Management Councils (DRRMCs). There were two push factors for these inclusions. One is the passage of the Philippine Disaster Risk Reduction and Management Act and the Climate Change Act.

The second factor is closely linked to the first: village, municipal and school authorities wanted to know more about the new laws and are requesting assistance for them to be able to comply with the provisions of the laws.

So then why an English edition? Early on, there was already a demand for an English edition from those who do not read and speak Filipino. The lack of an English edition prevented the dissemination of the manual on a wider scale, within the Philippines and beyond.

Training on Disaster Preparedness and Contingency Planning is the response to the oft-received request for an English translation of the manual. Updating of the original manual in Filipino, and its translation and publication in English are a fulfilment of the obligation of CARE and partners to share what has been developed from experience and collaboration amongst high-risk communities and local authorities.

Session 1. Framework for Disaster Risk Reduction (DRR): Rights-based Approach (RBA) and Community-based Disaster Risk Management (CBDRM)

LEARNING OBJECTIVES:

After the session, participants are expected to be able to:
1. Explain the meaning and importance of RBA and CBDRM.
2. Discuss the relevance of RBA and CBDRM as frameworks for DRR.

1. EXERCISE

The session starts with an exercise where each participant will be asked to answer the question: "What do you consider as the three most important things as a human being?"

The participants will write their answers on metacards, after which each answer will be posted on the board, with similar responses grouped together.

The objective of this exercise is to show that common, day-to-day things that matter the most to participants are actually human rights. The exercise also aims to show that these important things are rights that are not fully understood and most of the time, are not appreciated and valued as much.

1.1 Processing of Activity

Among the expected answers from the participants would be: their families, jobs, education, peace, food, house, clean environment, and the likes. These answers would embody normal and very basic needs, or daily concerns of ordinary Filipinos, but highly valued. Since these are highly valued, the facilitator will ask the participants what ought to be done with these rights. Expected answers would be – just like any important thing or possession, they should be appreciated, taken care of, defended, etc. The facilitator then cites its similarity to human rights, its importance and the need to value and defend, if necessary.

All these and other rights are included in the Universal Declaration of Human Rights (UDHR) which is grouped into three categories: Economic, social and cultural, political, and security rights.

The exercise aims to show that in reality, these rights are not enjoyed or experienced fully. To some, they would not even know that these are their rights.The facilitator will refer to the responses made by the participants and will ask the following questions to stimulate further discussion:

- Jobs are important to all of us, but what kind of job do you have? What kind of jobs do most Filipinos have? Are these jobs proportionate to what you finished in college? Does it pay well and let you live a decent life? What about those who leave their families behind to look for a job elsewhere? What about those who have to sell their bodies to earn a living? What kind of jobs are available, if there are, and why?

- A clean and healthy environment is important, but what is the state of our environment today? Why do we have polluted and clogged waterways? What is being done with this? Why is our natural resources being degraded but in the name of development? Who are exploiting this and why?

- Other questions may also be raised, depending on the type of responses and the issues in the specific communities.The idea is to raise more questions than answers and the session, considering the very limited time, will not seek to answer them.

The exercise further aims to increase the awareness on human rights as something that is concrete, relevant, and permeate the daily lives of ordinary people unlike it being perceived as something that is abstract, a taboo, wary, or apprehensive of.

2. **KEY MESSAGES**

What are human rights (HR)? – Human rights are prerequisites so that each individual will have the opportunity to live a life of dignity and self-worth, as opposed to merely surviving.
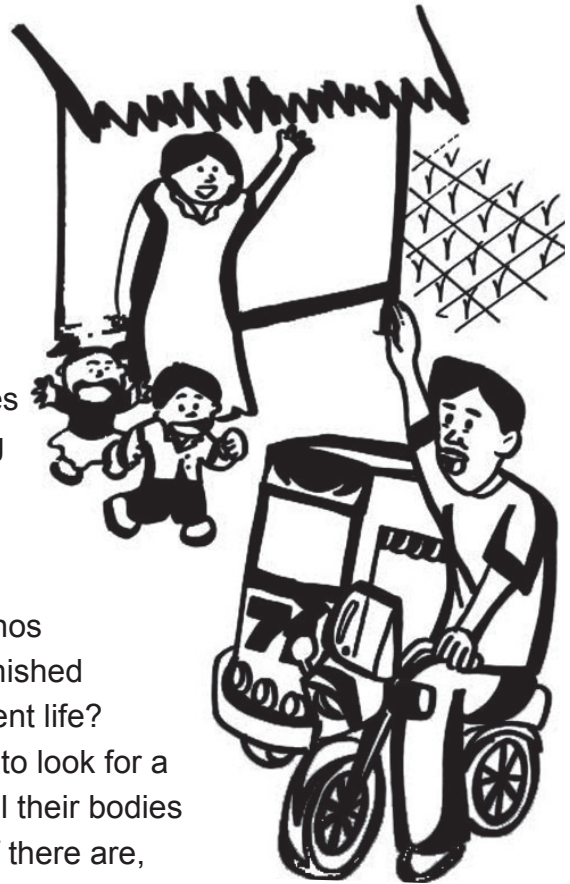
2.1 ALL HUMAN BEINGS HAVE RIGHTS

The first key message in discussing RBA is the universal foundation of human rights, human dignity, equality and non discrimination. Article 1 of the UDHR states that human beings are equal in dignity and rights. Human rights are universal, therefore, all human beings have rights.

Article 2 also states that everyone is entitled to all human rights and freedoms, without distinction of any kind such as race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.

The rights in the UDHR can be grouped in three categories, namely:

Economic, social and cultural (ESC) rights which include all rights essential to livelihood security such as economic well-being, nutrition, food security, water, health, education, a clean environment, shelter, and the right to participate in one's culture (Articles 17, 22-27)

Security rights cover people's security. These include the rights to life, liberty, security of person, movement and asylum, as well as freedom from slavery, torture, forced displacement, degrading treatment, sexual assault of any form, and arbitrary arrest and detention. (Articles 3-5, 9, 13, 14)

Political rights include rights to nationality, equality and recognition before the law, rights to a fair trial and innocence until proven guilty, the freedoms of thought, conscience, religion, opinion, and expression, and the rights to assembly, association, and political participation in the power structures that affect people's lives. (Articles 6-8, 10-12, 15, 16, 18-21)
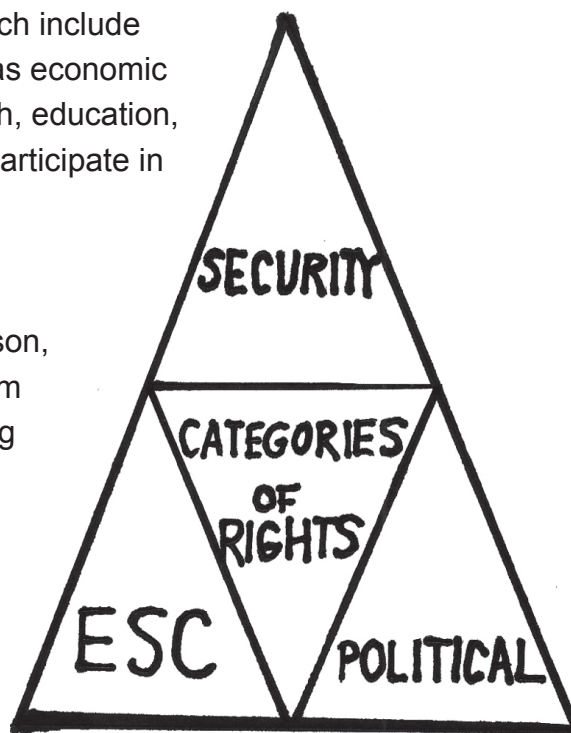
There are numerous international and local laws, agreements, and covenants prescribing or addressing the various rights of human beings, with specific/related rights for vulnerable sectors such as women, children, indigenous people, persons with disabilities (PWD), and senior citizens.These laws and covenants have been signed and endorsed by governments including the Philippine government.

This first key message emphasizes that the UDHR and all other laws and covenants guarantee that everyone is entitled to these rights by virtue of natural and inherent existence.

Laws are there to help and provide a comprehensive direction for human behavior. Laws are created to serve justice, help provide solutions to social conflicts, maintain social order and promote peace. It should protect those who are weaker against the mightier. (Learning about Rights, module 2 ActionAid).

2.2 PRINCIPLES OF HUMAN RIGHTS

There are general principles we use to clarify and guide us on how to define and interpret human rights. These principles must to be satisfied and should direct our behavior and actions.

Universality and alienability – everyone is entitled to human rights. It is inherent to every person on this earth when they become human beings or when they were born.

Participation and Inclusion – everyone is entitled to use and enjoy their rights.

Indivisibility – human rights come as a package, whether civil, cultural, economic, political, social, etc. All rights have equal importance,no right is more significant than another.

Equality and non-discrimination – all individuals are equal as human beings. Everyone is entitled to their human rights regardless of race, color, sex, ethnicity, age,

religion, nationality, etc. Interdependence and inter-relatedness–the fulfillment of one right always depends on the realization of others.

Accountability and Rule of Law – the states and duty-bearers are accountable for the observance of human rights, but the state holds the primary obligation.Rights-holders may seek its enforcement or accountability for its non-enforcement.

Among these principles, what stands out to be one of the most important principles is Accountability and Rule of Law. Rights do not just come as entitlements or benefits or privileges, they come with duties or obligations. It clarifies that rights-holders (claim) are also duty-bearers (enforces). As duty bearers, we all are expected to uphold human rights.However, it should be clarified that the state, the government,is the primary duty-bearer in enforcing the law (HRs).Governments are the signatories to these treaties and covenants and they have the primary responsibility to guarantee the human rights of all its citizens.

This principle also emphasizes the duties of rights-holders to claim for the enforcement of all human rights.Thus, as rights-holders, we do not just enjoy these entitlements but are obliged to protect, uphold and defend.

The other principles also help us to clarify the true and practical meaning of HRs such as "my right ends where the right of my neighbor begins".That rights are powers to act and to decide which reside only in the active recognition of the community, and not upon an individual's own force.This further defines that a person does not have an exclusive claim of his rights regardless of its effect or disrespect of the larger society of individuals. An individual can only enjoy his right as much as the others are enjoying theirs.

2.3. The third key message is to seek for their enforcement which still takes off from the previous principles in recognition of the responsibilities that comes with human rights. It is every human being's responsibility to respect, to uphold and to claim their human rights. Rights are useless if they are not understood, appreciated and enjoyed. Today, we witness a widespread violation of human rights which breeds vulnerability. The message is clear that our rights come with duties to inform, to educate and to help claim human rights for everyone, most especially for the poor, the vulnerable groups whom we seek to serve as humanitarian and development workers. In this context, it is our responsibility to educate and create awareness among people, especially the most vulnerable ones, of their rights, and the need to claim or fight for these rights.

3. **Therefore, what is Rights-based Approach (RBA)?**

RBA is an approach that is based on the recognition of human rights.It is a conceptual framework for human development that is based on international standards and actively commits to the protection, upholding and claiming of human rights.

3.1 **Why RBA in Disaster Risk Reduction (DRR)?**

Poverty is said to be a product of an unjust society.Therefore, poverty is vulnerability.

Human rights is said to be for every human being. In real life, this is far from being attained. There is unequal access to resources and power which breeds poverty. When there is poverty, it means that many rights are violated. If one is poor, one is vulnerable to various factors including risks which results to disasters.When disaster strikes, the poor is the most affected, and more rights are violated. It is therefore important that HRs are recognized, upheld and protected, and more especially during disasters so that victims live a life with dignity as against merely surviving.
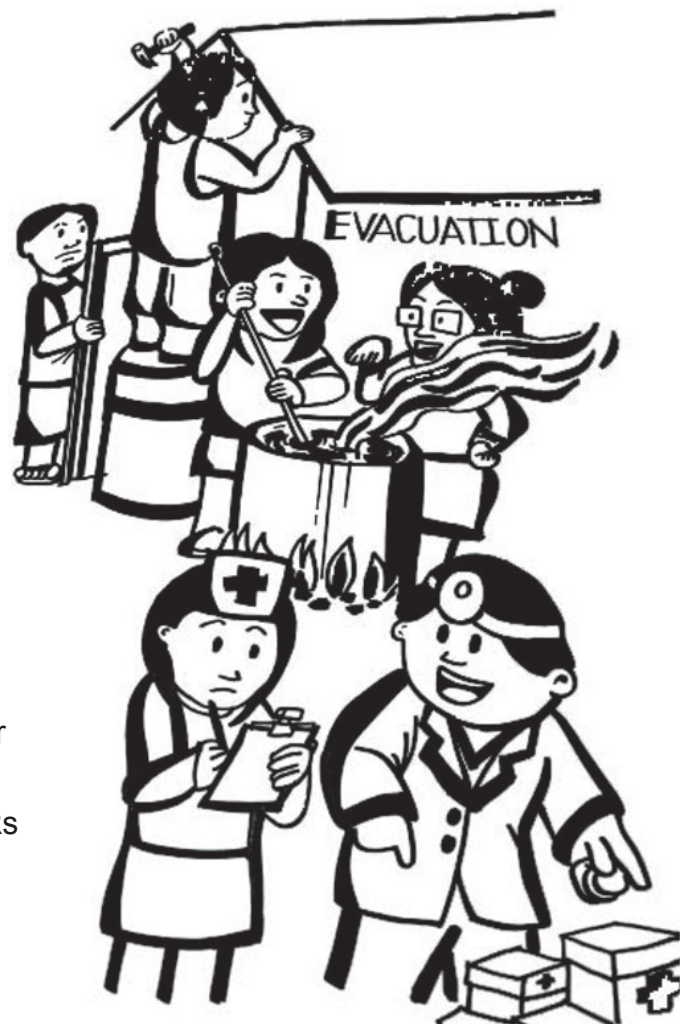
The RBA in DRR means that in order for people affected by disasters to claim and/or reclaim the rights that were violated, it becomes an obligation of the state and of all duty-bearers to provide help and service.The act of securing the required service or help is a duty and not an act of charity. In RBA, it becomes an obligation of the state and duty-bearers to secure the basic needs of the affected families such as shelter, clothing and food.It also emphasizes that the standard of service being provided must be fit for human beings – food must be clean, nutritious and appropriate to their requirements, evacuation centers must have the basic amenities such as toilets, cooking areas, drainage, and water must be clean, safe and sufficient, etc.

With RBA, roles and responsibilities are clarified. While we all have a responsibility to help achieve a life of dignity for all victims of disasters, it is foremost the government's accountability to help communities affected by disasters.

RBA is advocating for self reliance of affected families instead of encouraging dependence and a passive attitude that just waits for and accepts relief services. This stems from the belief that every person has capacities, even during disasters. RBA recognizes the capacities of affected communities and builds on these through participatory strategies (standards). Affected communities are encouraged to be part of activities or projects that affect their lives, especially during disasters.

In DRR, part of the work is claiming for rights that are violated to be able to reduce poverty, reduce vulnerabilities which will in turn reduce the adverse effects of disasters.With RBA, DRR work provides the basis for prioritizing the most vulnerable and poorest sections of our society because "taking sides is an imperative".

3.2 **RBA as lens for disaster risk management (DRM):**

a. It has a sound legal (a comprehensive legal system adopted by most countries), and moral (based on values of dignity, equality, humanity)

basis.It provides a solid mandate and foundation.

b. It offers a comprehensive and coherent analytical framework from planning (root causes of vulnerability), implementation (standards) and evaluation (accountability).

c. Accountability emphasis clarify roles and responsibilities.

d. It provides an objective criteria for cooperation and coordination.

e. It promotes self-reliance and dignity (empowerment) of the victims instead of being passive recipients of services and goods.

4. Community-based DRM (CBDRM)

4.1 CBDRM is another approach and framework that evolved from experiences of local NGOs in helping vulnerable communities in preparing for hazards, responding to the needs during disasters, and helping reduce the negative impacts of disasters in their communities.This was developed through years of work in vulnerable communities and after witnessing that any development achieved in these areas were only "lost" to disasters.

CBDRM was originally a framework for building disaster-resilient communities and was referred by the Citizens' Disaster Response Network (CDRN) as the"citizenry-based development-oriented disaster response".The CDRN was the network that helped develop this framework and was practiced even before RBA was popularized in the Philippines.The two, however, are complementary and CBDRM was developed around the need to uphold the human rights of most vulnerable communities.

4.2 CBDRM is characterized by the following features:

a. **It looks at disaster as a question of vulnerability** – This means that disasters can only happen because of conditions of vulnerability. It is not because a strong typhoon

had hit a community but because a strong typhoon had hit a community that is not able to withstand or cope with its effects that disasters become inevitable.The existing social and economic conditions in a community exacerbate or compound the effects of a strong hazard event.

Using this analysis, CBDRM addresses the need to reduce vulnerabilities which consequently reduces the impacts of a hazard. In essence, CBDRM is claiming for basic human rights, including the right to quality DRR services that were violated, so that communities are able to live with dignity, with security, especially during and after disasters.

With CBDRM, implementing DRR projects is prioritized in poor and most vulnerable communities because they have the greatest need and motivation to do DRR.

b. **It recognizes people's existing capacities and aims to strengthen them** - The people are at the center of all DRR initiatives.CBDRM believes that the people, even victims in disaster situations, have existing capacities that simply needs to be harnessed and strengthened. Any community has developed its own set of indigenous practices for preventing, preparing, and adapting to hazards and its effects.These practices are essential in DRM and should be considered as foundation of building activities and plans. Usually, the poor and highly vulnerable communities have very low literacy rates and providing basic knowledge on hazards, its effects, and preparedness measures linked with their practices gives them the confidence to deal with emergency situations. Aiming to increase their capacities helps communities to become self-reliant and helps preserve their dignity even during emergencies.

c. **It contributes to addressing the roots of people's vulnerabilities and transforming or removing the social structures generating inequity and underdevelopment**– With CBDRM, activities are not just focused on solving unsafe conditions such as seeking the evacuation or resettlement of affected communities in high-risk areas. Instead, we see

these as manifestations of the root causes of vulnerabilities and CBDRM seeks to go deeper to know why people are driven to live in unsafe conditions and what perpetuates these conditions.This approach recognizes that it is not sufficient to teach vulnerable communities, for example, to come up with an evacuation plan but also to have analytical skills to understand the socio-economic and political reasons that give rise to such poor and unsafe conditions. In this way, people living in high-risk areas will be able to identify what they need to do to address their situation.

DRM is seen as part of social development work because DRM helps preserve the fruits of development. Subsequently, CBDRM helps to address the causes of vulnerability to attain lasting social change.

d. **It considers people's participation as essential factor to disaster risk reduction** - People's participation in all DRR projects and activities is considered essential to the success of DRR. Ensuring people's participation in all aspects of the project cycle is important because it is through this process of participating and learning that their capacities are strengthened.They become better equipped and prepared to sustain the activities even beyond projects.

Recognizing people's capacities is recognizing their rights, too. CBDRM ensures that there are opportunities for vulnerable people to participate in planning, decision-making, implementing and evaluating projects that have to do with their lives and livelihoods. This process helps them regain their confidence to manage their own affairs in the community, providing meaningful and life-long changes for their own benefit.

e. **It puts premium on the organizational capacities of vulnerable sectors** – CBDRM does not only recognize people's capacities but further helps strengthen the development of their own organizations. People's organizations are a testament to their capacity to manage their own affairs thus, enabling them to achieve plans and projects they need to improve their situation. The process by which their capacities are strengthened to form and run their own organizations and their communities is in fact the process of claiming their rights.

Vulnerable people and communities must be supported with their desire to learn through ways they are familiar with. CBDRM must help through their process of learning and unlearning because all their lives they have been followers, merely existing and not enjoying their rights.

f. I**t mobilizes the less vulnerable sectors into partnerships with vulnerable sectors in DRR and development projects** – CBDRM as an approach recognizes that other sectors and organizations have the motivations to volunteer and help the less fortunate members of society, especially during emergencies.This springs from the responsibility or duty of every citizen towards their fellow human being especially when faced with disasters.CBDRM encourages these less vulnerable groups or sectors to share their time and talents to form partnerships with the more vulnerable sectors of society. Partnerships and support activities are venues for learning from the experiences of the vulnerable ones and be the basis for their advocacy to help work towards change.

CBDRM is helping vulnerable communities go through the process of knowing, understanding, and claiming their rights.This process helps in building disaster-resilient communities and it is through this process that they learn to depend on their own capacities to exercise their responsibilities in running the affairs of their communities.

Notes for the facilitator:

1. To ensure that participants fully understand the importance and implications of RBA and CBDRM frameworks to DRR, examples on how RBA is translated in specific DRR activities must always be referred to. Examples identified from within the realm of the participant's experience will be more helpful. Examples using standards from SPHERE, such as Food Aid Requirement must also be shared so that participants will appreciate that these quality indicators are based on the achievement of human rights.

2. Distributing copies of short readings on the Universal Declaration of Human Rights and the summary of the rights under the three categories will also help participants to better understand RBA.

3. For Training of Trainers, discussions on how RBA as framework for risk assessments, planning, implementation, monitoring and evaluation must be thoroughly discussed. For community trainings, discussions might be more difficult but the need to come up with specific and simple examples will help facilitate understanding.

Materials needed:
•   metacards of various colors
•   masking tape
•   scissors
•   markers
•   handouts on UDHR
•   Summary of Rights
•   prepared examples written or drawn on cartolina papers

Duration of session: 2 hours

References:
1.   MacCaston, Katherine M. with Michael Rewald and CARE Integration Team.Unifying Framework for Poverty Eradication and Social Justice: The Evolution of CARE's Development Approach.2005.
2.   Morago-Nicolas, Luis.Learning About Rights: A Set of Modules on Rights and Humanitarian Standards in Emergencies.Action Aid Emergencies Unit.
3.   Proceedings of the CARE-CNDR Training of Trainers for Disaster Risk Reduction Projects in Dingalan and Calabanga, July 2005.Session on RBA by Ted Bonpin.
4.   CARE Nederland Policy on Rehabilitation.

Session 2. Basic Concepts on Disaster Risk Reduction

LEARNING OBJECTIVES:

After the session, the participants are expected to be able to:
1. Explain the basic concepts of hazard, disaster, capacity, vulnerability, risk, climate change adaptation, ecosystem management and restoration, and disaster risk reduction;
2.   Explain the relationship between the DRR concepts hazard, disaster, capacity, vulnerability, and risk;
3.   Show the relationships amongst climate change, environmental degradation, and disaster and;
4.   Explain the objectives of disaster risk reduction and the activities involved in disaster risk management

KEY MESSAGES:

1. **Hazard**

A dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Hazards may result into a disaster. Some examples of hazards are: storm, earthquake, flood, flashflood, landslide, volcanic eruption, storm surge, tsunami, fire, war, and others.

Hazards may be a single event, i.e., only one hazard event impacts an area, or multiple. When more than one hazard event impacts the same area, multiple hazard situations arise. These different hazard events may occur at the same time or may happen in intervals. Multiple hazards may be:

• Consecutive or consequent – i.e., the succeeding hazard is dependent on the preceding hazard, and will not occur without the first one (e.g., earthquake and tsunami – a tsunami will not occur without the earthquake happening first. Other examples are earthquake and landslide, and heavy downpour and landslide)

• A combination of hazards – hazards occurring simultaneously and may both be natural (e.g. storm, heavy rains and landslide)

Hazards may be natural or man-made – there are natural hazards that become worse because of human activities (e.g. flashfloods aggravated by massive logging); there are also human activities that result tonew hazards.

2. Capacity

Capacity is the combination of all the strengths, attributes, and resources available within a family, community, society,or organization that can be used to achieve agreed goals. In disaster risk reduction, capacities are used to lessen the adverse impacts of a disaster,prepare for emergencies, and recover from a disaster. Examples include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills, and collective attributes such as social relationships, leadership, and management. Capacity also may be described as capability.

3. Vulnerability

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

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.

Vulnerability may also refer to the pre-disaster condition of a community that can be further exacerbated by a disaster. Such condition may worsen after a disaster.

4. **Risk**

Risk is the combination of the probability of a hazard occurring and the severity of its effect or consequences.

The concept of risk is not only an assessment of the likelihood of the occurrence of a disaster, but also an estimation of the magnitude of its effects. Risk (R) is being studied because it helps us determine the likelihood and severity of a hazard (H) that can be illustrated in the formula below:

R = H x (V – C)

*V = vulnerability, C = Capacity

Risk (R) is high if:
1. Theprobability of a hazard occurring is high (H)
2. The capacity of the community is low (C)
3. The vulnerability is high (V)

Disaster = Realization of Risk
Disaster is the occurrence of the expected risk.

5. **Disaster**

Disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic, or environmental losses and impacts,

which exceeds the ability of the affected community or society to cope using its own resources.

A disaster is the result of the exposure to a hazard of a community or society which has insufficient capacity to cope with the disaster's negative consequencesusing its own resources.

It is also important to note that not all hazards result in disasters. A hazard becomes a disaster only if:

a   A community or a significant number of people were affected

b   The hazard hits a vulnerable community and disrupts the regular activities and livelihood of the community

c   The community does not have enough capacity to cope with the damages using its own resources and external aid is needed

d   To a larger extent, the occurrence of a disaster could be attributed to the social condition of the community than as a natural phenomenon.
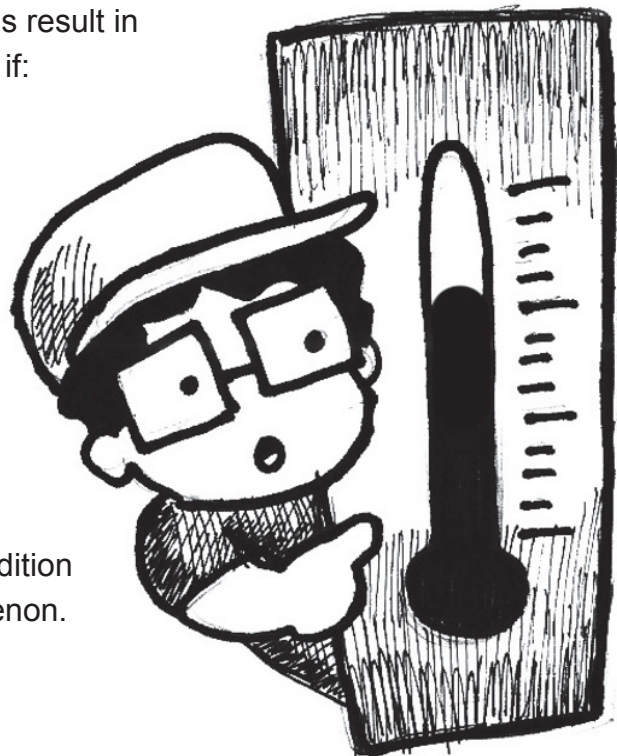
6. Climate Change

Climate change is any change in climate over time, whether due to the natural variability or as a result of human activity. It refers to observed and projected increases in average global temperature as well as associated impacts (e.g. an increase in the frequency or intensity of extreme weather; melting icebergs, glaciers, and permafrost; sea-level rise; and changes in the timing or amount of precipitation).

Climate change contributes to increase in frequency and intensity of hazards and gives rise to new or emerging types of hazards.The negative impacts of climate change are worse amongst poor people and countries.

7. Climate change adaptation

Climate change adaptation is defined as an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects which moderates harm or exploits beneficial opportunities.

Adaptation is a process focused on reducing vulnerability, which usually involves building adaptive capacity particularly of the most vulnerable people. Adaptive capacity is defined as the ability of a system (human or natural) to adjust to climate change, (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. One of the most important factors shaping the adaptive capacity of individuals, households, and communities is their access to and control over natural, human, social, physical, and financial resources.

In some cases, adaptation also involves reducing exposure or sensitivity to climate change impacts. In fact, adaptation is more than reducing vulnerability; it is about making sure that development initiatives don't inadvertently increase vulnerability.

8. Ecosystem and environment

An ecosystem is a dynamic complex of micro-organism, plant, animal and human communities and their non-living environment interacting as a functional unit. Ecosystems are sustained by the biodiversity within them.

The difference between ecosystem and environment is that environment refers to the physical and external characteristics, including the natural and man-made elements that surrounds and affects life, growth, and sustenance of organisms or community.

9. Ecosystem degradation

Ecosystem degradation is the reduction of the capacity of the environment to provide for the needs of man and society, and to fulfill its role in the ecosystem. The possible effects of ecosystem degradation are multiple and diverse – they aggravate vulnerability and increase the frequency and severity of natural hazards. Some examples of ecosystem degradation are

deforestation, desertification, water and air pollution, loss of biodiversity, climate change, etc.

Destruction of nature leads to the degradation of the quality of the ecosystem and the services it provides – decreased capacity to sustain sources of livelihood and to protect and control the natural processes of the environment wherein humans live in, such as flood regulation, water filtration, pollination, erosion control, and disease regulation.

10. **Ecosystem Management and Restoration**

Ecosystem management is a process developed for protecting and improving the condition of the ecosystem that provides benefits for human welfare. Ecosystem restoration is the process of restoring or bringing back the health of a degraded ecosystem. Ecosystem management and restoration also serve as an inexpensive and effective buffer to reduce the effects of hazard and climate change. It reduces the vulnerability of a community by supporting and sustaining sources of livelihood.

11. **Disaster Risk Management (DRM) and Disaster Risk Reduction (DRR)**

Historical Development of DRM

a. The concept of DRM originated from the practice of relief or emergency response that was launched as a response to World War II.

However, during the 1960s or 1970s, humanitarian organizations realized that distribution of food and other relief items after a disaster is not sufficient;thus, the emergence of the concept of Disaster Management.

b. Disaster management refers to the organization and management of the resources and responsibilities relating to preparedness, response, and recovery to lessen the impacts of a disaster. A disaster has different stages and there are activities that are specific to a particular stage.

In Disaster Management, the activities are focused on effective disaster response and not on risk reduction, wherein the capacities and vulnerabilities are taken into account.
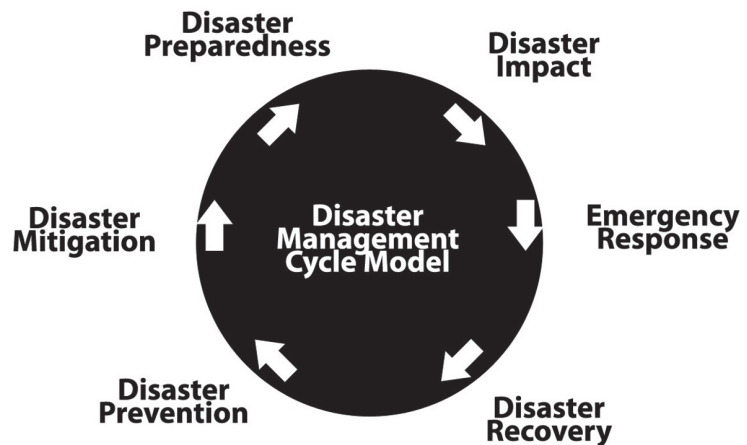
c. The Disaster Management Cycle is a model which illustrates the whole process of Disaster Management. The activities of Disaster Management begin after the disaster (Emergency Response), followed by recovery, prevention, mitigation, and eventually returns to preparedness. This is a continuous and repetitive cycle.
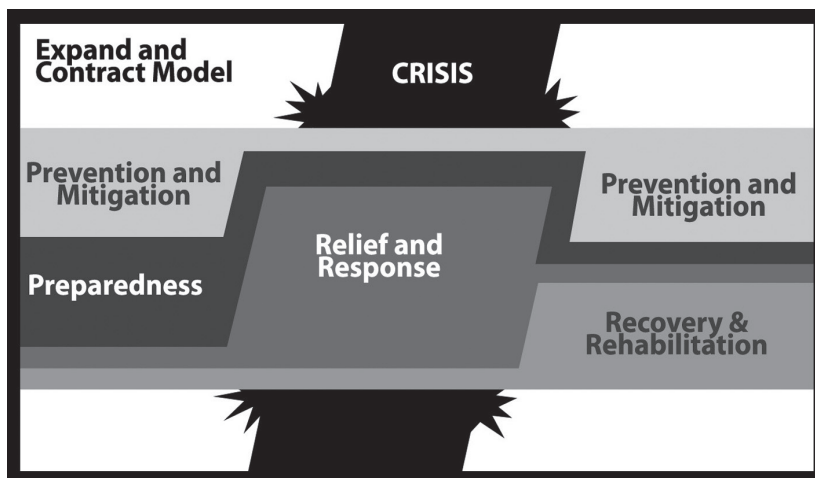
d. Later on, it was determined that the phases need not be linear (one after the other). Some phases may happen simultaneously as disasters could also occur simultaneously. In this context, "a post-disaster phase" does not exist.

On the other hand, the Expand and Contract Model shows that the activities are done simultaneously and given equal importance, but shifts priority depending on the phase and the availability of resources. For instance, in the event of a disaster, activities under rehabilitation might be interrupted to prioritize Emergency Response activities. While the areas first hit by a disaster are still in the recovery phase, other areas might be in the emergency response phase.

The concept of disaster management was further developed during the 1980s as a result of the experience of third world countries. This decade saw the emergence of the perception that enhancing the skills of the community is insufficient. There are social structures and systems that add to the vulnerability of the communities, thus the frequency of disasters.

e.   Currently, the dominant framework on disaster management is Disaster Risk Reduction.

The International Strategy for Disaster Reduction (ISDR) defines DRR as the "concept and practice of reducing disaster risks through systematic efforts to analyze 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." DRR focuses on reducing vulnerability by developing a culture of safety to prepare for the possible effects of hazards. All activities are done in the context of sustainable development.

f.   DRM, as distinguished from DRR, is a systematic process which involves activities on prevention, mitigation, and preparedness to lessen the adverse impacts of a disaster. In DRM, disaster preparedness activities such as risk assessmentare given emphasis, aiming to prevent risks from becoming actual disasters.

Disaster Prevention
•   Prevention is the outright avoidance of adverse impacts of hazards and related disasters.
•   Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake.
•   Very often, the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.

Disaster Mitigation
•   Mitigation is lessening or limiting the adverse impacts of hazards and related disasters.
•   Mitigation measures include engineering techniques, hazard-resistant construction, as well as improved environmental policies and public awareness.

Disaster Preparedness

• 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.

• Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems which includes such activities as contingency planning, stockpiling of equipment and supplies, development of arrangements for coordination, evacuation and public information, and associated training and field exercises.

• These must be supported by formal institutional, legal, and budgetary capacities.
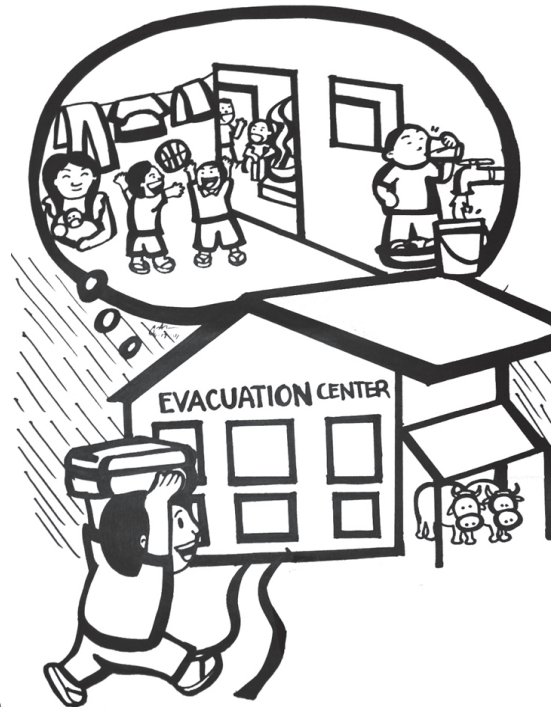
Disaster Response

• The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

• Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief".

• Activities during a response/relief phase include search and rescue evacuation, evacuation center management, food security assistance, nutrition, emergency shelter and distribution of non-food items, emergency health services, WASH and psychosocial services.

• The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.

Recovery

• The restoration and improvement where appropriate of facilities, livelihoods, and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

• The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended, and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and enable public participation.

• Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures, and to apply the "build back better" principle.

g. In January 2005, 168 countries ratified the Hyogo Framework for Action (HFA), a 10-year global blueprint for DRR. Its goal is to substantially reduce disaster-related losses on life, economy, and environment. The HFA set five priorities for action:
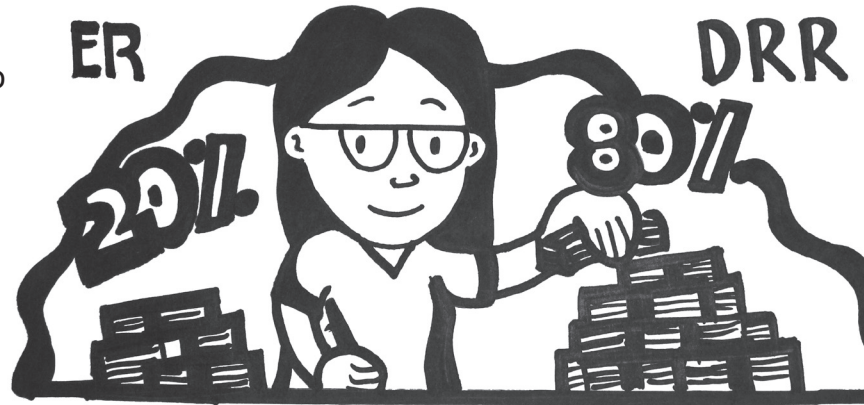
GOVERNANCE - making disaster risk reduction a priority (e.g. integrating disaster risk reduction into development policies, and planning);

RISK ASSESSMENT - improving risk Information and early warning (e.g. developing effective early warning systems which are appropriately adapted to the unique circumstances of the people at risk);

KNOWLEDGE MANAGEMENT - building culture of safety and resilience (e.g. including DRR subject matter in formal, non-formal, and informal education, and training activities);

RISK REDUCTION - reducing the risks in key sectors (e.g. protecting precious ecosystems such as coral reefs and mangrove forests, allowing these to act as natural storm barriers) and;

DISASTER PREPAREDNESS - strengthening preparedness for response (e.g. development and regular testing of contingency plans and regular disaster preparedness exercises including evacuation drills which are also keys to ensuring rapid and effective disaster response)

12. Ecosystem-based and climate-smart DRR

It is the DRR approach that is being championed by the Partners for Resilience which focuses on the contribution of climate change and environmental degradation to the

intensification of disasters. In this approach, the analysis is broadened from a particular community to the whole ecosystem, or ecosystems even. For instance, events in an upland ecosystem might have an impact on the level of risk on a coastal community.

On climate change, the risk assessment and analysis also takes climate projections into account.

13. Disasters and Development

Disasters and development are inextricably linked. A hazard event may wipe out any development that a community achieved and consequently push the people into poverty. The less vulnerable will experience scarcity and the most vulnerable will suffer more.

DRR aims to reduce the effects of hazards and the vulnerabilities of a community to safeguard the level of development achieved. In this context, it is important to understand and improve DRR activities because DRR contributes largely to development work.

There are two facets of disaster and development – positive and negative. Development projects that are introduced to a community need to be critically analyzed since not all development projects bring positive outcomes to a community. Often, the negative effects of the development projects to the environment and livelihood of the community outweighs the temporary progress it provides. There is also a need to put disaster response in the context of development, in the same way that development programs should be analyzed in the context of disaster risk.

Disasters set back development

Disasters may obliterate any progress that a community or household has achieved. In the absence of effective risk reduction measures, a hazard event can quickly turn into a disaster,resulting to suffering and loss of lives, property and livelihoods.

In poor and vulnerable communities, the effects of recurrent disasters are

big challenges to the sustainability of household livelihoods. When a disaster destroys the property and livestock that households have invested in such as carabaos, it will take time before these households are able to replace lost assets and recoup their losses. Sometimes, households have to resort to negative coping strategies such as selling their remaining livestock to buy food or pay for debts. Disasters also result in the destruction of the ecosystem, increase in the price of basic commodities, and spread of diseases.

The direct damages alone brought by frequent and severe disasters amount to billions of pesos annually. The annual repair of damaged bridges, roads, and school buildings also gets a huge allocation from the national budget. Aside from the amount needed to repair the damages it incurs, the cost allocated for Emergency Response can be considered as a reduction from the allocation on basic services. When the allocation on basic services is reduced, the poor are the most affected by it.

There are development projects that increase vulnerability of households and communities to disasters.

Development projects are implemented with the avowed goal of promoting national progress. However, not all development projects result in progress. There are development projects that actually result to increased vulnerability of households and communities to disasters. For instance, construction of dams that necessitates the displacement of communities leads to the loss of a community's land, livelihood, and even culture. The dams result to higher risk of flooding. Also, mining gives jobs for a few people but causes contamination of water and rivers which are the primary sources of food and income for the fisherfolks. Apart from the destruction of mountains which leads to landslide, agricultural projects that promote the production of cash crops result in the decrease of the yield of staple food.

It is important to analyze if a development project really brings about progress and who benefits from the progress.

Development lessens vulnerability to a disaster.

On the other hand, development has a positive effect specially if development programmes are designed properly and if the poor and underprivileged are clearly identified as the beneficiaries.

For example, the repair of roads and bridges may result to improved farm-to-market roads. Rural poor households benefit from this through access to market and eventually to increase of income. Furthermore, properly designed roads and bridges are not easily destroyed during disasters, facilitate quick evacuation, and prevent the exacerbation of flooding in an area.

Farmers benefit from agricultural technologies that are disaster resistant which contribute to increase in productivity, and do not have negative effects on the ecosystem (such as not using harmful chemicals that lead to land degradation and water contamination). Post-harvest facilities may be constructed in such a way that that they are less prone to hazards such as floods and storms.

There are disasters that bring opportunities for development

Though an unpopular fact, disasters also bring out positive opportunities. It is however, in the context that there are lessons learnt from a disaster to correct past mistakes. Communities affected by a disaster have the opportunity to design response and recovery activities in the framework of sustainable development. Relief or emergency response should be followed by preparedness, mitigation and development work, and should not be limited to addressing the immediate needs only. Another opportunity following a disaster is the change in culture and practices of a community from insensitivity to the negative impacts

of culture and practice on the ecosystem (which as a consequence increases disaster risks), to that of being protective and caring of the ecosystem. Oftentimes, it is also the experience of a community to be hit by a severe disaster that pushes them to practice and embrace DRR.

Methodology and Flow

1. After explaining the objectives, ask a question as an introduction: Is every storm a disaster?

2. The discussion will flow with their answers. In the plenary, differentiate a hazard from a disaster.

3. On the discussion of capacity, give a follow up question: Don't the victims of a disaster have the capacity to help themselves? Explain the concept of capacity based on the discussion.

4. On the discussion of vulnerability, ask: If a storm hits Forbes Park (or any exclusive subdivision, or rich community), can we call it a disaster? Why? Discuss the roots of vulnerability.

5. On the discussion of risk, use the comparison of an acrobat who balances on a cable (show the visual. This job is high risk but the acrobat is skilled and well-trained, reducing the risk. There are other ways to reduce the danger in this kind of work such as lowering the cable to reduce the impact in case of a fall, installing a safety net to catch the acrobat, increase the time of practices, move the audience farther from the acrobat to protect them from accidents, and deploy an efficient first aid team.

This example illustrates that there are many ways or activities that can be done to avoid accidents when an acrobat balances on a wire. It can be well compared to a DRR program wherein there are several activities that a community can do to prepare for a disaster and reduce its possible effects.

6. In explaining the evolution of DRR, give examples of DRR activities. On the evolution of concepts, ask the participants if they have been a part of a disaster response activity.

Group their answers into: before a disaster, during a disaster and after a disaster before explaining the evolution of the concepts and DRR model.

7. Continue the discussion until all the key messages have been discussed. The concepts on climate change, and ecosystem management and restoration are new concepts and may invite a lot of questions. Remind the participants that there will be a separate discussion where in these new concepts will be discussed. What is important is that the participants understood the correlation between these and DRR work.

8. On the discussion of disaster and development, ask the participants to give examples to measure their ability to assess their environment using the new concept on disasters and development.

9. End the session by summarizing the basic concepts and the last concept on disaster and development.

Materials needed:
*   Flipcharts
*   Masking Tape
*   Visual aids

Duration of the Session: 2 hours

References:
1.   ADPC, Capacity Building in Asia using Information Technology Applications (CASITA), Module 2. (www.adpc.net/casita/course-materials/Mod-2-Hazards.pdf)
2.   Hyogo Framework for Action
3.   Terminology of DRR, UNISDR 2009
4.   ACCORD CBDRM Manual, 2007
5.   http://www.careclimatechange.org/tk/cba/en/Open_Toolkit.html
6.   Millenium Ecosystem Assessment (2005)
7.   Cunningham and Cunningham - Environmental Science - A Global Concern 10th Ed. McGraw Hill 2008
8.   PEDRR - Demonstrating the Role of Ecosystems-based Management for Disaster Risk Reduction
9.   Pieter van Eijk, Wetlands International - Integrating ecosystem-based approaches in DRR and climate change adaptation, June 2011

Session 3. Understanding Hazards

LEARNING OBJECTIVES :

After the session, participants are expected to be able to:
1.   Explain the different hazards that affect the country and the community;
2.   Discuss the effects of each hazard, and;
3.   Identify safety measures that they should take to lessen the adverse impacts of hazards and the possibility of disaster

KEY MESSAGES

1. **What is Hazard?**

A dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health impacts, damage to property, loss of livelihoods and services, social and economic disruption, or environmental damage. (UNISDR 2009)
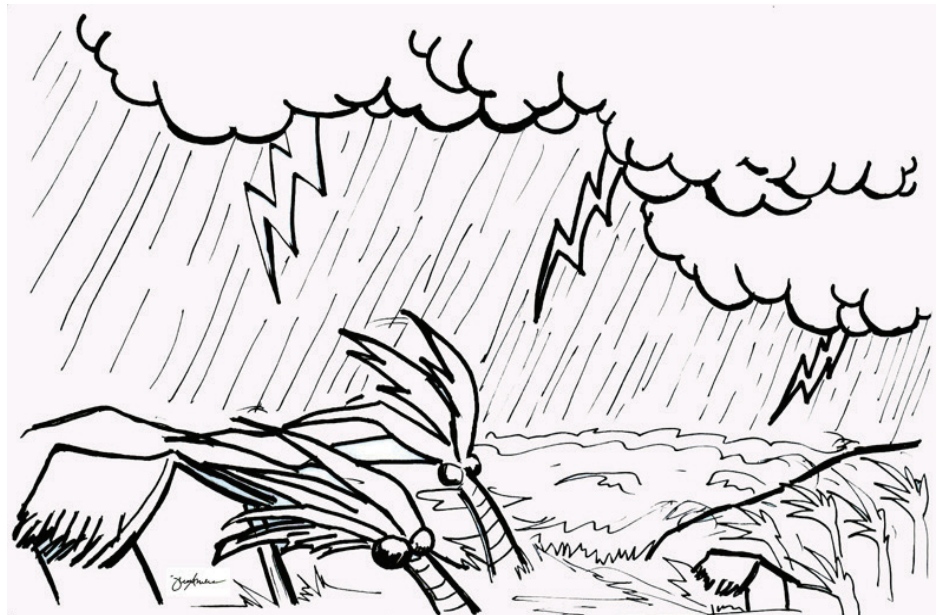
Hazards may bring about disasters but not all hazards result into disaster.

It is important to know the characteristics of hazards to understand the particular ones that communities experience or might face. This will effectively help them to conduct measures to lessen the adverse impacts of hazards or disaster risks.

Examples of hazards that affect the Philippines are tropical cyclone, flood, flashflood, landslide, earthquake, volcanic eruption, storm surge, tsunami, and others.

Hazards can be classified according to its characteristics such as hydrometeorological or geological.

3. **Hydrometeorological Hazards**

A hydrometeorological hazard is a process or phenomenon of atmospheric, hydrological or oceanographic nature that may cause loss of life, injury or other health impacts, damage to property, loss of livelihoods and services, social and economic disruption, or environmental damage.

Hydrometeorological hazards include tropical cyclones (also known as typhoons and hurricanes), thunderstorms, hailstorms, tornados, blizzards, heavy snowfall, avalanches, coastal storm surges, and floods including flash floods, drought, heatwaves, and cold spells. Hydrometeorological conditions can also be a factor in other hazards such as landslides, wild fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances and volcanic eruption material. (UNISDR 2007)

3.1 **TROPICAL CYCLONE**

Tropical cyclones are giant whirlwinds, which are locally known as *bagyo*. Rainfall associated with a tropical cyclone can be intense over a long period of time. (Disasters: the Philippine Experience, 1992) The eye of the tropical cyclone is the low-pressure centre but the outer sides are high-pressure areas that move in a circular manner. Tropical cyclones are commonly called typhoons.

a. **How are tropical cyclones formed?**

It is formed in large bodies of water with surface temperature above 27° C and have relatively still air. As warm, humid air rises, air from surrounding areas rush in. The earth's rotation twists the moving air such that the entire system begins to revolve. As the warm air rises and meets cooler air, the water vapour condenses and falls as rain. This reaction releases a large amount of heat, which makes the air ascend at an increased rate, creating a swirling air mass that travels faster and faster as it grows larger, finally becoming a tropical cyclone.
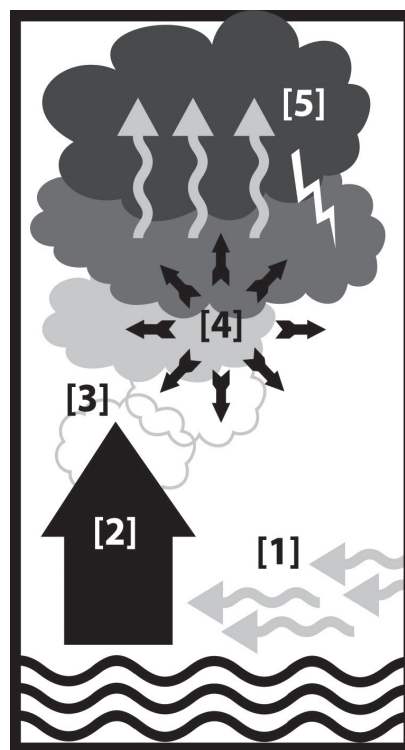
b. **Where are tropical cyclones formed?**

Tropical cyclones that the Philippines experience are formed in the Pacific Ocean and South China Sea. The following are areas of formation of tropical cyclones and the

annual average number worldwide:
- East Pacific Ocean - 15
- Western Atlantic Ocean - 12
- North Indian Ocean - 12
- South Indian Ocean - 12
- North and West Australia - 1
- Western North Pacific Ocean - 30
- South Pacific Ocean - 12

Once a tropical cyclone enters the Philippine Area of Responsibility (PAR), it is given a Filipino name. An average of 20 tropical cyclones enters the Philippines every year. This is the hazard that is most frequently experienced in the country.

c.   **Public Storm Warning Signal (PSWS)**

The PSWS is the official warning system that PAGASA uses to inform the public how strong the coming tropical cyclone is, where it is located at the time of the PSWS, its estimated path, its possible impacts, and what precautionary measures can be taken by the communities that are along the typhoon path.

- PSWS Number 1 – Winds of 30-60 kilometres per hour (kph) or intermittent rains may be expected in at least 36 hours. (When the tropical cyclone develops very close to the locality, a shorter lead-time of the occurrence of the winds will be specified in the warning bulletin.)
- PSWS Number 2 – Winds of greater than 60 kph up to 100 kph may be expected in at least 24 hours.
- PSWS Number 3 – Winds of greater than 100 kph up to 185 kph may be expected in at least 18 hours.
- PSWS Number 4 – Very strong winds of more than 185 kph may be expected in at least 12 hours.
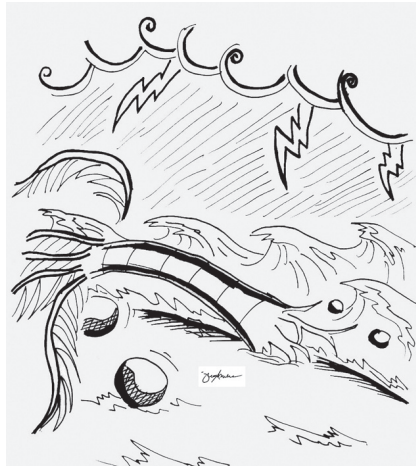
The risks brought by tropical cyclones:

•   Strong winds that can destroy buildings and other manmade structures, spoil crops and damage trees and orchards

•   Strong winds that spawn storm surge

•   May bring torrential rains that result to severe floods or landslides

WHAT TO DO

BEFORE the tropical cyclone hits

Have the following emergency materials ready:

•   Radio and flashlight with extra batteries

•   First aid kit

•   Food that do not easily spoil like canned goods and biscuits

•   Drinking water

•   Clothes

•   Mats and blankets

•   Important documents, etc.

•   Reinforce and fix roofs and windows to make sure they can withstand the strong wind

•   Trim branches of trees near the house

•   Clean up and clear waterways

DURING typhoon

•   Watch out for advisories and warnings on the tropical cyclone in the news over the radio and television and observe the surroundings

•   Refrain from going out of the house when not necessary

•   Coordinate with your local DRRMC for instructions

•   If there is need to evacuate, turn off the main electricity switch and the LPG tank, and lock the doors.

AFTER the typhoon

•   Make sure that the area is safe before leaving the evacuation centre

•   Repair the damaged parts of the house

•   Make sure that electrical lines and outlets are safe before using them again

•   Help out in the repair of damaged facilities in the community such us school, water pipes, etc.

3.2 STORM SURGE

Storm surge is the rise in sea level or the piling up of seawater that sweeps inland due to increase in wind velocity and decrease in atmospheric pressure during a tropical cyclone. Storm surge happens when a tropical cyclone nears the coastal area where the shallow slope off the coast will allow a greater surge to inundate coastal communities.

It is important to comply with the PAGASA recommendation to put up residences at least 20 meters from the shoreline.

3.3 FLOODS AND FLASHFLOODS

Floods occur when bodies of water such as streams and rivers overflow their natural borders and inundate the surrounding areas such as plains or low-lying areas.

a.   **Floods occur because of the following:**

•   Heavy rains

•   Heavy siltation of rivers and waterways

•   Clogged waterways

•   Failure of dams, water reservoirs, and flood control structures

•   Rise in sea level or piling up of sea water that sweeps inland brought about by storm surge

There are 18 major river basins in the Philippines where floods usually occur during intense rains. Flood prone areas are situated near these river basins.

There are communities where houses are raised so floods will not

reach them. In Talacogon, Agusan del Sur, houses are placed on rafts so they could adjust accordingly when the floodwaters rise.

Flashfloods

A flood that rises and falls quite rapidly with little or no advanced warning, usually as a result of intense rainfall over a relatively small area are called flashfloods. Often, there is a short interval between rainfall and the occurrence of the flood, which makes a flashflood particularly dangerous. The onrush of floodwater may also carry mud, boulders, logs, etc.

WHAT TO DO

BEFORE the floods
•   Get information on the local flood warning system
•   Monitor the news and situation
•   Prepare the things you need should evacuation become necessary
•   Coordinate with your local DRRMC
•   Wait for the warning signal to evacuate
•   Evacuate while roads and bridges are passable en route to the evacuation area
•   Bring pets and farm animals to higher and safe ground
•   Switch off electricity
•   Participate in preparedness tasks in the community like river dredging and tree planting

DURING the floods
•   Keep away from flooded areas especially if you are not sure how deep the floodwater is.
•   Keep children away from playing in floodwater.
•   Make sure your food is properly cooked and water is boiled for drinking.

AFTER the floods
•   Have an electrician check your power line before using it again.

•   Make sure that food and drinking water have not been contaminated by floodwater.

•   Report to proper authorities any damage in facilities such as power lines and posts, water pipes, roads, bridges, and others.

3.4 LANDSLIDE

Landslide is the downslope movement of soil, debris or rock when the shear stress exceeds the shear strength of the material. It is a denudational process where soil or rock is displaced along the slope mainly by gravitational forces.

Landslides often happen due to heavy or prolonged rains. Earthquakes can also trigger landslides. Human activities like mining, road construction, inappropriate land use, and deforestation can also aggravate landslides.

Areas where the threat of landslide is high include:
•   Slopes where previous landslides have occurred
•   Slopes that have ground cracks
•   Dry gullies and mouths of rivers coming from hills and slopes that are highly prone to landslides

AFTER a Landslide:
•   Leave the landslide area. Landslides might occur again.
•   Conduct search and rescue.
•   Coordinate with your local DRRMC for instructions.
•   Keep in mind that floods can possibly happen after a landslide.

3.5 TORNADO

A tornado is a violent, funnel shaped whirlwind that moves over a narrow path. Its wind speed is 80 kilometres per second or stronger and can lift houses, trees, vehicles, and other objects and can hurl them hundreds of meters away. It is classified as a "severe local storm" confined in relatively small geographical areas. Among local storms,

tornadoes are considered the smallest but the most dangerous and most violent. A tornado that develops over a body of water surface is called a waterspout. A waterspout is less strong.

A tornado is usually associated with thunder, lightning, and hail. It usually occurs in the afternoon, or evening, or when there is a typhoon. Signs that a tornado will possibly occur are the following:
- Presence of cumulonimbus clouds
- Calm, hot and humid weather
- Thunder and lightning

3.6 THUNDERSTORM

Thunderstorms are weather-causing phenomena, associated with the following hazards:
- Lightning and thunder
- Heavy rainfall
- Tornado
- Hail or chunks of ice from the sky

Safety measures when there is lightning
- Go inside a large building, if you can.
- Avoid using electrical appliances such as telephones, computers, or television sets.
- If stuck outside, do not take shelter under a tall, isolated tree.
- Stay away from bodies of water.
- If you are trapped in an open field and you feel your hair stand on end, lightning is about to strike. Do not lie flat on the ground. Instead, sit in a squat position with your heels lifted while doing the duck and hold.

3.7 DROUGHT

Drought is a condition of climatic dryness that causes lack of water for the normal needs of agriculture, livestock, industry, or human population.(CDRC 1992) It is a situation when the amount of rainfall is less or below normal over a prolonged period.

Drought results to crop damage and livestock deaths, which can lead to food shortage. Drought can also result in secondary hazards such as the emergence of destructive

number of rats, pest infestation, fire and epidemic. This can also cause springs and other water sources to dry up. The most destructive El Nino episode in the Philippines was experienced in 1997-1998, causing much damage to agriculture. It brought about food shortage with some 37 million people affected.

Drought can be predicted months in advance, giving adequate time for communities to implement risk reduction measures such as:
• Water impounding
• Planting drought-resistant crops
• Adjusting the planting calendar (advancing the days for planting and planting fast-maturing crops)

4. Geological Hazards

A geological hazard is a geological process or phenomenon that may cause loss of life, injury or other health impacts, damage to property, loss of livelihoods and services, social and economic disruption, or environmental damage.

Geological hazards include internal earth processes, such as earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize; although they are triggered by undersea earthquakes and other geological events, they are essentially an oceanic process that is manifested as a coastal water-related hazard. (UNISDR 2007)

4.1 EARTHQUAKE

Earthquakes result from the sudden shifting of the earth's crust below or at the surface, causing ground vibrations and shocks.

The earth is made up of a dozen several large plates and a number of smaller ones, which are in
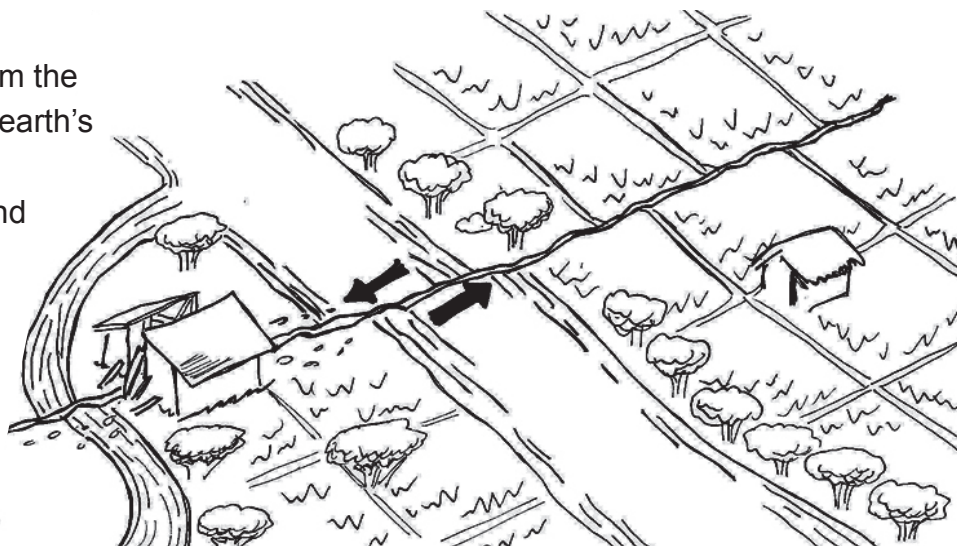
constant motion. One of these is the Philippine plate. Earthquake occurrences are not dispersed but concentrated along plate boundaries.

There are 2 types of earthquake
• 	Tectonic - earthquakes produced by sudden movement along faults and plate boundaries
• 	Volcanic - earthquakes produced by movement of magma beneath volcanoes

Epicentre is the point in the earth's surface directly above the origin of the earthquake. Focus or hypocentre on the other hand is the origin of earthquake found below the earth's surface.

Intensity is the perceived strength of an earthquake based on relative effect to people and structures (on the earth's surface); generally higher near the epicentre. There are different scales to measure earthquake's intensity including the PHIVOLCS Earthquake Intensity Scale (PEIS).

Magnitude is the measure of the total energy released at the earthquake's point of origin (below earth's surface) based on information derived from a seismograph. The Richter Scale indicates the range of magnitude of earthquakes.

A **seismograph** is an instrument used to record seismic waves. A record from a seismograph is called a seismogram and can be reflected on a digital screen or paper. Seismic waves are vibrations generated by an earthquake, explosion, or similar energetic source and propagated within the Earth or on its surface.

Faults are fractures in the earth's surface where rock movements have taken place and earthquakes have been produced. An active fault is defined as a fault, which has moved within the last 10,000 years. Active faults and trenches are the earthquake generators in the Philippines. An average of 20 earthquakes is recorded per day in the Philippines.

Hazards associated with earthquakes:

• Ground shaking – its impact could result in the collapse of buildings and other structures

• Ground rupture

• Liquefaction - is a process where particles of loosely consolidated and water-saturated deposits of sand are rearranged into more compact state, squeezing water and sediments towards the surface in the form of sand fountain and creating condition resembling "quick sand".

• Tsunami

• Landslides

• Fire

One of the most destructive earthquakes experienced in the country happened in July 16, 1990. 23 provinces in 6 regions of Luzon were affected and at least 1,283 persons died. The cost of damage reached P12.23 billion.

Actions to take to prepare for earthquakes:

• Prepare your house and workplace for possible earthquake:

• Secure heavy furniture and fixtures to the wall by tying to prevent them from falling.

• Breakable items, dangerous chemicals, and flammable materials should be placed at the lower part of the cabinet. Make sure that these items will not easily fall or thrown off.

• Always turn off the LPG tank after use.

• Be familiar with your house, workplace, or any place where you frequently stay

• Know the strong parts of the building like doorframes, areas near the elevator shaft, and sturdy tables where you can stay while an earthquake is happening.

• Know where to find the fire extinguishers, first aid kit, warning equipment and the nearest emergency exit. These places should be located in areas that can be accessed easily and clearly.

While an earthquake is happening:

• If you are inside a sturdy building, do not go out.

• Duck, cover, and hold.

• Stand under the doorframe or take cover under a sturdy table to protect yourself from falling materials

•   If you are outside, look for an open space.

•   Move away from power lines, posts, fences, and other structures that might collapse.

•   Move away from buildings that have glass materials, which might break.

•   If you are near the slope of a mountain, move away from steep areas, which might be affected by landslides.

•   If you are near the seashore and have experienced an earthquake so strong that you find it difficult to keep standing, it is better to assume that a tsunami will come. Run towards an area away from the shore.

After an earthquake:

•   Come out of the building.

•   Be ready for aftershocks. Do not enter buildings that have damaged parts. An aftershock might trigger its collapse.

•   Inspect electrical lines and turn off the main switch if you fear that there has been damage.

4.2 TSUNAMI

Tsunami is a chain of fast moving waves that send surges of water onto land, sometimes reaching a height of 100 feet. It can travel as fast as 600 miles per hour (mph); and its wavelength can reach up to 100-200 kilometres. Tsunamis are generated either by earthquakes, volcanic eruptions, landslides or meteor impact.

A tsunami's speed depends on water depth. It travels faster in deep water, reaching up to 1000 kph. When it hits the shoreline, it slows down to 30-50 kph. A tsunami's height also depends on water depth. In the deep parts of the ocean, its height is less than 1 meter. The tsunami becomes taller when it hits the shoreline, reaching up to about 30 meters.

There are two kinds of tsunami: local and international. A tsunami is local if it is generated by an earthquake occurring within the Philippine Sea or Pacific Ocean. The warning for a locally generated tsunami is issued locally. A tsunami is

international if it is generated by an earthquake occurring in another country, e.g. Japan and Chile. Warning for an internationally generated tsunami is issued by an international centre, NDRRMC and PHIVOLCS.

According to a study conducted by PHIVOLCS, a tsunami caused by a locally generated earthquake in the Pacific Ocean can reach Dingalan, Aurora province in 12 minutes. If the tsunami is foreign generated or a strong earthquake took place in other countries, the following are the estimated lead times before a tsunami strikes the country:

- 40 minutes if the earthquake took place in Japan
- 2.5 hours if it's in the Marianas or Pacific Islands
- 10.5 hours if the earthquake happened in Alaska
- 24 hours if the earthquake took place in Chile

Other characteristics of tsunami:
- Tsunami can move faster than a person can run.
- Tsunami can travel up rivers that lead to the sea.
- The force of some tsunami is enormous. Large rocks, boats, and other debris can be moved inland and can kill and injure people.
- A tsunami consists of a series of waves. The first wave may not be the largest. The danger from a tsunami can last for several hours after the first wave.

One of the most destructive tsunamis that hit the country occurred in 1976. It devastated the southwest coast of Mindanao. The five-meter high waves left more than 4,791 people dead, more than 2,000 missing, about 9,928 injured and left 12,000 families homeless in the provinces of North Cotabato, Sulu, Zamboanga del Norte, Zamboanga del Sur, Lanao del Norte, Lanao del Sur, Maguindanao, and Sultan Kudarat.

Some 200,000 people perished in the Indian Ocean tsunami in 2004. Twelve countries were affected including Indonesia, Thailand, Sri Lanka, and India.

Signs of an impending tsunami:
- Strong earthquake, the magnitude of which is 7 or above.

• Unusual sea conditions such as lowering of the water level at the shoreline such that fish and shells are drawn in the beach area.
• Rumbling sound of the approaching waves described by tsunami witnesses as:
    • Distinct roaring sound
    • Strange unusual strong sound (e.g. sucking sounds)
    • Rumblings of many trucks
    • Jet-like or gush of strong rain

What to do before a tsunami strikes:
• Help establish a community-based EWS for tsunami.
• Conduct Public Awareness activities on tsunami and other hazards.
• Strengthen and build capacity of community through drills.
• If an earthquake has occurred, be vigilant. Retreat of sea level preceding a tsunami may strand fishes on dry land and expose sandbars and corals, attracting people to flock to the shoreline.

What to do when a tsunami strikes:
• Run away from the shore towards a higher ground
• Never go down the beach to watch a tsunami and take pictures.
• Ensure family and community members are safe.
• Help reduce panic and maintain order in the community.
• Stay tuned to news or announcements from PHIVOLCS, NDRRMC, MDRRMC, or BDRRMC.
• Tsunami wave activity is imperceptible in open sea. Do not return to port immediately if you are at sea and have received warning of incoming or on-going tsunami.
• Help rebuild the community
• Conduct an assessment after the event to identify lessons learned

4.3 VOLCANIC ERUPTION

Volcanic eruptions are vents in the crust of the Earth, from which issue eruptions of molten rock, hot rock fragments, and hot gases.

Hazards associated with volcanic eruption
• Explosions
• Volcanic ash or blocks

- Pyroclastic flows
- Glowing avalanches or ash flows
- Gas clouds
- Ash falls

People, animals, houses, croplands, trees, and other things can be buried or burned by the volcanic debris and gases. Lahar flows can also happen when heavy rains mobilize volcanic debris.

There are more than 200 volcanoes in the Philippines of which 23 are active and 26 are considered potentially active. Some of the active volcanoes in the country include:

- Mt. Pinatubo in Zambales, which erupted in 1991 after 600 years of inactivity. The eruption changed the landscape and situation of Central Luzon region. Thousands lost their homes, croplands and other means of livelihood.
- Taal had its most destructive eruption in 1977.
- Mayon is the most active volcano in the country. Its most powerful eruption was recorded in 1993.

5.   BIOLOGICAL AND TECHNOLOGICAL HAZARDS

A biological hazard is a process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins, and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Examples of biological hazards include outbreaks of epidemic diseases, plant or animal contagion, insect or other animal plagues, and infestations. (UNISDR 2007)

Technological hazard originate from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, damage to property, loss of livelihoods and services, social and economic disruption, or environmental damage.

Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event. (UNISDR 2007)

5.1 EPIDEMIC

An epidemic is a rapid and significant increase in normal number of cases of an infectious disease in a particular area. The most common epidemics in the Philippines are measles, malaria, dengue, and cholera. To date, there is no available vaccine for dengue.

What to do when there are signs that a person is suffering from dengue:
• Do not give aspirin to a person who has fever.
• Have him/her drink plenty of water.
• If the fever has lasted for two days, consult a doctor.

When the increase in the number of cases goes on a global scale, it is called pandemic. Examples of pandemic are the cases of SARS and Avian Influenza.

5.2 FISHKILL

Fishkill is when a large number of fish suddenly perish and are found floating in the bodies of water. The causes of fishkill are the following:
• Pollution
• Water contamination due to extensive use of pesticide
• Water contamination due to chemical spill
• Increase in water temperature

5.3 RED TIDE

Red tide refers to the presence of an extremely high

concentration of microorganisms called dinoflagellates in seawaters, which causes the reddish colour of water. Not all dinoflagellates are toxic. The toxic ones are found in the Samar Sea, Carigara Bay, Maqueda Bay, Villareal Bay, Manila Bay and the coastal waters of Zambales. Salinity, temperature, light, nutrients, amount of rainfall, and air temperature influence the increase of these organisms in seawater. Pollution contributes to the occurrence of red tide.

People who eat fish or shellfish contaminated by the toxic organism can become fatally ill with paralytic shellfish poisoning. Red tide has a large effect on communities that depend on the production, harvest, and sale of shellfish. These economic activities are temporarily halted until government declares that red tide is no longer present.

5.4 INFESTATION

Infestation is an attack of a large number of insects, animals, viruses, etc., which are harmful to livestock and crops. Most common in the Philippines are rat and locust infestation destroying crops overnight, and foot and mouth disease causing hogs to die. The effects of pests on people may be direct or indirect such as possible health problems after consumption of contaminated meat like in the case of foot and mouth disease. Pests that attack crops and animals could also threaten the people's source of livelihood and food.

5.5 FIRE

Fire becomes disaster when it goes out of control and spreads fast, threatening human life, homes, and other structures. Crops, forest vegetation, and animals can also be endangered particularly during dry season. Urban poor communities are most vulnerable to fire because of congestion, poor housing materials, and faulty electrical wiring.

Fire prevention measures:
• Do not smoke in bed and in "no smoking" areas
• Be careful when using candles indoors.

- Regularly check your electrical wiring system and conduct immediate repair when needed.

6. **ARMED CONFLICT**

This involves armed hostilities between the Armed Forces of the Philippines (AFP) and other armed groups in the country. The clashes result in the displacement of communities, uprooting large number of families from their homes, and disrupting their livelihood and community life.The situation worsens when evacuees are restricted to go out of the evacuation area and even to engage in their farming activities.

In 2000, large number of communities in Mindanao were displaced due to the armed conflict between government troops and the Moro Islamic Liberation Front (MILF). The clashes arose from the declaration of total war by then President Estrada.

Methodology and flow:

Part 1 Review of community hazards

1. For participants from project areas, review the draft CRA at the project start. Assign 2 persons who will explain the hazard map, hazard assessment table and disaster timeline to the group. For other participants, start with no. 2.
2. Based on the discussion in the Basic Concepts (Session 2), differentiate hazard from disaster.
3. For participants from project areas, validate from the group the hazards that affect them and categorize each hazard according to hydrometeorological, geological and other hazards. For other participants, have them enumerate examples of hazards experienced in their communities.

Part 2 Discussion of Each Hazard and Safety Measures

1. Form 8-10 groups depending on the number of hazards that will be discussed.
2. Assign a hazard to each group.
3. Give the groups 15 minutes to prepare their report which will provide answers to the following questions:

- What is hazard? How does this occur? For example, what is a typhoon? How does a typhoon form? What are the characteristics of a typhoon? Name some typhoons that hit the country and your community.

•   What actions do you have to do before, during, and after a typhoon occurs?

4.   Each team should prepare a visual aid that they will use for reporting. They can request assistance from the training team on the content and materials for the visual aid.

5.   Classify the groups according to hydrometeorological, geological and other hazards.

6. Give each group 15 minutes to present their report.

7. Each group should also provide 2 questions for the quiz that will be done after the session.

8. The facilitator will summarize the key points discussed after the report of each group. She/He will also provide additional discussion and clarification points if necessary.

9. After each set of presentations, the facilitator will summarize the hazard presented before proceeding to the next type of hazards.

10.   After discussing all the hazards identified, end the session by administering a test (from the questions provided by each group). The big group will answer the questions together.

Tips for the Facilitator:

The session plan covers a range of hazards, some of which are not applicable for discussion according to the specific context of a community. The facilitator should only choose which hazards are appropriate to discuss in the particular community where the training is being conducted. For information purposes, data on the other hazards can also be included in the training hand-outs.

The session is quite long so it would help to do it by inter-active teaching. This is why the participants are formed into groups who present the initial discussion. The facilitator then just explains the necessary clarifications and additional key points.

With the hazard maps, it is easier to establish that the hazards discussed can possibly occur. This also demonstrates the application of scientific studies while the participants also incorporate their indigenous knowledge as the discussion progresses.
The summary after each set of hazards provides the participants some time to absorb and reflect on the discussion before the next report.

The test at the end of the session will determine whether there are points or messages to be reviewed or clarified. It is important to properly formulate the test questions that came from the participants. Another option is for the training team to prepare or formulate test questions while the discussion is going on. This will also serve as guide in summarizing the discussion for each set of hazard.

Materials Needed
- Craft paper
- Community hazard maps from the CRA
- Copy of available multi-hazard maps
- Drawings or photos of hazards
- Metacards
- Masking tape
- Scissors
- Safety tips/measures for hazards
- marker pens

Duration of the Session : 2.5 hours

References:
1. Report on the Result of Hazard Mapping conducted by PHIVOLCS and PAGASA for the municipality of Dingalan, Aurora, 2006.
2. Report on the Result of Multi-Hazard Mapping of the READY Project, Saint Bernard, Southern Leyte, December 2007
3. Praymer sa Bagyo at Baha at Lindol, CARE-CNDR CBDRM Project. September 2007.
4. Praymer sa Lindol at Landslide, CARE-CNDR CBDRM Project, September 2007.
5. Disasters: the Philippine Experience. CDRC, 1992.
6. Powerpoint presentations of PAGASA.
7. Terminology on DRR, ISDR 2009.
8. Relief Basics, CNDR 2004.
9. Illustration in page 29 from http://web.mit.edu / 12.000 / www/m2010 / final website / background / huricanes / images / huricanes formation jpg.

Session 4. Understanding Vulnerability and Capacity

LEARNING OBJECTIVES:

After the session, the participants are expected to be able to:

1.   Explain the concepts of vulnerability and capacity

2.   Identify the causes of vulnerability among communities

3.   Build a connection or link between the local and national situation that contribute to vulnerability

4.   Identify actions based on community capacities aimed at lowering disaster risks

KEY MESSAGES

Before reviewing the concept of vulnerability, remind participants about the pseudo formula for disaster risk, $R = H \times V - c$, show the importance of reducing vulnerability, and why it is essential to conduct a thorough review on this.

Since reducing vulnerability is a valuable activity in lowering disaster risk, it is imperative to understand the different vulnerabilities within a particular community and society.

1. VULNERABILITY

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

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.

Vulnerability may also refer to the pre-disaster condition of a community that can be further exacerbated by a disaster. Such condition may worsen after a disaster.

Vulnerability can also characterize the condition of the community prior to a disaster, which worsens during an emergency, and may become much worse after it.

1.2 Categories and Factors of Vulnerability

Factors that make communities susceptible to the damaging effects of hazards can be grouped into three categories of vulnerability: physical and material, social and organizational, and attitudinal and motivational.

a.   The factors that contribute to physical and material vulnerability include:
- Being physically located or living in unsafe locations such as unstable mountain slopes, riverbanks, coastal areas, and garbage dumpsites;
- Lack of access and control over assets such as land, farm animals, machinery and tools;
- Having household incomes that are insufficient to meet basic needs;
- Poor health of household members and inability of children to attend school;
- Degraded ecosystems such as polluted rivers whose fishes are no longer safe to eat; and
- Unpredictable climate that negatively affects food production of farming households.

The physical location of the Philippines exposes it to many hazards as shown in the previous sessions.

b.   The factors of social and organizational vulnerability that make communities   more susceptible to hazards include:

- Lack of cohesion or divisiveness amongst community members;
- Community members are not organized to pursue common interests;
- Political affiliations and electoral practice that prevent community members and local authorities to work together for the common good;
- Lack of commitment from government units and agencies to implement sustainable poverty-reduction programmes; and
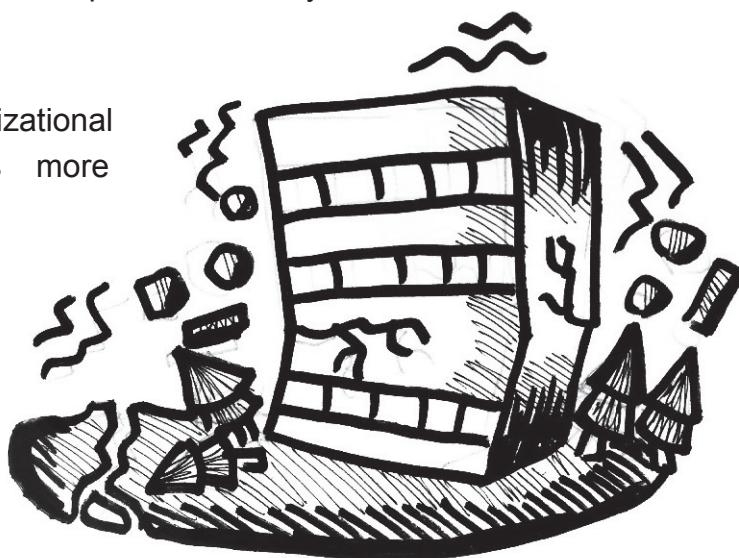
• Government policies and priorities that do not effectively address poverty and vulnerability, or that create and exacerbate poverty and vulnerability even more.

c. The factors of attitudinal and motivational vulnerability that make communities more susceptible to hazards include:

- •. Defeatism and lack of confidence in a community's capacity to change its conditions;
- •. Lack of initiative or volition amongst community members and leaders;
- •. Beliefs that things are meant to be and nothing can be done to change them;
- •. Dependence on others and on external assistance
- • Lack or low level of awareness;
- • Lack of capacity or willingness to review past events, and learn lessons from these.

1.3 **Extreme poverty of many Filipinos the main reason for disasters**

Poverty is the main factor why many communities are prone to disasters. The different facets of poverty, such as the intensity of deprivation, its magnitude or the number of people that are poor, the causes and effects of poverty are analysed in order to gain insights on how to reverse this problem and for capacities to overcome vulnerabilities.

a. **More and more Filipinos becoming poor.**

Let's take a look at the facts: Almost two thirds of the population is poor. A survey from IBON Foundation (IBON) on April 2010, reveals that 69% Filipinos rated themselves poor and becoming poorer. The 2010 Census shows that 63 million out of 93.3 million are living below the poverty line.

This is not far from the Social Weather Station (SWS) Survey data of March 2012 where 55% Filipinos consider themselves poor, a 10% rise from the survey in December 2011. In another SWS Survey in January – March 2012, there is an increase in the percentage of families experiencing involuntary hunger, lack of food sources, and inability to buy food. Disturbingly, the number of poor families in Mindanao rose from 38% to 72% this year, as percentage of those who are experiencing hunger increased.

According to the National Framework Strategy on Climate Change (NFSCC), majority of poor families are found in the rural areas where agriculture is the primary source of income. The fishing sector has the highest poverty incidence of 41.4% followed by the farmer sector with 36.7%, according to the National Census and Statistics Board (NCSB). This shows no difference on the data in 2006 in which poverty incidence rose across all sectors with the agriculture sector having the highest poverty incidence. The International Fund for Agricultural Development (IFAD), on the other hand, states that only 5% of farmers own the land they till out of the 45% total agricultural land, while 70% of farmers are landless agricultural workers.

Also, illiteracy, unemployment and incidence of poverty rates are also high among indigenous peoples or those who live in the upland areas.

Family Living Wage **Minimum Wage**

In National Capital Region (NCR), there is a growing gap between the minimum wage and the family living wage (FLW). According to IBON, the 2012 minimum wage of PHP 426 is actually PHP 567 less than the living wage of PHP 993. This is a 62% gap increase from 2001 when the minimum wage is PHP 265, with an interval of PHP 244 from the FLW of PHP 509.

 The use of price index for goods that can be purchased is based on the 2008 level, and the percentage intended for food from the PHP 426 daily minimum wage is P204 only. This shows that the intended daily minimum wage provides very little quality of life for the poor families. This is far from the PHP 18,041 average expenditure for food alone of the 10% rich families in NCR.

From its research, IBON cited that the government changed the way they measure poverty threshold this year (2012). Poverty threshold is equivalent to the amount of
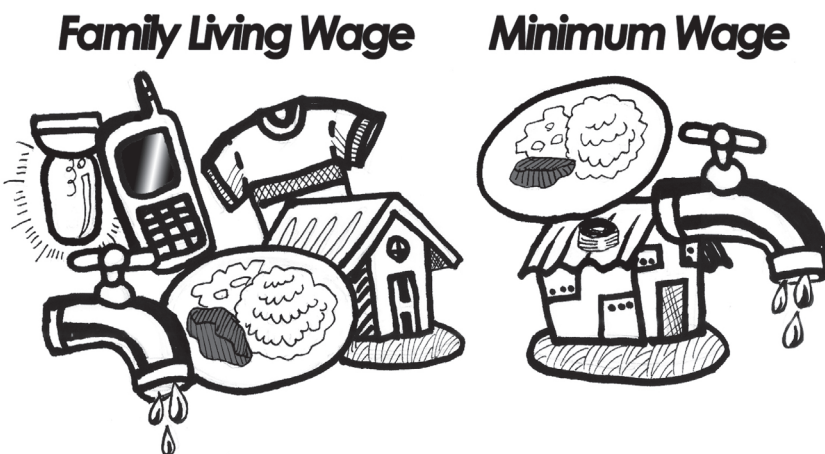
money required to live adequately or have a tolerable standard of living. The previous threshold of the government is PHP 52/day per person and was changed to PHP 46. In calculation, the number of poor Filipinos was reduced by 5.32 million but made no improvement in their conditions. If we estimate using the previous price of PHP 52, the number of poor Filipinos will increase from 850,000 in 2006 to 28.5 million in 2009. But according to IBON, this is still low because an average Filipino would only need more than PHP 52 a day to say that he is not poor.

The unemployment rate is also disturbing as it directly affects the poverty rate. According to the January 2012 Labor Force Survey by National Statistics Office (NSO), the estimated unemployment rate is 7.2% while the underemployment rate is at 18.8% which show minimal decrease in the 2011 data. This is different from the data given by IBON and from the result of surveys where the number of poor families unable to buy food actually rise.
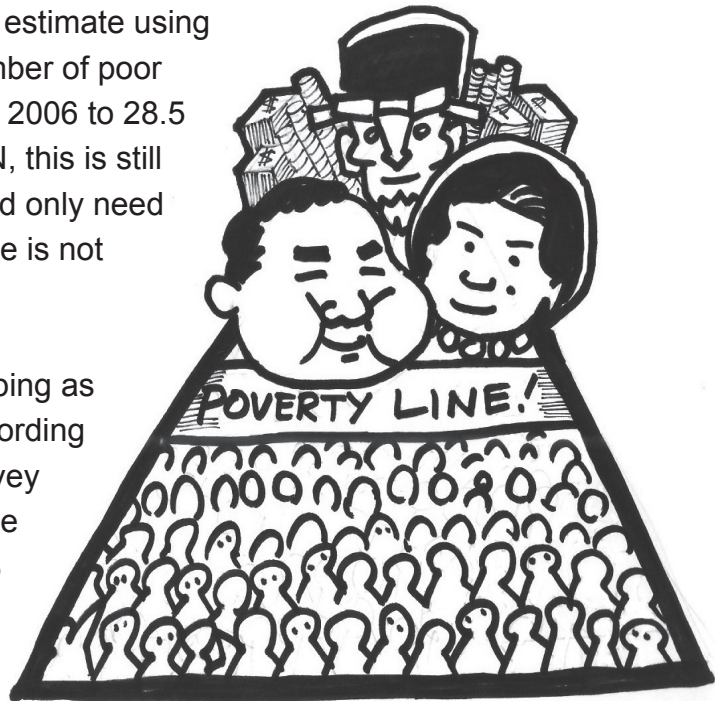
All these data prove that there is no significant change in the division of wealth of Filipinos. The triangle is still the same; many are sharing a small amount of the country's wealth while a few possess the bigger chunk. According to a study that was conducted by former administrator of NSO Tomas Africa, there is no difference in this division since 1985 to 2009. The top 1% owns the 32% of the national income and the bottom 50% of the population share the 20%.

Poverty, hunger, inadequate income, unemployment and illiteracy are key factors why communities are becoming increasingly vulnerable to disaster.

b. **A single vulnerability leads to more vulnerability**

Because of poverty, some people are forced to find food and income through activities that destroy the environment such as slash-and-burn farming (kaingin) and illegal logging. Due to its destructive effects on the ecosystem, the effects of hazard are also intensified even as the capacity of the ecosystem to support livelihoods are degraded, giving rise to another factor of vulnerability.

Multinational companies encouraged by the government to explore the country's natural resources often leads to exploitation which results to more fragile ecosystems and might cause extreme disasters. Some of these practices include mining, commercial fishing, fishpond expansion, quarrying and logging.

An example of this is the unabated large-scale commercial logging that is also one of the major contributors to deforestation. From 27.5 million hectares in the late 1500's, the remaining forest is 7.2 million hectares or 24.7% of the total land area of the country. (NFSCC) Other contributing factors include lack of protection for the forest, ineffective government policies, expansion of upland agriculture, forest fires, infestation, diseases and conversion of land that is not properly planned. The cumulative effect is that of the remaining forest, only .08 million hectares can be called primary forest. This condition has effectively erased the role of the forest ecosystems as effective buffer against floods and landslides, as a source of livelihood for poor communities, and as carbon sink for greenhouse gases that are responsible for global warming and climate change. Climate change is associated with extreme weather events.

c. **The country is prone to recurrent disasters due to multiplicity of hazards and widespread poverty**

Natural disaster	2011	Last Decade
Casualties/ Death	1,842	8,460
Number of Affected	10,966,662	30,779,712
Damages (amount)	$728,706 million	$2.33 billion

• Every year, we experience so much natural (typhoon, landslide, flood, and earthquake) and man-made hazards (fire, armed conflict, etc).

• In 2010, the Centre for Epidemiology of Disasters (CRED) ranked the Philippines as the 3rd country with most natural disaster occurrence: 14 were reported to have affected 3.9 million Filipino.

• In 2009, Typhoon Ondoy (Ketsana) recorded PHP 8.3 billion worth of damages, while Typhoon Pepeng (Parma) recorded PHP 19.6 billion.

• October 2011 – Philippines was ranked 3rd to the list of countries that are most vulnerable to climate change next only to Vanuatu and Tonga.

Let's take a look at the following data from CRED EM-DAT:

These data do not present the complete picture because only extreme disasters are being recorded by CRED. In any case, the data, which show the geometric increases in the direct economic costs and the number of persons affected by disasters, imply that recurrent disasters aggravate poverty among those already poor and can also drive middle-income households to poverty. The huge effects of disasters have an impact to the economy and people. Reconstruction or repair of damaged properties will again be taken from taxes and funds that could have been used in providing the basic needs of the citizens.

Much more pervasive vulnerabilities that are the outcomes of disasters are ecosystem degradation and damages sustained by agriculture, infrastructures, houses and other resources, increase in the price of goods, spreading of diseases, rising of hunger, decrease of resistance to disease and deterioration of health among the affected populations. There are also indirect effects like increase of rural to urban migration, rise of domestic violence, sexual harassment, and HIV infection due to sex trade (globalization).

Due to the chain effects of vulnerability, it has been viewed as a complicated issue. With this, we need to analyse and discover what factors cause vulnerability for us to know how to reduce them and attain lasting change.

2. CAPACITY

Capacity is the combination of all the strengths, attributes and resources available within a family, community, society or organization that can be used to lessen the adverse impacts of a disaster, prepare for emergencies, and recover from a disaster.

2.1 Categories and Factors of Capacity

2.1   Factors that make communities more resistant to the adverse impacts of hazards can be grouped into three categories of capacity: physical and material, social and organizational, and attitudinal and motivational.

a. The factors that contribute to physical and material capacity of communities include:
   • Proper identification and use of safe locations
   • Access and control over land, capital and other means of production
   • Projects and/or activities that increase resilience of livelihoods
   • Healthy population and low poverty incidence
   • Healthy ecosystems

b.   The factors that contribute to social and organizational capacity of communities include:
   • Community leaders, formal and informal, are well-respected;
   • Community members are organized and actively pursuing their common interests;
   • There is broad participation in decision making, where the poor and disadvantaged groups have a voice on matters that affect their lives; and
   • Conflicts in the community are quickly and justly resolved.

c.   The motivational and attitudinal capacity factors that make communities more able to reduce and withstand hazard impacts, prepare for emergencies and recover from disasters include:
   • Confidence amongst community members that they have the capacity to change and improve their conditions;
   • Positive indigenous or local practices such as bayanihan or mutual aid;
   • High level of awareness on community concerns;
   • High level of unity and cooperation amongst community members
   • Capacity and openness of community to collectively review past events, learn lessons from these and apply lessons in appropriate future events.

d.   There are many types of activities that strengthen our capacity:

•   Increasing community knowledge about local risks through community risk assessment
•   Identifying and implementing risk reduction measures based on good risk assessments;
•   Organizing or strengthening community organizations that have ecosystems-based and climate-smart DRR in their agenda
•   Helping households and communities develop resilient livelihoods, i.e. ecosystem-friendly, climate-smart, and less susceptible to hazards
•   Developing capacity of local authorities to mainstream ecosystems-based and climate-smart DRR in development plans and to implement these plans
•   Emergency preparedness planning of communities and local government units
•   Choosing the right leaders who are committed to serve and protect the common good, and giving particular attention to the poor and disadvantaged;
•   Advocating for ecosystems-based and climate-smart DRR policies and programmes
•   Promoting broad participation and giving voice to poor households, and to disadvantaged groups such as women, children, indigenous peoples, elderly and persons with disability

Understanding capacities and increasing them is essential to offset or reverse the vulnerabilities that exist within communities. This is key to reducing the level of risk in communities.

3.   **CRUNCH Model or Pressure and Release Model (PAR)**

PAR is a tool that aids in more insightful analysis of vulnerability by showing cause and effect relationships of vulnerability factors. PAR expands and deepens one's ability to examine and understand the conditions that make a community or society more prone to disasters by better identifying the multiplicity of factors that cause such vulnerability, and in understanding the cause-and effect relationships of these vulnerability factors.

PAR uses the analogy of the nutcracker, where there is a build-up of pressure, coming from hazards on one side, and from vulnerabilities on the opposite side. The pressure continues to build up until the nut cracks (for this reason, PAR is also called the Crunch Model). The cracking of the nut represents the disaster. The cracking of the nut, or the occurrence of a disaster, can be stopped from happening by releasing pressure. Turning unsafe conditions to safe conditions, by reducing vulnerabilities, and increasing capacities can release pressure.

Progression of vulnerability *(adapted from Wisner et al. 1994)*

| ROOT CAUSES | DYNAMIC PRESSURES | UNSAFE CONDITIONS | DISASTER | HAZARDS |

Limited access to
• Power
• Resources and jobs
• Land

Ideologies
• Political systems
• Economic systems
• Cultural systems

Lack of
• Local institutions
• Appropriate skills
• Training & education
• Awareness
• Good governance
• Law enforcement
• Local investments
• Local markets

Macro-forces
• Population growth
• Urbanisation
• Unemployment
• Violence
• Environmental degradation

Physical environment
• Dangerous locations
• Inadequate buildings & infrastructure

Local economy
• Insecure livelihoods
• Low income levels

Society
• Marginalized groups
• Fatalism

Public actions
• Lack of mitigation & preparedness
• Response focus

$$R = H \times V - C$$

ELEMENTS AT RISK
• Death/injury
• Loss of livelihood
• Food inaccessibility
• Houses and assets lost or damaged

Earthquake

Tsunami

Tropical storm

Storm surge

Flooding

Volcanic eruption

Landslide

Tornado

Drought

Virus & pest

The PAR is very similar to the problem tree and solution tree.

3.1 Progression of Vulnerability

The various vulnerability factors that contribute to the build up of pressure can be grouped into three: Unsafe conditions, dynamic pressures, and root causes. In the language of CARE, these are the immediate causes, intermediate causes, and root causes. These three groups of causes or vulnerability factors have cause-and-effect relationships. These relationships show that pressure will be effectively released through working in the different groups or categories of vulnerability factors. It is not enough to work on addressing unsafe conditions. Dynamic pressures or intermediate causes, as well as root causes need to be resolved if pressure would be effectively released, i.e. if disaster would be prevented from happening, or its likelihood of happening becoming significantly reduced.

Unsafe conditions – this is the actual state of people and communities exposed to hazards. The factors that result to unsafe conditions can be due to the physical

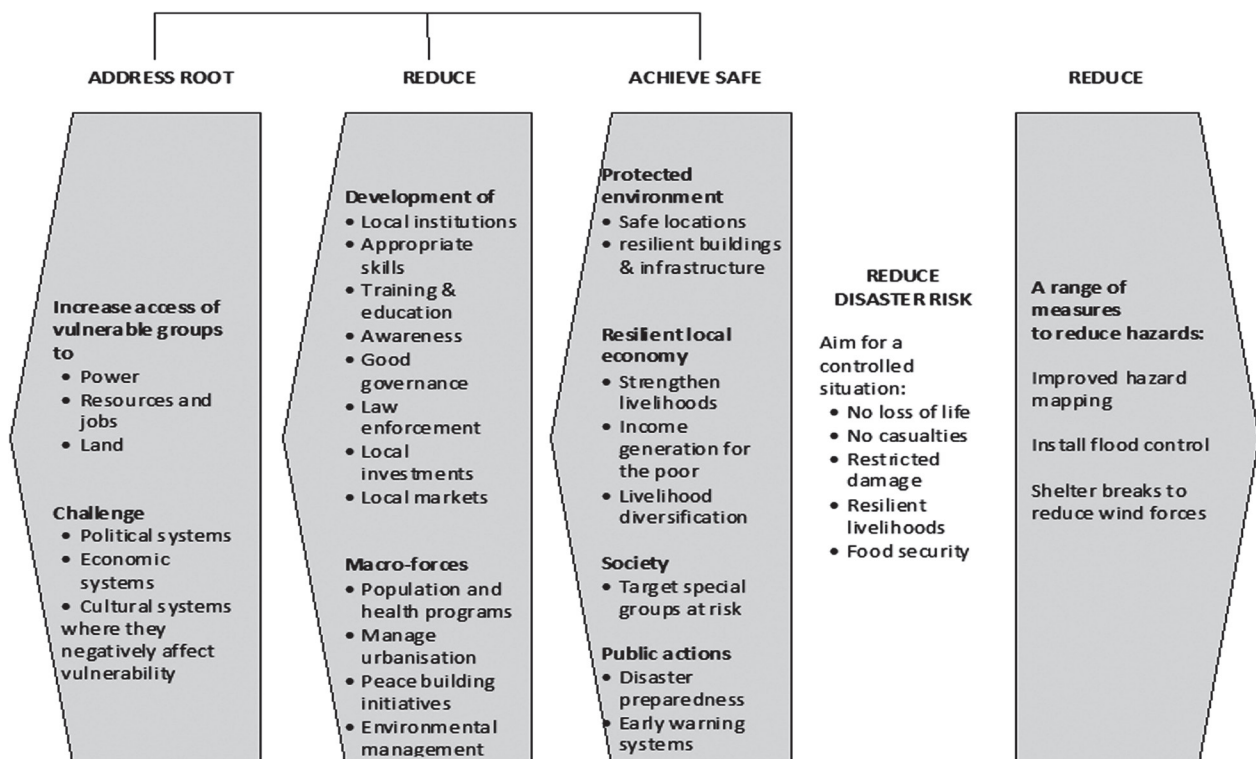environment, such as the location of people and livelihood assets in dangerous locations. Insecure livelihoods, such as farming in typhoon- or flood-prone location, or insufficient household incomes contribute to unsafe conditions. Lack of preparedness of a household or community also contributes to, and demonstrates an unsafe condition. These conditions are manifestations or results of other underlying factors of vulnerability.

Dynamic pressures – these are structures and processes that translate the effects of root causes into unsafe conditions. To put it more simply, these are the immediate underlying reasons and additional pressures that force households and communities into unsafe conditions. Lack of appropriate skills, awareness and local market, combined with ecosystem degradation, can contribute to insecure livelihoods. Poor governance by local government units for example, lack of institutions such as local disaster risk reduction and management councils, and lack of training and education contribute to poor risk reduction capacities.

Underlying or root causes – shows that the real origin of vulnerability is deeply rooted in the unequal distribution of wealth, resources, and power. These are also the political, economic, and cultural systems that perpetuate the unequal distribution of power, resources and wealth.

Progression of safety *(adapted from Wisner et al. 1994)*

ADDRESS ROOT   REDUCE   ACHIEVE SAFE   REDUCE

Increase access of vulnerable groups to
- Power
- Resources and jobs
- Land

Challenge
- Political systems
- Economic systems
- Cultural systems where they negatively affect vulnerability

Development of
- Local institutions
- Appropriate skills
- Training & education
- Awareness
- Good governance
- Law enforcement
- Local investments
- Local markets

Macro-forces
- Population and health programs
- Manage urbanisation
- Peace building initiatives
- Environmental management

Protected environment
- Safe locations
- resilient buildings & infrastructure

Resilient local economy
- Strengthen livelihoods
- Income generation for the poor
- Livelihood diversification

Society
- Target special groups at risk

Public actions
- Disaster preparedness
- Early warning systems

REDUCE DISASTER RISK

Aim for a controlled situation:
- No loss of life
- No casualties
- Restricted damage
- Resilient livelihoods
- Food security

A range of measures to reduce hazards:

Improved hazard mapping

Install flood control

Shelter breaks to reduce wind forces

The politics and political system in the country is controlled by the few who run the economy of the country. At the local level, political power and local wealth are also concentrated on the hands of a few families. This condition is not conducive to the development of accountability, good governance, and development of institutions, among others, which are essential elements for turning unsafe conditions to safe conditions. The concentration of wealth and power in the hands of a few also make possible economic activities that have no regard for sustainable use of the ecosystem. The uneven relationships also give rise to violence. These are the underlying reasons for the vulnerability factors and pressures, which give rise to unsafe conditions.

3.2   **Progression of Safety**

Release is the reduction of disaster risk. Release will be achieved by a combination of reducing hazards, achieving safe conditions, reducing pressure, and addressing root causes of vulnerability. Progression of safety helps to identify measures that will transform unsafe conditions into safe conditions. It also shows that addressing dynamic pressures and root causes are equally important as addressing unsafe conditions. If the first two are not transformed, they will continue to press communities into unsafe conditions, and vulnerability will persist.

Safe conditions - can be done through reducing exposure to hazard by improving the physical environment. Disaster preparedness, early warning system, mitigation and developing resilient livelihoods are also examples of ways of achieving safe conditions.

Dynamic pressures released – the immediate underlying reasons are addressed, and the pressure that force households and communities into unsafe conditions are relieved. Pressure can be relieved, for example, by developing local institutions, appropriate skills, training and education, awareness and good governance. Releasing pressures means that the structures and processes, which create unsafe conditions for communities need to be transformed. Capacity building and advocacy are effective ways for promoting the transformation.

Root causes addressed - means that systems and relationships that perpetuate the concentration of political and economic power in the hands of a few will be challenged, and that vulnerable groups would have equitable access to political power, and to economic resources such as land, capital and other resources.

This can also be interpreted to mean that social positions, human conditions and an

enabling environment of the vulnerable communities would be improved.

Methodology and flow:

1. This session gives a deeper understanding on the concepts of vulnerability and capacity. Several local examples will be needed for better understanding. It is better to conduct an initial study on the community where the training is to be conducted to gather the right examples.

2. Data about poverty, environmental condition, disaster and its effects should be updated on a yearly basis. Correct and appropriate data is important. There are numerous data that can be included especially the situations in the province or target areas of the project.

3. During the discussion on three categories of vulnerability, it is better to list down all the examples that will be gathered from the participants. These examples can be used in answering the exercise on the discussion of the PAR model.

4. In the discussion of the PAR model, there is no need to show the table of Progression of Vulnerability at the start. The essence of showing the table is to encourage participants that they have to do something up to the root and intermediate causes of vulnerability if they want to reduce disaster risk.

The facilitator will ask the participants some questions and list down the answers in the appropriate columns of the PAR. Once the table is completed, the Progression of Vulnerability will be shown and explained to the participants.

a. The first question to ask the participants is about the most devastating disaster experienced in their community, and the hazard that triggered the disaster. The participants would write the response on the right-most column of the Progression of

Vulnerability table (i.e. Typhoon Pedring, landslide)

b.   On the next column from the right, allow participants to write down the effects of disaster on their lives, properties, and the community as a whole.

What damages did Typhoon Pedring leave in Benguet? (i.e. 5 people died, crops were damaged, some towns were isolated because major roads were destructed, many were covered by landslide, numerous people got sick)

c.   The next column contains the context of why people, their properties, and community are vulnerable to disaster risk.

The guide questions that will elicit the correct answers are:

- What are the unsafe physical conditions that brought that kind of disaster? (The possible answers are: mountainous terrain, located on the slope of the mountain, houses near riverbanks. Other possible answers could also be that the location is along the typhoon belt, the water level increases quickly)

- What is the current state of people who are forced to live in the mountain slopes? What types of house do they have? (i.e they are poor, cannot afford to build sturdy homes)

- What are their jobs and sources of income? (i.e farmers who grow vegetable crops in vegetable gardens, selling or transporting vegetables in Baguio City, fishing, maintaining fish cages, no other source of income)

- Are there ways that communities can prepare for hazards? Is an EWS in place? Evacuation centre? BDRRMC?

d.   On the fourth column from right, facilitator will ask the participants on their perception of the immediate causes for the unsafe conditions.

- Why do people live on the mountain slopes? (i.e. they have nowhere to go, their source of income is located on the slopes, increasing population and lack of land has forced them to live on the slopes)

- What led them to grow vegetables/crops that serve as their primary source of income? (i.e. vegetables are easy to sell in Baguio)

- Why are houses made from light materials? (i.e. building materials are expensive,

constantly damaged by typhoons)

- Why are roads unsafe? (i.e. corruption, low quality, etc.)

- Why are BDRRMCs inactive? Why is there an absence of an Early Warning System or evacuation centre? (i.e. the government does not prioritize DRR or Disaster preparedness, etc.)

- What causes frequent landslide in mountains? (i.e. logging, cutting of trees, changes in land use, etc.)

- Why does the water level rise quickly in the river? Why is fish catch decreasing? (i.e. the rivers are highly silted due to soil erosion; chemicals from large-scale vegetable farming are polluting the river, etc.)

e.   On the left- most column, participants will be asked about their opinion on the root or underlying causes and why vulnerability persists in their community as shown in the answers gathered so far.

- What pushes the government to continuously allow and permit logging when it has already been banned? (i.e. income for loggers and for those who give the permit or laws, etc.)

5.   After answering all the columns, the facilitator will sum up the workshop results by creating a scenario where a disaster happens due to the occurrence of typhoon, putting emphasis on the layers of vulnerability factors that contributed to severity of the disaster. The facilitator will end the session by saying that until no action is made on the dynamic pressures and root causes of vulnerability, disasters will continue to happen.

6.   Before taking on the Progression of Vulnerability, ask participants if they have the capacity to reduce or resolve the vulnerabilities identified. Ask for their thoughts on this. In addition, do they want to reduce the effects of a hazard in their community? If yes, say that there are ways to do that and then continue with the presentation of the Progression of Safety.

Progression of Safety is the opposite of Progression of Vulnerability. In order to reduce the adverse impacts of hazards, vulnerabilities should be reduced, and the Progression of Safety can guide this. For every step in the Progression of Safety, the facilitator will discuss the possible actions and what the community can do. Use identified factors in

the categories of safe conditions, dynamic pressure released, and underlying causes addressed in identifying the activities or actions that will result to safe conditions and reduced risks.

Materials:
- craft paper
- markers
- metacards

Duration of the session: 2 to 2.5 hours

References:
1.   Disaster Risk Reduction: A Development Concern. Policy brief by Department of International Development (DFID) 2004.
2.   Ma. Stella Dulce, Paper on Disasters and Climate Change in the Philippines: Hazards, Vulnerabilities and Capacities , Dec. 2, 2010, CARE Nederland Strategic Planning workshop.
3.   Social and Economic Indicators from NSCB, IBON Databank, IFAD
4.   At Risk, 2nd Edition, Natural Hazards, People's Vulnerability and Disasters. Ben Wisner, Piers Blaikie,

Session 5. Climate Change Adaptation

LEARNING OBJECTIVES:

After the session, the participants are expected to be able to:

1. Explain the basic concepts of climate change including the difference between climate and weather, cause of climate change, and manifestations;

2. Explain effects of climate change on disaster risk through (a) increase in vulnerabilities of the communities, and (b) increase in frequency and severity of disasters related to hydrometeorological hazards;

3. Identify the primary entities responsible for the occurrence of CC and their obligations to the vulnerable countries most affected by it and;

4. Explain climate change adaptation and mitigation as the responses to CC, the important link of CCA to ecosystem management and restoration, DRR, and identify concrete examples of community-based CCA.

KEY MESSAGES

1. **What is weather ?**
Weather is the condition of the atmosphere at a specific time, day, and location. Examples of weather are rainy, sunny, windy, etc.
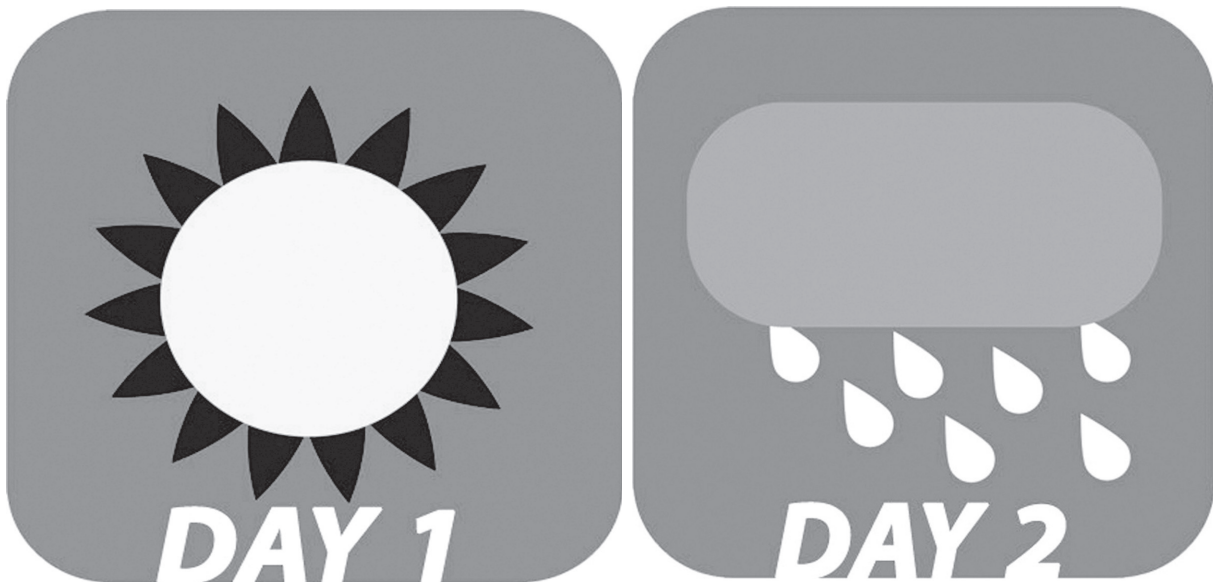
2.   **What is climate ?**

Climate is the average weather. It is the mean and variability of temperature, rainfall, wind, etc. over a relatively long period of time (typically 30 years). (RC/RC Climate Guide) Examples are tropical and temperate climate. As it is said, "Climate is what you expect, weather is what you get."

3.   **What is climate change ?**

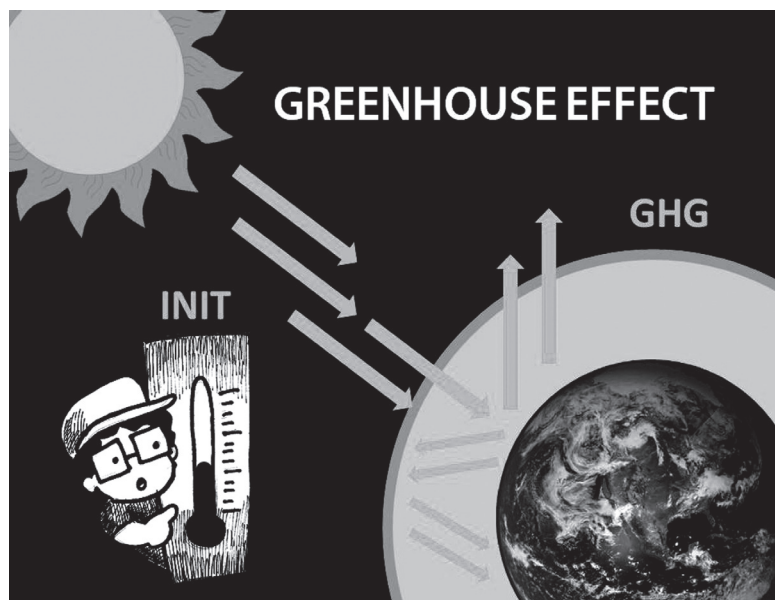According to the Intergovermental Panel on Climate Change (IPCC), climate change is "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes, external forces, or persistent anthropogenic changes in the composition of the atmosphere or in land use."

Climate change happens in the geologic history of the earth. It has experienced both global warming and global cooling. The change in climate being experienced today is caused by the increase in the earth's temperature or global warming.

4.   **What is the Greenhouse effect ?** It is the process wherein the heat energy from the sun is trapped by the greenhouse gases (GHGs) in the atmosphere to maintain and regulate the earth's temperature. The greenhouse effect is very important because it retains the heat inside the earth needed to sustain life. GHGs serve as the earth's blanket. If there are no GHGs, the earth's temperature would be around -18°C, losing its ability to sustain life.

Examples of greenhouse gases include water vapour, carbon dioxide, methane, and nitrous oxide. Carbon dioxide is produced when fossil fuels are burned, mainly used by power plants for producing electricity and by various industries. On the other hand, methane comes from decaying objects, agricultural waste, and production of natural gas. The most abundant GHG in the atmosphere is water vapour, followed by carbon dioxide.

The past century has seen significant increase in GHGs emissions, similarly increasing amount of heat trapped in the earth. Trends indicate that the increase of GHGs in the atmosphere will continue.
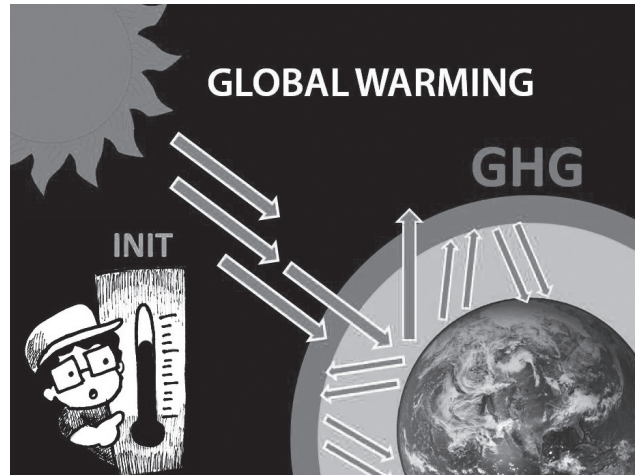
5. What are the causes of climate change ?

5.1 Natural causes
There are processes naturally occurring on earth that have an impact on climate change. An example is the eruption of Pinatubo volcano in 1991 which caused a temporary decrease in the earth's temperature by about 0.5°C, until the gases and ash have been cleared from the atmosphere.

5.2 Anthropogenic causes
Anthropogenic causes or causes that are brought upon by human activities are seen to have more contributions to global warming than natural causes. The rapid and large increase in the amount of GHGs, particularly carbon dioxide, is due to the use of fossil fuels (such as oil, coal, and gas) for industries, transportation, and electricity generation. Agriculture also contributes, through the use of chemical fertilizers. Animal wastes are also sources of GHGs.

Of these causes, stronger emphasis is given to anthropogenic causes because it is where we can do more about.

5.3 Loss of forest cover

Plants and trees absorb carbon, removing them from the atmosphere. Carbon dioxide is used by plants and trees for producing their own food. The vast forests are rapidly lost mainly due to extractive industries such as logging and mining, and land use conversion where forests are converted and used for agriculture, plantation, and residential and commercial means. This loss means that there is lesser carbon removed from the atmosphere.

6. What are the manifestations of climate change ?

6.1 Increase in average sea and wind temperature
The significant increase of the earth's average temperature started in the Industrial

Revolution in the 1860s, when the use of machines for production and transportation started and rapidly spread. Since then, the trend in temperature change has been increasing.

According to studies, global temperature has gradually increased by 0.7°C during the 20th century. The hottest years in recorded history also occurred during this century and continue up to the present.

In the Philippines, there is an observed increase in the frequency of hot days and nights, and decrease in the frequency of cold days and nights. Over all, the minimum and maximum temperatures are increasing.

6.2   Rapid melting of ice caps or glaciers on the southern and northern poles of the earth.

The gradual increase in temperature greatly impacts on the melting of ice caps, which in turn is one of the causes of sea level rise.

6.3   Rise in sea level due to melting of ice caps and expansion of water caused by increase in temperature.

Rise in sea level has a big effect on coastal communities because it results to retracting shorelines. According to IPCC, the annual rise in sea level is around 1.88 mm, from 1961 to 2003, or roughly 0.17 meter during the 20th century.

Increase in temperature causes water to expand. In fact, all kinds of matter have the tendency to expand due to increase in temperature (thermal expansion). And since the global temperature is increasing continuously, water in the oceans, seas, and other bodies of water also continue to expand.

7.   **What are the effects of climate change and how are these related to disasters**?

Climate change causes changes in temperature, climate, weather, and sea level. All these have an impact on various aspects of the lives and livelihood of vulnerable communities that bear the negative effects of climate change:

7.1   Increased intensity of hazards
•   Stronger hydrometeorological and related hazards
•   Hydrometeorological and related hazards happen more frequently

Because of climate change, it has been observed that there are changes in the characteristics and frequency of rainfall, storms, and drought. In some communities, there are recognizable changes in weather, duration, and amount of rainfall and flood, which are caused by climate change. An example of related hazard is the increased presence of diseases and epidemics.

7.2   The effects of climate change worsens the vulnerability of the communities.

•   Effects on coastal areas
Sea level rise increases the risks of coastal communities to flooding wherein both residential and agricultural areas are affected.

•   Effects on water
Rise in sea level means more salt water penetrating the water table. This and the more frequent and severe dry season negatively affect the quality and quantity of fresh water that we use. Because of these, competition for water becomes more intense. Before, water is free or acquired at low cost as compared to its present high price. Consequently, this limits access of vulnerable communities to quality water.

•   Effects on agriculture
Farmers' harvest decrease because of the frequent, heavy and unpredictable period of hazard events. When typhoons occur, farmers are forced to harvest their crops prematurely or everything will be destroyed. Nowadays, farmers in some areas can only come up with one crop cycle compared to the usual two or three crop cycles before. Because of the unpredictable characteristics of rain, typhoon, and flood, other farmers choose not to plant crops anymore for fear that inputs will be wasted. Due to the intense heat, the crops need more water, and at the same time there is less water to

irrigate the farms, leading to decrease in harvest. Saltwater intrusion is also experienced in areas near the shores resulting to decrease in productivity or inability of plants to grow.

• Effects on forest

Climate change affects the health and productivity of forests. The severe and intense drought leads to the decrease of other trees and plants, which are replaced by drought-tolerant species. This results to changes in the composition of forests and areas where plants and trees can grow. Also, it is important to note that there is an increasing damage brought about by forest fire and new pests.

• Effects on biodiversity

The loss of habitat, which leads to the decrease in number of species, is due to ecosystem degradation brought by climate change. Aside from forests, polar and marine ecosystems, among others, are also affected. The increase in the ocean's temperature is one of the reasons for the damages of corals and death of other fish species.

• Effects on health

There are cases of diseases and death, which are related to weather. The worsening quality of air leads to diseases. If there is very hot weather, diseases such as chicken pox and sore eyes increase. During rainy days, cases of flu, cough, fever, dengue, leptospirosis, and other diseases caused by polluted water also increase.

8. **Who are responsible**? **Who are victims**?

Based on data gathered by different organizations, developed countries are the primary emitters of GHGs such as carbon dioxide and methane. These include the United States of America, countries in Western Europe, China, India, Russia, Japan and other industrialized nations with high rates of production and consumption.

UNITED STATES **WESTERN EUROPE** PH

On the other hand, developing countries like the Philippines, Bangladesh, Vietnam, Sudan, Malawi, Ethiopia and Pakistan are most affected by climate change because of lack in financial, institutional, technical capacities, and the knowledge to adapt to climate change. In these countries, vulnerable communities are most affected. Inequality in health, availability of food, clean water and other services is worsened. In the 1990s, two billion people in poor countries were affected by climate-related disasters and figures have doubled in 2000s.

In this case, there is an inverse relationship between vulnerability to its effects and the responsibility for the occurrence of climate change. Countries that are primarily responsible for producing large amounts of emissions must change their way of production and consumption of energy and take the lead in finding sustainable solutions.

Poor countries are still in need of social and economic development to support the needs of its people. To ensure this, adequate supply of energy and infrastructure for transportation and industries are needed. But these must be done in a manner that would not aggravate global warming.

In terms of obligations and rights, it is the obligation of the rich countries to reduce emissions especially in their own territories. They should also provide sufficient and reliable funding and share alternative technology for small countries to develop without adding up to the causes of global warming and be able to adapt to the effects of climate change.

There have been discussions and agreements signed among countries such as the Kyoto Protocol which aimed to reduce GHG emissions. However, powerful countries like the United States and Canada have withdrawn from the agreement, and are still emitting high amounts of GHGs.

9. **What should we do to respond**?

There are two ways to respond to the challenges and threats of climate change to lives and livelihoods of vulnerable communities:

9.1 Mitigation

Climate change mitigation is responding to the causes of CC. It is the reduction of GHGs in the atmosphere through emission reduction and sequestration from the atmosphere through:

a. **Land use and management**

Converting forests to agricultural, commercial and residential uses, and clearing of forests for logging and mining means much less trees will absorb carbon from the atmosphere. Some agricultural practices such as intensive use of pesticides, fertilizers, and vast plantation areas also have negative effects. Proper land use and management such as designation of protected forest areas and sustainable agriculture will significantly help in CC mitigation.

b. **Emission reduction by industrialized countries through reducing overproduction and consumption**

Production-driven industries result to an increase in the quantity of GHGs released in the atmosphere. Industrialized countries, which account for the largest share in the world's GHGs must therefore reduce and regulate their production and consumption. Large industries should stop their expansion and reduce production even if they have the capital and resources to continue. These industries, being capitalist-driven and production-intensive are primary contributors to the increasing GHGs in the atmosphere as they exploit the natural resource and extract raw materials for their production. Forest covers, for example, are being depleted to supply the raw materials necessary for production. Meanwhile, poverty incidence is increasing in poor countries, particularly in those countries whose economies are agriculture-dependent. With the degradation of natural resources, the most vulnerable and poorest communities who depend on agriculture are also the most affected.
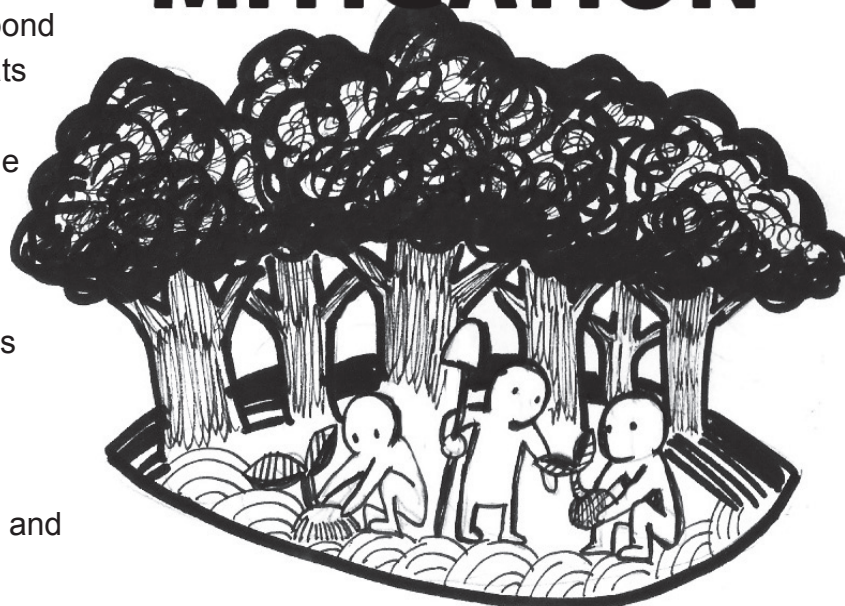
c.   Use of alternative and sustainable energy sources

Energy used in electricity generation, transportation, production, and other needs is very important. However, we must also reduce the use of fossil fuels as energy source. Because of this, there is a very urgent need for developing and improving technologies to make sources of energy more sustainable and carbon friendly. Some examples are the use of solar, wind, water, and geothermal energy.

Mitigation is very important because it seeks to address the very cause of climate change. However, it will take a long time before we can see the results of mitigation efforts, even if industrialized countries reduce their GHG emissions now. And because we are already experiencing and are still expecting worsening of climate change effects, it is imperative that we do another form of response, which is adaptation.

9.2   Adaptation

Climate change adaptation or CCA is the adaptation of natural and man-made systems to actual or expected effects of CC. The adaptive capacity or the ability of a system to adapt to CC minimizes potential damages, maximizes opportunities, or withstands possible effects and must be strengthened. CCA is important especially to poor countries, which are expected to bear the brunt of climate change.

Adaptive capacity is closely related to social and economic development. (IPCC, 2007)

10.   **How are DRR and CCA linked**?

Both CCA and DRR deal with climate-related hazards (hydrometeorological, climatological and biological). The differences are: CCA also deals with adaptation to positive conditions brought about by CC; and DRR deals with geophysical hazards in addition to climate-related hazards.
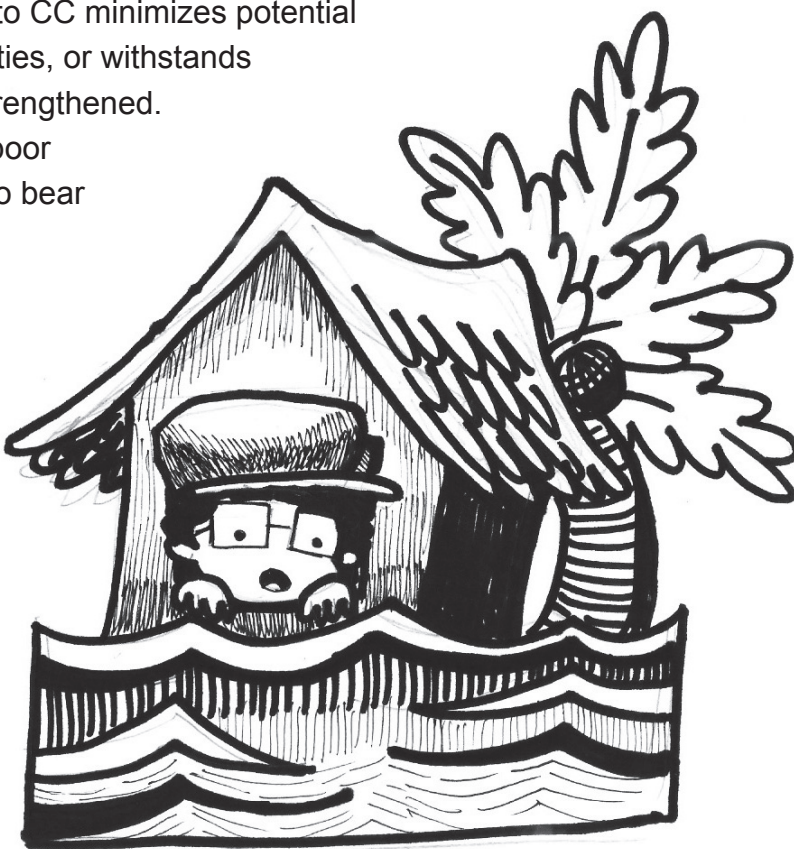
In responding to effects of CC, DRR is more focused on the negative effects while CCA deals with both negative and positive effects of climate change.

ADAPTATION
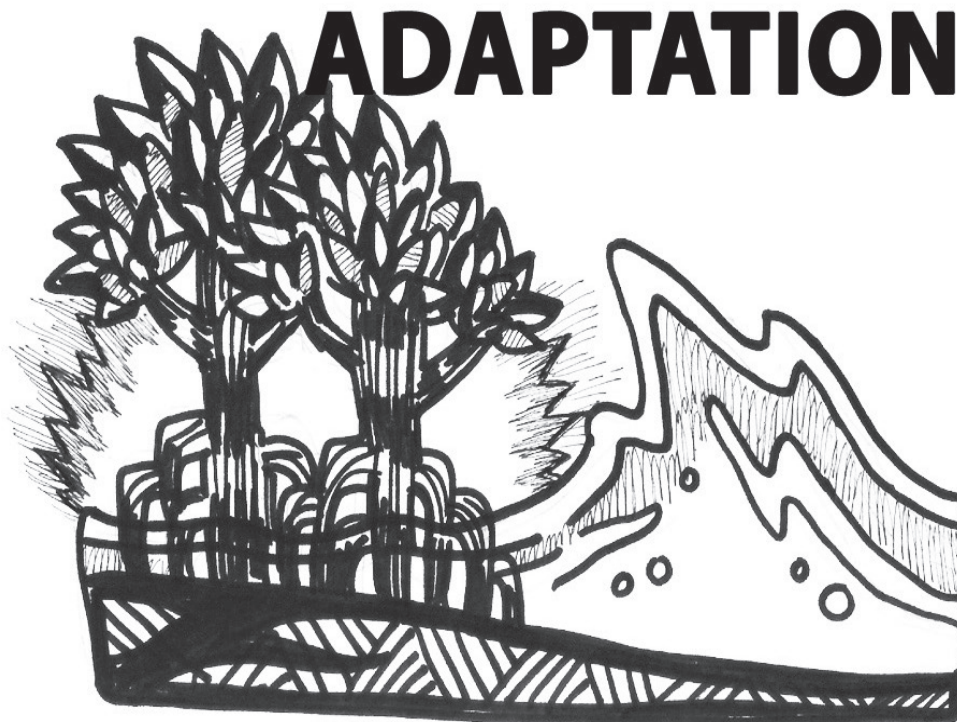
CCA also gives emphasis to:
• Responding to climate stresses;
• Forward-looking component of DRR, taking into consideration possible events in the next 20 to 30 years. CCA also strives to use information on climate and weather before a disaster happens, and to implement early action using these information; and
• New information and technology.

11. Some examples of community-based CCA

Community-based CCA is important for vulnerable communities because they are the ones who are directly affected by the threats of climate change. These communities are also the first to respond to challenges of climate change and the ones who understand and know their own situation. The following are examples of activities that can be done to increase their capacities:
• Conduct of education and public awareness campaigns, trainings and planning activities
• Educational campaigns on basic human rights and environmental protection
• Protection of forests, mangroves, and other ecosystems
• Awareness and advocacy activities for sustainable use of natural resources, considering the interests of vulnerable communities
• Develop a community-based early warning system
• Sustainable agriculture

METHODOLOGY AND FLOW:

1.   Open the discussion by explaining the objectives of the session.
2.   Ask the participants: Is weather the same with climate? From the participants' response, begin the discussion by differentiating weather from climate.
3.   Ask the participants what they think is the cause of climate change.
4.   In discussing the signs and effects of climate change, ask the participants to give examples on how these are observed in their own communities or validate if they have experienced these signs and effects.
5.   Emphasize and clarify to the participants the difference between CC mitigation and disaster mitigation.
6.   Ask the participants for examples of community-based CCA activities.

Materials Needed:
•   Flip charts with photos and/or illustrations of communities vulnerable to CC, causes of CC, examples of mitigation and community-based CCA measures
•   Masking tape

Duration of the session:
One and a half to two hours (1.5 to 2 hours)

References:
1.   Presentation materials from PAGASA
2.   International Strategy for Disaster Reduction, Terminology on Disaster Risk Reduction 2009
3.   Intergovernmental Panel on Climate Change, Fourth Assessment Report, 2007
4.   UNEP/GRID Arendal, Philippe Rekacewicz, Emmanuelle Bournay, http://www.grida.no/graphicslib/detail/past-and-future-co2-concentrations_a92d
5.   UNEP/GRID Arendal, Hugo Ahlenius, http://www.grida.no/graphicslib/detail/trends-in-sea-level-1870-2006_9987
6.   Worldmapper http://www.worldmapper.org/images/largepng/295.png
7.   AGHAM, Giovanni Tapang PhD
8.   Kalikasan People's Network for the Environment, Climate Basics
9.   Hotspots! Mapping Climate Change Vulnerability In Southeast Asia, Arief Anshory Yusuf andHerminia Francisco, Economy and Environment Program for Southeast Asia
10.   http://news.bbc.co.uk/2/hi/science/nature/4269921.stm

Session 6. Ecosystem Management and Restoration (EMR)

LEARNING OBJECTIVES:

After the session, the participants are expected to be able to:
1.   Illustrate the characteristics of ecosystems and the services that they provide;
2.   Explain the importance of ecosystems in climate change adaptation (CCA) and DRR
3.   Identify the services that ecosystems provide to the community and find out if these services worsen or lessen the risk in their community.

The session is divided into 3 parts:

•   Ecosystems
•   Ecosystems and Human Beings
•   Ecosystem-based and Climate-smart DRR

KEY MASSAGES:

•   It is important for the people to know the characteristics of ecosystems that surround them and the services they provide to effectively protect ecosystems.
•   Healthy ecosystems serve as buffer against hazards and lessen socio-economic vulnerability.
•   Ecosystem-based Disaster Risk Reduction is natural and cost-effective; however, other means of disaster risk reduction should not be disregarded.

1.   **Ecosystem and Environment**

1.1   An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the non-living environment interacting as a functional unit. Humans are an integral part of ecosystems. Eco-systems vary enormously in size; a temporary pond in a tree hollow and an ocean basin can both be ecosystems. [Millennium Environment Assessment, 2005]

Ecosystem and environment are often used interchangeably since they are closely related concepts. Environment refers to the physical and outside condition, including natural and man-made elements, which surround and affect life, growth and sustenance of organism or community. Ecosystem, on the other hand, is more particular to the interactions between the environment and the organisms that dwell within it. It is likened to a community that functions as one unit. Although technically incorrect when used in some sentences, the term "environment" is more commonly used as it is better understood by the most number of people. The term "environment" does not readily include the relationships that exist between the living and the physical attributes of the surroundings compared to the ecosystem that shows the ecological relationship relating to all organisms and the environment.

1.2 Levels of ecological organization

There are different levels of ecological organization:

a.   Organism is an individual form of life, and is the lowest level of ecological organization.

b.   Population is made up of similar specific organisms.

c.   Community is made up of two or more population of different species.

d.   Ecosystem is made up of communities of living organisms, its physical and chemical environment. It is also the minimum system that can capture and sustain life.

e.   Biosphere is the global sum of all ecosystems.

1.3 Ecosystems have two components: biotic and abiotic

a.   Biotic components consist of producers, consumers and decomposers

   • Producers – plants and other organisms that have the capacity to make their own food belong to this group. Through photosynthesis, plants produce substances which are essential for their growth and development. Photosynthesis is a process wherein plants produce nutrients with energy from the sun, water, air and minerals.

   • Consumers – animals and other organisms that obtain energy and nutrients from other organisms.

• Decomposers – Worm, fungi, bacteria and other microbes are organisms that decompose dead organism. In this manner, the chemical composition of dead organisms is converted into food source.

b. **Abiotic components**
• Physical (i.e energy and heat)
• Chemical (i.e. water)
• Climate
• Environment – refers to the physical and outside condition, including both natural and man-made elements which surrounds or affects life, growth and sustenance of the organism or community.

1.4 **Biodiversity**

Biodiversity is the sum of varied organisms or species. Rich biodiversity sustains healthy ecosystems and as a result, ecosystems will be more stable and will further provide services to human beings.

Biodiversity hotspots are areas with high number of organisms that can only be found in that particular area and its loss will lead to the extinction of its habitat.

Examples of ecosystems:
Terrestrial – forest, grassland, farm, desert, mountain
Aquatic – river, fishpond, sea, lake

2. **Ecosystems and Human Beings**

Human beings are an integral part of ecosystems. It is where they live and get their requirements for sustenance.

2.1 **Ecosystem services**

According to Millennium Ecosystem Assessment (MEA), ecosystem services are the benefits people obtain from ecosystems.

There are four types of ecosystem services:

Regulating services – These services provide protection and serve as buffer to the natural processes of the environment where humans live in such as flood regulation, water filtration, pollination, erosion control, and disease regulation.

Provisioning services –These are the products that can be obtained in ecosystems. (i.e. food, freshwater, wood, fibre, genetic resources, and medicine)

Cultural services – These are the non-material benefits from the ecosystem. (i.e recreation, ecotourism, spiritual enrichment, intellectual development, reflection, and religious experience)
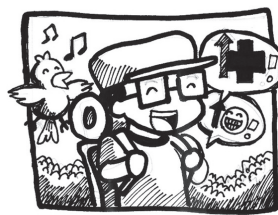
Supporting services – Supporting services are important in the provision of other ecosystem services. This is in connection with the fundamental processes of the environment with indirect effect that will occur eventually. (i.e biomass production, atmospheric oxygen production, soil formation and retention, nutrient cycling, water cycling, and provision of habitat)

It is important to protect the ecosystems so that the present and succeeding generations will be able to continue to benefit from its services.

2.2   What is Ecosystem Degradation?

Ecosystem degradation is defined as the destruction of ecosystems that reduces its capacity to provide ecosystem services. This may be due to the excessive use or consumption of other services which compromises the entire ability and condition of the ecosystem.

2.3   Global Situation of Ecosystems

The study conducted by MEA in 2005 published in the book, "We Are Living Beyond Our Means", concluded that:
•   All human beings are dependent on ecosystem and ecosystem services to live a life with dignity.

• In the last 50 years, there are changes in ecosystems that are brought by human intervention which are not done before—mostly to meet the increasing demand for food, fresh water, fibre and energy.

• Many people experience good lives; however, it worsens ecosystems' capacity to provide key services such as clean air and water.

• 60% of the ecosystems studied by MEA are damaged or used in an unsustainable way.

• Pressure on ecosystems will be more intense if humans will not change their activities and attitude towards the ecosystems.

• There are increasing evidences that ecosystems are now reaching its "tipping points" where there might be an abrupt and irreversible change. (i.e. deadly diseases, collapse of fisheries and climate change)

• We have knowledge and the technology to protect our ecosystems and human well-being.

2.4 Ecosystem Degradation in the Philippines

• In the Philippines, massive ecosystem degradation is brought by the economy that depends on the export of raw materials.

• Massive extraction of resources damages ecosystems including other surrounding ecosystems.

• Most of the forests in the Philippines are denuded and only 5% of the total forest remains.

• Massive destruction of ecosystems is due to large-scale mining. With this kind of extraction, corporations have to remove vast portion of soil and other vegetation above the mineral deposits. It also damages water tables. Chemicals used in mining result to contamination of rivers that largely affect the health of community members.

2.5 Ecosystems are interrelated

Energy, matter and organisms can flow from one ecosystem to another. Any change in one ecosystem, therefore, may in turn trigger changes in other ecosystems surrounding it. If an imbalance or degradation occurs in one ecosystem, it can in turn affect other surrounding ecosystems.

2.6   What is ecosystem management?

According to United Nations Environment Programme (UNEP), ecosystem management is "an integrated process to conserve and improve ecosystem health that sustains ecosystem services for human well-being."

It is based on an adaptive and collectively formulated plan for future conditions which brings together ecologic, socio-economic and institutional perspectives. This is applied to an area and primarily set by ecological boundaries. (MEA 2005)

2.7   What is ecosystem restoration?

Ecosystem restoration is the process of helping to bring back the natural health of a degraded ecosystem. Ecosystem restoration usually takes many years and strong commitment to this is needed. However, it also provides many benefits.

In identifying ways of doing restoration, it is important to clarify the stakeholders who will benefit, and the long-term objectives in doing EMR.

There are feasible ways of restoring ecosystems, but setting priorities for ecosystem restoration should be made according to current conditions and the objectives of restoration.

3.   Ecosystem-based and Climate-smart Disaster Risk Reduction

Ecosystem-based and climate-smart DRR is an approach that incorporates ecosystem management and restoration and climate change adaptation into disaster risk reduction. This approach is founded on the prevalence of evidence that disasters have become more frequent and more destructive because of extreme weather events that are manifestations of climate change, and of ecosystem degradation. By combining EMR and CCA with DRR, communities are envisioned to become more resilient against disaster.
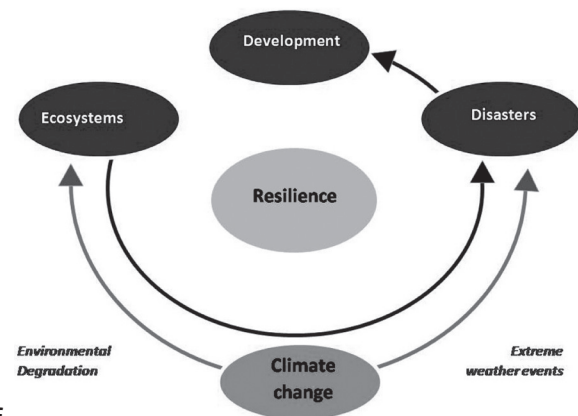
3.1   How is EMR linked to DRR?
•   Ecosystem degradation leads to many disasters and weakens resilience of ecosystems and society against the effects of climate change and other disasters.

•   Degradation lessens the natural capacity of ecosystems to buffer against hazards and its capacity to provide ecosystem services resulting to vulnerability.

•   Continuous ecosystem degradation lowers the community and ecosystems' resilience against disaster.

•   Disasters on the other hand can increase damage in the environment. For instance, chemicals and other waste products which are used in mining can spread out if an earthquake destroys the dam where mine tailings are stored. In Benguet, pesticides from the farms and other plantations are carried away by the heavy rains down to the rivers and irrigation canals.

•   Disasters can affect biodiversity through the spread of invasive species, mass species mortality, loss of habitat, etc.

•   Disasters could also damage other natural resources, and natural and man-made infrastructures that benefit humans. Landslide or flood debris can cover fertile agricultural land, for example. Drainage and irrigation canals are destroyed by flashfloods.

•   Conduct of ineffective and inappropriate relief and recovery activities can increase ecosystem degradation. For example, distribution of disposable baby diapers in a community might increase waste problem and pollution of rivers

3.2   Why are ecosystems important in disaster risk reduction?

Healthy ecosystems are important in disaster risk reduction for two main reasons:

a.   Ecosystems serve as effective and affordable natural buffers to reduce the impacts of hazards and climate:
•   Flood protection
•   Landslides: slope stabilization
•   Coastal protection (tsunamis, storm surges)
•   Avalanche protection
•   Buffers against droughts and desertification

According to the World Bank (2004), investments on preventive measures including maintaining healthy ecosystems, is seven-fold more cost effective than the costs incurred by disasters.

b.   These reduce the vulnerabilities through supporting and providing for livelihood
•   Healthy ecosystems, such as intact forests, wetlands, mangroves and coral reefs provide many livelihood products e.g. firewood, clean water, food, fibres, medicine
•   Ecosystems also provide a range of services: regulating water flows and water quality, carbon sequestration, decontamination, soil conservation.

3.3   What is ecosystem-based DRR?

The Partnership for Environment and Disaster Risk Reduction (PEDRR) defines ecosystem-based DRR as sustainable management, conservation, and restoration of ecosystems to provide services that mitigate hazards and increase livelihood resilience.

Core Elements of Ecosystem-based Disaster Risk Reduction
•   Identify numerous roles played and services provided by ecosystems, including natural mitigation or reducing impacts of hazards
•   Link ecosystem-based risk reduction to sustainable livelihoods and development
•   Combine ecosystem investments and other effective DRR strategies, including infrastructure
•   Address risks related to climate change and extreme events and reduce their impacts on ecosystem services
•   Strengthen capacities of the government on ecosystem-based DRR through multi-sectoral and multidisciplinary platforms
•   Ensure participation of local stakeholders in decision making
•   Utilize existing instruments and tools on ecosystem management, and increase their value or importance in DRR (PEDRR 2010)

## 3.4   How is Ecosystem linked to CCA?

•   Climate shocks and gradual changes contribute to environmental degradation, undermining the buffer and livelihood support function. Moreover, destruction of the ecosystem results to decreased carbon sequestration.
•   The beneficial functions of healthy ecosystems are insufficiently recognized in current (climate change) adaptation planning.

•   Non-climate related anthropogenic pressures on ecosystems or "mal-adaptation" also contribute to increased vulnerability to climate change: (i.e misinformed infrastructure development, unsustainable water use, deforestation etc.)

•   Ecosystem-based approaches are often cost-effective, robust, low-technology and sustainable adaptation solutions.

3.5   How is CCA linked to DRR

•   Climate change increases risk of climate-related disasters.

•   Climate change leads to new, more urgent questions for humanitarian organisations:

  •   How to deal with an increasing intensity and frequency of disasters?
  •   How to handle new and unknown risks?
  •   How to use scientific knowledge about climate change to enhance risk reduction?

•   Addressing rising climate risks through the "4 As":

  •   Assessment
  •   Awareness raising
  •   Action, and
  •   Advocacy

•   Early Warning, Early Action: bridging time scales
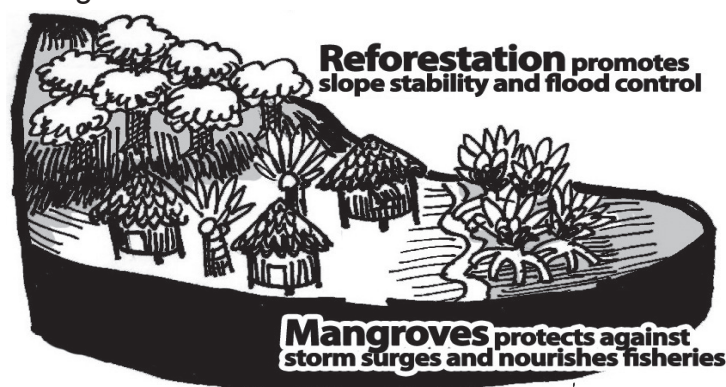
The combined efforts on DRR, CCA, and EMR aim to build more resilient communities and ecosystems that can withstand disasters and have continuous and sustainable development. EMR is important to further broaden and complete disaster risk reduction.

EMR – aims to restore/ bring back healthy ecosystems that can support people's needs and livelihoods for human beings to be able to perform more effectively in buffering against hazards and provision of livelihood support. A key element EMR contributes to DRR is the scale (landscape) by which risks are determined and corresponding risk reduction measures are planned.

CCA – strengthens communities through identification and implementation of adaptive measures to the effects of climate change, particularly on frequency and severity of hydro-met hazards.

DRR – aims to implement preparedness and risk reduction measures to protect lives, properties and livelihoods from hazards.

Together, DRR, CCA, and EMR support and strengthen each other in achieving sustainable and long-term development. These must be done together with measures on alleviating poverty and reducing vulnerabilities. All these together are what we call ecosystem-based and climate-smart DRR.

Notes to Facilitator:

1.   Explain what an ecosystem is. Emphasis must be given on the concept of interrelatedness of all living organisms as well as non-living elements.

2.   In explaining the different levels of organization in ecosystems, provide the view of how broad the scope is, show the number of various populations that make up an ecosystem, and highlight the interaction among the living and non-living components of an ecosystem.

3.   During the discussion on biodiversity, provide examples of animals and plants that can only be found in the Philippines to demonstrate the concept of biodiversity and biodiversity hotspots.

4.   A suggested exercise activity is the identification of ecosystem services in the community and surrounding areas. This will help participants understand ecosystem services affecting and benefitting them and its importance.

5.   Another recommended activity is aimed at finding out the condition of ecosystems in the area. This is done by simply giving scores on whether the ecosystem services in their community and surrounding areas are in good or bad health/condition.

Materials needed:

- craft paper
- markers
- metacards

Duration of the session: 2 hours

References:
1.   Millennium Ecosystem Assessment (2005)
2.   Cunningham and Cunningham – Environmental Science – A Global Concern 10th Ed. McGraw Hill 2008
3.   PEDRR – Demonstrating the Role of Ecosystems-based Management for Disaster Risk Reduction
4.   van Eijk, Pieter, Wetlands International – Integrating ecosystem-based approaches in DRR and Climate Change Adaptation, June 2011
5.   International Union for Conservation of Nature and Natural Resources (IUCN) - The World Conservation Union, "Ecosystems, Livelihoods and Disasters - An integrated approach to disaster risk management" (2006)
6.   United Nations Environment Programme - "ECOSYSTEM MANAGEMENT PROGRAMME – A new approach to SUSTAINABILITY" 2009
7.   United Nations Environment Programme – The Role of Ecosystem Management in Climate Change Adaptation and Disaster Risk Reduction, Copenhagen Discussion Series, June 2009
8.   Day, Trevor, Guide to Savage Earth: A Dramatic Journey Across the Planet , Dorling Kindersley Publication 2001
9.   IAN Symbol Libraries, Integration and Application Network, (http://ian.umces.edu/symbols/)
10.   Partners for Resilience, How do DRR, CCA and Ecosystem Management and Restoration interrelate? (Powerpoint presentation)

Session 7. Understanding DRR and CCA Laws in the Philippines

LEARNING OBJECTIVES:

After the session, the participants are expected to be able to:

1.   Explain the legal basis of DRR and CCA laws in the Philippines;
2.   Identify the salient provisions in RA 10121 and compare with the provisions of PD 1566
3.   Identify the salient provisions of Climate Change Act of 2009;
4.   Discuss the ways to maximize the laws in pushing for DRR and CCA in communities
5.   Discuss the limitations and challenges of the laws on DRR and Climate Change

KEY MESSAGES

A.   **DRR laws**

1.   **History and background**

The Philippine Constitution mandates the state with the primary responsibility of protecting and upholding the rights of its people. During disasters, when threats to lives, livelihood and property are heightened, this constitutional mandate requires duty-bearers to provide humanitarian aid and protection.

Consistent with the constitutional mandate, Republic Act 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010 (also known as DRRM Act) was passed into law. The DRRM Act serves as the updated legal framework for disaster risk reduction in the country. It also serves as the basis for institutionalizing the DRR structure - the Disaster Risk Reduction and Management Councils (DRRMCs) – from the national down to the local level. (DRRMC structure will be discussed in the second module of the manual)

Before it was passed into law on May 27, 2010, the DRRM Act underwent a long and tedious process. The DRRM Act repeals the old law, Presidential Decree 1566, which was passed on June 11, 1977, around three decades ago. The limitations and

weaknesses of PD 1566 pushed advocates to press for a new law that will provide a more comprehensive framework and will put premium on disaster risk reduction. Advocating for the new law started in the early 1990's. However, it took more than a decade before a new law was passed. The recent devastating typhoons and large-scale disasters, like typhoons Ondoy (Ketsana) and Pepeng (Parma) finally convinced legislators to pass a new DRR law.

DRRM Act is greatly influenced by the Hyogo Framework for Action that was formulated during the World Conference on Disaster Risk Reduction in Kobe, Hyogo Prefecture, Japan in 2005. The Philippines is one of the 168 nations that subscribed to the HFA. The HFA provided a guiding framework for the nations around the world in strengthening their DRR capacities. HFA is also considered a comprehensive and practical guide in disaster risk reduction.

HFA identifies five priorities for action:

* Risk assessment
* Governance
* Knowledge management
* Disaster preparedness
* Vulnerability reduction

In support of the HFA, the Agreement on Disaster Management and Emergency Response (AADMER) was also fostered among member-states of the Association of South-East Asian Nations (ASEAN). The agreement contains provisions on how the 10 ASEAN member-states will work together on risk reduction, risk identification, monitoring and early warning, disaster prevention and mitigation, preparedness and response, rehabilitation, and research. AADMER also establishes the ASEAN Coordination Center for Humanitarian Assistance on disaster management or AHA Center. On September 14, 2009, the Philippine Senate ratified AADMER. The

NDRRMC, pursuant to the implementing rules and regulations of the DRR Act, shall coordinate or oversee the country's obligations to AADMER.

On October 23, 2009, Republic Act 9279, also known as Climate Change Act was also passed into law as the government's response to the challenges posed by climate change.

List of agreements and laws passed over the years:

1978 – DRRM Act or PD 1566 was passed into law
2005 – Hyogo Framework for Action was created
2009 – AADMER was ratified by the Senate
2009 – Climate Change Act was passed into law
2010 – Disaster Risk Reduction and Management Act of 2010 was passed into law
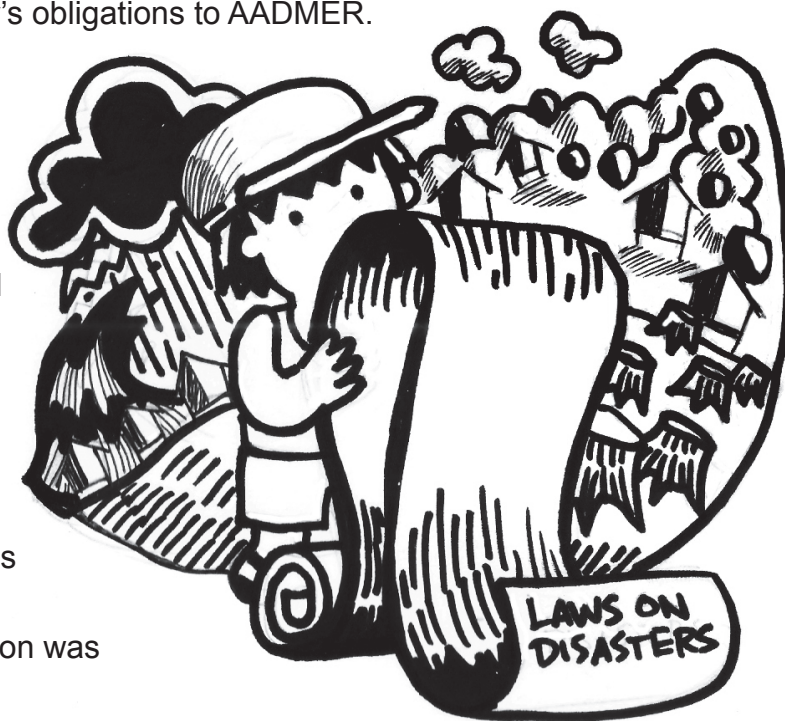
2. **Objectives of the DRRM Act**

Among the objectives of the DRRM Act are:

a)   Uphold peoples' constitutional rights to life and property. The Act upholds the basic rights of people by addressing root causes of vulnerabilities as well as increasing the country's institutional capacity. It also aims to build resilience of communities against disasters and climate impacts.

b)   Adopt and incorporate international principles on DRR in the creation and implementation of national, regional, and local sustainable development strategies, policies, plans, and budget.

c)   Adopt a holistic, comprehensive, integrated, pro-active, and multi-sectoral approach in addressing the impacts of disaster and climate change.

d)   Mainstream DRR and Climate Change in development plans and processes (policy formulation, socio-economic planning, budgeting, and governance) in

environment, agriculture, water, energy, health, education, poverty reduction, land use and urban planning, public infrastructure, housing, peace processes, and conflict resolution by reducing the loss of life and property and ensuring that affected persons can go back to their normal lives.

e)   Build on the capacities of the local government units (LGUs) by decentralization of powers, responsibilities, and resources and to increase the capacities of the communities in terms of mitigating, preparing, responding, and recovering from disasters.

f)   Ensure that DRR and CCA measures are gender-responsive, sensitive to indigenous rights, and respect human rights.

g)   Encourage the participation of civil society organizations (CSOs) and the private sector in order to complement resources and effectively deliver services to the citizens.

3. **Comparing PD 1566 and RA 10121**

The passage of RA 10121 provided new perspectives and a larger view of disasters. Stronger emphasis is now given to reducing and managing risks. The following are the major differences between PD 1566 and RA 10121:

a)   How disaster is defined
The old law defines disaster as a natural phenomenon, and that it is the result of exposure to hazards. The new law now recognizes other factors in the occurrence of disasters such as physical, social, and attitudinal conditions of the people. Disaster is now defined as a result of exposure to hazards of a vulnerable community with a limited capacity to cope and recover from the effects of the disaster.

b)   Government control
Another difference is on the form of government control. Structures and processes in the old law were more centralized, where in all decisions and orders came from the

President and relayed to lower levels of government. On the other hand, RA 10121 delegates powers and functions to lower levels of the government (provincial, municipal, and barangay). This decentralization is based on the Local Government Code of 1991, which gives the LGUs autonomy to develop their respective territories. According to the law, LGUs' capacities must be increased because they are the ones who will take the lead in reducing risks and managing emergency situations. Other powers devolved include declaring a state of calamity and budgeting, among others.

c)   Fund utilization

One of the major differences is in the utilization of funds. Under the new law, local governments must allocate at least 5% of their internal revenue allotment (IRA) for the DRRM Fund. Unlike the 5% calamity fund under PD 1566 wherein allocation may only be used during emergencies, the DRRM fund may be used for disaster risk management initiatives such as trainings on DRR, purchase of emergency rescue and equipment, rehabilitation, and others, even if there is no declaration of a state of calamity. Seventy percent (70%) of the fund goes to preparedness activities while the remaining 30 % is the quick response fund (QRF) or "stand by" fund which can only be used for emergency response and early recovery.

Also, the DRRM fund allocated may exceed 5% of the IRA. If the DRRM funds are not fully expended, the remaining funds will be placed on a special trust fund that can only be used for DRRM activities. If the remaining funds are not used up after five years, the funds will go back to the general fund and may only be used for social services set and approved by the local legislative council. (Section 21 and 22, DRRM Act of 2010)

d)   Management style

The different authority levels of government are now performing management functions, instead of being limited to coordination tasks. Risk reduction and increasing communities' capacities are made through different and related processes such as planning, organizing, staffing, directing, coordinating, and budgeting. Coordination is now only a part of management.

e)   In addition, the new law requires the establishment of the Local Disaster Risk Reduction and Management Offices that will lead in implementing risk reduction initiatives.

f)   Disaster Response

The most significant difference between PD 1566 and RA 10121 is in responding to disasters. Under the old law, the focus is on disaster response, or responding and mobilizing resources only when a disaster has already happened. With the RA 10121, there is emphasis on anticipation and projections. Increasing capacities of vulnerable communities to enable them to prepare, cope, and recover from disasters is of prime importance.

Comparing PD 1566 and RA 10121

4. **Other salient provisions of the DRR law:**

a)   DRR education is integrated in the school curricula at the secondary and tertiary levels, National Service Training Program (NSTP), Sangguniang Kabataan (Youth Council). Training in DRR for public sector employees, including formal and non-formal,

	PD1566	RA10121
Definition of disaster	Results of exposure to hazard	Results of a combination of exposure to hazard of vulnerable community with insufficient capacity to cope with the potential negative consequences
Government control	Centralized	Decentralized
Use of funds	5% calamity fund allocated from IRA can only be used during disaster (when state of calamity has been declared)	Sharing of calamity fund-DRRM fund: 70% for DRR and 30% for QRF
Management style	Coordination	Management-POSDRB (Planning, Organizing, Staffing, Directing, Coordinating, Reporting)
		Budgeting
Response to disaster	Reactive	Pro-active

vocational, indigenous learning, and out-of-school youth courses and programs are mandatory.

b)   NDRRM training institutes will be established. These institutes will train public and private individuals on DRRM topics, develop training materials in disseminating the DRRM messages, consolidate best practices, and conduct public awareness activities on DRRM.

c)   Mechanisms for coordination during emergencies are created. According to the Implementing Rules and Regulations of DRRM Act, the LDRRMCs shall take the lead in preparing for, responding to and recovering from the effects of disaster based on the following criteria:

• Barangay Development Council (BDC), if barangay is affected;
• City or municipal DRRMC, if 2 or more barangays are affected;
• Provincial DRRMC, if 2 or more cities/ municipalities are affected;
• Regional DRRMC, if 2 or more provinces are affected;
• National, if 2 or more regions are affected

d)   Declaration and lifting of state of calamity can be done by the President of the Philippines upon recommendation of the NDRRMC. However, this may also be issued by the local legislative authorities (Sanggunian) upon the recommendation of the LDRRMC, based on the results of damages, needs, and capacities assessment.

5. **Prohibited Acts and Penal Clause**

Prohibited acts are primarily towards management of relief goods – from prevention of entry, to buying, selling, misrepresenting source, non-delivery or diverting of relief goods, substituting, and misappropriation of relief goods.

Other prohibited acts include dereliction of duty or failure due to negligence to perform one's legal and moral responsibility; inflated requests for funding or relief; and destruction of preparedness equipment and paraphernalia. (Sec. 19 and Sec. 20 of DRRM Act)

Violators of the law (as provided for in Sec. 19 of DRRM Act) shall have corresponding punishments such as:
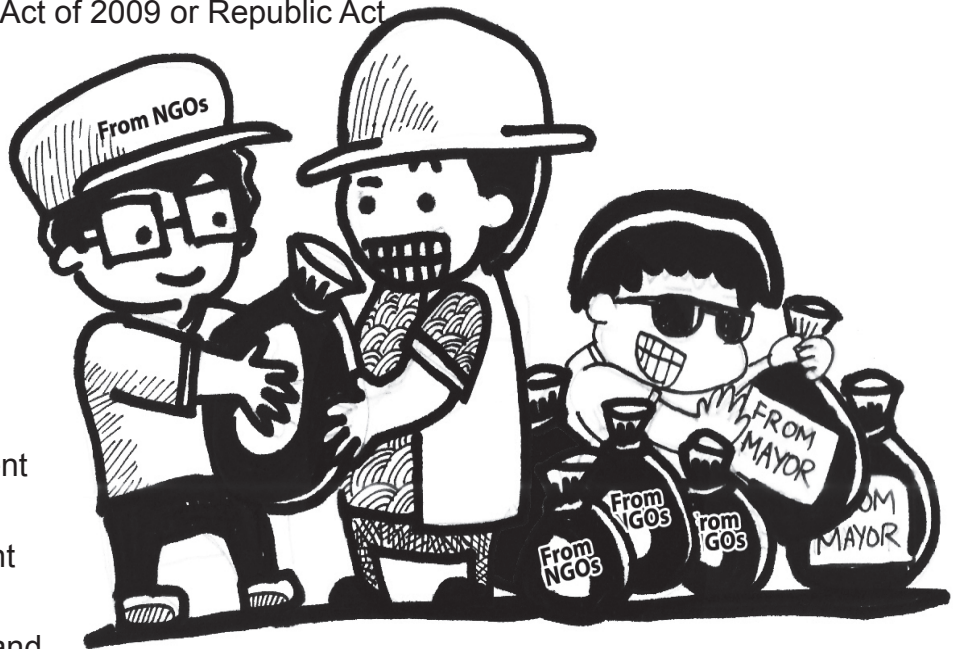
• Fine of not less than PHP 50,000 but not exceeding PHP 500,000 .
• Imprisonment of not less than 6 years and one day or not more than 12 years

•   Perpetual disqualification from public office if the offender is a public official

•   Confiscation in favour of the government of the objects and instrumentalities used in committing any of herein prohibited acts;

•   Cancellation of license or accreditation, if the offender is a corporation, partnership, association, or other judicial entity.

B.   **Climate Change Act**

The Climate Change Act of 2009 or Republic Act 9729 was created for the country to have a national strategy in responding to the challenges posed by climate change. The law provides for the creation of a Climate Change Commission (CCC), an independent policy-making body (similar to government agencies) tasked to coordinate, monitor, and evaluate government plans and programs related to climate change. The Commission also represents the country in international conferences and dialogues on climate change.

The CCC has an advisory board composed of representatives of the cabinet, academe, NGOs, private sector, and the chairpersons of League of Provinces, League of Cities, League of Municipalities, and Liga ng mga Barangay. Experts from different areas related to climate change and disaster risk reduction are also involved in the CCC. The diagram on page 93 shows the present structure of the CCC:

1.   **National Framework Strategy and Program (NFSP)**

One of the most important tasks of the CCC is the formulation of the NFSP within the first six months after passage of the law. The NFSP aims to mainstream climate change adaptation and mitigation measures in government policies from the national down to the barangay level. NFSP also includes the formulation of development plans to protect

CLIMATE CHANGE COMMISSION

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┌─────────────────────────────────────────┐      ┌───────────────────────────┐
│    H.E. BENIGNO S. AQUINO III            │----->│   NATIONAL PANEL OF       │
│         Chairperson                      │      │   TECHNICAL EXPERTS       │
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│    MARY ANN LUCILLE L. SERING            │
│    Commissioner/Vice Chairperson         │
│                                          │
│  HEHERSON T. ALVAREZ    NADEREV M. SAÑO  │
│    Commissioner          Commissioner    │
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Climate Change Office

MARY ANN LUCILLE L. SERING
Executive Director

Deputy Executive Director
(Assistant Secretary)

Officials

Staff

ADVISORY BOARD

MEMBER:

Secretaries:
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- Department of Energy
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- Department of Social Welfare and Development
- Department of Trade and Industry
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- Director General of National Economic and Development Authority / PCSD Chair
- Director General of the National Security Council
- Chair of the Commission on Filipino Women

Presidents:
- League of Provinces
- League of Cities
- League of Municipalities
- Liga ng mga Barangay

Sectoral Representatives
- Academe
- Business Sector
- Non-Governmental Organizations
  - * At least one (1) of the three (3) sectoral representatives shall come from the Disaster Risk Reduction Community

* Commissioners have a fixed term of six (6) years

vulnerable communities from climate risks; and guidelines on implementing measures that address the cause of climate change, with emphasis on voluntary reduction of the country's carbon emissions.

2.   **National Climate Change Action Plan (NCCAP)**

Another important task of the CCC is the drafting of the NCCAP. Included in this plan are the assessment of climate change impacts, identification of the different impacts of climate change to men, women and children, assessment and management of risks and vulnerabilities, identification of measures to address the cause of climate change
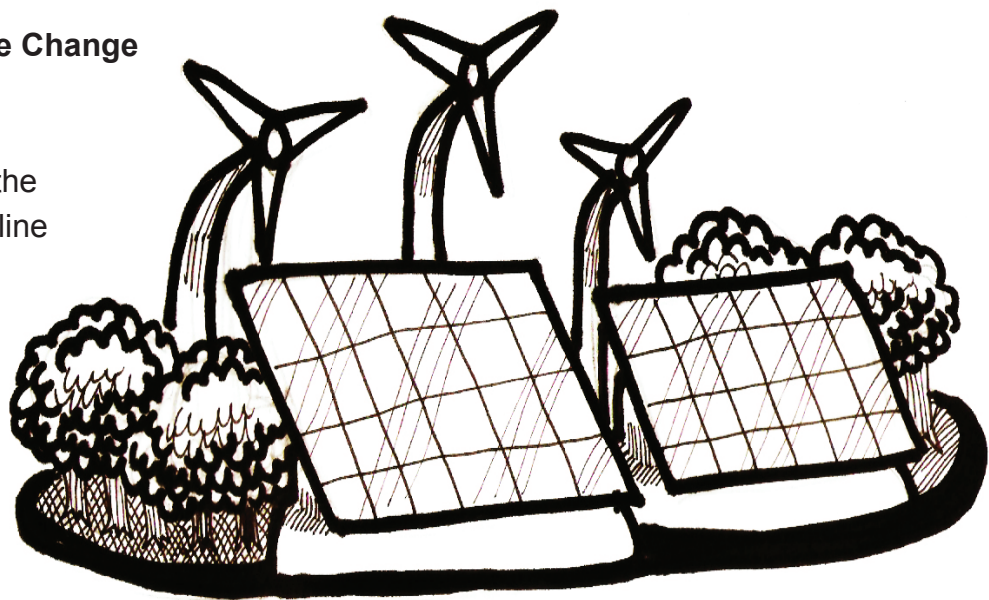
(mitigation), and alternative and appropriate measures of responding to effects of climate change (adaptation).

Seven strategic priorities of the NCCAP are also identified:

a) Food Security – strengthening farming and fishing communities, building climate change-resilient agriculture, fisheries production, and distribution systems

b) Water Sufficiency – equitable and sustainable access to water resources

c) Ecosystems and Environmental Stability – enhanced resilience and stability of natural systems and communities

d) Human Security – reduced risks to women, men and vulnerable sectors (including children, elderly and persons with disability) from climate change and disasters

e) Climate Smart Industries and Services – creation of industries and services, cities and municipalities that are resilient, eco-efficient and environment-friendly

f) Sustainable Energy – sustainable, renewable and ecologically-efficient technologies as an integral part of sustainable development

g) Knowledge and Capacity Development – increased knowledge and capacity of the people in adapting to climate change.

3. **Local Climate Change Action Plan**

At the local level, the LGUS as the frontline agencies have to formulate Local Climate Change Action Plans which should be regularly updated. The law states that climate change adaptation should be part of the regular tasks and activities of the LGUs. Together with the barangays, LGUs should also assess social, economic and environmental conditions as well as identify emerging issues related to climate change. The LGUs must also be able to source and allocate resources needed to implement the action plan.

C. Challenges and limitations of DRRM Act and Climate Change Act

1. In the creation of LDRRMOs, where will 4th and 5th class LGUs source their budgets?

2. For 3rd, 4th and 5th class LGUs funds for DRR are limited. The calamity fund and the funds needed for DRR activities depend on the IRA of an LGU. If the IRA of an LGU is very limited, the amount that can be allocated for DRR activities will likewise be limited. The law has no corresponding budget appropriations, thus funds for ER are being used for DRR.

3. While the law indicates the integration of DRR and CCA in the curricula of secondary and tertiary schools, the survival rate of students especially in public schools is very low. Thus, the need to integrate these messages as early as elementary level should be done.

4. It is difficult to re-align programmed funds to DRR activities

5. Accreditation of CSOs is limiting.

6. Lack of capacities of CSOs may hinder them from being actively involved in DRR.

7. Lack of guidelines on how to release and utilize the DRRM funds, on the establishment of training institutes, and on accreditation requirements for disaster volunteers.

8. There is a need to harmonize the DRRM Act and Climate Change Act to avoid duplication of activities, programs, and plans.

Notes to Facilitator:

1.	Discuss the key messages. Start the discussion by asking the participants if they know any laws related to disaster risk reduction and climate change. Remind the participants on the key messages learned from the RBA session and how these messages link with the session on DRR and CCA laws. Remind them that knowledge of the laws is a key step in claiming their rights.

2.	In discussing the DRRM Act, inform the participants that there is a separate session on DRR structures.

3.	For the challenges and limitations on DRR laws, the discussion may not be limited with the points identified in the session. Explore with the participants other challenges and limitations that they see.

Materials needed:
Manila paper
Marker pens
Masking tape

Duration of the session: 1.5 - 2 hours

References:
1.	R.A. 10121 "Disaster Risk Reduction and Management Act of 2010"
2.	Implementing Rules and Regulation of R.A. 10121
3.	DRR Net Primer on DRRM Act, 2010
4.	Rentuza, Rico. DRRM Act: A Dream or a Nightmare, 2010
5.	Villegas, Jason, Climate Change Commission, PowerPoint presentation on Climate Change Act of 2009
6.	R.A. 9729 "Climate Change Act of 2009"

List of Abbreviations

AADMER	Agreement on Disaster Management and Emergency Response
BDC	Barangay Development Council
BDRRMC	Barangay Disaster Risk Reduction and Management Committee
BDRRMO	Barangay Disaster Risk Reduction and Management Office
CBDRM	Community-based Disaster Risk Management
CBEWS	Community-based Early Warning System
CC	Climate Change
CCA	Climate Change Adaptation
CCC	Climate Change Commission
CRA	Community Risk Assessment
CRED	Centre for the Epidemiology of Disasters
CSO	Civil Society Organizations
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRRMC	Disaster Risk Reduction and Management Council
EMR	Ecosystem Management and Restoration
ER	Emergency Response
ESC	Economic, social and cultural
EWS	Early Warning System
FLW	Family Living Wage
GHG	Greenhouse gases
HFA	Hyogo Framework for Action
IPCC	Intergovernmental Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
LDRRMC	Local Disaster Risk Reduction and Management Council
LDRRMO	Local Disaster Risk Reduction and Management Office
LGU	Local Government Units
MDRRMC	Municipal Disaster Risk Reduction and Management Council
MDRRMO	Municipal Disaster Risk Reduction and Management Office
MEA	Millennium Ecosystem Assessment
NCCAP	National Climate Change Action Plan
NCSB	National Census and statistics Board
NDRRMC	National Risk Reduction and Management Council
NFSCC	National Framework Strategy on Climate Change
NSO	National Statistics Office
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAR	Philippine Area of Responsibility
PAR	Pressure and Release Model
PD	Presidential Decree
PEDRR	Partnership for Environment and Disaster Risk Reduction
PEIS	PHIVOLCS Earthquake Intensity Scale
PFR	Partners for Resilience
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PSWS	Public Storm Warning Signal
PWD	Persons with disability
RA	Republic Act
RBA	Rights-based Approach
RC	Red Cross
SWS	Social Weather Station
UDHR	Universal Declaration of Human Rights
UNEP	United Nations Environment Programme