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DISASTER NURSING (N110)
STUDY GUIDE

Week 4: DISASTER RISK REDUCTION (DRR) Part 1

Introduction

Hello! Welcome to Week 4! Hope you are enjoying our topics so far.

After learning about emergencies and disasters, as well as the various roles of the nurse in disaster management, our topic this week will focus on disaster risk reduction (DRR). Understanding DRR is very essential as this is the primary guiding concept that informs nurses' work in emergencies and disasters.

This portion will delve deeper on the institutions and structures involved in DRR, including the health system. These information will help you navigate the different levels of Philippine governance and the local health system, as well as familiarize with the various stakeholders/partners involved in DRRM work.

In addition, this part will provide you an overview of disaster nursing across the disaster management continuum, and familiarize with the frameworks and tools used in assessing and analyzing hazards, risks, vulnerabilities, and capacities.

Learning Outcomes

After studying this topic, you should be able to:

1. Familiarize with the existing institutional structures and systems in DRRM
2. Describe the integration of DRRM in the Philippine health system and nursing practice
3. Discuss the goals of nursing care across the disaster management continuum
4. Familiarize with the different frameworks and tools used for hazard, risk, vulnerability, capacity assessment/analysis
5. Analyze hazards, risks, vulnerabilities and capacities in a given setting/situation
6. Describe mechanisms for reducing disaster risks and minimum DRR actions in the community

Review of Disaster Risk Reduction

The Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121) 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 exposures to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events."

The term DRR is often used interchangeably with disaster risk management (DRM). However, there are two (2) critical differences between DRR and DRM: (1) goal, and (2) focus.

As discussed in Week 2:

DRR or DRM?

Disaster risk reduction (DRR) is focused on **activities** on a **strategic level of management** – primarily at **policies** that aim at anticipating and reducing risks (PreventionWeb, n.d.; USAID, 2011).

Disaster risk management (DRM) is focused on **actions** on a **tactical** and **operational level of management** – which aim to **achieve the goal of reducing risk**, and can be considered as the **implementation of DRR** (PreventionWeb, n.d.; USAID, 2011) – the **application of DRR policies and strategies**.

In the Philippines, following RA 10121, the term **disaster risk reduction and management (DRRM)** is widely used by government agencies and civil society. In doing coordination and collaborative work, learning the terms used by partners facilitate common understanding and swift communication especially in times of emergencies and disasters, where time is of the essence.

Disaster risk reduction and management (DRRM) is "the systematic process of using **administrative directives**, **organizations,** and **operational skills and capacities** to **implement strategies, policies and improved coping capacities** in order to lessen the adverse impacts of hazards and the possibility of disaster."

Basically, DRRM attempts to ***combine*** the work of DRR and DRM. Learning from the past experiences and the increasing incidence and severity of disasters, the Philippine DRRM Law (RA 10121) provides for a more comprehensive, all-hazard, multi-sectoral, interagency, and community-based approach to disaster risk reduction and management.

The three (3) paradigm shifts brought about by the Philippine DRRM Law are the following:

- From **top-down** and **centralized disaster management** to **bottom-up** and **participatory DRR process**
- Disasters as merely a **function of physical hazards** to disasters as mainly a **reflection of people's vulnerability**
- Focus on **disaster response** to an **integrated approach to social and human development** to reduce disaster risks

Deepening Your Understanding

Familiarize yourself with RA 10121 by accessing a copy of the law:

- https://ndrrmc.gov.ph/attachments/article/45/Republic_Act_10121.pdf

View the following video to learn more about disaster risk reduction and management in the Philippine context:

- Lagmay, A.M.A. (2020). NSTP Common Module 6A: Disaster Risk Reduction and Management. https://www.youtube.com/watch?v=5LSE7jbJYkE

DRRM Structures

In Week 3, you were given an overview of the organizational structure or set-up of disaster risk reduction and management (DRRM) in the Philippines. The National DRRM Council or NDRRMC is the government institution responsible for overseeing the implementation of the National DRRM Plan (NDRRMP) (the latest is the Enhanced National DRRM Framework and Plan 2020-2030).

The NDRRMC chair is the Department of National Defense (DND). The Office of the Civil Defense (OCD), under DND, is tasked to lead in developing a comprehensive national DRRM program. Table 1 shows the lead national government agencies (NGAs) under each DRRM pillar.

Table 1. Lead Government Agencies per DRRM Pillar

PHASE	COMPOSITION	
Prevention and Mitigation	**Vice/Co-Chair**	**DOST**
	Key Members	OCD, DENR, DPWH, DOST
Preparedness	**Vice/Co-Chair**	**DILG**
	Key Members	PIA, OCD
Response	**Vice/Co-Chair**	**DSWD**
	Key Members	OCD, NDRRMC, DOH, DILG, DND, LGUs
Recovery and Rehabilitation	**Vice/Co-Chair**	**NEDA**
	Key Members	NHA, OCD, DPWH, DOH, DSWD

Other members of NDRRMC are shown in Figure 1:

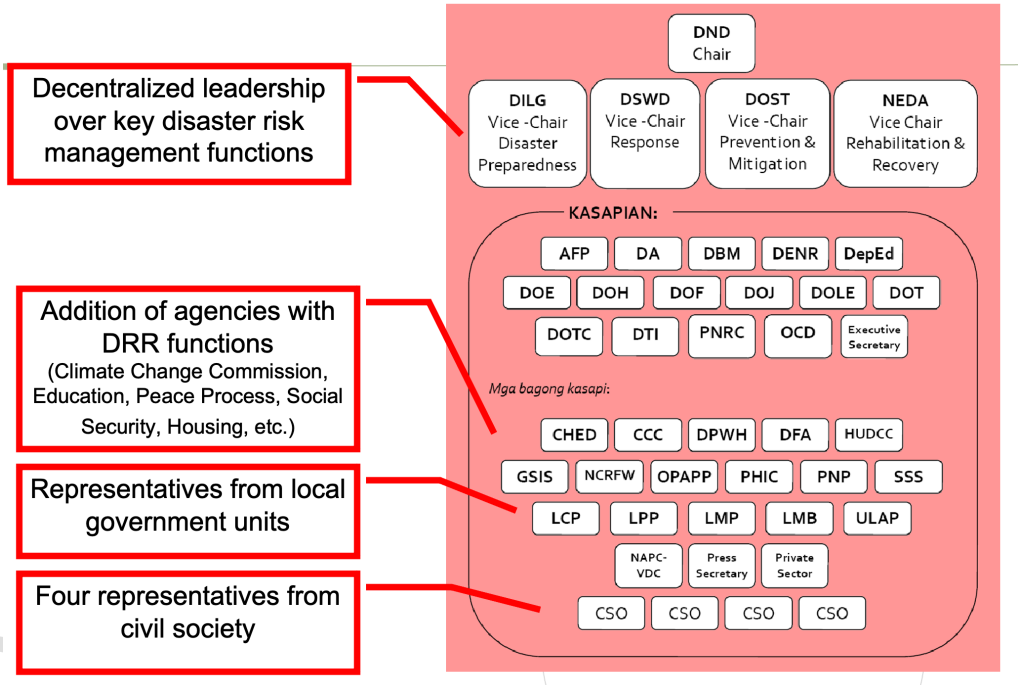

Figure 1. Composition of the National DRRM Council (Vera, 2019)[1]

[1] Selected acronyms: PNRC – Philippine National Red Cross; CCC – Climate Change Commission; HUDCC – Housing and Urban Development Coordinating Council (*dissolved since 2019*); NCRFW – National Commission for the Role of Filipino Women (*now called Philippine Commission of Women, PCW*); OPAPP – Office of the Presidential Adviser on the Peace Process; PHIC – Philippine Health Insurance Corporation (*also known as PhilHealth*); LCP – League of Cities of the Philippines; LPP – League of Province of the Philippines; LMP – League of Municipalities of the Philippines; ULAP – Union of Local Authorities of the Philippines

As seen in Figure 2, the NDRRMC has its local counterparts through a network of 17 regional DRRMCs, 80 provincial DRRMCs, 113 city DRRMCs, 1,496 municipal DRRMCs, and 41,956 barangay DRRMCs[2].

Figure 2. NDRRMC Organizational Network

Figure 3 shows the various DRRM councils as oversight bodies while the different authorities, offices, and committees serve as implementing units of DRRM policies and plans within their level of responsibility (i.e. national, regional, provincial, city, municipal). Please do note that **from the provincial level downwards**, the DRRMO is lodged into the LGUs – meaning the **LGUs are now responsible for leading, coordinating, and implementing all DRRM efforts**.

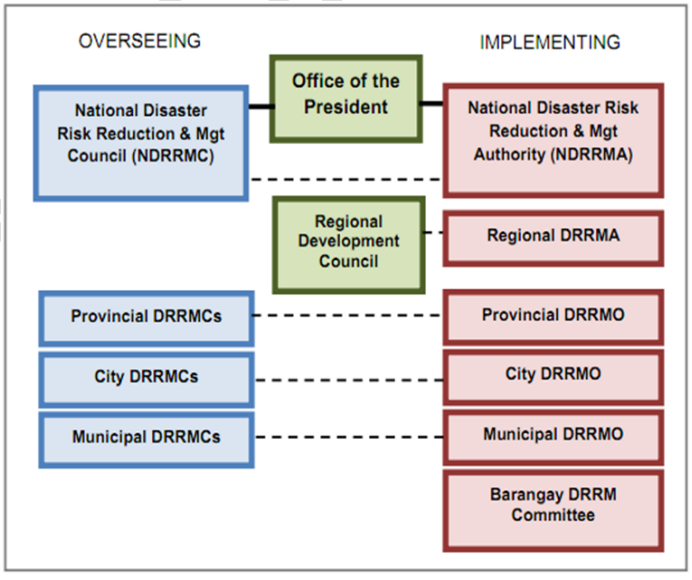

Figure 3. DRRM Councils' and Implementing Units

[2] At the barangay level, the term "committee" is used instead of "council"

On the other hand, Figure 4 shows a sample set-up of the barangay DRRM committee. The BDRRMC, chaired by the barangay captain, is responsible for leading, coordinating and implementing DRRM activities at the community or barangay level. Note how medical or health is an essential part of BDRRM.

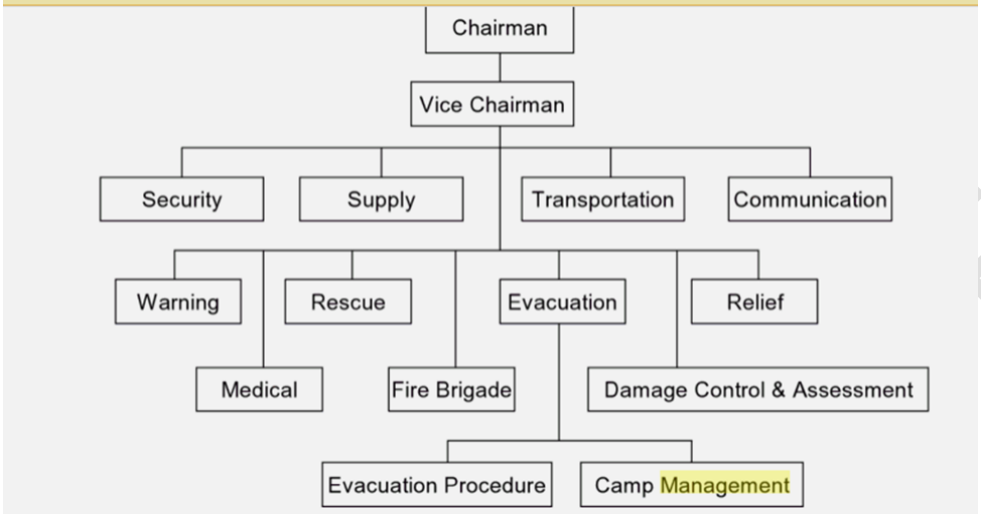

Figure 4. Sample Organizational Structure of the Barangay DRRM Committee

Inter-Agency Task Force (IATF) on Emerging Infectious Diseases (EID) for COVID-19

Creation of IATF-EID

The IATF-EID was created in 2014 through Executive Order (EO) No. 168 by former President Benigno Aquino III. The Task Force was made in response to the threats of emerging and re-emerging infectious diseases such as SARS, avian flu, ebola, MERS-CoV, meningococcemia among others.

The EO specified DOH as the chair of the IATF, with DFA, DILG, DOJ, DOLE, DOT, and DOTC as its core members. It also indicated that other departments, bureaus, offices, agencies, government-owned and controlled corporations (GOCCs), government financial institutions (GFIs), LGUs, NGOs and the private sector may be requested for assistance by the IATF as needed.

The EO further stipulated that the DOH secretary may recommend to the President of the Philippines the enlistment of AFP to supplement the PNP and other law enforcement agencies to enforce quarantine of specific areas, for facilitating transport of patients, and other related purposes. The various functions of the Task Force were also indicated in the EO, as well as the development of an EID preparedness manual, which will outline the government response and protocol in managing EID cases.

To learn more about the details of EO No. 168, s. 2014, you may access this:

- https://www.officialgazette.gov.ph/downloads/2014/05may/20140526-EO-0168-BSA.pdf

IATF-EID in COVID-19 Pandemic

In 2020, the unprecedented impact of COVID-19 pandemic in the Philippines changed the existing organizational structure, coordination, and implementation of DRRM activities in many ways. Figure 5 summarizes the roles of the national and local government in responding to COVID-19.

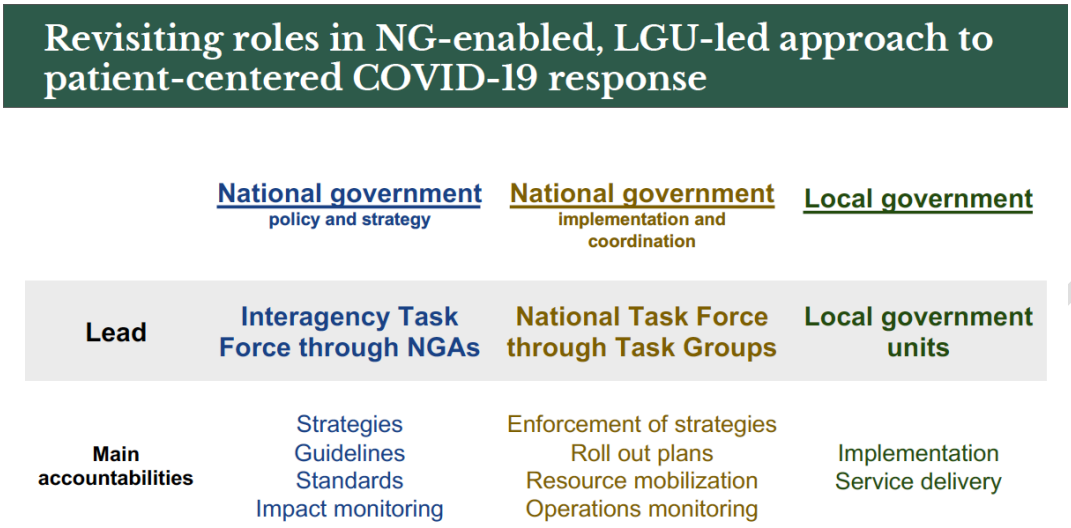

Figure 5. Roles of the National and Local Government in COVID-19 Pandemic Response (DOH, 2020)

Changes in DRRM are most apparent when you examine the most recent composition of IATF in Figure 6. The **expansion of the IATF** from its original structure in 2014 calls for **complex and intricate communication, coordination and intersectoral collaboration**.

On a strategic level, those that **formulate policies and set the direction of COVID-19 pandemic response** is the **National Command Authority (the President of the Philippines) and IATF**.

Coordination and implementation at the national level is handled by the **National Task Force (NTF)**, **where NDRRMC is lodged**. The **National Incident Command (NIC)** is in charge of **day-to-day concerns and operations at the country level**, and where the NDRRM Operations Center (OpCen) is embedded.

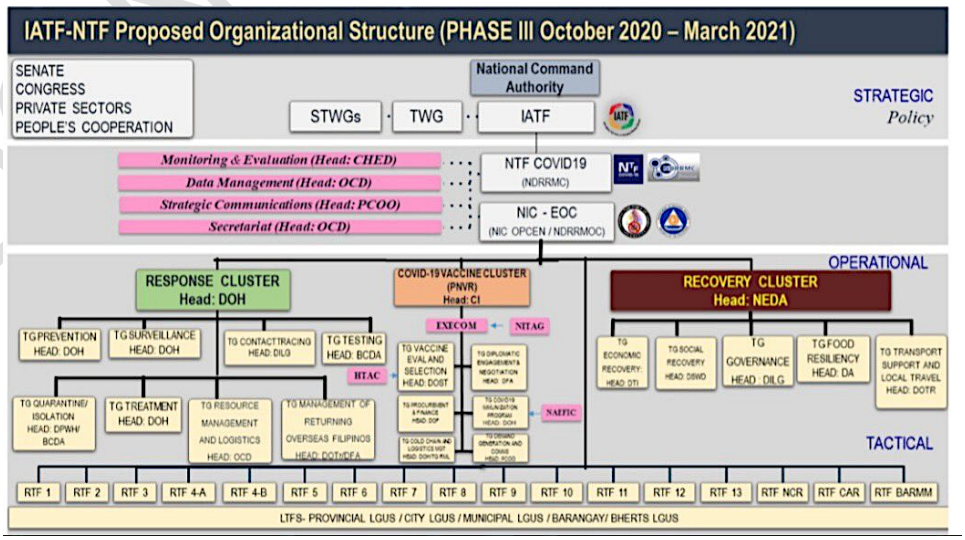

Figure 6. Expanded Organizational Structure of the IATF-National Task Force (NTF) for COVID-19 Pandemic
(Source: https://twitter.com/teddybird/status/1374890575766249472)

At the operational level, there are three (3) clusters: (1) Response, (2) Vaccine, and (3) Recovery. **DOH** is the **lead agency for the Response cluster**, the **Chief Implementer (NTF)** heads the **Vaccine cluster**, while **NEDA** is the **lead agency for the Recovery cluster**. Under each cluster are task groups (TG) with specific assignments and concerns. The **Regional Task Force (RTF)** is found in every region for a total of 17 RTFs.

Figure 7 shows the extension of the IATF-NTF organizational structure to the local level: tactical groups or **local TFs (LTFs)** are formed at the **provincial, city and municipal levels**, which are responsible for the **day-to-day operations and implementation of COVID-19 pandemic risk reduction and management strategies, interventions and activities**. As seen in the figure, the LDRRMCs and LDRRMOs are mobilized by the local chief executives (LCEs, i.e. governors, mayor, barangay captains), and clusters are also formed for each concern. The **local health office** is the **LGU department/office** primarily responsible for the **Health Cluster**.

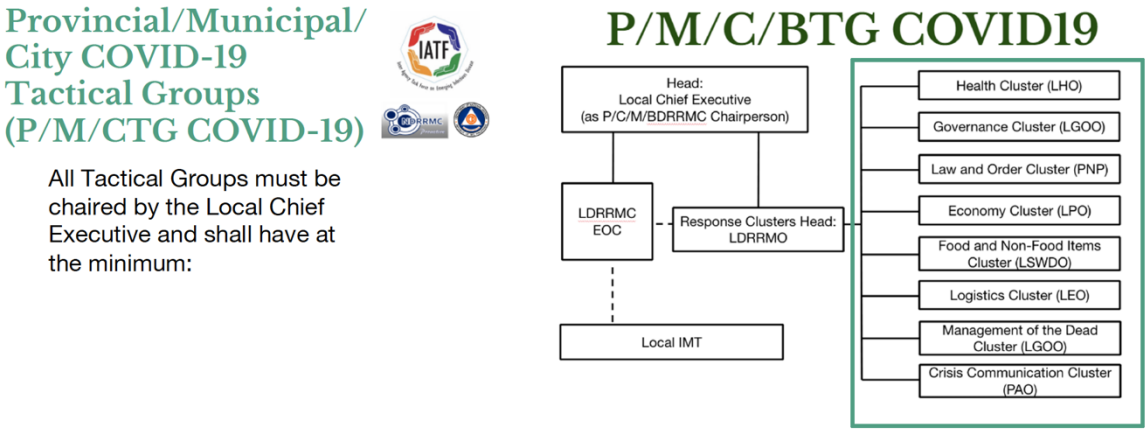

Figure 7. Local Organizational Structure for COVID-19 Pandemic (DOH, 2020)

BHERT: The Barangay Health Emergency Response Team

The Barangay Health Emergency Response Team (BHERT) was originally created in 2003 in response to SARS (DILG, 2003). At that time, BHERTs were directed to contain, prevent, and control the spread of SARS at the barangay level.

In 2020, to address the rising cases of COVID-19 pandemic in communities, barangay captains were again directed by national government agencies to organize BHERTs/mobilize existing BHERTs or Health Emergency Management Teams. For every 5,000 population, one (1) BHERT shall be organized. This means that the number of BHERTs will mainly depend on the total barangay population.

According to the Joint Memorandum Circular released by DILG, DOH, DICT and NEDA (2020), the barangay captain shall appoint BHERT members (**composition of BHERTs**) which include: (1) an **executive officer**, (2) a **barangay tanod**, (3) a **nurse or midwife**, and (4) a **barangay health worker** or **barangay volunteer**.

BHERTs are tasked to do the following (DILG, DOH, DICT & NEDA, 2020):

- Implementation of preventive measures
- Support in the conduct of contact tracing at the household level
- Monitor close contacts under home quarantine
- Provision of first-line response
- Coordination with the assigned Referral and Liaison Coordinator for patient referral

Deepening Your Understanding

To learn more about the different community teams organized and mobilized for mitigation of COVID-19, you can read this:

- DILG, DOH, DICT & NEDA (2020). Organization and mobilization of composite teams in local government units for community mitigation of COVID-19. Joint Memorandum Circular No. 2020-01. https://www.dilg.gov.ph/PDF_File/issuances/joint_circulars/dilg-joincircular-2020811_2dd099a177.pdf

Disaster Risk Reduction and Management in Health (DRRM-H)

You have already familiarized yourself with the Philippine DRRM system and how DRRM is implemented through its network of NGAs, LGUs, and civil society partners. Now, we will focus on the health sector and the health system at the local level, where DRRM is implemented and carried out.

According to DOH (2020), **Disaster Risk Reduction and Management in Health (DRRM-H)** is "an **integrated**, **systems-based** and **multisectoral process** of utilizing **policies, plans, programs, and strategies** to **reduce health risks due to disasters and emergencies**, **improve preparedness** for adverse effects, and **lessen adverse impacts of hazards** to address the needs of affected population with emphasis on the **vulnerable groups**".

The **three (3) goals of DRRM-H** are to:

1. **Provide uninterrupted health services**
2. **Avert preventable morbidities and mortalities**
3. **Ensure no outbreak occurs secondary to disasters**

DOH uses the **5K Approach** – **Kaligtasang Pangkalusugan sa Kalamidad sa Kamay ng Komunidad** – which envisions the **community** as the **main focus of DRRM-H interventions** and **actor in building health resilience** (Figure 8).

Note that **all disasters are local** – disasters begin and end locally. Therefore, it is critical that **hospitals, primary health facilities, LGUs, businesses/workplaces, schools, and communities have the capacity and are prepared to respond to disasters**.

The 5K Approach emphasizes that **resilience of the health system** is **dependent** on two (2) factors: (1) the **continuity in the delivery of health services in emergencies and disasters**, and (2) **reduction in the number of preventable morbidities and mortalities**, to avert emergency and disaster-related outbreaks.

Figure 8. The 5K Approach: Kaligtasang Pangkalusugan sa Kalamidad sa Kamay ng Komunidad (DOH, 2020)

Review: The Philippine Health System

Understanding where we are situated in the health system and the settings where nurses practice their profession are essential to determine the appropriate platforms, channels and partners especially in doing disaster risk reduction and management.

The Philippine health system is a dual health system composed of two (2) sectors: (1) public and (2) private. The Department of Health or DOH is the lead national government agency responsible for policies and oversight of the national health care system.

The Local Government Code of 1991 (RA 7160) mandated the devolution of health care to local government units. LGUs are responsible for implementing national (DOH) health programs and providing health services to their constituents. They are also responsible for managing health personnel and health facilities.

Health services in the public sector are provided by health facilities run by the national and local governments, and mainly financed through taxes. As shown in Figure 9:

- **Provincial LGUs** operate provincial and district hospitals as well as provincial and district health offices (as applicable)
- **City LGUs** are in charge of city hospitals, city health office/department, city birthing clinic/lying-in* and barangay health stations (BHS)
- **Municipal LGUs** manage the municipal health office, rural health unit (RHU), municipal birthing clinic/lying-in* and BHS

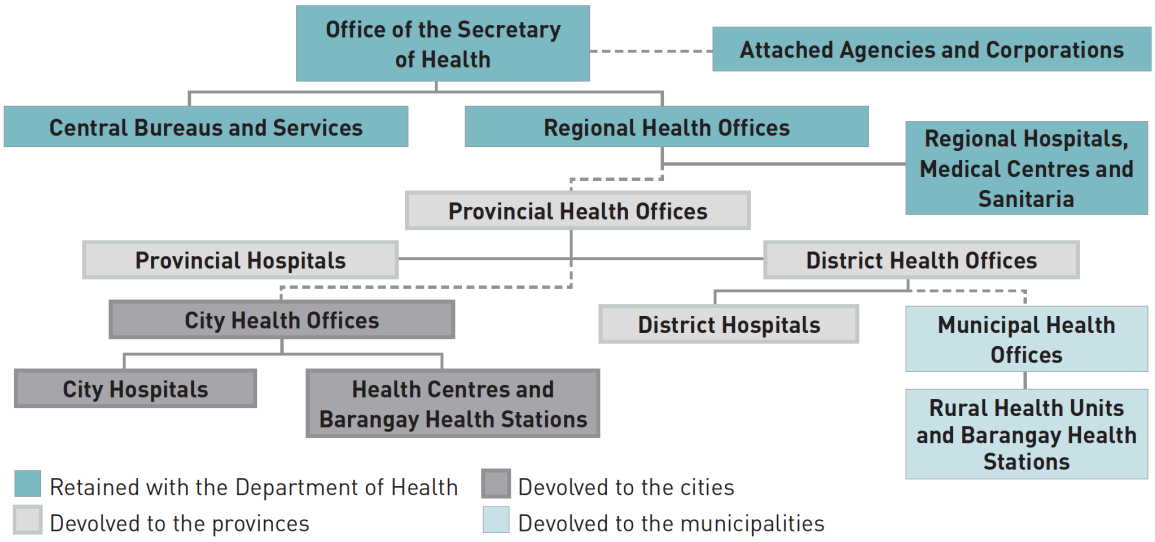

Figure 9. The Philippine Health System: Public Sector (Dayrit, Lagrada, Picazo, Pons & Villaverde, 2018)

On the other hand, the private sector is usually market-oriented, where health services are usually paid through user fees at point of service. The private sector comprise the hospitals, clinics, laboratories and industries related to health care. It can be divided into for profit and non-profit.

- **For profits** comprise health facilities that charge fees to patients and industries that sell their products and services to clients
- **Non-profits** include non-government or civil society organizations (NGOs/CSOs) that usually implement health or health-related programs and provide health services, usually in selected localities. They mostly cater to underserved and marginalized communities or groups that are not reached by the government

Another important component of the health care system at the national/country level are **international development partners** such as the World Health Organization (WHO), United Nations Children's Fund

(UNICEF), United Nations Population Fund (UNFPA), World Bank (WB) and Asian Development Bank (ADB).

- WHO, UNICEF and UNFPA usually influence the national government through policies and planning. In addition, they provide support through technical assistance including capacity building of government and non-government partners, and funding of specific initiatives and projects.
- On the other hand, WB and ADB are financial institutions offering grants or loans to the national government. They are also very influential in government policies and planning.

Institutionalization of DRRM-H in Local Health Systems

Figure 10 shows how DRRM-H is integrated into local health systems through the local government units.

The **two (2) most essential components for nurses to know** are:

- **Core Elements of a Functional DRRM-H System**
  - Provincial, city, or municipal LGUs must have a DRRM-H plan, health emergency response teams, health emergency commodities, and functional operation or emergency operation centers
- **Minimum Health Service Packages**
  - Provincial/city/municipal LGUs must be able to provide services for medical and public health; nutrition; water, sanitation and hygiene (WASH); and mental health and psychosocial support (MHPSS)

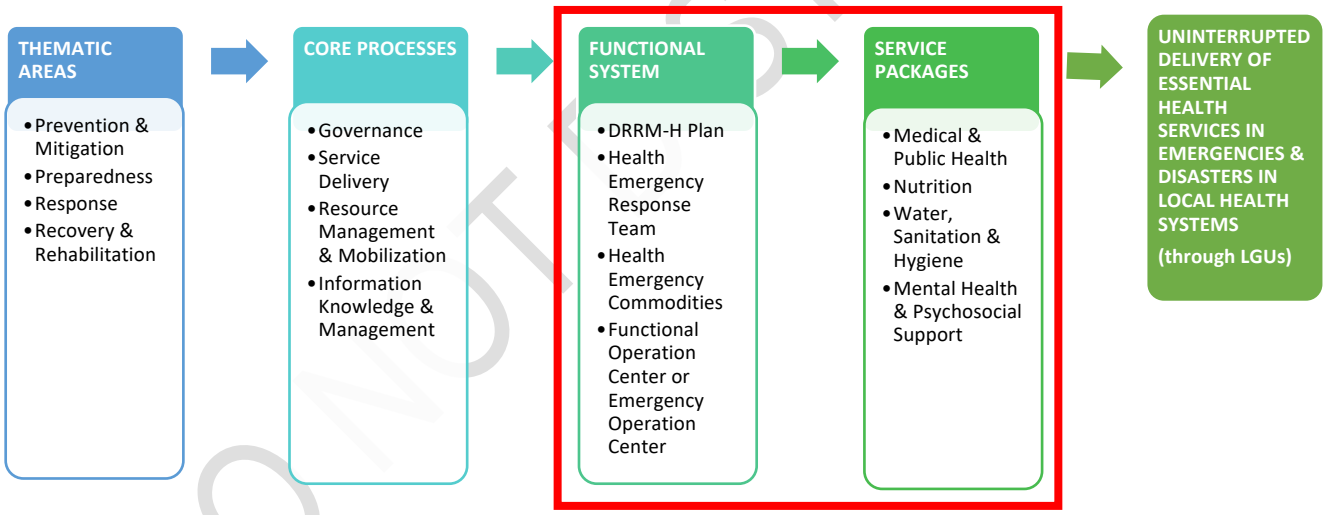

Figure 10. Framework of DRRM-H Institutionalization into Province-wide and City-wide Health Systems (adapted from DOH, 2020)

<u>Integrating DRRM-H in Nursing Practice</u>

At this point, you already know how DRRM, particularly in health, is operationalized and implemented through LGUs. Now, where does nursing practice enter?

In the initial weeks of the course, you learned that disasters affect the health of individuals, groups, populations, and communities directly and indirectly. Direct effects of disasters include deaths, injury, illness, and disability. On the other hand, indirect effects include damage to health infrastructure (plus

utilities such as water, electricity, and sanitation), service delivery, and as a whole, health systems (Dar, Buckley, Rokadiya, Huda & Abrahams, 2014).

In N100 you learned the various applications of health promotion (issues-based, settings-based, gender and life course, vulnerable population) while in N119, you learned about caring for groups, populations, and communities using the community health nursing (CHN) process. In these two (2) courses, you learned that public health nursing practice is population-based, community-oriented, with the goal of preventing disease and disability through creation of conditions where people can be healthy and well.

In N105 and N107, you learned more about taking care of different clients in illness states, with various medical conditions.

In DRRM-H, nurses contribute by building individual and social resilience in disasters. Specifically, nurses contribute to strengthening the resilience of people and communities in two (2) ways:

(1) Health promotion and disease prevention (promoting and maintaining good health and well-being)

(2) Provision of nursing care to various clients (individuals, families, population groups, communities) **in different illness states and in diverse settings**

Whether during normal times or during disasters, nurses are called upon to aid and provide care. Because of the **broad care giving skills** of nurses across levels (health promotion, disease prevention, treatment, and rehabilitation), **creativity and adaptability in life situations**, and **leadership skills** which can be applied in different disaster settings and situations, nurses often serve as **health frontliners** (WHO & ICN, 2009).

Therefore, the **overall goal of disaster nursing** is to "**ensure that the highest achievable level of care is delivered through identifying, advocating, and caring for all impacted populations throughout all phases of a disaster event, including active participation in all levels of disaster planning and preparedness**" (Powers, 2010).

Table 3 shows the goals of nursing care per phase in the disaster management continuum. This intends to guide nurses when designing, planning, and implementing strategies and interventions in the different phases or thematic areas of DRRM.

Table 3. Goals of Nursing Care Across the Disaster Management Continuum

PHASE	GOAL OF NURSING CARE
Prevention and Mitigation	• Avoid hazards and mitigate their potential impacts by reducing vulnerabilities and exposure and enhancing capacities of communities (WHO/ICN, 2009) • Ensure individuals and communities are with improved health and nutrition, and vulnerabilities are minimized if not completely removed (Bonito & Minami, 2017) • Know the hazards and vulnerabilities of national and local areas to help individuals and communities cope with potential emergencies and disasters (Bonito & Minami, 2017)
Preparedness	• Establish and strengthen capacities of communities and health facilities to anticipate, cope, and recover from the negative impacts of emergency occurrences and disasters (WHO/ICN, 2009)
Response	• Mobilize responders to the disaster area to save as many lives as possible (WHO/ICN, 2009) • Provide for meeting the immediate needs of the survivors and reduce the longer-term health impact of the disaster (WHO/ICN, 2009)
Recovery and Rehabilitation	• Continue to provide care and support to those with physical and mental health needs (WHO/ICN, 2009)

Disaster Nursing Timeline

Figure 11 shows the disaster nursing timeline. Relevant nursing actions/interventions are listed under each disaster phase (pre-impact/incident, impact/incident, post-impact/incident) and disaster continuum (planning/preparedness, response, recovery). The **disaster nursing timeline** is an **important framework for planning** all nurses should be familiar with.

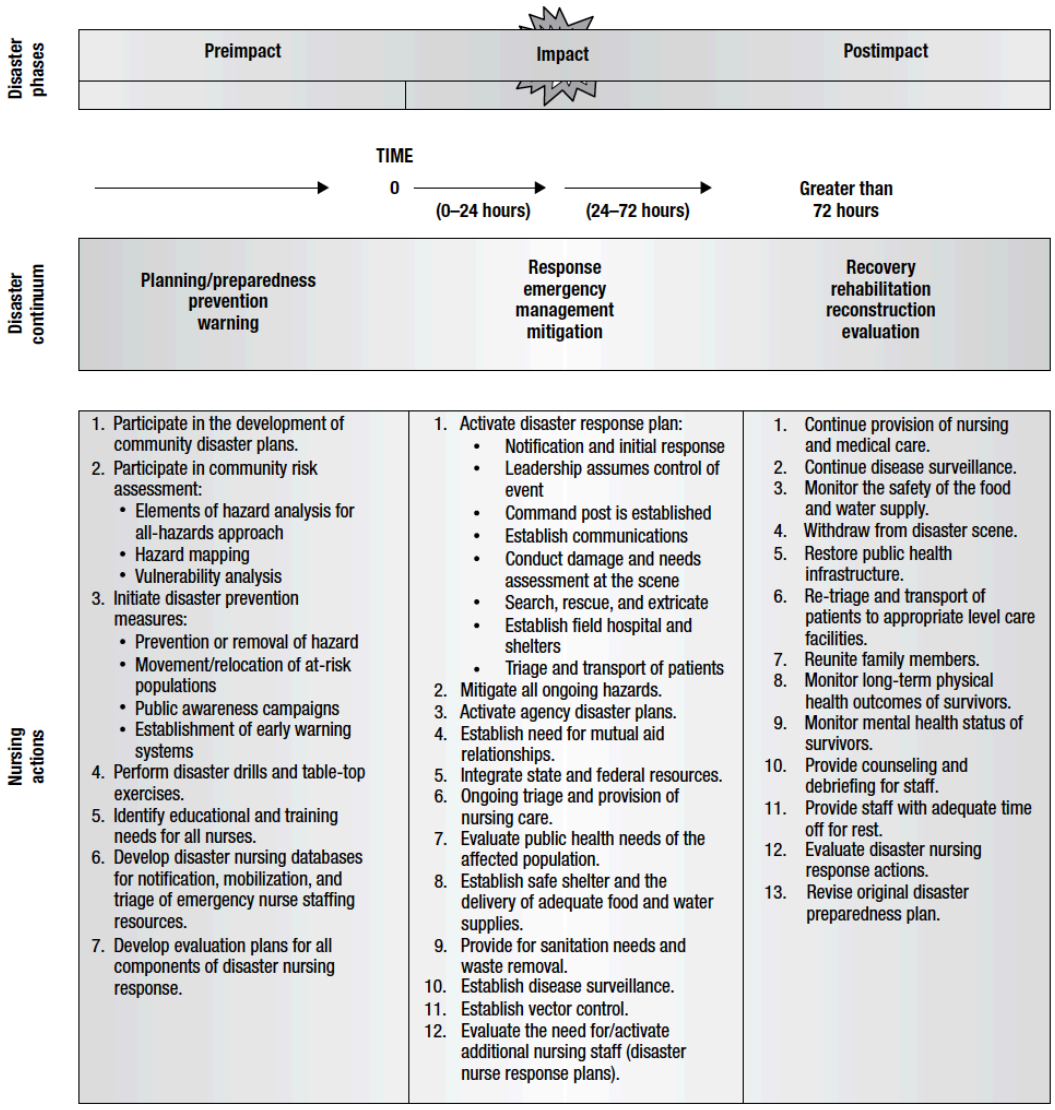

Figure 11. Disaster Nursing Timeline (Veenema, 2018)

On the other hand, Table 4 shows sample public health nursing activities within the different disaster phases. In the next few weeks, we will delve into the nursing interventions for each phase.

Table 4. Disaster Nursing in Public Health Practice (Adapted from Association of Public Health Nurses, 2014)

DISASTER CYCLE	NURSING PROCESS Based on Jakeway, C., Larosa, G., Cary, A. &Schoenfisch, S. (2008). The Role of Public Health Nurses In Emergency Preparedness and Response: A position paper of the Association of State snd Territorial Directors of Nursing. *Public Health Nursing, 25*(4), 353-361			
	Assessment	**Planning**	**Implementation**	**Evaluation**
Prevention and Mitigation **Preparedness**	Assess the area for populations at risk for access and functional needs during times of disaster. Conduct a hazard vulnerability assessment for threats and hazards that pose the greatest risk	Develop a care plan to address access and functional needs of populations during times of disaster. Complete this assurance function in collaboration with stakeholders to address needs such as sheltering in place, evacuation, and mass casualty surge capabilities.	Conduct training, drills and exercises related to the care of individuals, families and communities during disaster, focusing on populations with access and functional needs in an Identified region.	Evaluate the training, drills and exercises related to the care of populations with access and functional needs in disaster, identifying gaps and remaining needs. Evaluate operational plans for preparedness, response and recovery for populations with access and functional needs
Response	Use public health, population-based triage to assess communicable disease outbreak impact and needed response (e.g., influenza). Population based triage involving surveillance to divide the affected population into susceptible, exposed, infected, removed, and vaccinated for expedient and life-saving treatment.	Collaborate with response partners to develop plans for triage algorithms that determine appropriate care and sustenance logistics for populations based on their symptoms and co-morbid conditions (e.g., chronic disease).	Identify and place public health nurses and other support personnel to provide care according to the developed algorithms. Assure that logistics are in place to support community care during the crisis period. Conduct ongoing rapid needs assessments during the response phase in order to meet population needs.	Participate in ongoing response planning during the incident (e.g., the Incident Management System and its planning). Participate in service planning and provide real-time adjustment on the basis of real-time public health response evaluation. Assure needed and necessary public health nursing care.
Recovery and Rehabilitation	Conduct ongoing rapid needs assessment at appropriate intervals to determine health and critical resource capacity after a natural disaster (e.g., earthquake.)	Work with community stakeholders to plan for any long- term health concerns following an incident, getting ahead of the curve by identifying key resources and critical care logistics.	Participate in the reconstitution of critical services and the sustainment of the health and social infrastructure. Assist the community to find its “new normal” post- disaster.	Conduct evaluation of the long-term impact of disaster consequences on the whole community, promoting public health essential services through public health nursing.

DISASTER PREVENTION AND MITIGATION: *Disaster Risk Assessment*

Frameworks and analysis of hazards, risks, vulnerabilities, and capacities

Central to understanding the disaster nursing work is knowing what constitutes disaster risk (see Figure 1).

The UNISDR defines **disaster risk** as "the ***potential*** **losses** in **lives, health status, livelihoods, assets and services,** which could occur in a **particular community**, or a **society** over some **specified future time period**".

Disaster risk is the **interplay of hazards, vulnerabilities, exposures and capacities**. The relationship between these factors is expressed through this equation:

$$\text{Disaster Risk} = \text{Hazard} \times \text{Exposure} \times \frac{\text{Vulnerability}}{\text{Capacity}}$$

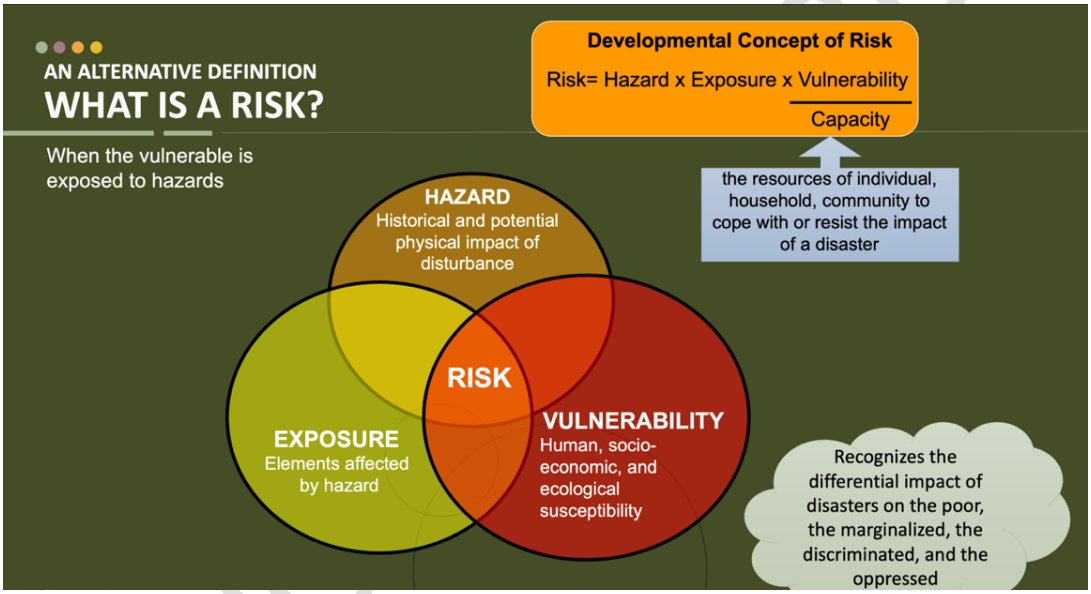

Figure 12. Definition and components of disaster risk (Vera, 2019)

Basically, **disaster risks** are created when **vulnerable conditions are exposed to hazards that are inherent in the process of nature** (i.e. natural) or **created by anthropogenic factors** (i.e. man-made) (UNESCAP, 2017).

This also means that **there is no "natural disaster", only natural hazards.** Natural hazards are widespread or endemic in the process of nature, and do not create disasters on their own unless combined with vulnerabilities, which are all anthropogenic or man-made (UNESCAP, 2017). Therefore**, most disasters are basically man-made, whether caused by natural or man-made hazards**.

When natural and man-made hazards combine, ***complex disasters*** result. An example of a complex disaster is the 2011 Great East Japan earthquake, in which an undersea earthquake triggered a tsunami that damaged a nuclear powerplant, and the resulting radioactive leaks contaminated the soil, local water supply, and ocean.

The **disaster crunch and pressure release model** or simply, **disaster crunch model** (Figure 13), is used to show that vulnerability (pressure), rooted in socioeconomic and political processes, has to be addressed (released) to reduce disaster risk (Oxfam GB, 2012).

This model states that a disaster happens only when a hazard affects vulnerable people or communities. It means that a natural phenomenon by itself is not a disaster. A population may be vulnerable for many years, and without a "trigger event" – there is no disaster (Oxfam GB, 2012).

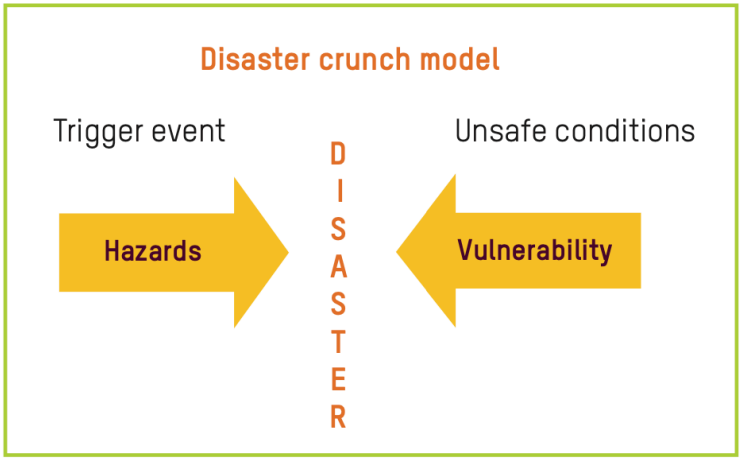

Figure 13. The Disaster Crunch Model (Oxfam GB, 2012)

Figure 14 shows the same model but provides further explanation regarding the interrelationships between different elements that cause vulnerability, through what is called the "**progression of vulnerability**", developed by Blaikie et al in 1994 (Oxfam GB, 2012).

Vulnerability, a pressure that is rooted from socioeconomic and political processes, is built up over time, and needs to be addressed or released to reduce the risk of disaster. As shown in the figure, **three (3) layers of social processes that cause vulnerability** are **(1) root causes, (2) dynamic pressures and (3) unsafe conditions**. The root causes lead to dynamic pressures which explain how unsafe conditions developed and persisted (Oxfam GB, 2012).

For example, using the disaster crunch model to analyze, people living beside a river prone to sudden onset flooding (hazard) will have the following vulnerabilities:

- **Unsafe conditions:** poor housing conditions, dangerous location, risky livelihoods, lack of skills in disaster preparedness, etc.
- **Dynamic pressures:** no community organization with collective efforts to reduce flood risks, rapid migration that change the social structure, lack of local markets for small farmers to sell their produce or buy agricultural inputs, etc.
- **Root causes:** government negligence of sand mining in the river, lack of government policy on flood warning systems and land using planning, poor men and women are not allowed to attend meetings on flood mitigation and emergency response preparedness, etc.

On the other hand, the **pressure release model** (Figure 15) shows that "pressure" between hazards and vulnerabilities should be released to reduce disaster risk. To reduce their intensity, hazards should be mitigated to affect vulnerable population less. Vulnerability should also be reduced at different levels: activities need to be undertaken to turn "unsafe conditions" into "safer conditions", "dynamic pressures" will be reduced and "root causes" will be addressed ("**progression of safety**" by Wisner et al, 2004). DRR activities aim to achieve a controlled situation and a resilient community, where there is no loss of life, few casualties, restricted damage, food security and capacity to recover quickly from any impact of a hazard (Oxfam GB, 2012).

The **disaster crunch and pressure release model** is used to examine the causes of vulnerability during **disaster risk assessment** and identify **disaster risk reduction measures** more comprehensively (Oxfam GB, 2012).

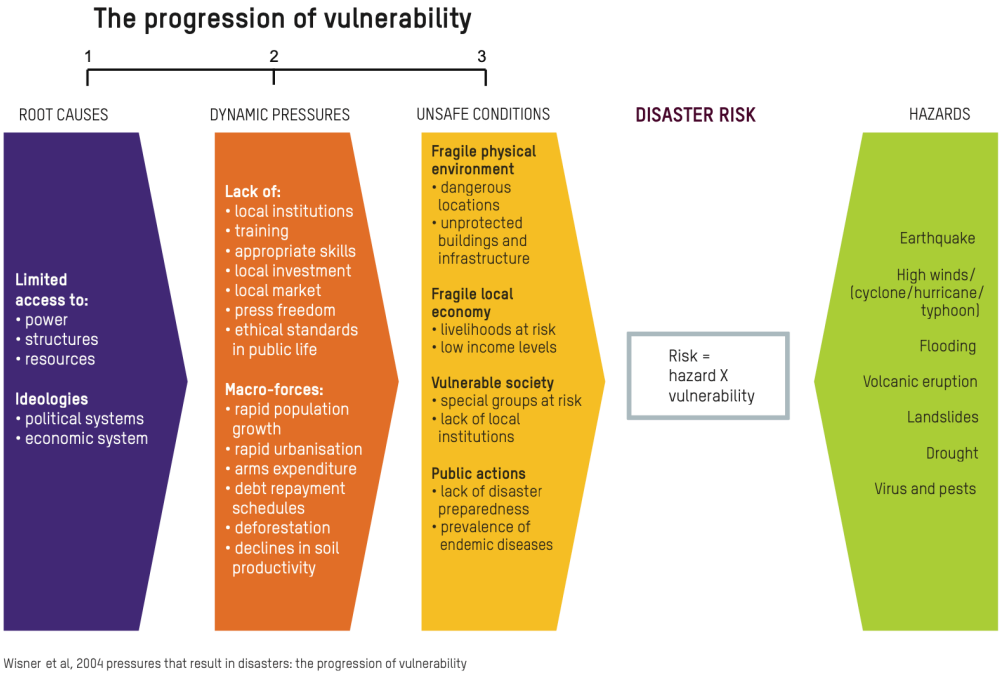

Figure 14. Progression of Vulnerability and the Disaster Crunch Model (Oxfam GB, 2012)

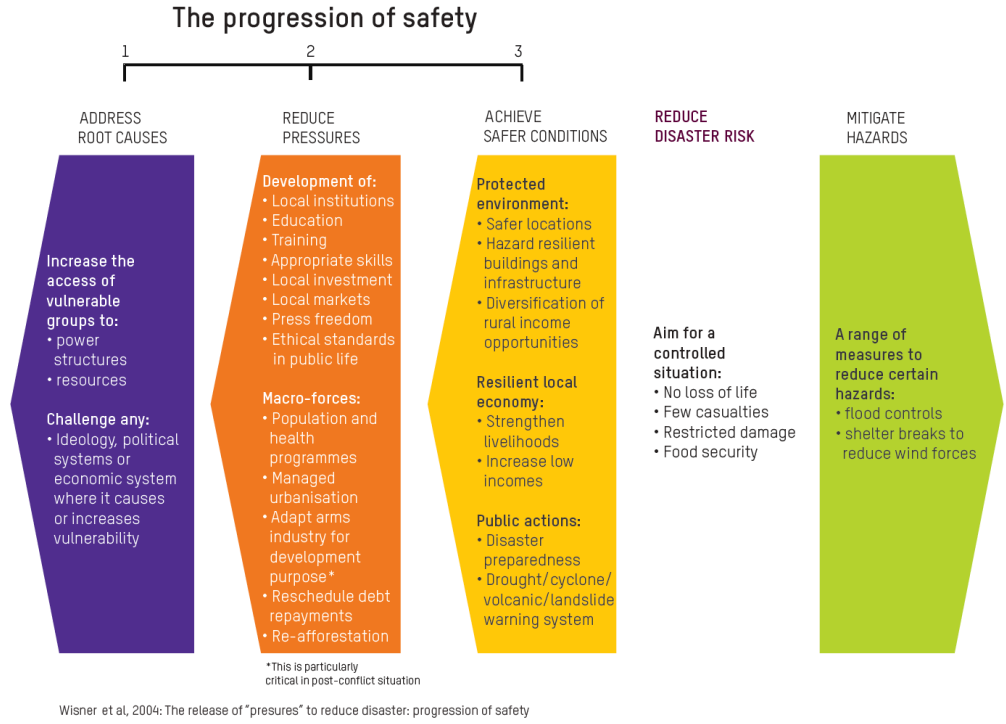

Figure 15. Progression of Safety and the Pressure Release Model (Oxfam GB, 2012)

Deepening Your Understanding

Disasters, Development, and Vulnerabilities

As defined in Week 2, vulnerabilities are conditions determined by various factors or processes which **increase susceptibility of individuals, communities, assets, or systems** to the **impacts of hazards**. According to UNESCAP (2017), vulnerabilities are created due to **(1) lack of development, (2) unplanned development,** or **(3) unsafe development**.

What is development? How is it connected to disasters?

Development is generally defined as "the improvement in a country's economic and social conditions" (UNESCAP, 2017). Specifically, it refers to "the **improvements** in **ways of managing natural and human resources** to **create wealth and improve people's lives**" (ibid). Development has **three (3) dimensions**: (**1) economic, (2) social**, and **(3) human** (ibid). Sustainable development is the act of balancing these three aspects or dimensions of development.

Disasters are intertwined with development, because of these three separate but interrelated dimensions (UNESCAP, 2017):

1. **Disasters erode gains of development**
2. **Deficits in development create disaster risks**
3. **Development creates new disaster risks**

As mentioned earlier, vulnerabilities may arise due to lack, unplanned or unsafe development. As development is broad, vulnerabilities may cover a wide range of areas (Table 5), such as (1) **physical vulnerabilities**, (2) **social vulnerabilities**, (3) **economic vulnerabilities**, and (4) **environmental vulnerabilities**.

Table 5. Types of Vulnerabilities

TYPE OF VULNERABILITY	EXAMPLES
Physical	Unsafe housing and infrastructure, fragile communication systems and networks, weak utilities and services
Social	Poor, children, women, elderly, persons with disabilities / differently abled, IPs/ethnic minorities, LGBTQ+
Economic	Industries, trade or tourism in hazard zones, business continuity practices not followed, insufficient insurance system to cover risks of business
Environmental	Denudation of mangroves, deforestation of mountains, excessive withdrawal of water from aquifers, discharges of polluting effluents into water bodies, emission of obnoxious gases

To learn more about the relationship of disasters and development, read Chapter 1 pp. 1-9:

- United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP] (2017). Mainstreaming disaster risk reduction for sustainable development: A guidebook for the Asia-Pacific. https://www.unescap.org/sites/default/files/publication_WEBdrr02_Mainstreaming.pdf

Vulnerable and Marginalized Population Groups in DRRM

In DRRM, special attention is given to **vulnerable and marginalized groups** such as **women, children, elderly, differently-abled, ethnic and gender (LGBTQ+) minorities**. This is because these groups face **higher exposure and susceptibility** to disaster risks.

To review the concept of vulnerability, previously learned during N100 Health Promotion, you can check this journal article again:

- Mechanic, D. & Tanner, J. (2007). Vulnerable people, groups, and populations: Societal view. *Health Affairs,* *26*(5):1220-1230. https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.26.5.1220

Sustainability Livelihoods Framework in DRRM

The Sustainable Livelihoods Framework (Figure 16) is an approach where sustainability is considered in terms of available capital or asset (i.e. human, natural, financial, physical, social) and an evaluation of the vulnerability context (e.g. shocks, seasonality, trends, changes) in which these capital/assets exist. All these assets are interlinked to each other, as seen in the pentagon below.

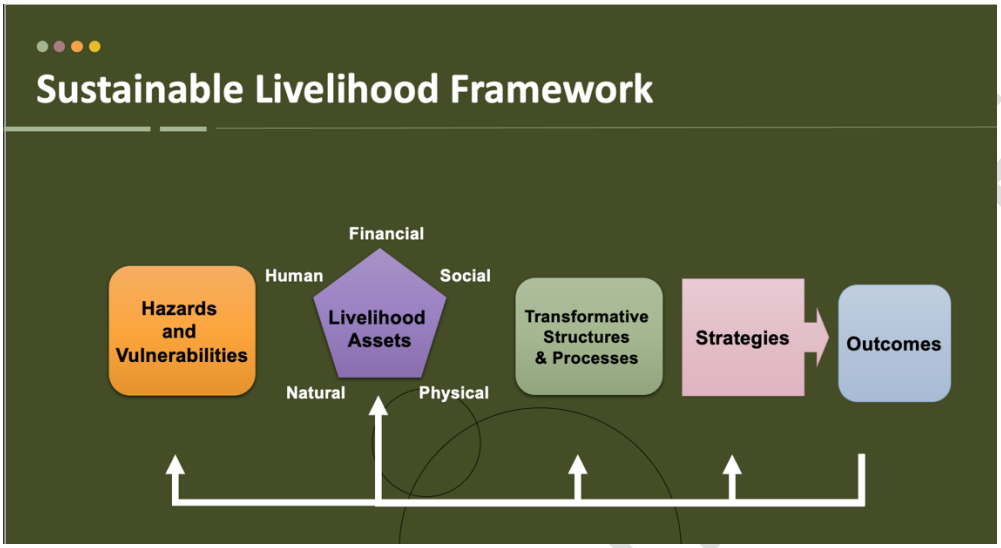

Figure 16. Sustainable Livelihoods Framework (Vera, 2019)

The size and shape of the **asset pentagon** – the amount and relative importance of each type of capital varies between communities and between wealthy and poor households within the same community (FAO, n.d.).

Table 6. Types of Livelihood Assets

TYPE OF ASSETS	EXAMPLES
Human capital	Household members, active labor, education, knowledge and skills
Physical capital	Livestock, equipment, vehicles, houses, irrigation pumps
Natural capital	Access to land, forests, water, grazing, fishing, wild products, biodiversity
Financial capital	Savings/debt, gold, jewelry, income, credit, insurance
Social capital	Kin networks, group membership, sociopolitical voice, influence

There is a link between asset ownership and vulnerability context. **Asset ownership decreases vulnerability and increases ability to withstand shocks** (e.g. disasters, illness or death in the family) **or stresses** (e.g. land degradation, climate change) (FAO, n.d.). For example, an upper middle class family can recover from the effects of a typhoon quickly vs. an urban poor family. The former has high human, physical, financial and social capital compared to the latter. An urban poor family may not have savings and other properties they can sell. Low educational attainment of family members limits the jobs they can take on and consequently the income they can earn. They may also have pre-existing illnesses that are not managed adequately or properly, and may exacerbate during or after a disaster.

Asset/capital is related to capacity (or capability)**,** discussed in Week 2 as the combination of all strengths and resources available within a community, society or organization that can reduce the level or risk or effects of a disaster, and strengthen resilience.

Disaster Resilience

As discussed in Week 2, resilience is the "ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from their effects in a timely and efficient manner, including through the preservation and restoration of essential basic structures and functions".

According to the Hyogo Framework for Action (2005), **disaster resilience** is determined by the degree to which individuals, communities, and public and private organizations are **capable of organizing themselves to learn from past disasters and reduce their risks to future ones at international, regional, national and local levels**.

Vulnerability and resilience are closely related. Some see vulnerability as the opposite of disaster resilience, while some view vulnerability as a risk factor and disaster resilience as the capacity to respond (Manyena, 2006 as cited in Combaz, 2014).

DFID (2011) proposed a disaster resilience framework (Figure 6) which includes **four (4) core elements**: **(1) context, (2) disturbance, (3) capacity to respond and (4) reaction**.

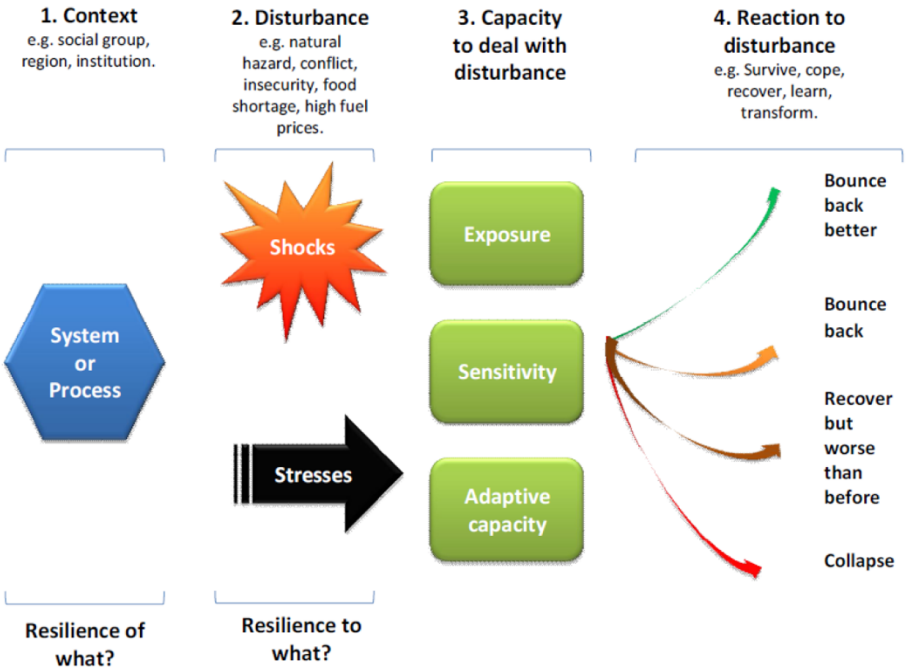

Figure 17. Components of a Disaster Resiience Framework (DFID, 2011)

In this framework, **context** means whose resilience is being built – is it the resilience of a social group, socioeconomic or political system, environmental context or institution?

Disturbance means what shocks (sudden events like conflicts or disasters) and/or stresses (long-term trends such as resource degradation, urbanization or climate change) the group aims to be resilient to.

Capacity to respond (or response capacity) is the ability of a system or process to deal with a shock or stress, and depends on ***exposure*** (magnitude of the shock or stress), ***sensitivity*** (degree to which a system will be affected by, or will respond to, a given shock or stress), and ***adaptive capacity*** (how well it can adjust to a disturbance or moderate damage, take advantage of opportunities and cope with the consequences of a transformation).

Reaction consists of a range of responses including ***bounce back better*** (where capacities are enhanced, exposures are reduced, and the system is more able to deal with future shocks and

stresses), ***bounce back*** (where pre-existing conditions prevail), ***recover but worse than before*** (where capacities are reduced), and ***collapse*** (where the system collapses, leading to a catastrophic reduction in capacity to cope with the future).

Manyena (2006) has described **disaster resilience** as **both an outcome and process** (as cited in Combaz, 2014). Practices focused on outcome tend to adopt top-down, reactive approaches which can favor the status quo and shift attention away from inequalities resulting from insecurity and disaster. On the other hand, as a process, building disaster resilience involves supporting the capacity of individuals, communities and states to adapt through assets and resources relevant to their contexts. For Andharia (2013) and Oxfam (2013), this implies enhancing people's rights and addressing socioeconomic, gender and environmental inequalities that exacerbate vulnerability.

Deepening Your Understanding

Individual vs. Social Resilience

The national government and the media often describe Filipinos for being "resilient" amidst numerous tragedies. But what exactly do they refer as "resilient"? Is there a difference between individual (psychological) resilience and community/social resilience?

Read this opinion piece to learn more about this:

- Tanggol, A. A. (2020, November 18). Challenging the narrative of Filipino resiliency. *Rappler.* https://www.rappler.com/voices/imho/opinion-challenging-narrative-filipino-resiliency

To learn more about how harnessing community capacities, enhancing people's strengths, and leadership contribute to disaster resilience and DRR, you can view/read the following:

- UP Resilience Institute (2020). UPRI Talks present MANUEL ABINALES: "Komunidad at Katatagan". https://www.youtube.com/watch?v=M35nsolzfrg
- Bankoff, G. (2015). "Lahat para sa lahat" (everything to everybody): Consensual leadership, social capital and disaster risk reduction in a Filipino community: https://www.academia.edu/34009702/Lahat_para_sa_Lahat_Everything_to_Everybody_Consensual_Leadership_Social_Capital_and_Disaster_Risk_Reduction_in_a_Filipino_Community
- Alcayna, T., Bollettino, V., Dy, P., & Vinck, P. (2016). Resilience and disaster trends in the Philippines: Opportunities for national and local capacity building. *PLOS Currents Disasters.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5061578/

Tools for assessing and analyzing hazards, risks, vulnerabilities, and capacities

The disaster crunch and pressure release model was introduced as a guide to examine the causes of vulnerability during **disaster risk assessment** and identify **disaster risk reduction measures** more comprehensively (Oxfam GB, 2012).

The results of hazard, risk, vulnerability, and capacity assessment and analysis provide critical information in identifying and planning appropriate disaster risk reduction measures.

The best way to help individuals, families, population groups, and communities in disaster risk assessment and DRR measures is to use a **participatory approach**. This is rooted in the belief that enabling people and communities to genuinely participate in program design, planning, and management leads to increased ownership, accountability, and impact, and therefore, the best way to bring about change (Oxfam International, 2012).

This portion will introduce you to the most common tools used for assessing hazards, risks, vulnerabilities and capacities that can be easily be understood and incorporated by the nurse working in and with communities. This is because these tools are very similar to the ones that are used in family and community/public health nursing:

- **Transect Walk**
- **Spatial Map**
- **Risk and Hazard Map**
- **Capacity and Resource Map**
- **Livelihood Analysis**
- **Institutional and Social Network Analysis**
- **Vulnerability and Capacity Assessment (VCA)**
- **Problem Tree**

For detailed information and instructions on how to use these tools, refer to:

- Partners for Resilience Philippines (2011). Community risk assessment toolbox.
- Oxfam International (2011). Participatory capacity and vulnerability assessment: A practitioner's guide. https://policy-practice.oxfam.org/resources/participatory-capacity-and-vulnerability-analysis-a-practitioners-guide-232411/
- Coastal CORE Sorsogon, Marinduque Council for Environmental Concerns & Social Action Center Northern Quezon (2011). Voyage to disaster resilience in small islands. A guide for local leaders. https://dilg.gov.ph/PDF_File/reports_resources/DILG-Resources-2012112-2a91abbcac.pdf

Transect Walk

A transect walk involves walking through the community to observe the surroundings and its resources, and used to note the sites and topography of the area as well as understand interrelationships in their natural surroundings (PFR Philippines, 2011). In the assessment phase, it is useful for getting a feel of the issues and capacities that exist in the community. In the planning and evaluation phase, it can be used to see what changes occurred in the community (ibid).

The transect walk is very similar to doing the windshield survey or ocular survey done by the nurse in the community, except there is a need to illustrate and describe the observations as shown in Figure 18.

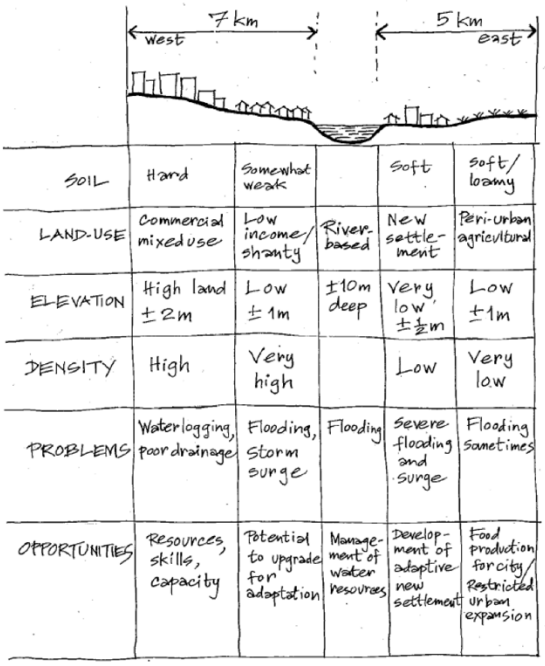

Figure 18. Example of an urban transect walk (Ahmed & McEvoy, 2011)

Spatial Map

A spatial map provides an overview of the main features of an area in relation to its surroundings (PFR Philippines, 2011). Map features include arrangement of houses, fields, roads, rivers, and other buildings or structures found in the community. It also includes land uses and which resources are accessible and owned by the community or individuals (ibid).

Maps generally help people to understand complex relationships and allow visual comparison of information. It also aids in facilitating communication and stimulate discussion of important community issues (ibid).

The spatial map is very similar to the spot map used in C/PHN.

Risk/Hazard Map

A risk or hazard map is used to outline in visual form the risks and vulnerabilities experienced by a community (PFR Philippines, 2011). These can relate to community location and resources in the environment.

A risk/hazard map can be integrated with spatial maps to create a comprehensive map showing multilayered information (ibid). An example of a risk/hazard map available digitally is NOAH (https://noah.up.edu.ph). Communities most often have a physical risk/hazard map available in the barangay LGU like in Figure 19.

Figure 19. Hazard map made by Roxas City, Capiz trainees in a disaster planning seminar (Panay Center for Disaster Response Facebook, 2016)

Capacity and Resource Map

A capacity or resource map indicates existing natural resources in the village such as land and water resources, health facilities, shops, electricity, communication, etc. and the use and accessibility (dependence) of these resources by the community.

Figure 20 shows a community resource map of Brgy. Cabladan, Municipality of Sibalom, Antique.

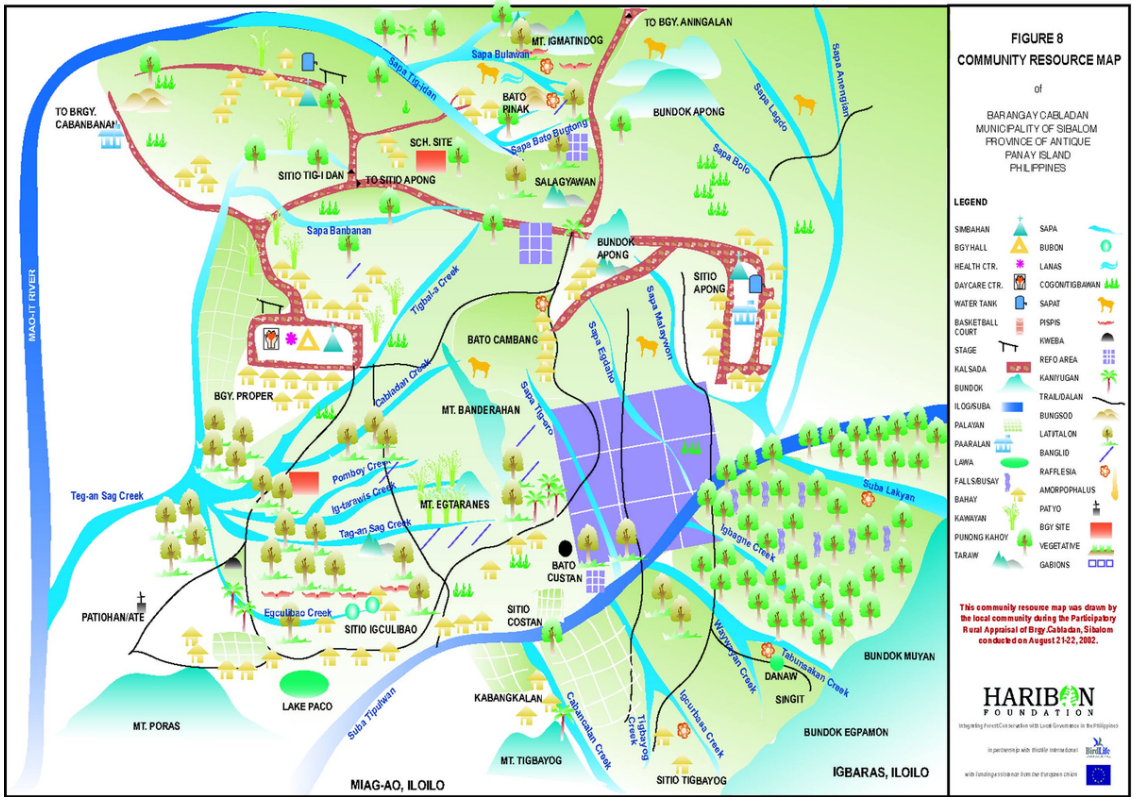

Figure 20. Community resource map created during participatory rural appraisal of Brgy. Cabladan, Sibalom, Antique in 2002 (Haribon Foundation, 2004)

Livelihood Analysis

Livelihood analysis uses a combination of interviews and diagrams (usually at the household level) to represent the different ways that income is generated to enable people to live (PFR Philippines, 2011). It collects information on the bundle of assets or resources available to the household for its livelihood activities (ibid). The amount or income gained from a livelihood will assist in determining the baseline socioeconomic status of households and the community.

Livelihood is one critical capacity of the people when facing a hazard – people with poor baseline health and nutrition status will be more vulnerable to many hazards (ibid).

Institutional and Social Network Analysis

Institutional and social network analysis uses a diagram to show key organizations, groups, and individuals in a community, the nature of the relationships between them, and people's perceptions of their importance (PFR Philippines, 2011). This helps identify the roles of social institutions and organizations can play in times of disasters.

Institutional and social network analysis is similar to stakeholder analysis used in C/PHN.

Household/Neighborhood Vulnerability Assessment

Household or neighborhood vulnerability assessment uses a chart to assess the main vulnerabilities faced by households and neighborhoods. It helps you to gather information about the main vulnerabilities faced by people in the community, both individually and collectively (PFR Philippines, 2011). When people have a clear idea of their main vulnerabilities, priorities and actions can be developed to reduce the risk of hazard/s (ibid).

Problem Tree

A problem tree is a flow diagram/chart that shows the interrelationships between different aspects of an issue or problem. It helps to build a picture of the major problems faced by the community. Root causes are identified, which are used to address or reduce vulnerabilities found in the community (PFR Philippines, 2011).

Problem tree is useful for giving structure when analyzing information obtained from other tools, and can be effective for building awareness and understanding of interrelationships through explanation of cause and effect (ibid). it is often used in C/PHN. Figure 20 shows a sample problem tree for an urban poor community identified to be at high risk of fires.

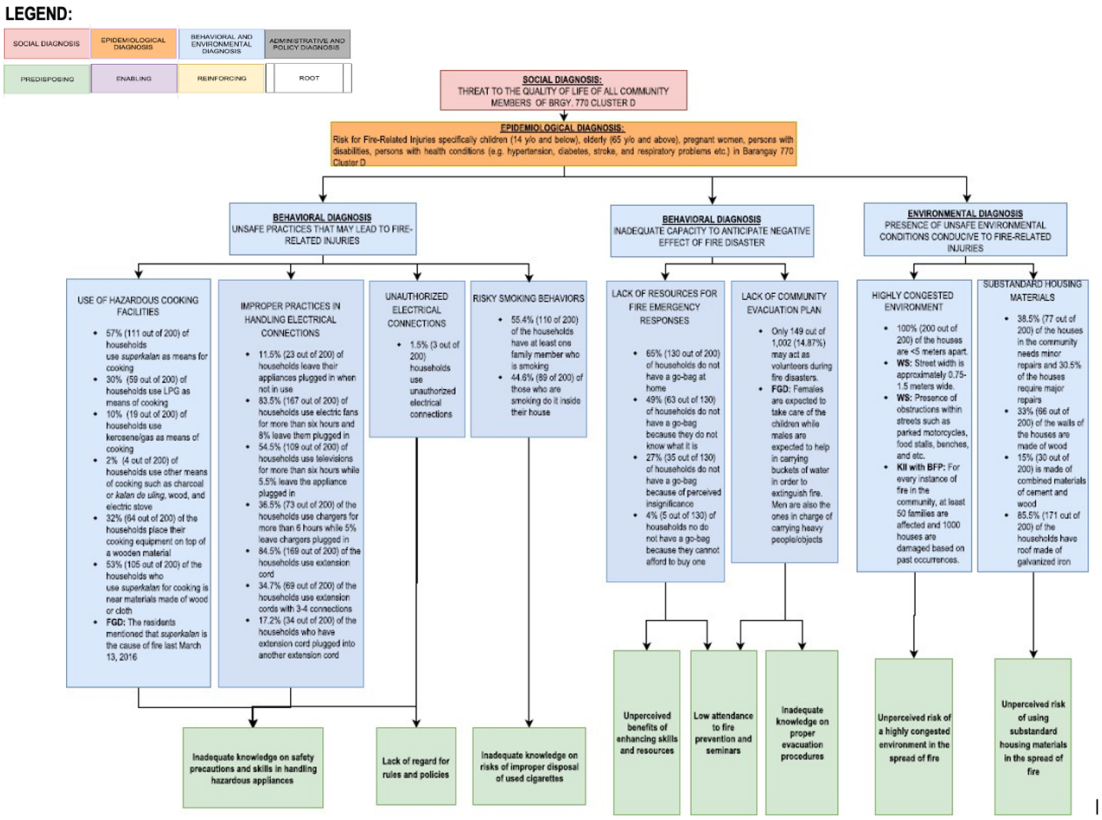

Figure 20. Excerpts from a problem tree regarding fire-related injuries for vulnerable groups (Chainchokers, 2017)

Mechanisms of DRR

According to Vera (2019), there are **seven (7) main mechanisms or ways to reduce disaster risks** (Figure 7):

1. **Mitigate hazards**
2. **Reduce vulnerabilities**
3. **Develop capacities, including improving disaster preparedness**
4. **Develop resource management**
5. **Protect rights**
6. **Minimize exposure**
7. **Transfer the risk**

Figure 7. Mechanisms of DRR (Vera, 2019)

Following, analysis of hazards, vulnerabilities, and risks, Table 7 shows some examples of how DRR mechanisms can be implemented:

Table 7. Examples of Disaster Risk Reduction Measures

DRR Mechanism	Examples
Hazard prevention or removal	Closing down an aging industrial facility that cannot implement safety regulations
Hazard containment or implementation of mitigation strategies	Enforcing strict building regulations in an earthquake-prone zone, increased engineering codes for buildings in coastal areas
Removal/minimizing exposure of at-risk populations from the hazard	Evacuating populations prior to the impact of a typhoon; resettling communities away from flood-prone areas Relocating a chemical depot farther away from a school to reduce the risk that children would be exposed to hazardous materials
Reduction/mitigation of vulnerabilities	Sensors for ventilation systems capable of detecting deviations from normal conditions; sensors to check food, water, currency, and mail for contamination Community health promotion and disease prevention, social protection programs (e.g. 4Ps, Sustainable Livelihood Program), COVID-19 vaccination
Developing/enhancing capacities (including disaster preparedness)	Healthcare coordination across the entire local health system, including local health offices, hospitals, primary health facilities (public and private) Provision of first aid kits, life-saving devices, and hazard monitoring equipment Organizing/mobilizing volunteers for first aid, quick response teams, and rescue Training barangay residents on first aid and basic life support Conducting earthquake and fire drills in workplaces, schools, and community Early warning systems such as using satellite data about an approaching typhoon for public service announcements Providing information concerning measures that the public can take to protect themselves during COVID-19 pandemic Linking with individuals and institutions/organizations for support services and resources
Developing/enhancing resource management	Mangrove forest protection, organic farming, food processing, rainwater catchment at evacuation centers,
Protection of rights	Protection of ancestral lands against large-scale, corporate mining, development projects (e.g. Kaliwa dam)s

At the community level, the minimum **DRR actions** are:

- Hazard, risk, vulnerability, and capacity assessment (and analysis)
- Development of early warning systems
- Contingency planning
- Formation of quick response teams (QRT)
- Mainstreaming DRRM in the local government

In general, nurses collaborate (and sometimes lead) with health teams, other professions, and sectors for DRRM activities.

Deepening Your Understanding

Minimum DRR actions

The Caucus of Development NGO Networks (CODE-NGO), a network of various non-government organizations in the Philippines has developed online learning modules on DRRM through the Humanitarian Leadership Academy (kayaconnect.org).

Accessing these basic modules is free, but make sure you **register** for a user account through this link: https://kayaconnect.org/login/signup.php

You are encouraged to complete the following online modules in the site: https://kayaconnect.org/local/catalogue/index.php?query=BLAST%20DRRM

- BLAST DRRM: Participatory Risk Assessment and Hazard Capacity Vulnerability Assessment
- BLAST DRRM: Community Early Warning Systems
- BLAST DRRM: Community Contingency Planning

BLAST DRRM issues a certificate for every module you finish in the platform

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