



Disaster Risk Reduction Management Plan



1.1 Introduction

Water crises and climate change are Kapatagan Water District's societal and economic risks. Disaster as a whole has the ability to kill people and the service in providing water as well. It is crucial that in the aftermath of a disaster a water supply is operational as soon as possible to minimize the outbreak of diseases that may exacerbate the disaster.

Several earthquakes have been adversely affected water sources and have caused damage to pipelines, reservoirs and pump houses. The recent deluge of disasters in many parts of the world has provoked governments around the world to put in place Disaster Risk Reduction Management Plan. In the Philippines, we have Republic Act No. 10211 or the Philippine Disaster Risk Reduction and Management Act of 2010 which institutionalizes risk reduction and management plans at the local level. Among others, the law mandates the creations of local risk reduction and management office in all provinces, cities, municipalities and barangays which shall be responsible for setting the direction, development, implementation and coordination of disaster risk management programs within their territorial jurisdiction.

Generally, there are two (2) types of disasters that we have to contend with and prepare for to wit:

1) Natural Disasters

Urban Infrastructure is highly vulnerable to natural disasters. Failures of these structures, such as water supply and other pipeline systems will most likely result to major impacts in terms of human lives and economic losses. Natural disasters can be any or combination of the following:

- a) Typhoons
- b) Floods
- c) Heavy monsoon rains
- d) Tsunamis
- e) El Nino phenomenon
- f) Droughts

- g) Biological agents (micro-organisms, insects or vermin infestations)
- h) Earthquakes
- i) Volcanic eruptions
- j) Hurricanes

2) Man-Made Disasters or Human Induced Disasters

Damage to or destruction of water supply facilities by terrorists attacks can disrupt the delivery of vital human services, threaten public health and may even cause loss of lives. Some man-made disasters are:

- a) Acts of war and terrorism
- b) Fires/Conflagration
- c) Explosions
- d) Chemical Spills
- e) Power Failures
- f) Systems Failures
- g) Accidents

Disasters in the operations of the Kapatagan Water District may also occur due to neglect and/or failure of the organization to properly institute and adhere to maintenance procedures.

The concern now is whether Kapatagan Water District can respond to disasters to avert its negative effects on water services due to contamination of water supplies, prolonged discontinuity of service, loss of fire-fighting capability and release of chlorine in the air among others.

1.2. Disaster Risk Reduction Management Plan

When a disaster hits the country, it is not always the national government that acts first. Kapatagan Water District is tasked to come up with a framework for disaster risk reduction and management as well as supervise preparations for, and responses to, natural calamities and human induced disasters. Kapatagan Water District is expected to be at the frontline of emergency measures in the aftermath of disasters to ensure the general welfare of its concessionaires.

Though one must always remember that it is not always possible to completely eliminate a risk, extensive experience and practice in the past have demonstrated that the damage caused by any disaster can be minimized largely by disaster preparedness, response, prevention and mitigation and rehabilitation and recovery.

The Disaster Risk Reduction Management Plan is consistent with the National Disaster Risk reduction Management Plan in which Republic Act 10121 is the enabling law and be implemented by the District's Officers and employees.

The Disaster Risk Reduction Management Plan of the Kapatagan Water District is to be seen as an information guide to the relevant role players. It is a continuing process to be developed and it will always be everybody's business. The workflow and coordination is supposed to ensure and facilitate quick response before, during and after disaster situations.

1.3. Purpose of the Disaster Risk Reduction Management Plan

The Disaster Risk Reduction Management Plan of the Kapatagan Water District aims to ensure the least possible impact on water supply and its public image during and after emergency and disaster situations. It also aims to enhance the capacity of the Kapatagan Water District to prevent and to deal with disaster and to avoid developments which are subject to high risk of disaster.

Specifically, this plan aims to:

- a) Provide policies and procedures to maintain quantity and quality of service even during adverse conditions;
- b) Identify potential disaster situations and the methods for responding to these situations quickly and effectively;
- c) Facilitate decision-making on critical issues in a potentially stressful environment and define responsibilities and roles during a crisis situation;
- d) Establish guidelines in addressing public relations and communications issues that may potentially arise from disaster, dealing with the media and communicating with the concessionaires;
- e) Protect employees and concessionaires, both minimizing injury and maintaining their security and integrity;
- f) Protect the properties of the Kapatagan Water District; and
- g) Protect the public image of the Kapatagan Water District and restore when necessary, after a disaster.

This Plan is also in accordance with the NDRRMP in which the four (4) distinct yet mutually reinforcing priority areas are to be achieved namely:

- a) Disaster Prevention and Mitigation
- b) Disaster Preparedness;
- c) Disaster Response; and
- d) Disaster Recovery and Rehabilitation.

Each priority area has its own long term goal, which when put together will lead to the attainment of the District and the country's over- all goal and vision in DRRM. It is crucial to have an effective and efficient Disaster Risk Management Plan in order to save lives, properties and prevent escalation of emergencies and incidents and relieve suffering.

1.4. Phases of Disaster Risk Management

The Disaster Risk reduction Management Plan involves the following phases:

1) Disaster Prevention and Mitigation - Measures taken in advance of a hazard impact aimed at reducing its impact on society and environment. The activities include are:

- a. Hazard/risk identification and assessment - develop, update and disseminate hazard maps and related information to decision makers, general public and communities at risk.
- b. Enforcement of zoning, land-use and building and fire codes.
- c. Integrating/mainstreaming disaster risk management
- d. Developing early warning systems that are people-centered timely and understandable to those at risk

2) Disaster Preparedness - measures undertaken to prepare people to react appropriately during and following such emergencies. It involves the following activities:

Planning - disaster management plans, contingency plans, SOPs etc,

Advocacy - information dissemination through mass media, enhancing people's awareness through the conduct of disaster management fora/briefing, observance of disaster consciousness month, etc.

Education and training of officers, employees, deputized coordinators, KAPWDDRRMT, volunteers. The conduct of drills and exercises, community based disaster risk management trainings.

Resources – The 5Ms which are manpower, materials, methods, machines and money.

3) Disaster Response – undertaken immediately following the emergency. Such measures are directed towards saving life, property, and dealing with the immediate damage caused by the disaster. Below are the activities associated with response:

- a. Early warning – timely and rapid dissemination of warnings to threatened communities/population
- b. Notification – mobilization and activation of response team
- c. The “Golden Hour” Principle – the time within which most lives could be saved and injuries minimized
- d. Incident Command System – on scene management of disaster operation activities.

4) Disaster Recovery and Rehabilitation – includes measures undertaken to restore affected communities/areas to their proper or normal level of functioning and development with reduced vulnerability and increased sustainability. This can be categorized into:

- 1) Short Term – restoring necessary lifeline systems (i.e. power, communications, water and sewerage, transportation, etc.) providing for basic human needs (food, clothing and shelter) and monitoring law and order
- 2) Long Term – restoring economic activity and development, rebuilding community facilities and housing, healing, repair and reconstruction in a way that is less vulnerable to future hazard impacts.
- c) The Cluster Approach – which is in line with the United Nations Humanitarian Reform Agenda in pursuing a reform program that seeks to improve the effectiveness of humanitarian response by ensuring greater predictability, accountability, and partnership.

1.5. Acronyms and Abbreviations

KAPWD	Kapatagan Water District
KAPWDDRRMP	Kapatagan Water District-Disaster Risk Reduction Management Plan
KAPWDDRRMT	Kapatagan Water District-Disaster Risk Reduction Management Team
BDRRMC	Barangay Disaster Risk Reduction Management Council
CCA	Climate Change Adaptation
CCC	Climate Change Commission
CDRRMC	City Disaster Risk Reduction Management Council
CHED	Commission on Higher Education
DA	Department of Agriculture

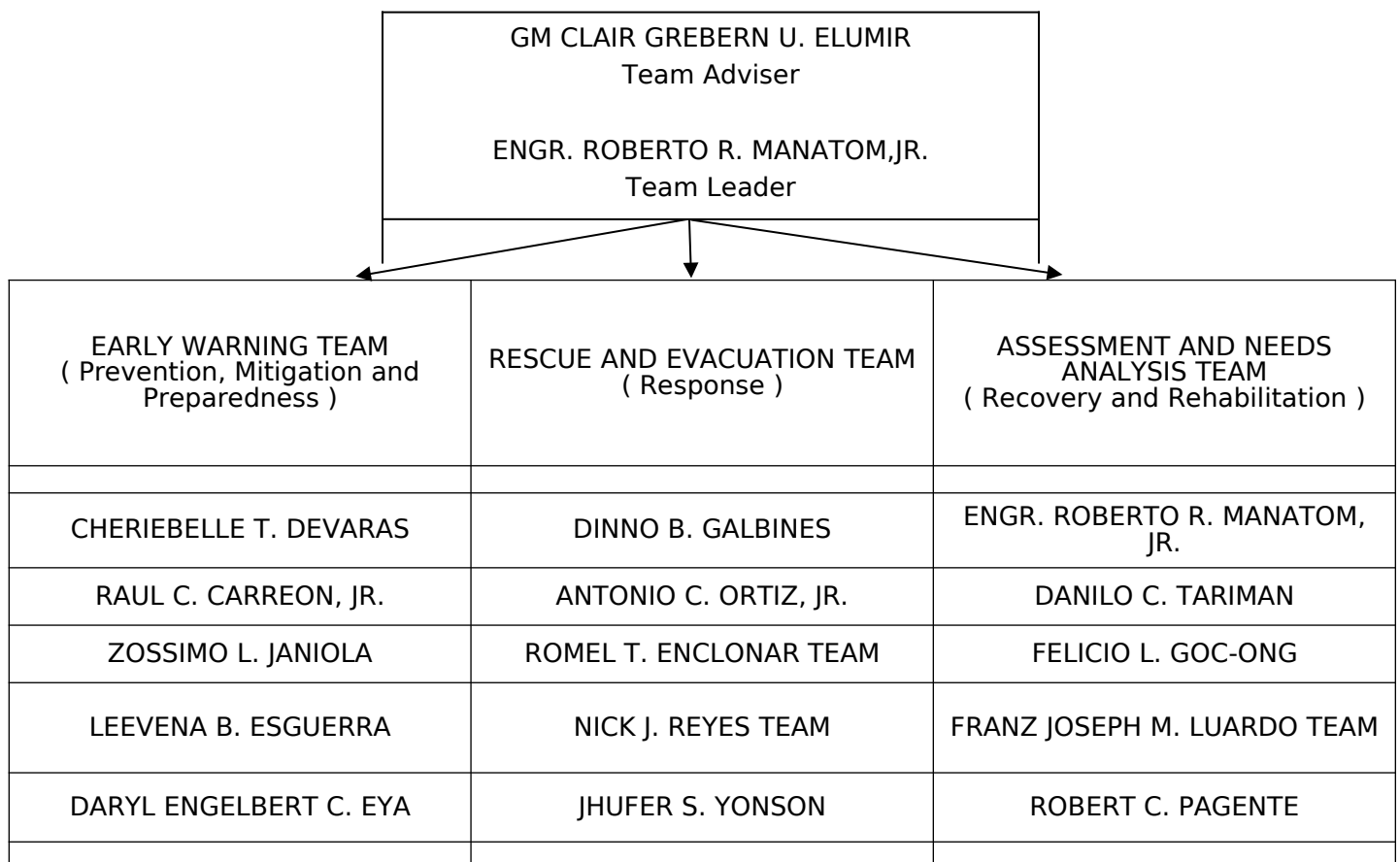
DAR	Department of Agrarian reform
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DILG	Department of Interior and Local Government
DOE	Department of Energy
DOH	Department of Health
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DRR	Disaster Risk reduction
DRRMP	Disaster Risk Reduction Management Plan
DSWD	Department of Social Welfare and Development
IEC	Information, Education and Communication
LGU	Local Government Unit
LWUA	Local Water Utilities Administration
MDG	Millenium Development Goals
NDRRMC	National Disaster Reduction Management Council
NEDA	National Economic and Development Authority
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAR	Philippine Area of Responsibility
PDP	Philippine Development Plan
PDRRMC	Provincial Disaster Risk Reduction Management Council

Chapter II

2.1. Kapatagan Water District - Disaster Risk Reduction Management Team (KAPWD DRRMT) Structure

The Kapatagan Water District Disaster Reduction Risk Management Team (KAPWDDRRMT) is a working team of officers and employees of the Kapatagan Water District established pursuant to Republic Act No. 10121 series of 2009. It is led by the General Manager of KAPWD. The Team is responsible for ensuring the protection and welfare of the KAPWD concessionaires and its employees, people and the community during disasters or emergencies.

KAPWDDRRMT STRUCTURE



2.2. Composition of the KAPWDDRRMT

The KAPWDDRRMT is a working team of the KAPWD in charge of planning, organizing and guiding the use of human, materials and financial resources and implementation of the four distinct yet mutually reinforcing priority areas, namely: (a) Disaster Prevention and Mitigation;

(b) Disaster Preparedness; (c) Disaster Response; and (d) Disaster Recovery and Rehabilitation. Each priority area has its own long term goal, which when put together will lead to attainment of KAPWD's over-all vision/goal in DRRMP.

These priority areas are not autonomous from the other nor do they have clear start and end points. The 4 priority areas are not seen as mere cycle which starts in prevention and mitigation and ends in rehabilitation and recovery. They are:

- a) Mutually reinforce to each other and are interoperable;
- b) Do not, Should not, and Cannot stand alone;
- c) Has no clear starting or ending points between each of the aspects and overlaps are to be expected;
- d) Are problem needs and asset strengths centered; and
- e) All point to one direction which is to reduce people's vulnerabilities and increasing their capabilities.

Team	Responsibility
Team Adviser	<ol style="list-style-type: none"> 1. Establishes policy guidelines and set priorities in the allocations of resources and facilities; 2. Direct and coordinate all the KAPWDDRRM teams of the KAPWD; 3. Direct and monitors all Emergency activities; 4. Assigns personnel as needed; 5. Advises the team leader to closely monitor information/Advisory given by warning agencies; and 6. Announces the suspension of offices on the basis of advisories given by warning agencies;
Team leader	<ol style="list-style-type: none"> 1. Reports to the GM all the activities of the KAPWDDRRMT; 2. Overseas the activities all teams; 3. Coordinate with LDRRMC and other warning agencies of the plans of actions of the KAPWDDRRMT when Ever crisis occurs; 4. Monitor the probable consequences of potential, on-going and past disaster;

	<p>5. Coordinate pre-defined and post disaster operational activities being undertaken by the KAPWDDRRMT;</p> <p>6. Notifies and updates the GM on the status of water quality, productions and distribution immediately before, during and after the disasters;</p> <p>7. Determines the resumption of normal operation can begin;</p> <p>8. Assesses the conditions of structural, electrical, and mechanical components of all facilities of KAPWD including but not limited to the pump stations, transmissions and distribution lines and reservoirs;</p> <p>9. Does related work as may be assigned by the GM.</p>
<p>Early Warning Team (Prevention, Mitigation and Preparedness)</p>	<p>1. Provide warning in close coordination with warning agencies and through all available means to the service areas, concessionaires and employees and providing a clear understanding of what to expect and advises on appropriate precautionary measures to be undertaken;</p> <p>2. Alert the KAPWDDRRMT and closely monitor the conduct of disaster response operations, mobilizing additional resources available as may be needed in the field;</p> <p>3. Maintain and update database of relevant baseline information (Pump Stations);</p> <p>4. Documents all past disaster situations to include a review of the pre-post disaster activities undertaken by all key actors, and maintain a database of these documents;</p> <p>5. Determine courses of actions to be taken based on the recommendation of the Team Leader;</p> <p>6. Coordinates with the Rescue and Evacuation Team of the operations being undertaken and those to be implemented;</p>
<p>Rescue and Evacuation Team (Disaster Responses)</p>	<p>1. Ensure availability of personnel and materials and maintain a current list of personnel locations;</p> <p>2. in the event of evacuation account all personnel and immediately inform the KAPWDDRRMT of any missing personnel;</p> <p>3. facilitates flow of information to offices and employees;</p> <p>4. Coordinate the administrations of First Aid including the identification and disposition of People receiving such care.</p> <p>5. Ensure availability of in-house and rental vehicles and machinery for quick mobilization;</p> <p>7. Determine the safest route out of an emergency area and ensure security of people and property;</p> <p>8. Assist the Police in determining the disasters and the situations;</p> <p>9. In case of fire, assign a sub-group to the fire scene and coordinate with the BFP to prevent looting and looters;</p>

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| | <p>10. Systematically store properties brought to the evacuation area and safeguard their release to their respective owners;</p> <p>11. maintains a guarding system for personnel, materials and other Installations;</p> <p>12. make an inventory of the returned documents, equipment, and supplies and submit a report of losses/damaged to the Team Leader and who shall submit the same to the GM;</p> <p>13. Maintain an adequate sanitation and hygienic standards and deal with matters related to emergency services;</p> <p>14. Monitor the storage of medicines, goods, food, drinking water, equipment, machineries and other supplies;</p> <p>15. Do related work as the need arises;</p> <p>16. Organize and supervise the evacuation, search and rescue, fire suppression; and rehabilitation;</p> <p>17. Determine courses of action to be taken based on the recommendations of the Team Leader of the GM;</p> <p>18. Systematically evacuate personnel, properties and records during emergency situations;</p> <p>19. Upon receipt of information from the Early Warning Team, the Team shall immediately establish an evacuation in the ff order of priority: occupants of the building especially the injured; cash; valuable documents and records; personal belongings of personnel; office equipment and other movable facilities;</p> <p>20. Locate/remove injured or trapped persons in the area;</p> <p>21. Obtain appropriate equipment for search and rescue operations;</p> <p>22. Coordinate with CDRRMC and other response agencies on matters relative to search and rescue operations;</p> |
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<p>Damage assessment and needs analysis Team (Disaster Recovery and Rehabilitation.</p>	<ol style="list-style-type: none"> 1. Evaluate crisis situations and determine courses of actions to be followed, formulate guideline in assessing the situation; 2. Assess information and advice the Team Leader of KAPWDDRRMT on possible measures to be undertaken in order to lessen the impact of the crisis; 3. Submit recommendation for allocation of needed resource; 4. Coordinate the plans and actions of the KAPWDDRRMT with the proper authorities; 5. Monitor the problem consequences of potential, on-going and past disasters or emergency situations around the country in close coordinate with other water districts; 6. Coordinate pre-defined and post disaster operational activities being undertaken by relevant agencies and ensure that all key actor are taken on board; 7. Initiate and lead the conduct of damage and needs assessment mission as the post disaster situation warrant; 8. Facilitate the conduct of debriefing of past disaster situation to look into areas of strength and areas for improvement; 9. allocate working stations of all teams; 10. Conduct monitoring and damage assessment of KAPWD properties and reports the same to the Team Leader as to the GM; 11. Validate report and determine damage for budget allocation; 12. Repair and rehabilitate damage structures; 13. Recommend appropriate intervention for damage structures;
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2.3. Functions of the KAPWDDRRMT

The role of Kapatagan Water District Disaster Risk Reduction Management Team is to conceptualize the promotion of hazard/disaster awareness, to manage impacts, and to help all employees and the community to reduce the risk of threats from natural and human-made/induced disasters.

The Disaster Risk Reduction Management Plan of the Kapatagan Water District provides procedures pursuant to Republic Act 10121 otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010. This Manual serves as the guide of the KAPWDDRRMT not just from the disaster preparedness and response but on how to manage and reduce risk. The adopted 4-phase strategy: prevention and mitigation, preparedness, response and recovery and rehabilitation illustrate the basic procedures that the KAPWDDRRMT will employ before, during and after the occurrence of a disaster.

The ultimate goal of this Manual is to protect the lives of the officers and employees of the District, the properties of the District, to ensure the uninterrupted or continuous water supply and services, and the immediate restoration of water supply after a disaster.

The officers and members of the KAPWDDRRMT must:

- 1) Analyze the condition of the District and its water system or conduct situational Analysis;
- 2) Identify possible hazards/threats faced by the District;
- 3) Follow and strictly act according to the KAPWDDRRMP especially in times of emergencies, calamity/disaster;
- 4) Provide feedback to the General Manager and the Board of Directors for policy formulation;
- 5) Request the officers of the KAPWD, LDRRMC, NGOs, GAs, LWUA and Water Districts for any assistance.

To effectively achieve the expected response in times of emergency and calamity, KAPWD Officers and employees and KAPWDDRRMT must take time to understand the contents of this

Manual, practice and internalize the risk reduction measures to eventually make a habit of being prepared before, during and after calamity, be it natural or human-made/induced hazard.

2.4. Designated Emergency Areas

In order to respond in a coordinated fashion to an emergency or disaster, the Conference Room beside the Office of the General Manager is designated as Command Post. It shall be the meeting place of the KAPWDDRRMT and all other personnel as may be called upon by the Team Adviser or the GM and KAPWDDRRMT Team Leader during an emergency situation. The KAPWDDRRMT command post shall be at the control and disposal of the KAPWDDRRMT Adviser and Team Leader.

In disasters where there is a need to evacuate employees and concessionaires outside the KAPWD Building, the assembly area shall be at the open parking area.

Chapter III- Natural Hazards

The Philippine Islands are prone to all kinds of natural hazards because of their geographical location and physical environment. The country is strategically located in the path of turbulent and destructive cyclones in the Pacific, and the “Ring of Fire”. This situation has adverse effects, not only on the lives and properties of the Filipino people, but also on the economy of the nation, as hazard impacts may result in widespread environmental and property damages.

Natural hazards may cause danger to people, to the District’s concessionaires, its system and properties and may lead to disaster if they are not mitigated against and prepared for. Phenomena that are atmospheric, hydrometeorological or oceanographic and geographical in nature may cause the loss of life or injury, property damage, social and economic disruption and/or environmental degradation. Hydrometeorological and geographical hazards can be single, sequential or a combination in origin and effects. The common hazards associated with these are heavy rains, strong winds, and storm surge, floods and landslides/mudslide and mud flow.

Geological hazards are normal and their processes occur as irregular events with direct interaction with the environment. They are capable of causing significant negative impact on human well-being. Their non-rhythmic occurrence makes their predictability difficult. An important characteristic of many geological hazards is their prime land preference – the characteristic of preferentially occupying areas targeted by man for his use. Almost all types of geological hazards occur in the Philippines except hazards associated with glaciers and seasonal snowfall. Hazards arising from volcanic eruptions, earthquakes and other related geotectonic phenomena such as landslide, tsunami and faulting are the most mitigated ones due to the frequency of their occurrence.

The natural hazards are further categorized in this Manual as water supply service crisis. The water supply service crisis may potentially and directly affect the water system and consequently the continuous provision of water supply.

The following are the natural hazards that may be further categorized as water supply service crisis, their effects on the water supply system of the KAPWD and the adopted 4-phase strategy of this Manual.

Natural Hazard	Description	Effects on KAPWD	Prevention Mitigation & Preparedness (what to do before?)	Response (what to do during?)	Recovery & Rehabilitation on (what to do after?)
1. Earthquake	It is the shaking of the ground caused by the sudden slippage of rock masses below or at the surface of the earth. An earthquake may be tectonic or volcanic. A very severe earthquake is usually associated with shocks. Foreshocks are a series of tremors that occur before the main earthquake while aftershocks are weaker earthquakes and can cause further damage to weaken buildings.	<ol style="list-style-type: none"> 1. Total or partial destruction of water sources, transmission and distribution lines, chlorinator houses, reservoirs, storage and office building. 2. Interruption of electric power, communication lines and access routes. 3. Deterioration of the water quality at the source due to landslide and other phenomena. 4. Loss or reduction in production from ground water sources. 	<ol style="list-style-type: none"> 1. Evaluate the structural soundness of the office building pump houses, water sources, transmission and distribution lines, reservoir and storage. 2. Familiarize officers & employees with the easiest exit or evacuation route to take. 3. Develop evacuation plan and hang/post it in the office building and pump houses. 4. Teach employee how to use the fire extinguishers, first aid kits, alarm and exits. 5. Prepare and maintain survival kits in the office and in pump stations. 6. Request assistance from the BFP for the conduct of orientation and earthquake drill. 	<ol style="list-style-type: none"> 1. Advise employees to stay in a sound building or place. 2. Perform the (Drop, Cover from the floor, cover your head & hold on to solid object) 3. When inside a vehicle, pull at the side of the road and stop. 4. Stay away from power lines, walls or posts & other structures that may fall or collapse. 5. Stay away from buildings with large away from steep escarpments which may be affected by landslide. 	<ol style="list-style-type: none"> 1. Get out calmly and in orderly manner from the building. 2. Check themselves for cuts and injuries. 3. Check the surroundings of the office building & pump houses. 3. Inspect all the power lines, 4. Inspect all the transmission & distribution lines, water sources and reservoirs. 5. Clean the building, pump stations and reservoirs, check if there is any spill of chemical. 6. Report to the Team Leader or to the GM the status of the office building & the whole system. 7. Help to reduce the number of casualties.
2. Volcanic Eruptions	1. It is process wherein volcanic materials such	1. Total destruction of the		1. Stay alert and awake.	1. Clear the office building,

	<p>as molten or hot fragmented rocks or gaseous materials are ejected from a volcano.</p> <p>2. The volume and magnitude of the eruption varies depending on the quantity of gases, the viscosity of the magma and the permeability of the ducts and chimneys of the volcano.</p>	<p>infrastructure in the areas directly affected by pyro lasting flow and surges.</p> <p>2. Obstruction caused by ash infiltrating surface water intake screens, transmission pipes, filters etc.</p> <p>3. Deterioration of water quality due to contamination of rivers, streams and springs in lahar deposition areas.</p>	<ol style="list-style-type: none"> 1. Close windows and doors of the office building & pump houses to reduce entry of ash if heavy ash fall is expected to hit the community. 2. Bring tools, machineries, equipment, vehicles & other supplies & materials into closed shelters. 3. Develop evacuation plans and conduct evacuation drills. 4. Avoid low place or areas vulnerable to mud flows, lava etc. 5. The Early Warning Team should spread the information coming from the warning agencies. 6. Always have a copy of hotline number and post it inside the office building & pump house. 	<ol style="list-style-type: none"> 2. Follow instructions that go with the warnings. 3. Give priority for evacuation outside the area of ash shower to employees with breathing problems. 4. Cover the nose with wet cloth. 5. Wear goggles and eye glasses. 6. Avoid driving in heavy ash falls unless absolutely required. 	<p>pump stations, reservoirs, canals & pathways of ash & other debris.</p> <ol style="list-style-type: none"> 2. Hose down the accumulated ash in the plant leaves and roofs of the office building & pump stations. 3. Stay away from slide area. 4. Check for injured or trapped persons near the slide areas without entering the slide areas. 5. Direct the rescuers to their locations. 6. Listen to radio or television for latest information. 7. Watch out for flooding which may occur after a landslide or debris flow. 8. Report broken transmission & distribution lines or even power lines and suspected damaged of the office building pump house or reservoir to the Team Leader and to the GM. 9. Stay indoors until local health officials advise that it is safe to stay outside.
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					10. Assess the damage of properties and analyze the needs of the KAPWD employees, concessionaires and the whole system.
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Landslides	<p>1. It is a massive outward & downwards of movement slop-forming materials.</p> <p>2. These masses may range in size up to entire mountainside. Their movements may vary in velocity.</p> <p>3. A landslide is initiated when a section of a hill slope or sloping section of a sea bed is rendered too weak to support its own weight.</p> <p>4. This is generally triggered by other natural hazards such as prolonged, heavy</p>	<p>1. Change in the physical or chemical characteristics of intake water which will affect treatment.</p> <p>2. Total or partial destruction of the facilities, particularly intake and transmission components in the path of active landslide.</p> <p>3. Contamination of the water at surface intakes located in the mountain areas.</p>	<p>1. Maintain the list contact numbers for emergency situations.</p> <p>2. Prepare evacuation of tools, machineries, equipment and vehicles upon the direction of warning agencies.</p> <p>3. Continue planting seeding to cover slopes.</p> <p>4. Build riprap to prevent soil erosion at the p Pump houses and water sources.</p> <p>5. Reinforce the foundation surrounding the water sources and pump houses.</p>	<p>1. Evacuate the tools, equipment, machineries and vehicles if warned of an impending landslide.</p> <p>2. Advise the technical staff to stay away from the path of the landslide debris or seek refuge behind a sturdy tree or boulder.</p> <p>3. Get out from the pump stations as soon as possible when rumbling sounds are head from upstream or the trembling of the ground is felt indicating a possible mudflow.</p> <p>4. Run across the slopes not downward.</p>	<p>Recommend to proper authorities to examine thoroughly the damaged structures and facilities before re-occupying and reutilizing</p> <p>2. Stay away from landslide area. There may be danger of additional landslide.</p> <p>3. Check with caution the injured or trapped persons within the landslide area.</p> <p>4. Direct rescuers to the locations.</p> <p>5. Listen to radio and television for information and warnings.</p>
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<p>4. floods</p>	<p>rainfall or by other sources of water which increase the water content of the slope materials. Landslide as a geological hazard is caused by earthquake or volcanic eruption. building constructions.</p> <p>1.It is the result of excessive rainfall, unusually high sea level, or the rupture of dams and dikes.</p> <p>2.Increasingly, floods result from human activities causing environmental degradation, and in appropriate land use.</p> <p>3.On the other hand, some floods are the result of the changes in geomorphology and climatology of water catchment areas.</p> <p>4.Rainfall intensity and duration are also factors that contributory to flood.</p>	<p>1. Damage to pump stations close to flooding water ways.</p> <p>2. Rupture of exposed pipes across and along rivers and streams.</p> <p>3. Contamination in water catchment areas.</p> <p>4. Power cuts, road blockages, and disruption of communications.</p>	<p>6. Conduct regular drills on evacuation procedures.</p> <p>7. Recommend d to proper authorities to enforce land use regulation geared at mitigating landslides.</p> <p>8. Promote public awareness & involvement on landslide mitigation.</p> <p>1. Find out the occurrence of flood in all the pump stations, reservoirs, water sources and office building.</p> <p>2. Know the flood warning system of the KAPWD & the City.</p> <p>3. Research from previous occurrences how fast the flood occurrences occur and how high it rises.</p> <p>4. Announce to the public to fill their drums with water.</p> <p>5. Watch out for rapidly rising water & notify Pump operators and employees for evacuation.</p>	<p>1. Always update employees especially at the field</p> <p>2. Keep updated though radio or news</p> <p>3. Remind pump operators to utilize gen set if it is possible.</p> <p>4. Warn the pump operators of snakes and falling debris around the pump stations.</p> <p>5. All technical must be on duty.</p> <p>6. Evacuate the office building & pump stations if the situation gets worse.</p>	<p>6. Seek the advice of a geotechnical expert for evaluating landslide hazard or designing corrective techniques to reduce landslide risk.</p> <p>1. Report busted transmission & distribution lines to the Team leader and to the GM.</p> <p>2. Ensure that electrical lines of the pumping equipment, are checked properly before switching.</p> <p>3. Avoid affected areas.</p> <p>4. Continue listening to radios & other updates.</p> <p>5. Stay away from the pump stations that are flooded.</p> <p>6. Construct barriers or ripraps to stop flood from entering water sources & pump stations.</p>
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<p>5. Extreme Climatic Variabilities (I,e. El Nino, La Nina, Heat Waves, Droughts, etc.</p>	<p>5.Floods can be show or fast rising, but generally develop over a period of hours or days.</p> <p>1.Climate Change is the direct impact of global warning.</p> <p>2.Rising temperatures will cause changes to weather pattern.</p> <p>3.As global warning occurs, most places will be warmer.</p> <p>4.This will cause changes in the amount and pattern of rain &</p>	<p>During drought or El Nino:</p> <p>1. Loss or reduction of surface & ground water sources and deterioration of water quality.</p> <p>2. A decline in water level at intake points & in storage facilities.</p> <p>3. Compulsory rationing of water supply.</p>	<p>6. Have a handy survival kit.</p> <p>7. Offer services & perform the assigned tasks in the event that the office building & pump stations are designated as evacuation areas.</p> <p>8. Always be updated and inform technical staff detailed at the field.</p> <p>9. Protect the KAPWD properties.</p> <p>10. Check up the gen set, fuels and extra fuels.</p> <p>11. If possible all gen sets must be operational with a least 2 or more operation.</p> <p>12. Keep documents and other valuables in a safe deposit box in a safe place.</p> <p>1. Climate change issues.</p> <p>2. Give warnings on the effect of climate change.</p> <p>3. Update the employees on the Emergency Response Plan of the KAPWD.</p>	<p>1. Plan changes in the daily activities of the KAPWD especially in the field.</p> <p>2. Announce to the public or to the concessionaires of water rationing.</p> <p>3. Warn the public to save water and fill their drums</p> <p>4. Operators must be on duty 24 hours in a shifting mode.</p>	<p>7. Check any damage of the system and repair if any immediately to avoid water interruptions.</p> <p>8. Continue checking the potability of the water.</p> <p>9. Check the service areas if all concessionaires have water supply immediately after the flooding.</p> <p>During drought:</p> <p>1. Assess the affected areas, document for future references.</p> <p>2. Provide assistance to those who were severely affected.</p> <p>3. Bring employees or victims of heat at the clinic or hospital.</p>
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	<p>snow, in the length of growing seasons, in the frequency and severity of storms and in sea level rises.</p> <p>5.Droughts are prolonged dry periods during climatic cycles caused by a complex set of hydro meteorological elements that affect the atmosphere.</p> <p>1.La Nina is characterized by unusually cold temperatures in the equatorial pacific as compared to El Nino which is characterized by unusually warm ocean temperatures in the Equatorial pacific.</p> <p>2.The system oscillates between warm (El Nino) to neutral, or cold (La Nina) conditions with an average of 3-4 years.</p>	<p>During La Nina:</p> <ol style="list-style-type: none"> 1. Rupture of exposed pipes across and along rivers and streams. 2. Contamination in water catchment areas. 3. Power cuts, road blockages, and disruption of communications. 	<ol style="list-style-type: none"> 1. Advocate for the recycle/reuse of everyday materials to help conserve resources, lead to less energy & less elements used in manufacturing them while recycling papers lead to less trees being cut down. 2. Save energy by saving electricity through the use of energy efficient lightning and appliance, biking/walking. 3. Advocate the use of renewable energy such as those from hydro-electric dams, wind, power, solar & other radiation & bio fuels. 4. Continue the tree annual tree planting activity of the KAPWD. 	<ol style="list-style-type: none"> 5. Utilize all the water sources including stand by. 6. Continue monitoring water level of all sources. 7. Continue monitoring the water quality 	<p>During La Nina:</p> <ol style="list-style-type: none"> 1. Assess damage. 2. Repair all busted pipes immediately. 3. Monitor supply of water. 4. Monitor the water quality 5. Continue dissemination on climate change and the role of everyone in mitigating and preventing the occurrence of climate change. 6. Update every now and then the Emergency Response Plan and this Manual.
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<p>6 Hurricanes/Severe Storms/Typhoons.</p>	<p>1. Depending on speeds, these natural hazards are called tropical depressions (winds up to 63km/hr accompanied by changes in atmospheric pressure); tropical storms (winds between 64 & 119 km/hr accompanied by intense rainfall or hurricanes (wind speeds of 120km/hr or higher accompanied by heavy rainfall & significant changes in atmospheric pressure)</p>	<p>1. Partial or total damage to facilities, pump stations, command posts & building broken windows, damaged roofs & door, and flooding.</p> <p>2. Rupture of mains & pipes in exposed areas such as river and streams.</p> <p>3. Rupture of disjuncting of pipes due to landslides and water torrents.</p> <p>4. Rupture and damage to tanks & reservoirs.</p> <p>5. Damage to electrical transmission lines & distribution system.</p>	<p>5. Conserve water & other natural resources.</p> <p>6. Be environment friendly.</p> <p>1. Establish & maintain coordination with all the members of the KAPWDDRRM T & the GM.</p> <p>2. Ensure that the office building, pump station & electrical posts can stand heavy rain & strong winds.</p> <p>3. Learn about typhoons & other weather disturbance their signs & warnings, effect & how to protect the employees, records, facilities & the whole system.</p> <p>4. Educate all employees especially those at the field on natural hazards.</p> <p>5. Participate actively in disaster response-drill or simulation.</p> <p>6. Update this Manual for</p>	<p>1. Monitor through radio or other information sources the latest update on the typhoon.</p> <p>2. Coordinate with the KAPWDDRRMT & the GM on possible immediate evacuation of employees, records, tools, machineries & equipment.</p> <p>3. Advise technical staff to get supply away from immediately structures, trees, electrical posts, power lines or telephone lines if out in the open.</p> <p>4. Advise the technical staff at the field to watch out fallen debris.</p>	<p>1. Check the office building, reservoirs, transmission & distribution lines & power lines for any damage.</p> <p>2. Assess the damage and immediately repair or purchase to avoid inconvenience to the concessionaires & employees.</p> <p>3. Restore water</p> <p>4. Coordinate with the Brgy. Officials and City Officials if necessary.</p> <p>5. Remind employees stationed at the field to continually observe safety measure in inspecting the whole system and in putting back the supply of water into normal condition.</p> <p>6. Continue listening to</p>
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			<p>the employees & the whole community.</p> <p>7. Inspect all the properties & systems of the KAPWD to ensure the protection.</p> <p>8. Secure megaphone as alternative alarm system.</p> <p>9. Listen to radio & TV for information & updates.</p> <p>10. Store flashlights & back up batteries to receive warnings.</p> <p>11. Recommend trimming and removal of dead or rotting trees that could fall and may cause damage or injury.</p> <p>12. Secure outdoor objects that could be blown away & cause damage.</p>		<p>local radio for update and further warnings.</p> <p>7. Coordinate with proper authorities for assistance.</p>
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Chapter IV- Human Induced Hazards

Human made or induced hazards are threats having elements of human intent, negligence, error and involving a failure of a system. Human induced disasters are a result of inadequately managed human induced hazards such as Technological Hazards, Environmental Hazards and Socio, Economic, Political, Security Hazards.

Technological hazards have little or no warning to precede the incident. These dangers originate from industrial accidents, dangerous procedures, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Some of the technological hazards which are discussed in this Manual are structure collapse, fire, vehicular related accidents, chemical spill, electrical black out/massive power failure, food poisoning and system failure.

Environmental hazards are events that pose a threat from the surrounding environment encompassing the broad spectrum of acute and chronic effects of industrial, agricultural and naturally occurring microorganisms, chemicals and radiation in our soil, water, air, food and wastes. Some environmental hazards included in this Manual are red tide and water pollution.

Socio-economic, political, security hazards are caused by criminal and human violence which pose threat to the security of a great number of people, and may be motivated by political or economic reasons. Some of these are robbery, bomb threats/explosion, kidnapping threats, civil disorder, work stoppage, theft, terrorists attack/sabotage, and suicide/death within the premises, misinformation and scandal.

In this Manual these human induced hazards are categorized as Non-Water Supply Service Hazards/Disaster. These will not only affect the provision of water supply but will potentially harm or distort the public image of the Kapatagan Water District and the goodwill that it has established, or put to risk the health and life of its employees and concessionaires.

