“Our Church helps in times of Disaster”

Facilitator Activity Manual







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Government blong Vanuatu National Disaster Management Office and Red Cross Vanuatu and Red Cross Australia

Download copies of this Manual from the NAB website: http://www.nab.vu/document-search

Symbols used in this Manual mean:

Time: Recommended time needed to complete an Acticity. The actual time needed will depend on the Facilitator and participants.

Discussion: A discussion activity where all participants should input and talk.

Presentation: Information that needs to be presented by the Facilitator.

Reading: An activity that requires participants to read and study.

Overview

This Manual is written for community leaders to facilitate Disaster Management training activities for Christian Church leaders and groups in Vanuatu. It gives a series of Disaster Management learning activities and is supported by a 'Participants Manual' that can be given to participants (in Bislama).

Purpose of Disaster Management Training for Churches

Ni-Vanuatu communities are vulnerable to a range of disasters (for example, earthquake, cyclone, tsunami, volcano). Ni-Vanuatu communities should be prepared for these disasters to save lives during and after a disaster. Christian Churches in Vanuatu are a strong network that can help all people (not just their own members) before, during and after a disaster. Our Churches are in every island and every community and are often used as safe places during disasters. Church leaders are highly trusted and an important source of information for communities. The purpose of this Disaster Management Training is to make sure our Churches are active in Disaster Management. They need to be prepared to survive and help everyone in their communities rebuild after disasters.

Time Needed to Complete Training

The activities in this Manual will train Church leaders to work with their community to prepare and respond to natural disasters. It uses a 'train the trainer' model. Participants will need to complete work in their communities after the training to become prepared for a disaster.

Each Topic in this training takes 30 minutes. Activities should be run as part of a full training program that will take up to two days. Some activities may take more or less time depending on the participants, group size and Facilitator. You can change the order of topics and activities to suit participants.

If participants complete *all* Topics they can be given a Certificate of Participation (at end of this Manual).

An example workshop plan is here:

DAY 1

Time	Topic	*Activities*
8.00 AM	*Arrivals*	
8.30 – 10.00 AM	Introductions and registration	*Race for truth <15 mins >* *Sharing stories <15 mins >*
	Topic 1: What is a Disaster Hazard?	*Hazard poster <30 mins >*
	Topic 2: What is the role of the Church in Disaster Management?	*Bible study discussion <15 mins >* *Salad bowl of strengths <15 mins >*
10.00 -10.30 AM	*Morning Break*	
	Topic 3: What are the roles of others in Disaster Management?	*Role Play < 30 mins >*
	Topic 4: How do we know when a Hazard is coming?	*Hazard Warning Signs* *< 30 mins >*
	Topic 5: How to Identify Disaster Risks?	*Risk Walk OR Risk Map* *< 30 mins >*
12.00 – 1.30 PM	*Lunch Break*	
1.30 – 3.00 PM	Topic 6: How to make a Disaster Response Plan?	*Disaster Plan Study < 30 mins >*
	Topic 7: How can the Church be a 'Safe Place' in a disaster?	*Safe Place Checklist Puzzle* *< 30 mins >*
	Topic 8: What should be in a Disaster Basket?	*Disaster Basket Ball < 30 mins >*
3.00 – 3.30 PM	*Afternoon Break*	
3.30 – 4.30 PM	Topic 9: How to fix up your community after a disaster?	*Community Knot < 30 mins >*
	Topic 10: How to stop disease after a disaster?	*Staying Healthy Cards < 30 mins >*
4.30 PM	*End of day*	

DAY 2

Time	Topic	*Activity*
8.00 AM	*Arrivals and roll call*	
8.30 – 10.00 AM	Topic 11: How to get help after a disaster, if it is needed?	*First Community Assessment Form < 30 mins >*
	Topic 12: How to give out Disaster Supplies?	*Practice Distribution < 30 mins >*
	Prepare learning presentation	*<30 mins >*
10.00 -10.30 AM	*Morning Break*	
10.30 – 12.00 PM	Learning presentations	*< 30 mins >*
	Close and reflection	*< 30 mins >*
	Presentation of Certificates	*< 30 mins >*

OR

Time	Topic	*Activities*
Evening One: *7 – 9.00 PM*	Introductions and registration	*Race for truth <15 mins >* *Sharing stories <15 mins >*
	Topic 1: What is a Disaster Hazard?	*Hazard Poster <30 mins >*
	Topic 2: What is the role of the Church in Disaster Management?	*Bible study discussion <15 mins >* *Salad bowl of strengths <15 mins >*
	Topic 3: What are the roles of others in Disaster Management?	*Role Play < 30 mins >*
Evening Two *7 – 9.00 PM*	Topic 4: How do we know when a Hazard is coming?	*Hazard Warning Signs < 30 mins >*
	Topic 5: How to Identify Disaster Risks?	*Risk Walk OR Risk Map < 30 mins >*
	Topic 6: How to make a Disaster Response Plan?	*Disaster Plan Study < 30 mins >*
	Topic 7: How can the Church be a 'Safe Place' in a disaster?	*Safe Place Checklist Puzzle < 30 mins >*
Evening Three *7 – 9.00 PM*	Topic 8: What should be in a Disaster Basket?	*Disaster Basket Ball < 30 mins >*
	Topic 9: How to fix up your community after a disaster?	*Community Knot < 30 mins >*
	Topic 10: How to stop disease after a disaster?	*Staying Healthy Cards < 30 mins >*
	Topic 11: How to get help after a disaster, if it is needed?	*First Community Assessment Form < 30 mins >*
Evening Four 7 – 9.30 PM	Topic 12: How to give out Disaster Supplies?	*Practice Distribution < 30 mins >*
	Prepare learning presentation	*<30 mins >*
	Learning presentations	*<30 mins >*
	Close and reflection	*< 30 mins >*
	Presentation of Certificates	*< 30 mins >*

Facilitators:

This Manual uses games and activities to encourage learning about disaster management. This ensures that participants learn by been involved and teaching one another.

Skilled facilitators are needed to lead the activities in this Manual. Facilitators need to be able to stand up and present confidently (in a relevant language), engage both male and female participants with different education levels and understand and be able to answer questions about Disaster Management in Vanuatu. They need to at least understand the information about disasters in TOPIC 1 ATTACHMENT.

Facilitators should also take the time to understand the participants and the community in which they are meet relevant community leaders before starting training and change the activities to suit. For instance, some activities may be more useful than others to different community members.

Participants:

The activities in this Manual are designed for small groups of Church leaders. Between 10 - 35 participants are needed. Participants should be leaders of their Church and able to lead, instruct and teach other members of their Church and community to prepare for disasters.

Conducting the training with a small group will make sure the Facilitator has time to understand each participant, participants can actively participate and the activities can include everyone.

Training Preparation:

Facilitators will need to read this Manual properly and understand all the activities before starting the training. Facilitators will also need to prepare all activities. This will take a few hours and facilitators will need access to a printer or photocopier.

Facilitators will also need the following materials to conduct the workshop:

1. This Manual and printed copies of attachments
2. Participants Manual books
3. Flip chart (poster/butcher paper)
4. Whiteboard markers or textas
5. Scrap paper
6. Pencils or pens for participants to use
7. Scissors
8. Salad bowl
9. Bibles
10. Cup
11. Bottle or jug full of water
12. Pictures cut out from newspaper or magazines
13. Blue-tack
14. Ball or screwed up piece of paper
15. Large envelopes
16. A disaster basket (Optional).

Introduction and Registration

Start training by introducing yourself. Give your name and tell a little bit about yourself. Explain why you are giving this training.

Explain it is important for Church Leaders to learn about Disaster Management so they can help prepare Church Members, other community members and assist after a disaster. However, attending the workshop only will not make participants ready. Participants will need to complete work after this workshop to prepare their community for a disaster. The work may be hard and it will take time and commitment. But it is a challenge all Church Leaders should accept.

Ask each participant to 'register' and give out the Participants Manuals. A registration list is at the end of this Manual. It asks for participant to write down their Name, Church, Village, Island and telephone number. These details are important for recording who attended the training and following up and monitoring after the training. You will also need everyone's' name to write the Certificates of Completion. Take a roll call after every break to make sure everyone is present.

Explain to the participants what topics you will cover and ask participants to ask questions anytime.

Start the first Activity:

ACTIVITY: Race for Truth

Time: 15 minutes

Equipment: None ***Purpose: Help everyone get to know each other***

1. Ask all participants to stand in a straight line at the 'start'. Tell participants you will ask them questions. If the question is true about them, they take one step forward. Mark a 'finish' line.
   The first person the finish line 'wins'.

2. Ask questions like
   - 'Who is excited about this training?'
   - 'Who has children?'
   - 'Who has been in a cyclone before"?
   - 'Who has already prepared a Disaster Basket?'
   - 'Who has done Disaster Management Training before?'
   - 'Who lives in a community with a Community Disaster Committee'?
   - 'Who is a member of a Community Disaster Committee?'

(If many of the participants answer 'yes' to these questions, you can adapt the training to be more hard, for example, in Topic 5: How to make a Disaster Response Plan, you can ask the participants to bring a copy of their Disaster Response Plan to compare with the example Plans in the Participants Manual).

ACTIVITY: Sharing Stories

Time: 15 minutes

Equipment: None ***Purpose: To learn about past disaster experiences***

1. Ask if any participants have experienced a disaster before. Ask them to share their story with the group. Ask them to explain what happened, how they knew the disaster was coming and what they did to be safe. Would they do anything differently next time?

(If no one has a story to share, tell one about a time you were in a disaster or about another disaster that you know about)

Topic 1 : What is a Disaster Hazard?

Participants may have different ideas about what is a 'Disaster'. For this training, the following definitions are used:

Hazard	*Something natural or man-made that may cause disruption or damage to life, property and/or the environment*
Disaster	*When a hazard strikes and the result exceeds the affected community's ability to respond and recover*
Disaster Risk	*Impacts that could happen to life, property and or environment if a hazard strikes*
Disaster Management	*All aspects of planning for and responding to disasters, including before and after activities*
Disaster Risk Reduction	*Prevention, mitigation, preparedness and response activities that a community may decide to undertake to reduce present and future hazard impact*

Some disasters can be started by man (for example, a fire or a terrorist attack) but the disasters most likely to cause big damage in Vanuatu are natural disasters (for example, cyclone or earthquake)

ACTIVITY: Hazard Poster

Time: 30 minutes
Equipment: Flip Chart paper and pens

Purpose: Make sure everyone understands what is a disaster Hazard

1. Ask participants to call out what they think is a disaster hazard? Ask them to call out the different kinds of disaster hazards that affect Vanuatu.

   For each kind of hazard, draw a small picture or ask the participant to draw a picture.

2. Give the following information for each hazard type:

Hazard	Key Information
Earthquake	Earthquakes happen because of movement of rocks under the earth or because of volcano. Earthquakes cause damage to buildings, roads, water pipes, electricity lines and more. They can cause landslides, rocks to fall and cracks in the earth. There is no warning for earthquake. In an earthquake you should STOP, DROP, HOLD and COVER.
Tsunami	A series of big, fast waves mostly caused by a big or long earthquake (more than 60 seconds) or underwater volcano. When the wave comes to land it can flood coastal areas quickly, damage buildings, roads, water pipes and electricity lines and carry people out to sea. Sometimes the earthquake is far away and you will not feel it, but warnings can be issued by the Meteo Department. If the earthquake is close, you will feel it but there will not be much time to give warnings. You should go to high ground or move at least a few kilometres from the ocean.
Cyclone	Cyclones are big, violent windstorms that can cause very strong winds, big rain which can cause flood and landslides and 'storm surges' – rise in seawater and waves that come on shore 2-5 meters higher than normal. There is a Blue, Yellow and Red alert for cyclone – Blue means cyclone will come in 48-24 hours; Yellow means cyclone will come in 12 hours and Red means the cyclone is hitting.
Flood	People can drown if they try to cross floods and floods can damage houses, crops and water supply. People often get sick after floods because of damage water supply.
Landslide	Landslides can be caused by lots of rain, earthquake, volcano or erosion. Clearing trees, leaking water pipes and vibrations from lots of trucks or building work can also cause landslides. Landslides can damage crops, houses, water storage and pipes, electricity lines and more. Warning signs of a landslide are growing cracks in ground, building or fences. You should run away from landslides up the hill.
Volcano	Volcanoes can erupt making ash, poisonous gas and lava come out. They can also cause landslides and earthquakes. People need to watch the volcano for signs of dangerous activity.
Fire	Fire in Vanuatu can cause harm to buildings and people. To put out a fire you must remove heat (put water on the fire); remove oxygen (throw a wet blanket or sand on the fire) or remove fuel (clear the area things that can burn).
Drought	Drought is a slow disaster. People need to look after their water supply to ensure there is enough water to survive time when there is no rain.
Pandemic	Pandemic is when many people get sick and spread a disease. To stop a pandemic you need to understand the disease, separate sick people from healthy people and have good hygiene.

(There is more information about each disaster type in TOPIC 1 ATTACHMENT at the end of this Manual)

3. Hang up the flip chart paper in the training area to help participants remember the different kinds of hazards.

In this training we ask participants to prepare for the disasters they think may cause them the most damage. This training applies to all different kinds of disaster. You can use the information in the *TOPIC 1 ATTACHMENT* at the end of this Manual to answer any questions from participants about what to do in a disaster.

Topic 2 : What is the role of the Church in Disaster Management?

Talk to the participants to explain that it is important everyone prepare for disaster and it is especially important that our Churches are involved in Disaster Management.
Explain to participants the reasons Churches need to be involved in Disaster Management are:

- It is our Christian duty to reach out to all members of our community to prepare for a disaster
- Preparing for disasters will help save lives and livelihoods
- Preparing for disaster will help keep our Church community and buildings safe
- Our Churches have strong leaders that can guide the community
- Our Churches have strengths, resources and materials that can be used to help after a disaster

ACTIVITY: Bible Study

Time: 15 minutes
Equipment: Bibles

Purpose: Make sure everyone understands what is the role of Christian Churches in Disaster Management

The Bible gives us many disaster management examples we can learn from.

Ask participants to divide into small groups. Give each group one of the Bible readings to read together and discuss for 10 minutes. Ask each group to refer to Topic 2 in the Participants Manual. After, ask one person from each group to stand-up and report to the whole group for 2 minutes about what they learnt about disaster management from the reading. Encourage and question the group about the key points in each reading:

Group	Reading	Key points
1	***Genesis 6:9–8:22***	• Noah listened to the warning of the disaster • He took action to prepare
2	***Nehemiah 2***	• Nehemiah works with others in authority and uses volunteers to rebuild Jerusalem. It is important to work with others • Nehemiah makes a full assessment of damage. He carefully makes plans. Good plans are needed when rebuilding after a disaster.
3	***Luke 10:25–37***	• When a Church prepares, responds and rebuilds after a disaster, it is important to reach out and help everyone (not just members of our Church).
4	***Acts 27:1–44***	• The ship's master should have listened to Paul's disaster warning. We need to pay attention to signs a disaster is coming. • We need to remain in good spirits, work hard and not give up when facing a disaster. Making sure everyone has enough water and food is important.
5	***Proverbs 31:21***	• The godly wife does not fear disaster season because she prepares for it.

Our Christian Churches in Vanuatu also have many strengths that mean local Churches are able help in times of disaster. The power of our Churches should be used to help everyone prepare, survive and rebuild.

ACTIVITY: Salad bowl of strengths

Time: 15 minutes
Equipment: Pieces of paper, pencils and a bowl

Purpose: Make sure everyone understands our Churches have special strengths and resources to help before, during and after a disaster

1. Give each participant a small piece of paper

2. Ask each participant to write something that their Church already has that is useful to help before, during or after a disaster (for example, the Church may have a strong building that is a safe place during a cyclone, a community disaster committee or regular church meeting that can be used to talk about disaster preparedness).

3. Ask each participant to fold the paper and put it in a salad bowl

4. Mix up the pieces of paper. After, pass the bowl around asking each participant to select a piece of paper and read it aloud.

5. After, explain to the group that our Churches have many strengths. We should use these special strengths in Disaster Management.

Make sure participants identified all of the below strengths:

Church Leaders:
- The leaders of the church have the skills to lead others, to understand and represent the needs of the community and to delegate tasks and activities.

Networks:
- Local Churches have access to wider Church networks and can access these for help and support in times of disaster.

Volunteers:
- Local Churches can organise volunteers and can use existing volunteer groups.

Local understanding:
- Local Churches understand their community and the people. This understanding is very important and can help when preparing, responding and rebuilding after a disaster.

Building:
- The Church house is sometimes the strongest building in a community and can become a good safe place for people to go during times of disaster or after a disaster if houses are damaged.
  The Church may also have some tools for rebuilding and some money that can be used for preparing and rebuilding after a disaster.

Spirit and prayer:
- Local Churches have the power of spirit and prayer. Faith can help everyone prepare, survive and rebuild after a disaster. Faith makes local churches strong and able to help others in times of disaster.

Topic 3 : What are the roles of others in Disaster Management?

It is important to understand the duties of other important people in Disaster Management in Vanuatu so that Churches know who to work with:

ACTIVITY : Role Play

Time: 30 minutes

Equipment: Printed copies of TOPIC 3 ATTACHMENT (at end of this Manual), cup of water and full water bottle or jug

Purpose: Make sure everyone understands the role of others in Disaster Management

1. Ask participants to call out who else they think is involved in Disaster Management?

As participants call out each key person/organisation in the table, explain their role:

Person/Organisation	Role
Local Chiefs and other community leaders:	Chiefs and other village leaders have a very important duty to ensure the safety of all people before, during and after a disaster. Church leaders must work with their Chief and other village leaders to make disaster plans.
Community Disaster Committee:	Some communities have formed a 'Community Disaster Committee' (CDC) to be responsible for making disaster plans, preparing and reducing risks before and after a disaster. Members of a Community Disaster Committee should include the Chief or Assistant Chief, Church leaders, school principle or teacher, local nurse or health worker and both men and women. It is important you tell the National Disaster Management Office about the Committee, so it can work with the Committee before and after a disaster.
Area Council:	Area Council Secretaries are been trained in Disaster Management in 2012 and 2013. Area Council Secretaries can help prepare for disasters and report disaster damage and rebuilding needs to the National Disaster Management Office after a disaster.
Provincial Disaster Committees:	Provincial Disaster Committees are been formed in 2012 and 2013. They are responsible for preparedness, response and recovery activites, including collecting damage reports after a disaster. Provincial Disaster Committees will meet and assist coordinate any help needed after a disaster.
National Disaster Management Office:	The National Disaster Management Office is responsible for coordinating all disaster management activities. If a disaster comes, the National Disaster Management Office will arrange an Assessment Team to visit villages and areas where there is damage and report needs. Afterwards, the National Disaster Management Office will coordinate giving out of any disaster supplies.

Vanuatu Meteorological and Geo-Hazards Department:	The Meteo Office and GeoHazards Department will provide warnings about disasters using the radio, newspaper and internet.
Red Cross and other humanitarian NGOs:	After a disaster, Red Cross and other NGOs (like ADRA Vanuatu) have some disaster supplies, staff and volunteers that can help. Red Cross and other NGOs will work closely with the National Disaster Management Office to decide the communities and villages that need help first. Most NGOs have signed a Code of Conduct that states after a disaster, NGOs must always help the people who need it most (not just communities of a particular region, religion or political belief).

2. Now test participant's knowledge with a role play game:
(Note: It is best to play this game outside)

1. Print a copy of *TOPIC 3 ATTACHMENT* (at end of this Manual) and fold each piece of paper in half so the sign has one side with the name of the actor and one side with the instructions

2. Ask for 6 participants and give each one a folded sign. Give the 'Community' actor a full cup of water and the 'NGO' actor a full jug or bottle of water

3. Ask the 'Actors' to follow the instructions on the back of their sign, starting with the 'Disaster' actor. Ask the Actors to speak loudly so everyone can hear.

Topic 4 : How do we know when a Hazard is coming?

Talk to the participants to explain that the Meteo Office and Geo-Hazards Department will look out for signs that a natural disaster hazard is coming and give out warnings. The best way for the Meteo Office and Geo-Hazards Department to warn people is using the radio. Radio Vanuatu will announce any disaster warnings given. Information will also be on the Meteo Website (http://www.meteo.gov.vu/). Participants can call the Meteo on ph. 22 932.

However, it is not always easy for the Meteo office to know when a disaster hazard is coming. Sometimes the disaster comes quickly (like a tsunami or earthquake) and there is no time to warn people. Disasters can also impact different islands differently.

We must listen to the radio. We must also look for other signs that a disaster hazard is coming and make plans to tell everyone in our community.

ACTIVITY: Hazard Warning Signs

Time: 30 minutes

Equipment: Pictures cut out from magazines, newspaper and TOPIC 4 ATTACHMENT

Purpose: To help everyone find ways to warn others about a disaster hazards

1. Cut out pictures from magazines and newspapers. Find all different kinds of pictures. You can also print and cut out the pictures in *TOPIC 4 ATTACHMENT.* Lay all the pictures on the ground or table.

2. Ask participants to come and look at the pictures and choose a picture that answers one of these questions:

   1. What signs does nature give us that a disaster hazard is coming? (for example the ocean sometimes recedes before a tsunami or you hear a 'roaring' sound before an earthquake)
   2. How did people used to know a hazard was coming before we had radios and scientific information?
   3. How do we find out about official warnings from the Government?
   4. How do we tell everyone else in our community that a disaster hazard is coming?

3. Ask participants to present their picture to the group and explain how it answers one of the questions.
Make sure someone talks about:
   - Talking to older people to find out history and disasters that have come before
   - Listening to the radio
   - Looking for strange animal behaviour (birds fly ashore before cyclone, dogs bark before earthquakes and animals run to high ground before tsunami)
   - Using one man to call out to warn everyone
   - Making a special sound with the Church bell to warn everyone

4. After, explain that we have lots of ways and signs that tell us a disaster hazard is coming. We must pay attention to these warning signs and take action when we see them. We must also plan how we will tell everyone else in the community a hazard is coming and what to do.

Topic 5 : How to Identify Disaster Risks?

Tell participants it is important that everyone know how identify disaster risks.
Risks are things that are dangerous and could affect life, property or the environment if a hazard strikes a community. For example, roof iron that is not attached strongly can fly away and hit people and become a risk in a cyclone; or a river to close to a house can flood the house and is a risk.

OPTION 1 ACTIVITY: Risk Walk

Time: 30 minutes
Equipment: Notebooks and pencils

Purpose: To practice finding disaster risks

1. Take participants for a walk and ask them to find and write down five risks. Ask them to write down how to fix or avoid each risk.

2. After the walk, ask each participant present back the risks and solutions they identified. Discuss each one to help participants be able to find risks in their community and take simple measures to stop them.

OPTION 2 ACTIVITY: Risk Map

Time: 30 minutes
Equipment: Flip chart paper and textas

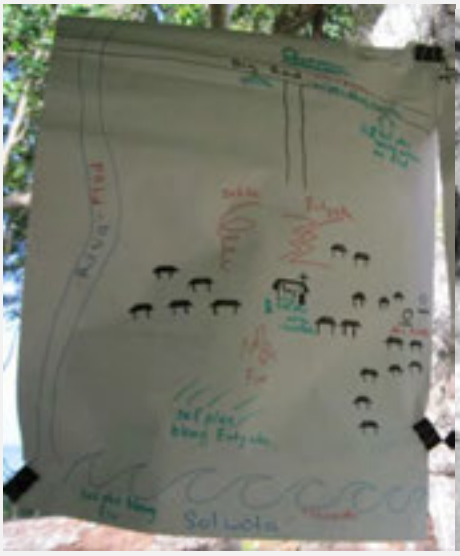
Purpose: To practice how to identify disasters risks to a village

1. Divide the participants into groups of 4-5.

(If you have many participants, you can ask everyone to stand-up and walk around, as they walk tell a story how their ship is stranded at sea and everyone wants to be saved in the lifeboat, but the life boat only takes a certain number of people. Explain that when you call out the number of people the lifeboat can take everyone must make a group with that number of people (for example 'FIVE!"). Repeat this several times to mix everyone up. On the last time call out the number you want in each group).

2. Ask for a leader in each group and give the leader a piece of flip chart paper and some textas.

3. Ask each group to draw a map of the area where the training is happening. Ask the group to mark all the possible disaster risks on the map (for example, the river can flood, the ocean can cause tsunami or a hill can cause a landslide in heavy rain).



3. Ask participants to present their map to the group. Are there any differences? Did everyone identify all the samedisaster risks? Ask everyone if there are some disaster risks more likely than others? You can hold a vote to decide the three biggest disaster risks.

Topic 6 : How to make a Disaster Response Plan?

Tell participants it is important that everyone know what to do when they get a hazard warning. Making a detailed plan of everything that needs to happen will make it clear who needs to do what.

Explain to the participants that to make a Disaster Response they should talk to different people to get ideas and knowledge about what kind of disasters they need to plan for. For example, to identify the biggest disaster risks, they should talk to:

- Other leaders (the Chief and other Church leaders)
- Men
- Women
- Young people
- Old people
- Local school principle and Facilitators
- Local nurses and health workers
- People with special needs (handicapped or sick people)
- Provincial Government officers

Ask participants if there anyone else they should talk to?

Explain to the participants that they can make a Community Disaster Committee that includes representatives of all these people (if they do not have one already). The Community Disaster Committee can then work together to make the Disaster Response Plan.

Note: Area Council Secretaries need to be told about any Community Disaster Committees so they can work with them in times of disaster.

Explain that the community will need a different plan for every type of disaster hazard they think can come to their community. The plan should clearly state what should be done when the community hears a warning before, during and after a hazard strikes.

Things that a good Disaster Plan will have are:

- Give clear responsibilities to men, women, leaders and youth - so the whole community is involved and one person is not responsible for everything
- Clearly identify who will do what and use people's name – so there is no confusion
- Be precise – a good plan will not say 'everyone will go to a safe place'; it will say where the safe place is and who will go there. A good plan will not say 'we will go on top of the hill'; it will say where on top of the hill people will meet
- Include a list of preparation activities – what needs to be done a long time before a disaster such as making cyclone shutters, checking radio batteries and cutting trees every year before cyclone season.

ACTIVITY: Disaster Plan Study

Time: 30 minutes

Equipment: Example Plans in the Participants Manual and pencils

Purpose: To make sure everyone understands what a good Disaster Plan needs

1. Show participants the Example Disaster Response Plans in the Participants Manual. Explain the communities that made these Example Plans decided what actions should be taken when they received a disaster alert, time when the hazard came and after. They also decided the different activities leaders, men, women and youth should do to involve the whole community.

2. Ask participants to form pairs and read the Example Disaster Response Plan in the Participants Manual together. Ask participants to underline activities in the Example Disaster Plan that they like or think are a good idea, but had not thought of before. If participants are from a village that already has a Plan, ask them to compare the Example Plan with their Plan.

3. Ask each pair to tell the group one action from inside each Example Disaster Plan that they thought was good and that they should use.

4. Ask participants if there were any actions missing from the Plans? Can anyone think of anything that would make these Plans better?
Ask participants if they think writing the Plan down is needed? What other ways can people make sure everyone knows the Plan and be clear about people's responsibilities?



After, explain that making the Disaster Plan is the first step.

The Plan will also need a list of preparation activities that should be completed every year (for example, checking window shutters and checking radio and torch batteries).

It should also have a list of things that have been agreed to help reduce the risk of disasters affecting people (for example, not building houses close to rivers).

Everyone in the community also needs to know about the Disaster Plan and understand their responsibilities.

Ask participants how they can tell everyone in their community about the Disaster Plan?

Some ideas are:

- Explain the Disaster Plan to Church youth and ask the youth to make posters about the Disaster Plan to put up in the community
- Have a yearly practice drill where everyone must practice what they will do
- Ask the women to make up and teach songs or nursery rhymes about what the children should do in a disaster
- Have regular meetings to talk about the plan, especially at certain times of the year like the start of cyclone season or end of yam harvest

Topic 7 : How can the Church be a 'Safe Place' in a disaster?

If the Church house is to be a safe place where people will go to shelter during a disaster, Church leaders need to think about many things. If houses are damaged after a disaster, people may need to stay in the Church for two or more weeks.

The Church should be prepared for this.

ACTIVITY: Safe Place Checklist Puzzle – Before, During or After

Time: 30 minutes

Equipment: Printed and cut up checklist items from TOPIC 7 ATTACHMENT, a salad bowl, flip chart paper and blue-tack

Purpose: To help everyone think about what a 'safe place' needs before, during and after a hazard strikes

1. Write these headings at the top of 3 pieces of flip chart paper and hang up:
   - Long team bifo wan hazard
   - Alert- team yu save wan hazard i kam
   - Afta wan hazard

2. Put cut up checklist items from TOPIC 7 ATTACHMENT – Saf ples checklist - in a salad bowl. Ask all participants to pass the salad bowl and take one piece of paper from the salad bowl and some blue-tack.

3. Ask each participant to stick their piece of paper on the flip chart paper with the heading that matches when they think they should check that the activity is complete – should the activity be done a long time before a hazard strikes, time a hazard alert is given or after?

4. After, ask everyone to look at the flip charts and decide if every checklist item is in the right place. Ask one person to read out the activities under each heading and swap the checklist items until everyone is happy.

Explain, it may not be for all safe places to have everything ready, but it is a good idea to think about what will be needed.

Topic 8 : What should be in a Disaster Basket?

Preparing a Disaster Basket is good to make sure all supplies you need when a disaster comes are ready.

You can prepare a disaster basket for a household, a church or a whole community (but you will need different amounts of supplies for each).

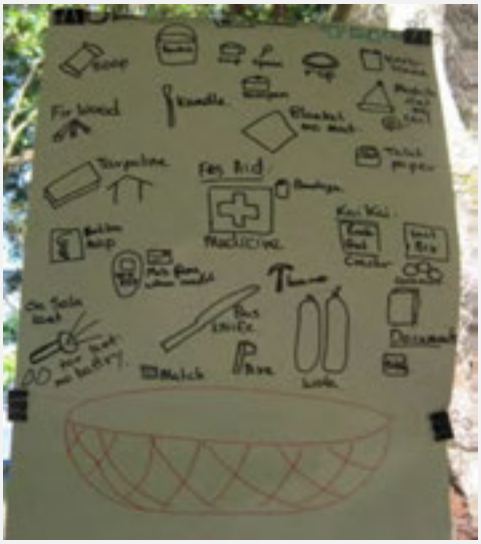
If needed, you can give out responsibility for different supplies to different people. You can also raise money for the disaster basket and keep adding things when you are ready.

ACTIVITY: Disaster Basket Ball

Time: 30 minutes
Equipment: Ball (or screwed up ball of paper)
Purpose: To help everyone think about what should be in a Disaster Basket

1. Ask all participants to make a circle and give the ball to one participant. Ask the participant to throw the ball to someone else. As they throw the ball, each person must call out an item that should be in a good basket (for example – "matches")

2. (Optional) As participants call out disaster basket items, write them down on a piece of flip chart paper and draw a small picture
Show the participants the flip chart paper and ask for more items until everyone is happy with the list of items created. Ask everyone to check the poster you have created against the items listed in the Participants Manual.
(Note: Drawing pictures helps people with low literacy and makes the poster more interesting and easy to remember.)



4. Explain that a community member will need to be made responsible for carrying the Disaster Basket to the safe place in a disaster. If the Disaster Basket is too big for one person to carry, you can give responsibility for different items to different people.
Remember, all items in the disaster basket should be checked at least once a year (such as at the start of cyclone season).

OPTIONAL EXTRA ACTIVITY: Disaster Basket show and tell

Time: 30 minutes
Equipment: A Disaster Basket

Purpose: To help everyone think about what should be in a disaster basket

1. Bring a disaster basket you have prepared for your family or Church. Show everyone all the contents. Ask participants:
   - Is there is anything they think you need but don't have already?
   - What is the most valuable item in the disaster basket? Why?
   - What is the least valuable item in the disaster basket? Why?

(Note: All participants will have different opinions but it is good they talk about it)

Topic 9 : How to clean up after a disaster?

After a disaster it is important to clean up the community quickly and rebuild.

ACTIVITY: Community Knot

Time: 30 minutes
Equipment: None

Purpose: To help participants think about how to work together after a disaster

1. If a big group divide the participants into groups of 10 or 12 (it must be an even number). Ask groups to stand in a close circle and reach out their *left* hand to hold hands with the person directly opposite. Then ask them to reach out with their *right* hand, and hold hands with someone different.

Explain the knot they have formed with their hands represents the confusion in a community after a disaster.

2. Ask everyone to try and untangle themselves to form a circle without letting go of any hands. Tell them they can nominate one or two people to be leaders, or they can all work together. As they get closer to un-tying the knot, give them a time limit- tell them they have only two minutes left to finish.
(Note: Sometimes the group may not be able to untie the knot, if so focus on how close they got)
If one group finishes before the other, ask them to help the other group.

3. Observe how the group works to become a circle again.
After, ask the group these questions:

- What made it easy or hard to work together?
- What made it easy of hard to become a circle again?
- Did appointing a leader help or not?
- How did you know who to appoint as leader?
- How important was it that everyone listens and talks clearly to each other?
- Did having a time limit make it easier or harder?
- What did people learn about working together and solving problems?

4. Explain that sometimes it is hard to organise everyone, especially after a disaster. But appointing leaders, forming teams, having meetings to talk clearly and communicate with everyone, making plans and setting dates and times to finish work can help.

There is more advice in the Participants Manual on how to work with everyone to clean up after a disaster.

Topic 10 : How to stop disease after a disaster?

Explain that after a disaster, people can get sick easily. People may not be living in their house, there may be more mosquitoes and other pests because of the disaster, food crops and water supplies may be damaged so people may not get to eat and drink as much as usual and hygiene standards may be hard to maintain.
When people get sick it makes it hard to fix up the community after the disaster.

ACTIVITY: Staying Healthy Cards

Time: 30 minutes
Equipment: Printed and cut up copies of the 'Staying Healthy cards' in TOPIC 8 ATTACHMENT

Purpose: To help everyone think about what is needed to stay healthy after a disaster

1. Ask participants to make two circles
(To mix people up, you can ask everyone to stand-up and form a line from shortest to tallest or from most number of pockets on their clothes to least number of pockets or from the person who woke up the earliest to the person who woke up the latest this morning. Then divide the line in half to make two groups).

2. Print, cut up and give one 'Staying Healthy Card' from TOPIC 8 ATTACHMENT to selected people in each group. Ask everyone with a Staying Healthy Card to present the card to the rest of their group. After, ask the group to think of any other things they must do to stay healthy after a disaster.

3. Encourage participants to ask any questions about staying healthy after a disaster.

Topic 11 : How to get help after a disaster, if it is needed?

Explain to participants that after a big disaster the Vanuatu National Disaster Management Office may send an 'Assessment Team' to find out if a community needs help.

If a community needs help after a disaster, they can contact the Vanuatu National Disaster Management Office (NDMO). The NDMO is responsible for coordinating any help needed after a disaster and will try to understand what is needed in all the islands of Vanuatu to make sure the people who need help most are helped first.

To ask for help from the NDMO community leaders should contact their Area Council Secretary first. The Area Council Secretary will work with the Provincial Disaster Committee. All Area Council Secretaries and Provincial Disaster Committees will receive disaster management in 2012 and 2013.

To report damage by a disaster to the Area Council Secretary, NDMO or a Disaster Assessment Team, the community can use the First Community Assessment Form which is in the Participants Manual.

If it is not possible to see the Area Council Secretary, community leaders can call the Area Secretary Council to give them the information in the form over the telephone or airport VHS radio.

ACTIVITY: First Community Assessment Form

Time: 30 minutes
Equipment: Participants Manual

Purpose: To help participants understand the First Community Assessment Form

1. Ask participants to form groups of 2 – 3 participants.

2. Ask each group to read the First Community Assessment Form in the Participants Manual and discuss the information they will need to give to get help after a disaster.

3. After, bring everyone together and test if they have read the form by playing 'Heads or Tails':
Ask something about the First Community Assessment Form and ask participants to guess if the answer is yes or no. If they think the answer is yes they should put their hands on their heads. If they think the answer is no they should put their hands on their hips. If anyone guesses wrong they are 'out' of the game.

Example questions include:

- Does the Form ask you how much money you have?
- Does the Form ask you what kind of communication you have so NDMO can talk to you?
- Does the Form ask if you need any bibles?
- Does the Form ask you if you have a laptop with internet?
- Does the Form ask you to write down how many men, women and children are in your village so funding partners can collect this information?
- Does the Form ask you to identify how NDMO can send you supplies?

Topic 12: How to Give Out Disaster Supplies?

After a disaster, the National Disaster Management Office and international development agencies (such as ADRA and Red Cross) might be able to help communities by giving them basic supplies to use for a short time after a disaster. Like:

- Water containers
- Soap
- Water purification tablets *(tablets you put in dirty water to make it safe to drink)*
- Water Filters *(bags that you put dirty water into and it comes out safe to drink)*
- Food
- Pots and cooking materials
- Tarpaulins
- Tents
- Tools to rebuild

As Church leaders, the participants may be asked to help give out disaster supplies. If this happens, supplies need to be given out to everyone fairly with the right amount of supplies going to the correct families. Disaster supplies are often donated by international aid agencies, so they need to be transparent and provide a report on who was given what supplies.

It is important to understand that NGOs in Vanuatu who help after a disaster have agreed to and signed the International Red Cross and Red Crescent Movement *Code of Conduct for Disaster Response.* Some of the key principles of this Code of Conduct are:

- Help will be provided to stop human suffering wherever needed
- Help is given regardless of race or nationality
- Help is given regardless of political or religious beliefs
- Local customs and culture will be respected
- In helping people after a disaster, programs must try to stop future disasters happening again
- Local people will be used to help others
- Programs must be accountable to the community and donors
- Any pictures or media reports will respect people impacted by disasters.

Importantly, this means, that if our Church leaders help give out disaster supplies, they must give them out to everyone in the community, not just Church members. They must also give out supplies to people who need them most first.

Ask participants to call out who they think will need supplies most after a disaster?
Make sure they call out:

- Mamas with small children
- Pregnant women
- Handicapped
- Elderly
- Sick people
- Children

ACTIVITY: Practice Distribution

Time: 30 minutes

Equipment: Printed and cut up example disaster supplies pictures and forms from TOPIC 10 ATTACHMENT put into envelopes

Purpose: To make sure participants understand the basics of giving out disaster supplies

1. Print and cut out example disaster supply pictures in TOPIC 10 ATTACHMENT and put a different amount of each picture into 5 - 6 envelopes (one for each group). Print and fill in a copy of the Disaster Supplies List in TOPIC 10 ATTACHMENT with the number of pictures you have put in each envelope *(Amount Sent)*. Fill in some Lists incorrectly. Print and add a copy of the Distribution Form in TOPICS 10 ATTACHMENT into each envelope.

2. Ask participants to make groups of 4 - 5 people. Give one envelop to each group.

3. Explain to the groups that inside the envelope they will find example pictures of disaster supplies, a list with how many of each item they should have and a Distribution Form that they need to fill in.
   - First, each group must count the supplies to make sure they have received the correct number of items as written in the List *(Amount Sent)*. Ask participants to write down if there are any mistakes.
   - Second, ask participants to pretend to give out the supplies. Practice filling up the Distribution Form. Fill in the details of every member of a family (name, age, gender) and then write down how many supplies would be given to that family.
     Tell participants that every family should receive:
     - 2 soap
     - 2 water containers
     - And 1 water filter to be shared between 3 families

4. Ask participants to add up the total number of supplies they have given out and write it down in the Supply List *(Total column).*

5. Check each group to make sure they are completing the forms correctly. Tell groups to look at the example in the Participants Manual if it is confusing.

After, ask groups if the activity was easy or hard? Explain that if they are to give out disaster supplies there are many other things they will need to think about. Like:

- How big are the supplies and how much space is needed to store them?
- How many people, trucks or boats are needed to carry the supplies?
- How will the supplies be kept dry?
- How will the supplies be kept safe (no one steal anything)?
- Do the supplies need to be kept safe from rats or insects?
- Is it easy for trucks and people to go to the place the supplies are kept?
- Will all people in the community come to collect supplies from one location or will leaders use volunteers to take supplies and give them to people in their houses?
- How will leaders make sure every family received the correct amount of supplies (should you ask only all mamas or all papas to come the collect supplies)?

The answers to these questions will depend on the disaster situation. More instructions about how to give out disaster supplies are in the Participants Manual.

Learning Presentations

ACTIVITY: Learning Presentation

Time: At least 30 minutes for preparation and 30 minutes for presentations
Equipment: Printed copies of TOPIC 1 ATTACHMENT

Purpose: To allow participants to practice what they have learnt

1. Ask participants to form groups of 4 – 5 people. Give each group a different kind of hazard (cyclone, earthquake, volcano, landslide, etc). Give each group a print out of the TOPIC 1 ATTACHMENT factsheets about their hazard type.

2. Ask each group to prepare a 5 minute drama about their disaster type using the information from the factsheets and what they have learnt.

Encourage groups to use drama, pretend the disaster is happening and show what they would do, sing songs, make dances and costumes or make posters.

3. Allow more than 30 minutes for groups to prepare and then ask each to present their drama to the group.

Close and Reflection

To finish the training, give participants time to share their thoughts about what they have learnt and ask any questions.

You can ask the following questions to prompt discussion:

- What was the most helpful thing you learnt in the training?
- How will you take what you have learnt and use it in your community?
- Who do you think is most important to work with in your community to make a Disaster Plan?
- Were there any topics in the training you did not think were useful?
- Do you think you are more prepared for a disaster now?
- If you hear a disaster warning, what will you do differently after this training compared to what you would have done before the training?
- How should Church leaders support each other to make Disaster Plans? Should the participants meet again in the future to share stories about what has worked and what has been a challenge?

Close the program with a prayer and presentation of Training Certificates to each participant that completed *all* activities (a copy is at the end of this Manual)

Registration: ATTACHMENT
Participant Registration List

Nem: ***(first mo family)***	**Man o Woman (M/W)?**	**Aeland we yu stap:**	**Nem blong vilij (we yu stap) blong yu:**	**Nem blong Joj blong yu:**	**Ol fon namba blong yu:**	**Deit yu takem disasta manejmen trening**	*Roll Call:*
Eksampol: *Catherine Harris*	*W*	*Efate*	*Port Vila*	*Numbatu*	*77 55 923*	*30 May 2013*	

Nem: ***(first mo family)***	**Man o Woman (M/W)?**	**Aeland we yu stap:**	**Nem blong vilij (we yu stap) blong yu:**	**Nem blong Joj blong yu:**	**Ol fon namba blong yu:**	**Deit yu takem disasta manejmen trening**	*Roll Call:*

TOPIC 1 : ATTACHMENT
Information on different kind of disasters

Government of the Republic of Vanuatu
National Disaster Management Office
Phone: +678 22699 / +678 23035 **Email:** ndmo@vanuatu.gov.vu
Post: NDMO, Private Mail Bag 9107, Port Vila, Vanuatu

What to do:

Cyclones

- National Alerts
  - Blue within potential 24hrs – cyclone preparation, tie down roof, trim garden crops, ensure you emergency kit is ready, pick up lose items for yard
  - Yellow within 12hrs – School and government close, food preservation, water preservation, move to strong / safe place, cyclone shutters if you have them
  - Red cyclone is imminent – Stay indoors and wait out the cyclone
- Continue to listen to the radio for cyclone updates and mark the path of the cyclone on the cyclone tracking map
- Have emergency kit ready – including; torch, batteries, battery radio, water, matches, firewood, food, blankets, charged mobile phone, medical supplies and prescriptions, firewood, kitchen utensils, water container, warm clothing, plastic bag to store important documents and cyclone tracking map

Earthquakes

- STOP, DROP, HOLD & COVER
- Not all earthquakes cause tsunami but if you feel a strong earthquake or a long one you should move to higher ground

Floods

Ways to protect your house, garden and family from flooding:

- Know the history of the area before building house and gardens
- Build steal or floor house in low lying areas
- During the design of the house and garden look to include drainage system
- Look to include water catchment systems
- If your house is prone to flooding think about rebuilding to higher ground
- When river is high do not cross
- Don't let children play in flood waters

Tsunamis

- Tsunami is a series of waves and the first one might not be the biggest
- Natural signs that might bring a tsunami
    - Strong earthquake
    - Long earthquake (lasting longer than 60 seconds)
    - Loud noise coming from the ocean
    - Draw back of the ocean
- Wave may come within minutes, don't wait for official warning move to higher ground

Following an earthquake (either big or long) immediately move to higher ground on foot and wait until the all clear is given by NDMO before coming down. Remember to take emergency kit as the all clear can take more than 2hrs

Landslides

Ways to protect your house and family from landslide

- Know the history of the area before building house and gardens
- Don't cut down too much trees in sloppy areas or hill
- Plant some trees in landslide prone areas to hold the ground together
- Don't build house at the bottom of the hill or cliff
- If you live in a landslide prone area identify safe place

Volcanoes

- Community to be aware of volcanic activities and wear protective clothes, long sleeve, mask, glasses, scarf or hat.
- Community must monitor changes to the volcano and the environment
    - Increased smell
    - Ash fall or increases in ash fall
    - Increase noise from volcano
    - Acid rain or increased acid rain
- During times of increased activity you should store water and food in closed or shelters containers and food must be washed before cooking
- During increased ash fall the community needs to beware that mudslides can occur during heavy rain
- Know your volcano hazard map and danger zones
- Know where to get volcano bulletins and alert levels-Radio Vanuatu (National Emergency broadcast)

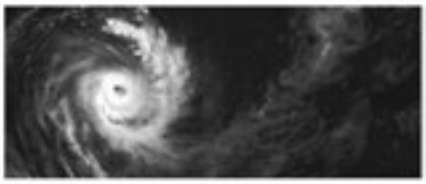
Tropical Cyclones

NATURAL HAZARDS IN THE PACIFIC - FACT SHEET 1

SOPAC

Reducing Vulnerability of Pacific ACP States

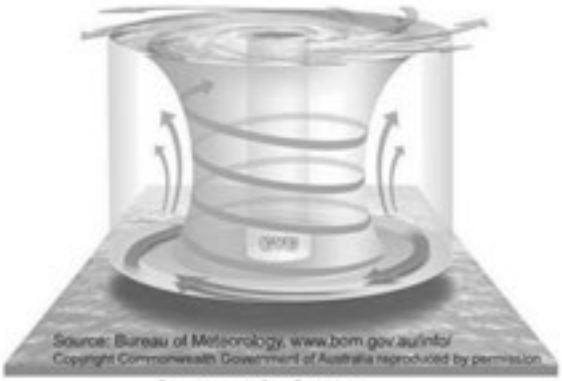
Tropical cyclones (also known as typhoons or hurricanes) affect nearly all Pacific island countries and are the most frequent hazard to affect the region, with around 7- 8 cyclones occurring every year. As a result of climate change cyclone frequency has doubled in the last decade. The cyclone season in the southern hemisphere runs from October to May and in the northern hemisphere from May to October but some cyclones do occur outside the season.



Satellite view of a tropical cyclone. Source: US National Geophysical Data Center www.ncdc.noaa.gov

What is a Tropical Cyclone?

A tropical cyclone is a violent rotating windstorm that develops over warm tropical waters warmer than 26.5 °C and located between 5° and 15° latitude.



Structure of a Cyclone.

Cyclones begin as thunderstorms, which due to the Earth's spin revolve clockwise in the southern hemisphere and anticlockwise in the northern hemisphere.

These storms rise up to 10 km into the atmosphere and can be up to 2000 km across. As the cyclone becomes organised, a calm clear area called the 'eye' forms at its centre. The eye is typically 10-50 km wide and is surrounded by a dense ring of cloud known as the eye wall, which marks the belt of strongest winds.

Tropical cyclones can persist for many days and follow unpredictable paths, however in the South Pacific they usually move southeast. The warmth of the tropical waters provides the energy to fuel cyclones. As a result, they tend to weaken and dissipate as they move over significant island landmasses or cooler waters further south, forming rain depressions.

Tropical Cyclone Hazards

Strong winds can continue for hours, days even, causing widespread damage to buildings, infrastructure and vegetation and causing loss of life. Wind speed levels of a tropical cyclone are:

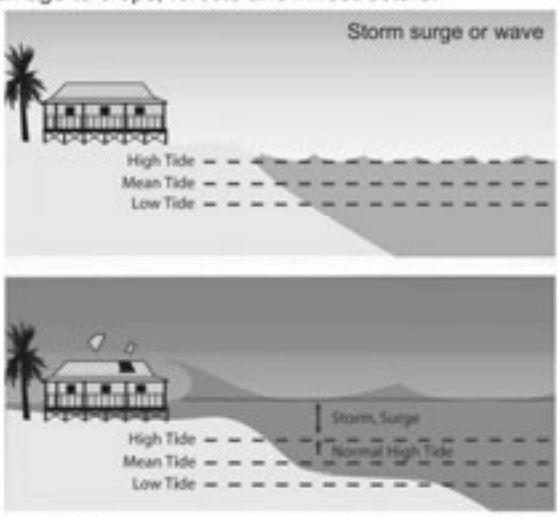
Gale force winds:	63-87 km/h
Storm force winds:	88-117 km/h
Hurricane force winds:	117+ km/h

Torrential rains can result in widespread flash flooding and river flooding. Up to 600 mm and more of high intensity rain can be produced in one day. These rains can also trigger landslides in hilly areas, which may already be sodden due to previous rains.

EXAMPLE: Although Cyclone Dani skirted past Fiji in 1999, it brought with it torrential rains that caused severe flash flooding, devastating western Viti Levu and killing seven people.

Storm surges and waves created by low atmospheric pressure and strong cyclonic winds blowing over long distances. A storm surge is a raised dome of seawater about 60-80 km wide and 2-5 m higher than normal sea level. As the cyclone makes landfall, storm surge and waves inundate coastal areas. At the coast, storm surge and waves are the greatest threat to life and property and also cause severe coastal erosion. In low-lying atolls, a surge may inundate the whole island.

Further **Saltspray** and **Lightning** can cause considerable damage to crops, forests and infrastructure.



EXAMPLE: When Cyclone Bebe hit Funafuti in Tuvalu in 1972, it caused a 4 m surge that swept entirely across the islet causing total devastation. In 2004, Cyclone Heta brought huge storm waves crashing over 20 m high cliffs at the Alofi coast of Niue.

EXAMPLE: Cyclone Heta smashed up a four tonne coral boulder and deposited it up a 20m cliff in Nauru. All houses in its path were destroyed.

EXAMPLE: Storm surge, Cook Islands during Cyclone Heta. This cat. 5 cyclone affected Samoa, Tonga, Niue and the Cook Islands in January 2004.

Source: Geoff Mackley

Cyclone Warning

There is a well established network of cyclone warning centres throughout the region. Places like the Regional Specialised Meteorological Centre (RSMC) in Nadi monitor, track and name tropical cyclones as well as provide warning services to Pacific island countries. Similar services are provided for Papua New Guinea and Solomon Islands by the Australian Bureau of Meteorology's Tropical Cyclone Warning Centres. French-speaking countries are looked after by Meteo-France and American affiliated states by the National Oceanic Atmospheric Administration (NOAA).

For more information about tropical cyclones and warning systems in the Pacific please see the following links:
Regional Specialised Meteorological Centre-Nadi:
http://www.met.gov.fj/about_RSMC.htm
Brisbane Tropical Cyclone Warning Center:
http://www.bom.gov.au/weather/qld/cyclone/
US Navy Joint Typhoon Warning Centre
http://www.npmoc.navy.mil/jtwc.html

CYCLONE SEVERITY: SAFFIR-SIMPSON HURRICANE SCALE			
Category	Wind Speed (km/h)	Damage	Storm Surge (m)
1	119-153	Minimal: No real damage to buildings. Coastal road flooding and minor pier damage.	1-1.5
2	154-177	Moderate: Damage to roof, window, door. Piers, shrubs damaged, trees felled. Coastal and low-lying escape routes flood. Craft break moorings.	1.5 - 2.5
3	178-209	Extensive: Structural damage to houses, utility buildings. Shrubs stripped, large trees felled. Low-lying escape routes cut off. Terrain less than 1.5 m above sea level flooded. Coastal evacuation.	2.5 - 3.5
4	210-249	Extreme: Extensive curtainwall failures, roofing failures on small houses. Extensive damage - doors, windows. Low-lying escape routes cut off. Major damage to lower floors of nearshore structures. Terrain lower than 3 m above sea level may flood. Massive evacuation up to 10 km inland.	3.5 - 5.5
5	>250	Catastrophic: Complete roof failures, some complete building failures, utility buildings blown away. Severe and extensive window and door damage. Low-lying escape routes cut off. Major damage to lower floors of all structures less than 4.5 m above sea level. Massive evacuation up to 16 km inland.	> 5.5

What you can do before, during and after a cyclone

PRE-SEASON PREPARATIONS

- Be aware of Cyclone Warning Systems.
- Check your house for structural weaknesses.
- Identify the safest room in your house.
- Clear your property of loose objects/material that could blow about during extreme winds. Trim tree branches away from windows and power lines.
- In case of a storm surge warning know the nearest safe high ground and the safest access route to it.
- Prepare an emergency kit for the family containing a portable radio with spare batteries, torch, fuel lamp, candles, matches, water containers, canned food with opener, spare clothes, masking tape for windows and plastic bags.
- Clear all drains and waterways on the property.
- Ensure houses have proper provision for earthing lightning.

UPON HEARING A CYCLONE WARNING

- Listen to your radio for further information.
- Fill water containers and fuel car (if you have one).
- Store or tie down all loose objects in the house.
- Batten down roof. Fix any loose parts of the house.
- Close off shutters. If you live in a flood-prone area take flood precautions.
- Ensure all the members of your family are present; keep children away from swollen drains and waterways.
- If your house is not structurally safe, prepare to move to the nearest evacuation centre.
- Collect firewood and keep in a dry place.

DURING THE CYCLONE

- Disconnect all electrical appliances but listen to your battery radio for further information.
- Open louvres on side away from wind to reduce the pull force of the wind on the roof.
- Remain calm, stay indoors but clear of doors and windows. Remain in the strongest part of the building.
- Only use the telephone for very urgent calls.
- If the building breaks up, protect yourself with rugs or mattresses under a strong table/bench or hold onto a solid fixture (e.g. a water pipe).

BEWARE THE EYE OF THE STORM:

If the cyclone eye passes over a sudden lull in winds occurs and may last up to 2 hours. The other side of the cyclone then hits and winds resume with equal strength but blowing from the other direction. It is vitally important to remain in shelter during and after the eye passes.

AFTER THE CYCLONE WIND STORM HAS PASSED

- Don't go outside until officially advised it is safe.
- Do not attempt to drive and don't allow children to roam around outside.
- Beware of fallen power lines, damaged buildings, trees or flooded waterways.
- Listen to your radio for advice and updates.
- Check for gas leaks. Don't use electric appliances if wet.

Published: September 2006 - www.sopac.org

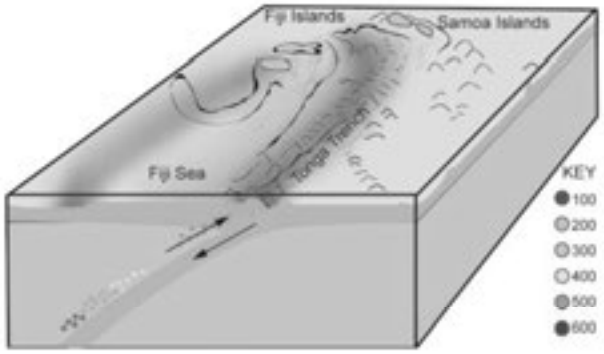
Earthquakes

NATURAL HAZARDS IN THE PACIFIC - FACT SHEET 2

SOPAC

Reducing Vulnerability of Pacific ACP States

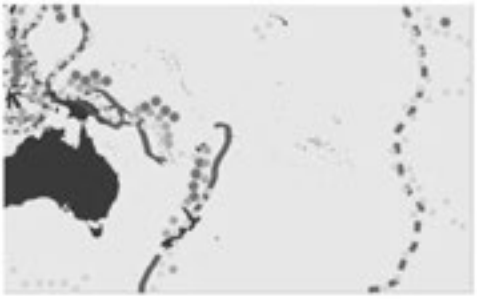
81% of the world's largest earthquakes occur at the edge of the Pacific, which is known as the "Pacific Ring of Fire" because it is renowned for earthquakes, volcanic eruptions and tsunamis. These hazards are caused by the movement of the Earth's tectonic plates, especially when one plate is dragged under another in what is known as a convergent margin.



The Tonga Trench, an ocean-ocean convergent margin.

What is an Earthquake?

As plates collide and grind over or past each other, stress builds up locally within the rock until the rock breaks along lines of weakness (faults). An earthquake is the vibration of the earth due to the energy released as the rock breaks. Additionally some earthquakes can be caused by volcanic activity or underground collapse. Both shallow (0-70 km deep) and deep (down to 700 km) earthquakes are associated with oceanic subduction zones such as the Tonga trench connecting New Zealand, Tonga and Samoa and the New Hebrides trench, which connects Vanuatu, Solomon Islands and Papua New Guinea. Regionally, these countries and Fiji are at greatest risk from earthquakes.



Earthquake location map: Pacific Ring of Fire

Earthquake Hazards

Earthquakes, both deep and shallow, can release huge amounts of energy and so can be extremely damaging to Pacific island countries.

EXAMPLE: The earthquake in East New Britain, Papau New Guinea in 2000 cost the country 14 million Kina in infrastructure and property damage and affected 100,000 people.

Ground shaking is caused by energy waves known as seismic waves hitting the surface of the earth. They cause the ground to shake up and down, back and forth and from side to side. This causes damage to buildings, roads, dams and reservoirs, buried pipelines, infrastructure, and overhead cables, leading to dangers from collapsing buildings, falling debris, uneven ground, land sliding, flooding and fires.

Ground shaking occurs at different intensities according to distance from and magnitude of the earthquake. The larger and shallower the earthquake and the closer to the centre of it you are, the more intense the ground shaking.

EXAMPLE: A powerful Ms 7.3 earthquake struck Port Vila, Vanuatu 2002.
First picture shows the damaged Teouma Bridge.
Second picture shows a bungalow damaged by rock fall.

Surface faulting is where an earthquake causes the ground surface to permanently split apart along a fault within the ground rock and soil. Faulting tends to occur when the earthquake is very shallow (0-10 km deep) and strong.

Liquefaction is where the vibrations of the ground cause the soil to behave like a liquid. It happens on mainly sand and mud/clay soils – the soil flows, acting like quicksand, and results in failure of building foundations. It is an especially dangerous effect in urban areas.

EXAMPLE: In 2002 a Ms 7.4 earthquake caused liquefaction of unconsolidated sediments, destruction of houses and water supply of islands offshore Wewak, PNG due to the remarkable uplift of 30-40 cm along faults.

Secondary Hazards. In addition, earthquakes can trigger secondary hazardous events such as **health problems** due to interrupted water supply or broken sewage disposal systems, **landslides**, **tsunamis**, **seiches**, **fires** (due to gas leaks and broken live electricity wires) and **flooding**.

EXAMPLE: Several earthquakes in 1993/4 in the Finisterre Range, PNG caused massive and widespread landsliding resulting in damming of streams with subsequent flooding and huge sediment problems.

Source: Geological Survey PNG

Earthquake Warning

Currently there are no effective prediction or warning systems to provide advance warning that an earthquake is about to happen. Thus, it is vitally important that you are aware of what to do should one occur. For more information, see the following links:

US Federal Emergency Management Association:
http://www.fema.gov/hazards/earthquakes
US Geological Survey: http://earthquake.usgs.gov

Modified Mercalli Earthquake Intensity Scale

I. Instrumental. Not felt except by a very few under especially favourable conditions detected mostly by Seismography. (2)
II. Feeble. Felt only by a few persons at rest, especially on upper floors of buildings. (2)
III. Slight. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing cars may rock. Vibration similar to the passing of a truck. (3)
IV. Moderate. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rock noticeably. (3)
V. Rather Strong. Felt by nearly everyone; many awakened. Some dishes, windows broken. Un-stable objects overturned. Pendulum clocks may stop. (4)
VI. Strong. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. (5)
VII. Very Strong. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures. (5)
VIII. Destructive. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of factory stacks, columns, monuments, walls. Heavy furniture overturned. (6)
IX. Ruinous. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. (7)
X. Disastrous. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bend greatly. (7)
XI. Very Disastrous. Few (masonry) structures remain standing. Bridges destroyed. Rails bend greatly. (8)
XII. Catastrophic. Damage total. Lines of sight and level are distorted. Objects thrown into the air. (8)

What you can do before, during and after an earthquake

PREPARE FOR AN EARTHQUAKE
Always keep an emergency kit in your home. Include water, food, necessary medicines, a reliable torch with fresh batteries and spares, portable radio, first aid kit, emergency phone numbers.

DURING AN EARTHQUAKE
If you are inside:
- Stay inside — do not attempt to run outside. However, be prepared for aftershocks and evacuate if necessary. Listen to your radio for information and advice.
- Take cover under strong support like an internal door frame, table, desk or bed. Stay away from windows, overhead fittings, shelves containing heavy objects etc.
- If in a high-rise building, stay away from windows and outer walls. Never use the elevator.
  If in a crowded public place, try not to panic. Do not attempt to barge at the door.

If you are outdoors:
- Keep well clear of buildings, power lines, trees etc. and stay in the open. Do not attempt to seek shelter in a building.
- If you are in a vehicle, pull off the road to a clear area and stop the car.
- Beware of fallen power lines, damaged roads and bridges.

AFTER AN EARTHQUAKE
- Check people for injuries and apply first aid. Call the ambulance and do not move the seriously injured unless they are in immediate danger.
- Do not use the telephone unless it is absolutely necessary.
- Do not use your vehicle unless there is an emergency.
- Do not enter damaged buildings.
- Turn off cooking stoves. Do not light matches until you have checked for gas or fuel leaks.
- Turn utility off at source if you have water leaks or damaged electrical wires or sewerage lines.
- Check food and water supplies.
- Stay calm and lend a hand to others if possible.

Earthquakes are sudden, striking with little or no warning. Be prepared in case it happens!

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Tsunami

NATURAL HAZARDS IN THE PACIFIC - FACT SHEET 3

SOPAC

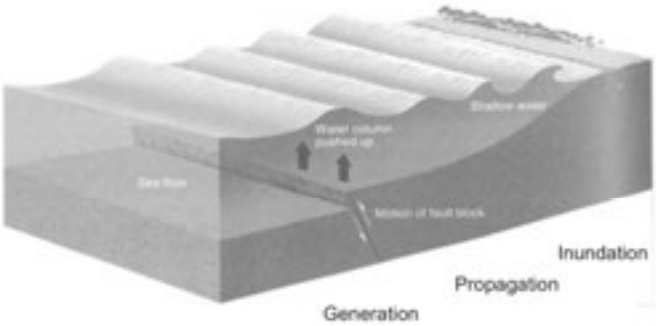
Reducing Vulnerability of Pacific ACP States

The most tragic and devastating tsunami in recent history occurred on 26th December 2004 just off the Indonesian province of Bande Aceh. Waves up to 30 m high battered the coastlines of Indonesia, Thailand, India, Sri Lanka and the Maldives, leaving about 300,000 people dead or missing. Whilst destructive tsunamis such as this are relatively infrequent, tsunami are common in the Pacific Ocean and can affect all of the Pacific island countries. This is because the Pacific basin is surrounded by the "Ring of Fire", a series of tectonic plate boundaries associated with high earthquake and volcanic activity.

Artist's impression of a Tsunami

What is a Tsunami?

A tsunami (a Japanese word meaning "harbour wave") is a series of waves, travelling at speeds of over 800 km/h in the deep ocean and often going unnoticed. They travel harmlessly until they reach the shallow water of a coastline where they slow down and steepen, cresting to heights of more than 10 m and can crash with devastating force across the shore, flooding low-lying areas and causing death and severe destruction.



Any disturbance that shifts a large volume of water away from its normal position can generate a tsunami. The most common cause of a tsunami is an offshore earthquake, which can cause the sea floor to abruptly lift or subside. This can disturb the overlying water column and possibly lead to a tsunami.

EXAMPLE: The 2004 Indian Ocean tsunami was caused by an earthquake as was the 2002 Port Vila, Vanuatu tsunami and the 1999 Pentecost Island, Vanuatu tsunami.

Similarly, a submarine volcanic eruption creates an upward force that lifts the water column above the volcano leading to the generation of a tsunami. A submarine landslide can also generate a tsunami from the sudden down-slope movement and the slumping of sea floor sediments. These landslides are most often the result of an earthquake and occasionally due to a volcanic eruption. In addition, coastal landslides and volcanic cone collapses that send tons of debris spilling into the water can also result in tsunami.

EXAMPLE: Earthquakes triggered the submarine landslides that caused the 1998 Aitape, Papua New Guinea and the 1953 Suva, Fiji tsunami.

Source: Pending Permission to Reproduce

Earthquake and Landslide Caused Tsunamis

EXAMPLE: In 1958 a huge landslide Lituya Bay, Alaska, generated an enormous tsunami 525 m high and in Ritter, Papua New Guinea, a major volcanic cone collapse caused a tsunami 12-15 m high, wiping out a number of villages on western New Britain.

Tsunami Hazards

Coastal inundation and erosion. Tsunami can severely impact coastal areas, completely inundating low-lying coastal areas, destroying buildings, damaging infrastructure, flattening trees, churning up soil and even washing away entire villages. The inundation can also cause severe coastal erosion and affect areas upstream from the coast since tsunami waves can travel up rivers and streams from the ocean.

Wave speed/force. Tsunami waves travel at 36-54 km/h in shallow water, faster than most people can run. This momentum means that the force of the waves can be enormous, able to move large rocks weighing several tons, along with boats and other debris. People can be caught up in the wave and tossed about, choking on seawater and suffering injuries due to the debris.

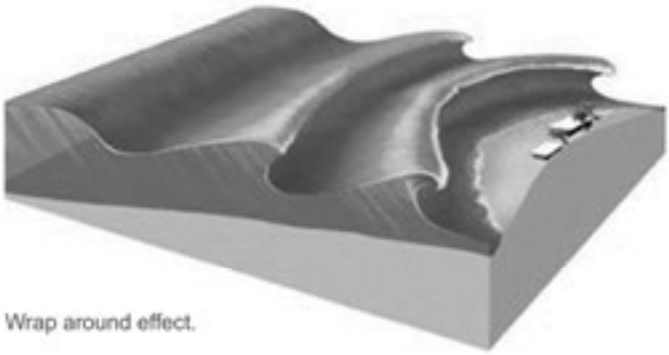
Debris. During major tsunami, fatalities and damage result not only from the force of the waves themselves, but also from the accompanying debris, such as broken glass, torn metal, parts of buildings and uprooted trees, churned up as the wave surges across the shore.

EXAMPLE: 17 July 1998. Three catastrophic tsunami waves hit the coast of Aitape, Papua New Guinea, penetrating up to 1 km inland, devastating villages. Along the 25 km strip from Sissano to Malol, wave heights reached between 10 and 15 m. Over 2000 lives were lost. This picture shows the sand spit where Arop Village once stood.

Source: US National Geophysical Data Center

Backwash. Another danger from Tsunami waves is that they bring a large volume of seawater onto the land. When the water flows back out it may carry people out to sea.

Wrap around. Tsunamis tend to align themselves parallel to the shoreline so they wrap around headlands, sand spits and even whole islands, so that it can be just as dangerous on coasts not facing the tsunami source.



Wrap around effect.

Tsunami Warning

The Pacific Tsunami Warning Centre (PTWC) in Hawaii detects and provides warnings of potentially damaging Pacific wide tsunami. For further information on tsunami and warning systems please see the following links:

International Tsunami Information Centre (ITIC):
http://www.tsunamiwave.info
Pacific Tsunami Warning Centre (PTWC):
http://www.prh.noaa.gov/ptwc

While warnings of far-source / ocean-wide tsunami can be given well in advance of the tsunami arriving, unfortunately, warnings cannot be given about a near-source tsunami because it can reach shore within 10-20 minutes of the earthquake or eruption that caused it. This was the case with the 17 July 1998 event in Aitape, Papua New Guinea.

KEY POINTS TO REMEMBER:

Tsunami can strike any coastline in the Pacific — warnings apply to YOU. For tsunami survival remember the following three warning signs:

1. An earthquake
2. Any unusual change in sea level
3. A ROARING noise

Upon noticing the warning signs:

- RUN to a safe place
- Do not wait to be told
- Do not wait until you see the wave – that is too late because the wave travels faster than you can run.

YOU ARE SAFE FROM THE WAVE AS LONG AS YOU ARE SEVERAL KILOMETERS FROM THE WATER'S EDGE OR ARE ON HIGH GROUND.

What you can do before, during and after a tsunami

PREPARE FOR A TSUNAMI

- Since tsunamis often happen suddenly, everyone in the community must know the warning signs: An earthquake in your area is a natural tsunami warning sign, as is a noticeable rise or fall of coastal water and a roaring sound as the tsunami rushes towards shore.
- Coastal communities and schools should plan for tsunami — prepare a safe area and escape paths (more than one) so that people can reach the safe area quickly. The safe area should be on high ground or at least a few kilometers from the coast.
- Have disaster supplies on hand — torch and battery radio both with extra batteries, emergency food and water, can opener, basic medicines, money and sturdy shoes.
- Develop an emergency communication plan and post-disaster meeting place in case family members are separated during a tsunami.

DURING A TSUNAMI

- Listen to your radio or television for emergency information – if you hear a tsunami warning or if you become aware of any of the warning signs, evacuate and seek higher ground immediately.
- Do not stay in low-lying coastal areas after an earthquake has been felt. If the earthquake occurs just offshore, there will be very little time for response so head for higher ground as quickly as possible.
- Never go to the shore to watch a tsunami. If you can see it you are too close to escape.
- If you are in a boat offshore, do not return to shore — the vessel is safe in the open ocean.
- During a tsunami emergency, police and other emergency organizations will try to save your life. Give them your fullest cooperation.
- A tsunami is not a single wave – it is a series of waves, so stay out of danger areas (coastal and low-lying regions) for at least 2-3 hours.

AFTER A TSUNAMI

- Listen to your radio for advice and updates.
- Help trapped or injured people.
- Stay out of damaged buildings. When returning to your home, enter it with caution – check for gas leaks, electrical shorts and live wires.
- A small tsunami at one point on the shore can be extremely large a few kilometers away. Don't let the modest size of one make you lose respect for them all.

Landslides

NATURAL HAZARDS IN THE PACIFIC - FACT SHEET 4

SOPAC

Reducing Vulnerability of Pacific ACP States

Landslides are a serious geological hazard affecting the mountainous, volcanic islands of the Pacific region - namely Fiji, Papua New Guinea, Samoa, Solomon Islands, Vanuatu and the Federated States of Micronesia. Globally, landslides are more widespread than any other geological event and cause thousands of deaths and injuries each year and can cost billions in damages.

Over 250 landslides initiated by the heavy rains of Typhoon Chata'an in 2002 (some 500 mm in less than a day), killed 43 people and destroyed 230 houses in the islands of Chuuk State, FSM

Source: Pending permission to reproduce from Harp, USGS

What is a Landslide?

Landslides occur when rock, soil or waste becomes unstable and moves downward under the influence of gravity. Many factors contribute to the instability of slopes, but the main factors that pre-dispose a slope's stability are its geology, its geometry and its (pore)-water conditions.

Three distinct physical events occur during a landslide:

- Initial slope failure
- Subsequent transport
- Final deposition of the slide materials

The term landslide refers to a number of different processes:

- **Falls & Topples:** Often the result of weathering, a fall is the collapse of steep (usually rocky) slopes, while a topple occurs when material detaches from an exposed vertical face with a rotational outward movement.
- **Slides:** A slide occurs when material detaches from the slope and slides downwards along the slope in either a translational or rotational movement.
- **Flows:** During a flow, material moves like a liquid at speeds of about 10 m/s and travels long distances. These can be highly destructive due to their speed and ability to accumulate large chunks of debris, such as trees, vegetation, cars etc.

Landslides travel at a variety of speeds from a few millimeters a year to over 100 metres per second and are frequently associated with other natural hazards. Natural events and human activity can cause slope failures.

Natural causes include:

- Saturation of slope material from intense/prolonged rainfall or seepage due to storms and tropical cyclones.
- Earthquake vibrations.
- Volcanic eruptions.
- Undercutting of cliffs and banks by waves or rivers etc.

Human activities that cause landslides may include:

- Removal of vegetation or interference with or changes to natural drainage.
- Leaking pipes (water, sewer) or modification of slopes by construction of roads, railways or buildings.
- Mining activities and vibrations from heavy traffic or blasting; and excavation or displacement of rocks.

The steep, volcanic Pacific islands are particularly susceptible to landslides due to large amounts of rainfall, continual urban development and high earthquake potential and volcanic activity in the region.

Types of Landslide

EXAMPLE: Three of the world's largest landslides within the last 120 years occurred in the Pacific. A debris avalanche in 1985 along the Bairamen River (PNG), which released 0.18 km^3 of material, formed a 210 m high dam that impounded a 0.05 km^3 lake. Villagers were just in time before the dam failed causing a debris flow-flood downstream. A major rockfall in 1988 killed 74 people at Kaiapit (PNG) by discharging 1.8 km^3 of material ran out into the main valley over a distance greater than 10 km. The collapse of Ritter Island volcano (PNG) in 1888 is maybe the largest landslide in recent times. The displacement of 5 km^3 of material caused a local tsunami with 12-15 m high waves run-up destroying several coastal villages.

Landslide Hazards

Landslides can be fast, sudden and can cover large areas, engulfing people, crops, animals and buildings. Areas prone to landslide hazards include old landslides, slopes dried out and cleared by fire, the bases of steep slopes, drainage channels and developed hillsides.

Cyclone Bola 1988 caused this large landslide in Gisborne, Solomon Islands, creating a lake.

Source: Pending Permission to reproduce from N. A. Trustrum, IGNS NZ.

Fatalities and Damage
Landslides cause tremendous damage to property and infrastructure, as well as numerous fatalities and injuries. One of the major problems is that landslides can cut off roads and communication lines, leaving people stranded. Landslides also affect the viability of food gardens and cash cropping areas on which rural Pacific economies are heavily dependent.

Secondary Effects

Alteration of the landscape. Very large landslides can have an enormous effect on the surrounding geography. They create huge gaps in the vista and dam rivers, flooding surrounding areas and creating lakes.

EXAMPLE: A prehistoric landslide that occurred in the Namosi Gap (Fiji) sent 50 million m^3 of debris downhill building a dam 120 m thick. This led to flooding of the areas surrounding the river as a lake of 150 sq km formed. After 1000s of years the lake emptied to the South cutting the narrow Navua Gorge and creating a new catchment.

Landslide dam outburst floods. Failure of a landslide dam, which has trapped large volumes of water behind it, can cause catastrophic flooding downstream.

Tsunamis. Large landslides underwater or into the sea may create tsunamis.

Reef damage. Landslides cause severe soil erosion and deposit this sediment in rivers, which then carry it into the sea causing considerable damage to the surrounding coral reefs.

Source: Garaebiti

Blockage of road by landslides during the Vanuatu earthquake in 2002.

Landslide Warning Signs

- Doors or windows stick or jam for the first time.
- New cracks appear in plaster, tile, brick, or foundations.
- Outside walls, walks, or stairs begin pulling away from the building.
- Slowly developing, widening cracks appear on the ground or on paved areas and underground utility lines break.
- Bulging ground appears at the base of a slope and water breaks through the ground surface in new locations.
- Fences, retaining walls, utility poles, or trees crack, tilt or move and boulders knock together.
- You hear a faint rumbling sound that increases in volume as the landslide nears.
- The ground slopes downward in one specific direction and may begin shifting in that direction under your feet.
- If you are near a stream or channel, be alert for any sudden increase or decrease in water flow and for a change from clear to muddy water.

What you can do before, during and after a landslide

PREPARE FOR A LANDSLIDE

- Learn to recognise the landslide warning signs.
- Look for drainage patterns on slopes near your home noting where flow increases over soil-covered slopes. Check these slopes for signs of land movement, such as small slides or flows or even increasingly tilting trees — changes could alert you to a greater landslide threat.
- Minimize home hazards — plant ground cover on slopes and build retaining walls.
- Make evacuation plans — plan at least two evacuation routes since roads may become blocked or closed.
- Safe areas include slopes that have no movement history, flat-lying areas away from sudden changes in slope, and areas along ridges away from tops of slopes.
- BE ESPECIALLY ALERT WHEN DRIVING. Embankments along roads are particularly susceptible to landslides.

DURING A LANDSLIDE

- Quickly get out of the path of the landslide or mud flow, RUN UPHILL to the nearest high ground in a direction away from the path. If rocks and other debris are approaching, run for the nearest shelter such as a group of trees or a building.
- If escape is not possible, curl into a tight ball and protect your head.

AFTER A LANDSLIDE

- Stay away from the slide area, there may be danger of additional slides. Remember that flooding may occur after a landslide.
- Check for injured and trapped persons near the slide, without entering the direct slide area. Direct rescuers to their locations.
- Listen to a battery-operated radio or television for the latest emergency information.
- Check building foundations, chimney, and surrounding land for damage. Check for damaged utility lines and report any damage to the utility company.
- Replant damaged ground as soon as possible since erosion caused by loss of ground cover can lead to flash flooding.

For further information on landslide hazards and preparedness measures, contact your government natural resources department or see the following websites:
http://landslides.usgs.gov
http://www.redcross.org/services/disaster/keepsafe/landslide.html
http://www.fema.gov/hazards/landslides/

Volcanoes

NATURAL HAZARDS IN THE PACIFIC - FACT SHEET 5

SOPAC

Reducing Vulnerability of Pacific ACP States

The Pacific Rim is often called the "Ring of Fire" due to the large number of volcanic eruptions that occur along its plate boundaries. Volcanic eruptions are the greatest single cause of natural hazard induced deaths in the Pacific, having caused over 3500 fatalities in the last 100 years.

Map of active volcanoes within the Pacific Region.

What is a Volcano?

A volcano is a mountain formed by erupted lava, rock fragments and ash. Volcanic eruptions occur when magma (molten rock) from inside the Earth rises to the surface along plate boundaries or at weak points within the plates called hotspots. There are many different types of volcanoes associated with different eruption types.

Volcano Type	Characteristics	Example	Picture
Shield Volcano	Gently sloping, shield shaped volcano built by non-violent lava eruptions.	Giluwe, PNG	
Cinder Cone Volcano	Small cone shaped volcano usually found on other volcanoes or in cone fields. Built by small explosive eruptions blowing lava into the air, which fragments and falls as cinders.	Cone on Mauna Kea, Hawaii	
Com-posite Volcano	Steep volcano built by alternating layers of gentle lava flows and explosive eruption products usually found along destructive plate boundaries.	Manam volcano, PNG	
Lava Dome	Dome shaped pile of lava created by individual flows of thick, sticky lava.	Bamus, PNG	
Caldera	Large crater shaped basin, formed during large, violent eruptions, when either the summit is blown away or the volcano collapses into the emptied magma chamber.	Billy Mitchell Volcano, PNG	

Image sources: 1. PNG Rabaul Volcanic Observatory, 2. Vic Camp, San Diego State University, 3. Micheal Bonte, 4. PNG Rabaul Volcanic Obersvatory, 5. PNG Rabaul Volcanic Obersvatory.

Eruption Frequency and Variability

Small eruptions are much more frequent and usually less disastrous than large, violent eruptions, which can take several thousand years to build up gas pressure before exploding. The explosivity of eruptions depends on the composition of the magma and the amount of water present. If more silica is in the magma it is less fluid and fewer gas bubbles can escape from it, leading to more violent eruptions. However, if water is present during the eruption, even highly fluid magma can erupt explosively - these hydrovolcanic eruptions lead to violent steam explosions, fragmenting the magma into fine-grained ash.

1

Image source: Cronin, Massey University NZ

2

Image source: Rabaul Volcanic Observatory, PNG

1. Huge eruption column of a violent, large eruption at Lopevi, Vanuatu.
2. Hot ash flows are amongst the deadliest volcanic hazards, as shown here in Manam, PNG in 1996. In 1951 nearly 3,000 people were killed by hot ash flows at Lamington volcano, PNG.

Volcanic Hazards

Hot ash flows are the most dangerous hazard because they are fast-moving (up to 240 km/h) avalanches of hot (up to 800°C) ash, rock fragments and gas. They flow down the flanks of the volcano during explosive eruptions and tend to follow valleys, destroying everything in their path.

Lava flows can reach far distances and are capable of destroying all in their path, although they are usually fairly slow moving and thus not really life threatening.

Volcanic gases such as poisonous sulphur and carbon monoxide are emitted during eruptions. Acid rain damages crops and vegetation and carbon monoxide is lethal to animals and people.

Volcanic bombs (lava fragments larger than 64 mm across) blasted during eruptions can damage buildings and start fires.

Ash falls can rain down during eruptions burying people, crops and livestock and causing buildings to collapse.

Ash clouds pose a serious risk to air traffic.

EXAMPLE: In September 1994, two volcanoes, Vulcan and Tavurvur erupted and buried the town of Rabaul, PNG under millions of tonnes of ash and made 80,000 people homeless.

Secondary Effects

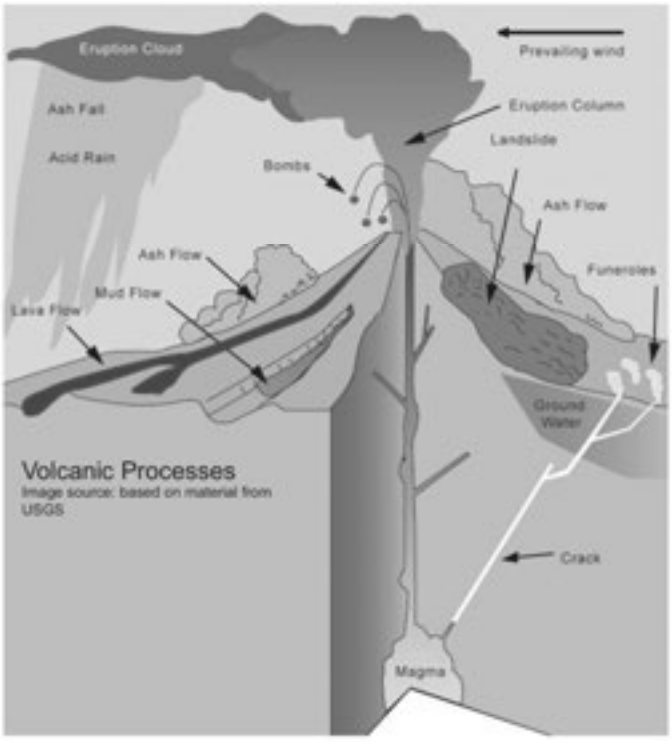
Landslides on steep, unstable flanks can have disastrous impacts. For example during the 1985 eruption in Colombia 23,000 people were killed by a fast moving mudflow of ash and water.

Tsunamis can be triggered by violent submarine eruptions or major volcanic landslides entering the sea.

Earthquakes can be caused by the intrusion or release of magma.

Fires can be caused by hot ash, bombs or lava.

World's climate is affected by the gases and particles forced high into the atmosphere during eruptions.

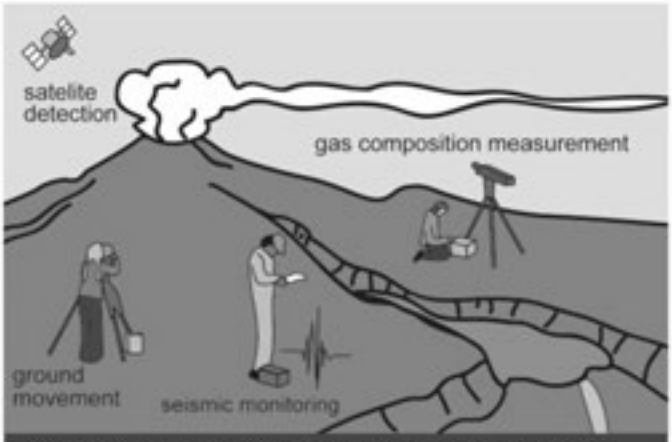


Volcanic Processes
Image source: based on material from USGS

Volcano Warning

Effective management of volcanic activity and good prediction saves lives. Volcano monitoring is designed to detect and measure changes within a volcano caused by magma moving beneath it. A combination of observing stations, expert teams and a well educated and aware community is crucial to avoiding disasters during eruptions. An alert system should outline crucial emergency response actions for the different stages of volcanic activity.

However, Pacific island countries suffer from both many dangerous volcanoes and a lack of resources and often require outside help to properly monitor and assess their volcanoes.



Predicting volcanic crises: Ground and satellite sensors can detect earth tremors, ground distortion due to rising magma, changes in temperature and composition of steam and gas emissions.

Image source: based on material from USGS

For more information, see the following links.

Observatories:

- RVO-PNG: http://www.mineral.gov.pg/volcObs/volcanObs.htm
- DGMWR–Vanuatu: observatoire@vanuatu.com.vu
- USGS - Hawaii: http://hvo.wr.usgs.gov
- IGNS – NZ: http://www.geonet.org.nz
- DVAAC-AUS: http://www.bom.gov.au/info/vaac

Educational:

- http://www.geology.sdsu.edu/how_volcanoes_work/

What you can do before, during and after a volcano

Volcanic eruptions are preceded by signs, some of which are not detected by instruments, nor observed by a volcanologist. The following are some points that should be taken into account to effectively respond to a volcanic eruption.

PREPARE FOR AN ERUPTION

- Make evacuation plans. If you live in a known volcanic hazard area, plan a route out and have a backup route in mind.
- Always keep an emergency kit in your home. Include water, food, necessary medicine, a reliable torch with fresh batteries and spares, portable radio, first aid kit, emergency phone numbers.
- Report any and all unusual physical changes around volcanoes e.g. the drying up of vegetation, rumbling sounds, earthquakes, landslides and other possible abnormalities.

2. DURING THE ERUPTION

- Listen to the radio for information and advice. Pay attention to warnings, which include evacuation notices.
- Escape from area as quickly as possible.
- Find shelter, but NOT in a building with low-pitched or flat roof, if heavy ash is falling.
- Avoid basements and closed spaces where gases may accumulate.
- Wear protective clothing over head and body if you have to move in an ash shower.
- Breathe through a handkerchief.
- Always carry a flashlight, even during the daytime.

3. MITIGATION MEASURES

- Establish permanent danger zones (4 to 6 km radius circle) around the summit of active volcanoes.
- Educate population about volcano risks.
- Improve warning and evacuation systems.

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River Floods

NATURAL HAZARDS IN THE PACIFIC - FACT SHEET 6

SOPAC

Reducing Vulnerability of Pacific ACP States

River flooding is a frequent risk to high volcanic Pacific island countries due to high rainfall, small river catchment areas and low lying coastal areas. Whilst floods cause considerable damage to people and property, some benefits of flooding include an increase in soil fertility due to sediments being deposited on flood plains, pollutants being washed away and groundwater being replenished. However, currently our knowledge of Pacific island river system behavior remains poor.

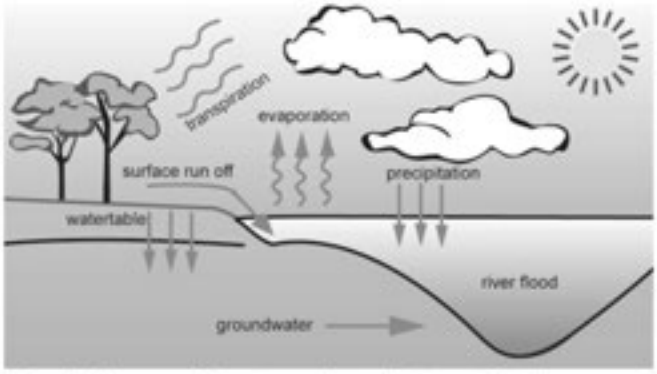
Evacuation at Navua Hospital, Fiji, during Easter floods 2004.

What is a Flood?

Inland flooding results from heavy and prolonged rainfall, when the water level in rivers and streams rises over the banks and inundates the surrounding land. There are three different types:

- **Flash Floods** occur within a few hours of torrential rains with little or no warning and dissipate rapidly. This is the most common form of flooding in Pacific island countries.
- **Rapid-Onset Floods** occur within several hours of heavy rainfall, can last several days and are specific to medium-sized river catchments.
- **Slow-Onset Floods** occur gradually over a fairly long period of time and are only characteristic of large river systems like the Sepik, PNG.

Coastal flooding is a separate hazard which occurs when storm surges, waves and/or extremely high tidal levels inundate low-lying coastal areas.



A simple diagram of the water cycle as it relates to flooding.

What Causes Flooding?

Many factors influence the intensity of a flood:

- Rainfall intensity and duration.
- Steepness of terrain.
- Water levels and moisture conditions preceding the rains.
- Increased runoff due to deforestation.
- Capacity of rivers, streams and drainage networks.
- High tide levels preventing river drainage.

Example: Cyclone Ami in 2003 cost Fiji's agricultural sector alone FJ$66 million. The floods killed 17 people and there were outbreaks of diarrhoea, dengue fever, leptospirosis and typhoid. Floods in Samoa in 2001 cost SAT 11 million and affected nearly 30,000 people. Papua New Guinea suffers several seriously destructive floods every year, which affect thousands of people.

Flood Hazards

Floods disturb fragile island economies by affecting individuals, businesses, insurance companies and governments. The costs of flooding are high. For example, Fiji's economy suffers annually losses of some FJD 20 million on average due to flooding.

People and property. Floods have tremendous impacts to life and property, with 10 people on average being killed every year in Fiji alone. Buildings, personal belongings and stock get washed away or seriously damaged by muddy water. Businesses and services become disrupted for several days and people need to be evacuated from flooded areas, sometimes for weeks.

Livestock and crops. Animals and crops get drowned and washed away and sometimes soil is saturated for months afterwards, preventing new planting.

Disruption of transport. Floods can seriously affect transport lines with airports closed, roads submerged and bridges washed away.

Health hazards. Spread of epidemics such as cholera is frequently associated with floods due to the flooding of septic tanks and sewage systems contaminating drinking water.

Flooding impacts largely on sparse transport roots in small Pacific islands countries, as shown here on Savai'i, Samoa.

Flooding in February 2005 led to the disruption of the Lae-Madang Highway, a main transport route in PNG.

Floods can transport a huge amount of sediments into oceans and onto reefs. At this bridge in PNG the whole river channel was filled up with sediment over a distance of 20 km. The river channel disappeared altogether within 3 - 5 years. This bridge worth a million kina became redundant and was dismounted.

Flood Risk Reduction

Flood risks can be reduced through a combination of options including engineering solutions, development planning and early warning systems. Structural flood defence measures require ongoing maintenance to be effective and can unfortunately result in flood prone areas being used inappropriately. Development planning and control is essential and cost-effective but it can be difficult to enforce. Some flood mitigation options are outlined below:

Structural:

- Hydropower dams and water-reservoirs control river flood levels in lowland areas.
- Embankments along river courses contain greater quantities of floodwaters.
- River dredging, deepening and widening of river channels increases its capacity.

Non-structural:

- Development control based on flood hazard zones
- Catchment management practices to decrease runoff.
- Insurance to transfer the costs of flood damage.
- Flood warning systems.

Flood Warning

Effective flood forecasting and warning is difficult in Pacific island countries because catchments are invariably small and steep, high intensity tropical rainstorms are common and flash flood forecasting technology is lacking in the region. However, standard techniques of flood forecasting, such as using data on previous floods, geology, soil, drainage and precipitation in sizeable catchments do help predict flooding.

Currently Fiji operates the only functional flood warning system in the region. As part of the European Union funded Reducing Vulnerablility Project implemented by SOPAC, an additional flood warning system will be established in Fiji. It will also strengthen flood monitoring, modelling and warning capacities in Samoa, Vanuatu and PNG. SOPAC provides further assistance in this field through a global initiative called Pacific-HYCOS, funded by the European Union.

EXAMPLE: At the village of Nabouciwa, the Fijian Government devised a project to reduce the risk of flooding by a) dredging the river delta, b) using sludge from dredging to raise the village level, c) raising houses on stilts using local materials, d) implementing a village draining system and e) educating and mobilising the community.

What you can do before during and after a flood

PREPARE FOR A FLOOD:

- Learn all you can about previous floods in your area and about possible warning signs and systems.
- Keep an eye on the weather conditions, listen to the weather forecast and follow flood warnings.
- Keep to hand materials such as lumber, plywood, nails, rope, wires, plastic sheeting, sandbags, etc.
- Keep to hand a portable radio, spare batteries and an emergency kit.
- Store all chemicals away from the reach of flood waters.
- Store livestock feed and supplies above expected water levels. Ensure safety of pets.

UPON HEARING A FLOOD WARNING:

- Listen for emergency instructions.
- Ensure all your family members are present.
- Watch for rapidly rising water.
- Store drinking water in sealed plastic containers as water supply may be interrupted.
- Move livestock to higher ground.
- Move household items to higher levels. Secure objects that could float and cause damage.
- Evacuate if necessary when it is safe to do so, don't move quickly.
- Turn off electricity at the main switch before evacuating.

DURING A FLOOD:

- Avoid areas prone to flash flooding.
- Don't attempt to cross rivers or streams where water is above knee level.
- Beware of water-covered roads and bridges.
- Never allow children to play around high water or storm drains.
- Animals can swim well. Do not leave them in confined areas or pens. Open gates so that animals can escape.

AFTER THE FLOOD:

- Re-enter buildings with caution. Use flashlights, NOT lanterns with open flames in case of flammable gas inside.
- Be alert for fire hazards such as broken electrical wires.
- If the building has been under water, do not switch on the main, wait for professional assistance. Never touch electrical switches while wet or standing in water.
- Don't use appliances or equipment until they have been cleaned, dried and thoroughly checked for damage.
- Report damaged utility lines (electricity, water, gas and telephone) to the appropriate authorities.
- Boil all water and don't eat left-over food until it is checked for contamination.
- Keep away from disaster areas as your presence may hamper rescue efforts.

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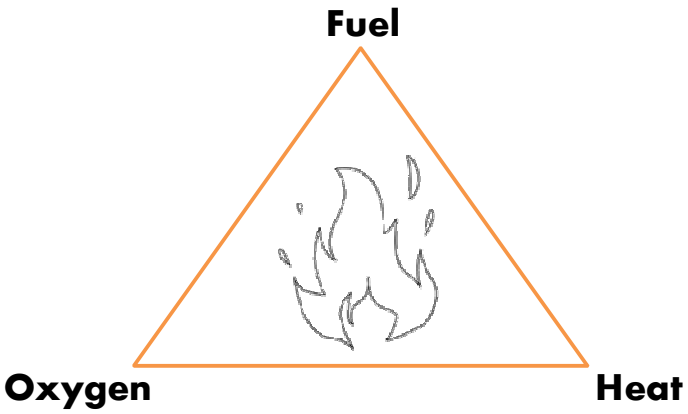
FIRE

Fire requires three things: **Oxygen**, **Fuel** and **Heat**. This is called the Fire Triangle:



If you can remove one of the sides of the Fire Triangle you can put out the fire.

How to remove Heat	How to remove Oxygen	How to remove Fuel
Cool down - Drop the temperature (heat) For example, apply water	Smothering – Exclude all or part of the oxygen For example, use a foam or carbon dioxide extinguisher, fire blanket or pot lid.	Starving – Remove the fuel For example, shut off the gas supply or remove fuel in the path of the fire (form a firebreak)

- How to put out Different Fire Types -

Wood fires and candles	Throw water or sand on the fire.
Electrical fault	Shut off the power to the object or building if possible, then extinguish with a Carbon Dioxide or Dry Chemical extinguisher. Once power is shut off water can be used for the fire (but not before as may cause an electric shock)
Gas cylinder	If the gas line is on fire cool the cylinder with by throwing water on it. DO NOT put out the flame as this can cause a gas leak and make a bigger explosion. If the flame is put out but the gas is still leaking DO NOT light any fires or try to turn the flame on again - Turn off the gas cylinder, if safe.
Car on fire	Remove the key. Make the car stable if safe to do so (for example, leave the car in gear, park brake on, fix the wheels with a rock.) After put out fire with water.
Cooking Oil	DO NOT put water straight onto the fire because the oil will react violently and will spread the fire out of the pot. If safe, turn of the flame and cover with a pot lid, fire blanket or damp cloth till the fire is put out. The blanket will remove the oxygen from the fire. If a cotton cloth is available only, make sure you soak in water first so it does not catch fire too.
Person on fire	If a person catches on fire make them drop to the ground and roll. After, wrap them in a woollen blanket or wet cloth to put out the flames. Remove their clothing (as it will stick to the burnt skin) and run cool clean water over the affected area for 20mins. Get them to a hospital.

TOPIC 3 : ATTACHMENT

Role Play Game Signs

DISASTA!!

******* FOLD *******

GO LONG MAN IA WE I KAREM
SAEN BLONG 'KOMUNITI';
DANIS RAON LONG HEM;
MO KAPSAEDEM
KLAS WOTA BLONG HEM!

Komuniti

****** FOLD ******

Afta long Disasta,
Go long Komuniti Leda mo telem
long hem se wota saplae blong
yufella i damaj gud
mo yufala nidim help
long wota quiktaem

Komuniti Leda

After Komuniti i askem help,
Komuniti Leda i ringim Eria
Kaonsel Secretary mo i talem
abaot bigfala nid blong komuniti
long wota quiktaem

******* END ******

Kaonsel

Eria

****** EOI D ******

Afta yu (Eria Kaonsel) i harem ripot blong Komuniti Leda, ringim NDMO mo askem help long olgeta

National Disaster Management Office (NDMO)

Afta i kasem ripot blong ol damej blong disasta, toktok witem olgeta NGO mo askem help blong olgeta long saed blong wota blong ko long Komuniti

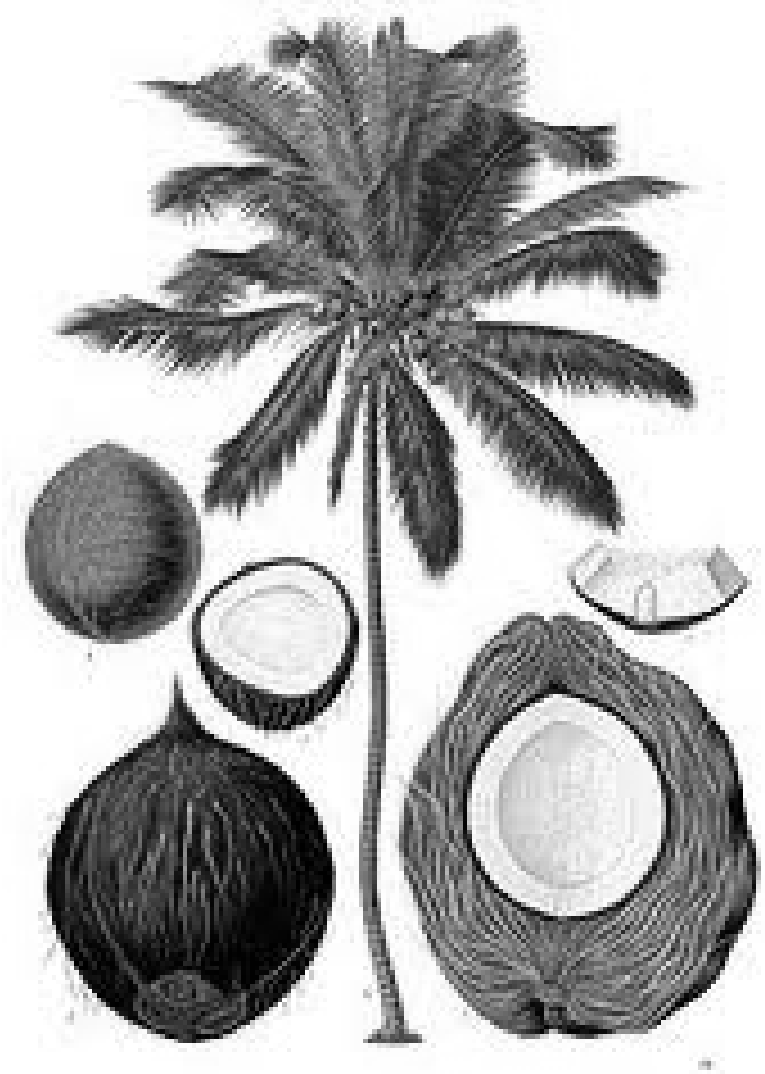
N·G·O

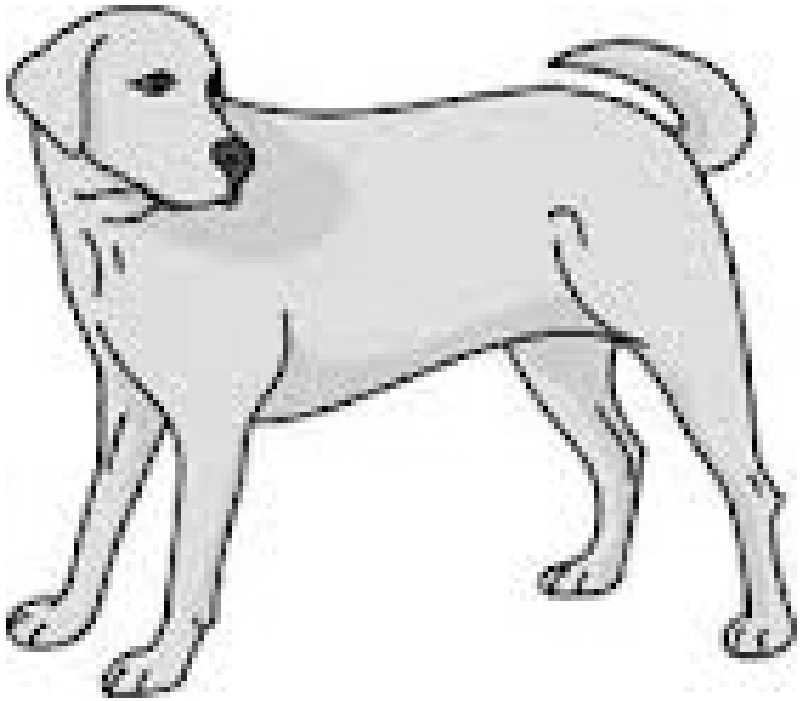
Afta NDMO i askem wan
NGO blong provaedem,
givim wota i ko long
Komuniti Leda
blong kivim long Komuniti

****** EOI D ******

TOPIC 4 : ATTACHMENT

Example disaster warnings pictures

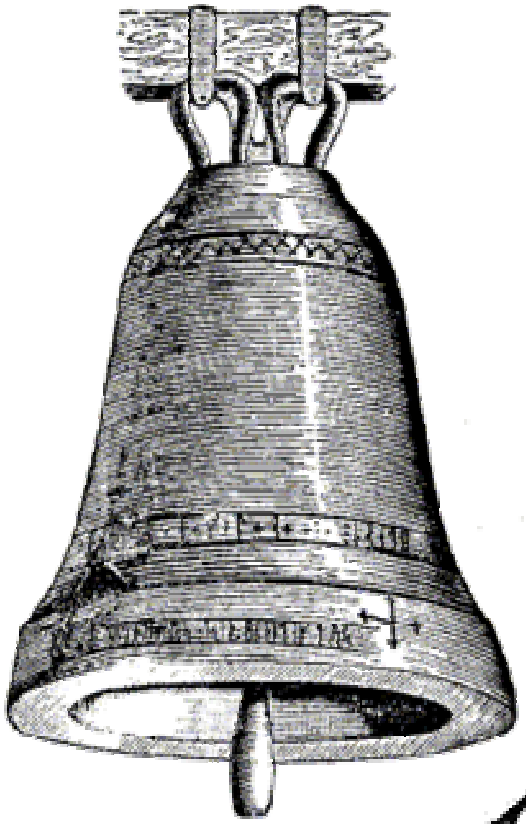


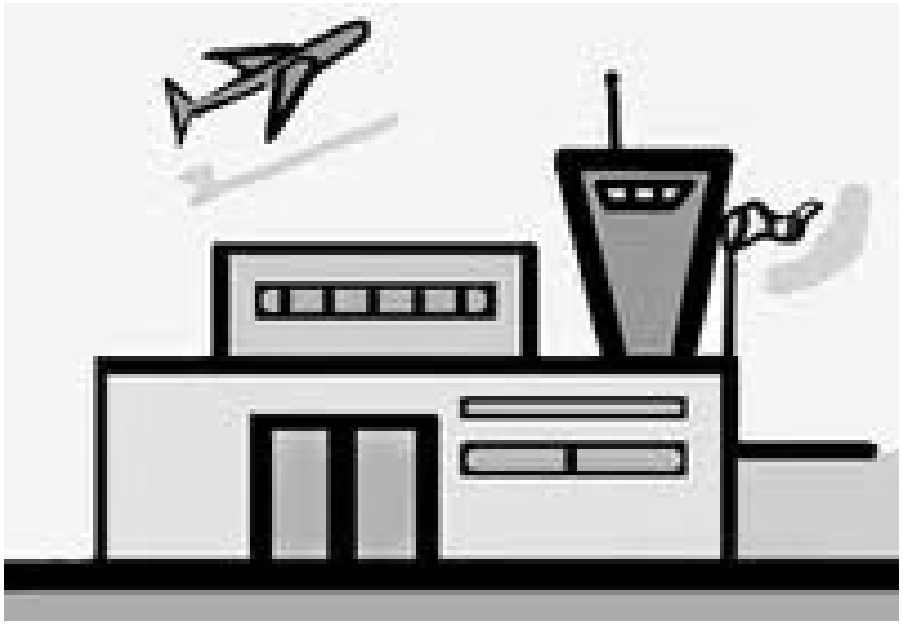


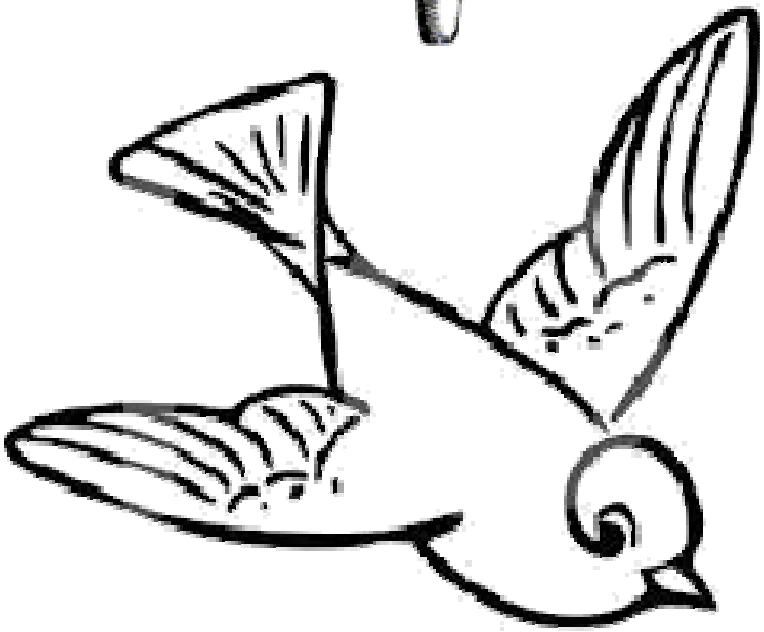

VANUATU POLICE


P&O


SCHOOL
CLOSED







TOPIC 7 : ATTACHMENT

Safe Place Checklist Puzzle – Before, during or after

Cut up each line and mix up in a salad bowl for participants to pick one:

Sef ples i sud strong mo i no lik

Sef ples i sud stap longwe long riva mo solwata blong hem i sef long flading mo tsunami

Katemaot ol tree klosap long sef ples mo klearem ani drein blong wota

Sef ples i sud gat ol sata long ol windo blong stopem strong wind blong no go insaed

Sef ples i no sud stap antap long hill o long wan ples we I no gat tumas wind

Sef ples i no sud stap klosap long stamba blong hill from problem blong landslaed

Sipos sef ples i smol tumas blong evri man i go insaed, yu sud faenem wan nara ples we i sef

Sef ples i nidim faenem wan redio blong lisen long ol woning

Sef ples i nidim ol toelet blong ol man mo toelet blong ol woman

Sef ples i sud gat ol sef ples blong ol man mo ol woman ol i swim long hem

Ol rod i go long sef ples i sud klea mo i no gat flading mo land slaed

Sipos ol man mo woman oli draev i go long sef ples, yu sud gat ol sef ples blong putum ol trak blong olgeta long hem

Faenem wan nara sef ples blong putum ol animol long hem

Kolektem ol fes aid saplae olsem bandij, meresin mo rop mo putum insaed wan bokis

Karem ol wota mo kaikai mo putum insaed long sef ples

Putum gud ol samting mo fasem ol samting we strong wind i save sakem olgeta olbaot

Karem ol mat mo blanket blong slip mo hangem ol kaliko blong seperatem ples long slip blong ol man, woman mo ol sik pipol

Karem sop mo baket blong wasem han

Karem ol kandel mo matjes mo torj laet

Sipos yu gat gas, elektrisiti mo wota saplae – satem mo pulum aot ol rop blong olgeta

Openem ol doa mo geit blong fenis blong ol animol o movem olgeta i go long sef ples

Helpem ol pipol wea ol i nidim ol spesel help olsem ol olfala

Prea mo singsing tugeta blong mekem ol man ol i hapi mo no fraet

Lisen long redio mo stap insaed long sef ples kasem taem i deinja i pas

Organaesem ol pipol blong rikodem ol damej mo organaesem sam fela blong klinap

No usum ani elektrisiti o gas kasem taem yu jekem mo oli sef (no lik mo no wetwet)

No go klosap long riva wea i save ron strong mo mekem sua ol pikinini oli no pleiplei long riva we i ron strong

Mekem sua evriwan i wasim han blong olgeta blong stopem olgeta long sik

Sipos ol man i sik, muvum olgeta i go long wan nara ples mo lukaot long olgeta

Sipos yu nidim help, kolem Area Council Secretary o NDMO

TOPIC 9 : ATTACHMENT

Staying Healthy After a Disaster Cards


4.
Boelem wota blong dring – iven hemia we i kamaot lo paep – blong yu save kat wota we i sef blong dring blong ol pikinini mo famli blong yu.


5.
Mekem sua se ol famli blong yu ol karem aot gud mo saikem o berem long wan sef ples, ol sisit blong ol pikinini. Fasin olsem i save stopem ol sik olsem daena/sisit wota


6.
Sapos pikinini o wan memba long famli blong yu i kasem daeria/sisit wota, miksim blong olgeta ol paket ORS (Oral Re-hydration Solution; suka/sol wota) we ol helt o rilif woka oli givim. Mekem sua se oli dring wota ia evri taem afta we oli daeria/sisit wota – bae i save sevem laef blong olgeta.


7.
Mekem sua se ol famli memba mo ol pikinini oli wasem gud han blong olgeta wetem wota mo sop bifo/ afta oli holem kakae mo fidim ol pikinini. Hemia i save help blong stopem sik we bae oli save kasem mo blong stopem daeria/sisit wota.

8.

Kavremap mo kipim sef ol kakae blong famli bloeg yu. Kipim ol kakae oli fresh mo oli stap kongwe long eni samting we i save spolem olgeta olsem fiae, kokroj mo rat. No kakae ol kakae we oli nogut finis – i save mekem yu sik.

9.

Mekem sua se yu berem ol ded animol o yu sakem olgeta long wan ples we i longwe long ples we ol man oli stap long hem.


10.
Pleplei wetem ol pikinini blong yu everi dei, storian wetem olgeta mo singsing tugeta. Letem ol pikinini oli tokbaot wanem we i hapen long olgeta. Traem blong mekem se everi dei hemi semak. Sapos famli oli save fil se evri samting hemi nomol, bae yufala i save kop we-tem situesen.

TOPIC 12 : ATTACHMENT

Example Disaster Supply Items, Supply List and Distribution Form


World
Wide
Water


World
Wide
Water


World
Wide
Water


World
Wide
Water

Suplae Lis

Oli kam from:	
Iko long:	
Deit:	

Suplae Item	Numba sent	Numba i kam?	Instraksen blong kivemaot	Total numba kivemaot?
Sop			2 blong evri famili	
Wota kontaena			2 blong evri family	
Wota filta			1 blong serem bitwin 3 familis	

Suplae Lis

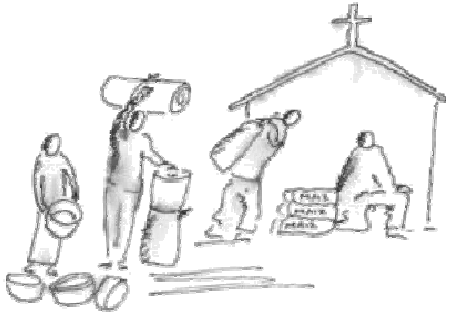
Oli kam from:	
Iko long:	
Deit:	

Suplae Item	Numba sent	Numba i kam?	Instraksen blong kivemaot	Total numba kivemaot?
Sop			2 blong evri famili	
Wota kontaena			2 blong evri family	
Wota filta			1 blong serem bitwin 3 familis	

Ol Disasta Saplae: Distribution List

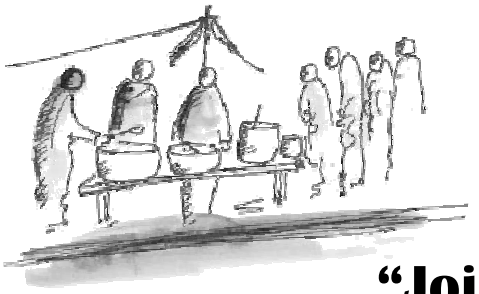
Sipos wan NGO i givim ol samting blong yu givemaot long komuniti afta wan disasta, usum fom ia blong raetem daon evri samting we yu givemaot

Nem blong famili:	Nem blo evri famili memba:	Man/boeo woman/gel	Hamas yia?	Gat ol spesel nid? (sik, gat bel, handikap?)	Hamas blong evri samting yu givemoat long famili? (putum numba)						Man/Woman we i tekem ol samting i saen lo ples ia:	Deit:
					sop	Wota kontena	Wota filter					



Certificate of Completion

This Certificate certifies that:



_____

Has completed the
"Joj blong yumi i help long taem blong disasta"
training program & is qualified to assist
Disaster Management activities

_____ **_____**

Trainer **Date**