VQA Level: 1

Learner Workbook

Certificate I in Climate Change and Disaster Risk Reduction

Unit 1: CGHR0116

Demonstrate knowledge of hazard risks

Learner: .....

Facilitator: .....

Date: .....

Before we start…

This Learner Workbook is designed to accompany the Learner Guide for the unit of competency CGHR0116. It provides learner-centred activities and assessment tools to foster learning of key concepts and skills in this unit, which forms part of Certificate I in Climate Change and Disaster Risk Reduction. The competencies developed are line with the key competencies promoted by VQA to foster greater empowerment and success in the work place. Additionally, a Facilitator Guide for this unit provides further background knowledge and teaching notes for facilitators, trainers and teachers.

This guide was designed to be used by a trained and accredited assessor who is registered to assess this specific unit standard as per the requirements of VQA. Prior to the delivery of the program the facilitator and assessor must familiarize themselves with the content of this Learner Workbook and the accompanying Learner Guide. The assessor, facilitator and learner must plan the assessment process together, in order to offer the learner the maximum support and the opportunity to display his/her competence.

This guide provides step-by-step instructions for the assessment process of:

Title: Demonstrate knowledge of hazard risks		
VQA Code. CGHR0116	**VQA Level**: 1	**Credits**: 6

This unit standard is one of the building blocks in the qualification listed below:

Title	Code	VQA Level	Credits
Certificate 1 in Climate Change and Disaster Risk Reduction	……..	1 & 2	46

Activity 1.1 – Instruction to learner:

Pair work

Study the information on the landslide and flooding in Puarante village, South Santo.

Then work with a friend to complete the following table:

Type(s) of hazard	Date of disaster	Effects of the disaster	How people prepared for the disaster before it happened	What happened after the disaster?
			1. Nine households responded to the call to evacuate the village 2. Four households did not respond and stayed in the village.	

Do you think the loss of human lives could have been avoided? ☐ Yes ☐ No

Give a reason for your answer:

_____

_____

_____

Why do you think that four households did not want to move away from the village before the disaster happened?

_____

_____

_____

_____

_____

Activity 1.2 – Instruction to learner:

Research work in small groups

In small groups of 3-4 trainees, complete the following table to show five actual examples of at least five recent disaster events in your local area or in other islands of Vanuatu. For each disaster, explain some of its immediate or short-term effects, as well as longer-term effects that lasted for several months or years. Please comment on any preparations that were made before the disaster happened. Finally, indicate what happened after the event, and state any actions that were taken by individuals, communities or provincial / national governments to help people recover.

Type of disaster	Date	Location	Effects of the disaster on people, infrastructures, livelihoods, environment		How people prepared for the disaster before it happened	What actions were taken during and after the disaster?
			Short- term	Long- term		
1.						
2.						
3.						

Type of disaster	Date	Location	Effects of the disaster on people, infrastructures, livelihoods, environment		How people prepared for the disaster before it happened	What actions were taken during and after the disaster?
			Short-term	Long-term		
4.						
5.						

Activity 2.1 – Instruction to learner:

Individual exercise

Write your own definitions of "natural hazard", "emergency" and "disaster":

Natural hazard: _____

_____

_____

_____

Emergency: _____

_____

_____

Disaster: _____

_____

_____

_____

Activity 2.2 – Instruction to learner:

Individual exercise

Explain in your own words how a natural hazard can become a disaster, with some actual examples. For example, why can we say that the natural hazard affecting Puarante village became a disaster? Why was cyclone Lusi a disaster for some islands in Vanuatu, but not for others?

Activity 3.1 – Instruction to learner:

Paired discussion

Some hazards or disasters have been caused by humans and not by natural processes. Work in pairs to give two recent examples of human-made hazards or disasters from your local area or from another island in Vanuatu.

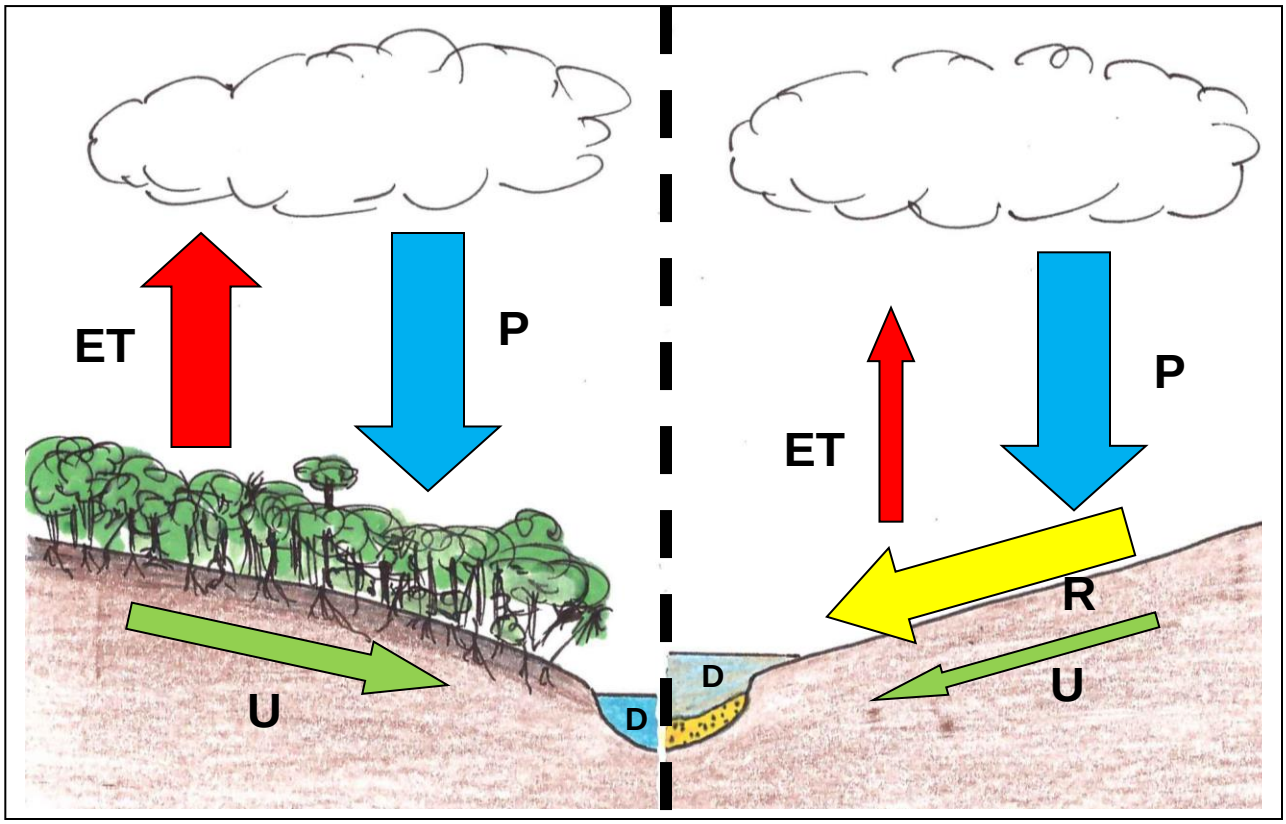
Example 1: _____

Example 2: _____

Activity 3.2a – Instruction to learner:

Completing a diagram (Fig. 1)

Fig. 1



Pierce, C., 2014

1. What do the letters "P" and "ET" mean?

   _____

2. On the right-hand side of this diagram, the forests have been removed. State <u>three</u> results of this deforestation. *(Look at the arrows and the river itself. Note that "U" means underground flow, "R" means run-off, and "D" means the discharge, or volume, of the river.)*

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Activity 3.2b – Instruction to learner:

Paired discussion

1. For each of the following photos (Figs 2, 3, 4 and 5), work in pairs to:
   a) state the type of hydro-meteorological hazard that is shown;
   b) give an actual example;
   c) suggest reasons why this hazard has occurred.

Fig. 2

Pierce, C., 2011

a) _____

_____

_____

_____

b) _____

_____

c) _____

_____

_____

_____

_____

Fig. 3

SPC/GIZ CCCPIR, 2013

a) _____

_____

_____

_____

b) _____

_____

c) _____

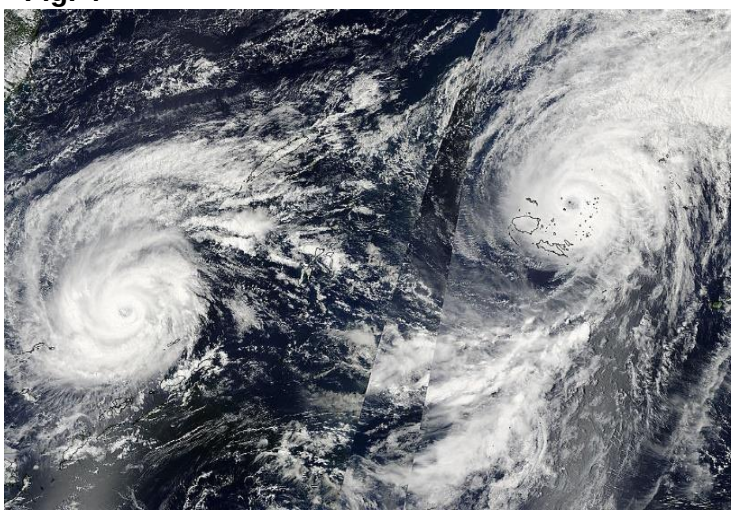
_____

_____

_____

_____

Fig. 4



LANCE Rapid Response, 2010

a) _____

_____

_____

_____

b) _____

_____

c) _____

_____

_____

_____

_____

Fig. 5

SPC/GIZ CCCPIR, 2013

a) _____

_____

_____

_____

b) _____

_____

c) _____

_____

_____

_____

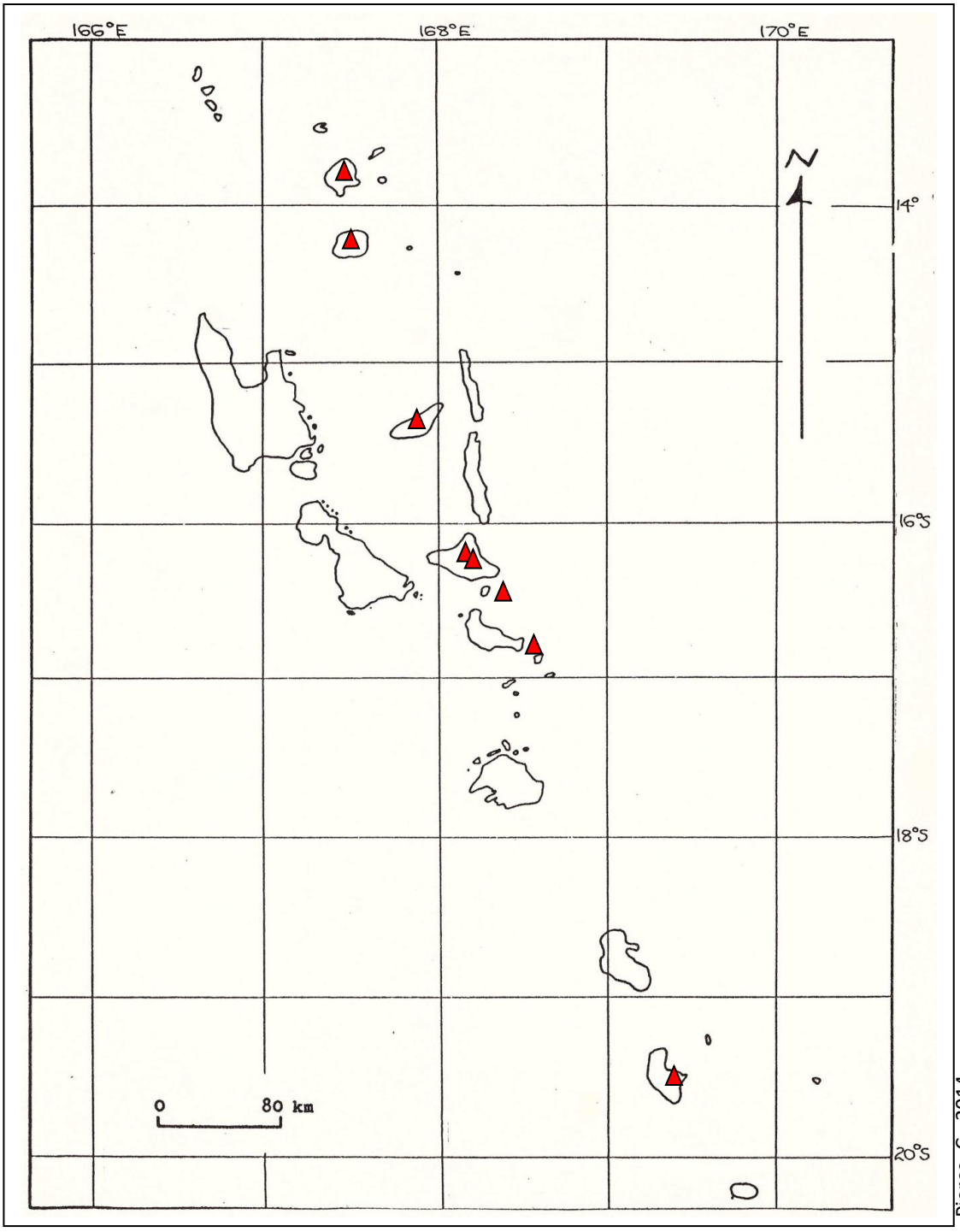
_____

2. State whether each of the following statements is TRUE or FALSE:
   a) A long-term rise in temperature will cause sea levels to fall. …....
   b) Dangers of river flooding increase when there is deforestation in the area. …….
   c) In the southern hemisphere, winds in a tropical cyclone spiral clockwise. …….
   d) In the future, Vanuatu is likely to experience fewer droughts. …….
   e) In the eye of a cyclone, there is low pressure and a higher sea level. …….
   f) When coral reefs are damaged by cyclones, they are less able to protect the coastline and more coastal erosion can occur. …….
   g) Hydro-meteorological hazards include floods and earthquakes. …….

Activity 3.3a – Instruction to learner:

Mapping Vanuatu's volcanoes

Fig. 6



Pierce, C., 2014

Active volcano ▲

On this map:

- Print the names of all the islands
- Name the following volcanoes:

SURETAMATE
GARET
MANARO
MARUM
BENBOW
LOPEVI
KARUA
YASUR

Activity 3.3b – Instruction to learner:

Questions on volcanoes

1. On this photograph, (Fig. 7), show and label two craters and one eruption cloud.

Fig. 7: Eruption of Marum and Benbow, 23rd February 2012

VMGD, 2012

2. Name three main gases that come from volcanoes:

_____

_____

3. Explain why volcanoes are so dangerous:

_____

_____

_____

_____

4. What kind of damage is done by each of the following:
   a) Ash falls: _____

      _____

   b) "Acid rain": _____

      _____

5. There are two lakes on top of Mount Manaro on Ambae. Why do you think this makes an eruption of Manaro very dangerous? _____

_____

_____

Activity 3.3c – Instruction to learner:

Paired discussion on earthquakes and tsunamis

1. True or False?
   a) The point where an earthquake begins is called the epicentre. …....
   b) An earthquake is really just a vibration of the ground. ……
   c) The earthquakes that cause the most damage are those that have a high number on the Richter scale but only last for a few seconds ……
   d) Earthquakes are caused by tsunamis. ……
   e) There is only one huge ocean wave in a tsunami. ……

2. Use these pictures and your own knowledge to complete the table below:

Fig. 8: Baie Martelli, Pentecost, after the 6m high tsunami of 26th November 1999

AGU, 2000

Fig. 9: Lycée LAB, Port Vila, 3rd Jan 2002

VMGD, 2002

Fig. 10: Wharf Road, Port Vila, 3rd Jan 2002

Tony Deamer, 2002

Hazard	Example in Vanuatu	Effects of the hazard
EARTHQUAKE		**1.** **2.** **3.** **4.** **5.** **6.**
TSUNAMI		**1.** **2.** **3.** **4.**

Activity 3.4 – Instruction to learner:

Field work in pairs or groups of three

Please form small groups of two or three trainees. Then go out of your training institution and walk around your community. Complete the questionnaire below (Fig. 11).

Fig. 11 QUESTIONNAIRE ON BIOLOGICAL AND OTHER HAZARDS

Names of observers: ……

Name of community: …… Island: ……

Briefly describe the location of your community, e.g. on the coast, next to a river, in a valley, on a ridge, on a small island, on the side of a mountain, on a plateau, etc.

……

1. Count the number of mosquito-breeding sites that you see. How many? ☐

2. Have there been any cases of the following diseases in your community during the last 12 months?

		YES	NO
a.	Malaria	☐	☐
b.	Dengue fever	☐	☐
c.	Ciguatera poisoning	☐	☐
d.	Other (please specify: ……)	☐	☐

3. Which invasive plant species can you observe in your community?

		YES	NO
a.	Mile-a-minute	☐	☐
b.	Lantana	☐	☐
c.	Other (please specify……)	☐	☐

4. Which invasive animal, marine or insect species can you observe in your community?

		YES	NO
a.	Fire ant	☐	☐
b.	Cocoa pod borer	☐	☐
c.	Taro blight	☐	☐
d.	Crown of thorns starfish	☐	☐
e.	Other (please specify ……)	☐	☐

Pierce, C., 2014

Activity 3.5 - Instruction to learner:

Paragraph writing

Think about recent events described in the newspapers or on the radio, especially those that have taken place in Vanuatu or in the Pacific region. Then write a paragraph on each of the following. Each example should give names of real places, people or events.

1. An example of how a person or people can deliberately cause a hazard or disaster:

2. An example of how a disaster can be caused when someone makes a mistake:

3. An example of a disaster caused by the failure of a human-made system or infrastructure:

Activity 4.1a - Instruction to learner:

Individual research

For each of the following hazards, find out whether or not they have been experienced in your community. If you tick "yes", please indicate the date or year when the last one was experienced:

	HAZARD	YES	NO	IF YES, WHEN? (Give date or approximate year)
1.	Earthquake			
2.	Tsunami			
3.	Tropical cyclone			
4.	Flooding			
5.	Drought			
6.	Very high temperatures (higher than normal)			
7.	Coastal erosion			
8.	Landslide(s)			
9.	Volcanic eruption			
10.	Ash fall			
11.	Acid rain			
12.	Fire			
13.	Outbreak of pests and/or diseases (caused by weather)			
14.	Pollution			
15.	Other (…….)			

Activity 4.1b - Instruction to learner:

Paired discussion and reporting

1. Look back to your answers for activity 4.1a. For all the hazard events that you ticked (✓), discuss with a friend the causes of each. Think of the natural causes and the human actions that led to the hazard or disaster. An example is provided for you.

Type of hazard or disaster	Year	Natural causes of the hazard or disaster	Human actions that led to the disaster
Drought	2013	No rainfall during the months of August-December. Local creek had very little water.	• No warnings issued by NDMO. • Water tanks and wells in the village had not been maintained properly. • Pollution of the creek.

2. Talk about the following topics with your friend. Then each pair can share its views with the other trainees in the class.:

   a. Do you think that most biological hazards are natural, or are they caused by humans? Give some reasons for your answer.

   b. What are some of the natural causes of landslides in Vanuatu? Do human actions also help to cause landslides? If so, how?

Activity 4.2 - Instruction to learner:

Short answers, including completion of a diagram

1. Explain the difference between a fast-onset hazard and a slow-onset hazard, giving examples of each. _____

_____

_____

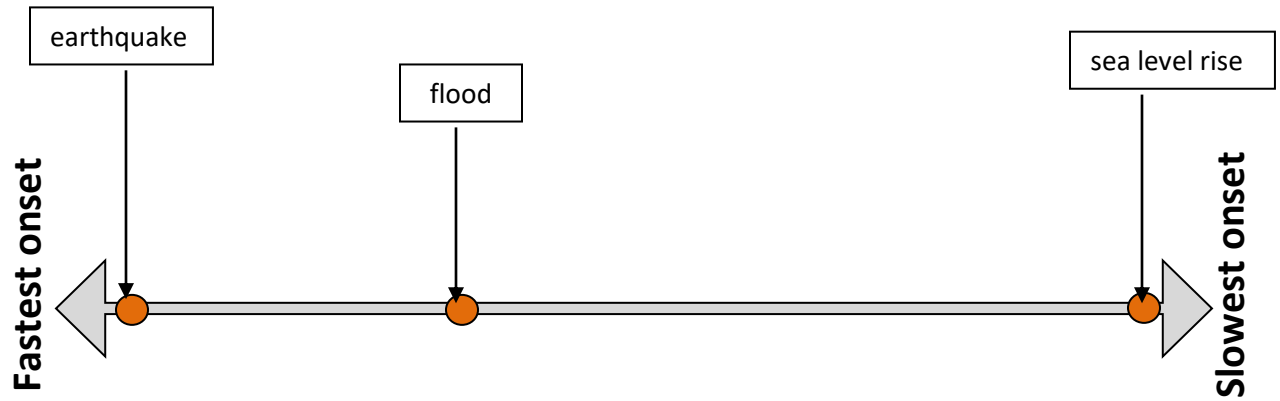
_____

_____

_____

2. This diagram (Fig. 12) shows how the onset of natural hazards can be plotted on a line between two extremes - very quick and very slow. Three hazards have already been plotted. Can you now plot the following on the line in the same way: **tsunami, cyclone, landslide, drought, coastal erosion, volcanic eruption, ash fall, outbreak of pests, increasing temperatures (global warming), fire.**

Fig. 12



Pierce, C., 2014

3. Why are there usually more deaths resulting from a fast-onset hazard than from a slow-onset hazard? _____

_____

_____

_____

_____

Activity 4.3 - Instruction to learner:

Prepared talk

Read 4.3 again in your Learner Guide. Then prepare a short talk (3-5 minutes long) to explain why all of us need to take responsibility to try to reduce disaster risks and increase community resilience.

Now present your talk in front of a group of people. You can arrange with your trainer to either talk to a group of people in your village, or else to a group of your fellow-trainees in your rural training centre.

Activity 5.1 - Instruction to learner:

Group work: Describing and mapping your local community

Form groups of 3-4 trainees, select a local community, then carry out these tasks:

1. Describe your selected community, as follows:

Name of community: …… Island ……

Population: Males: …… Females: …… Total: ……

Brief description of location, e.g. on a hill slope, next to the sea, along a river valley, on a ridge, on a small offshore island, on a plain, on a plateau, etc.

……

How do people make a living in this village? List some of the jobs and activities done by men and women: ……

……

……

2. Now get a large sheet of paper and draw a large map of your community. Be sure to add a key, a north point and an approximate scale (for example, 1 cm on your map represents 10 metres on the ground). The following things should be shown on your map:
    - Buildings such as homes, schools, dispensary/hospital, church, community centre, village nakamal(s), cooperative store, other shops.
    - Food gardens and plantations
    - Bush and forested areas
    - Roads, footpaths, bridges, harbour, etc.
    - Water sources (rivers, piped supply, tanks, wells)
    - Mangroves
    - Beaches, lagoons and ocean
    - Fishing grounds
    - Steep slopes, gently sloping land and flat land
    - Energy sources - private generators, solar panels, sources of firewood, etc.
    - Communications infrastructure - Digicel or TVL relay stations, radio transmitters, etc.
    - Any other features that are found in your village.

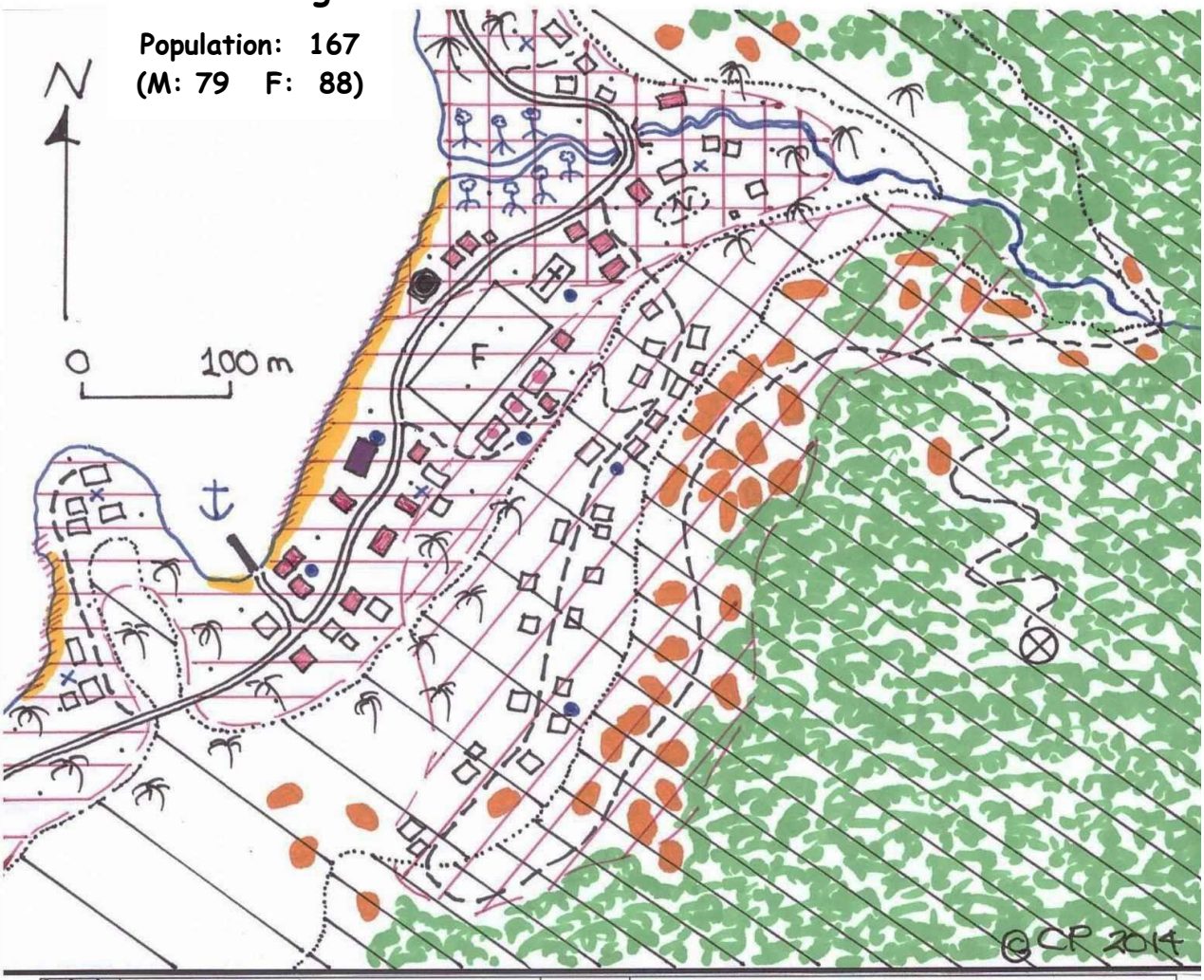
3. Complete this table to show existing hazards that the community faces, together with past disasters have occurred. Describe the effects of these hazards and disasters on the community's people, infrastructure and environment. Also indicate whether you think these effects have become more or less severe.

Hazard or disaster	Effects on:			Have the effects become more or less severe?
	People	Infrastructures	Environment	

4. Now show the parts of your map that are at risk from hazards such as tsunamis, floods, landslides, cyclones, volcanic eruptions, earthquakes, etc. Use a different kind of shading for each type of hazard. Indicate the location of any major disasters that have taken place.

AN EXAMPLE OF A HAZARD MAP FOR THE IMAGINARY VILLAGE OF PINAT IS SHOWN ON THE NEXT PAGE. USE THIS MAP TO HELP YOU DRAW YOUR OWN.

Fig. 13



	Very steep slopes	×	Well
	Gentle slopes		Wharf
	Flat land		Anchorage
	Beach	F	Football field
	Building		Digicel tower
	School		Forest
	Church		Food garden
	Dispensary		Coconut plantation
	Cooperative store		Mangroves
N	Nakamal		Area in danger of flooding from river
	Road		Area at risk from tsunamis
	Track or footpath		Area at risk from landslides
	River		Houses damaged by 2002 earthquake
	Water tank		Coastal erosion taking place

Pierce, C., 2014

Activity 5.2 - Instruction to learner:

Group work: Report on areas, assets and people in your selected community that are at risk from hazards and disasters.

In your group, discuss your findings about the impacts of hazards and disasters in your chosen community. Then prepare and deliver a short report to your fellow trainees. Your report should cover the following aspects:

1. A short description of your community, using information shown on your map.

2. Areas on your map that are at risk from different types of hazards, and why.

3. Community assets that are at risk (i.e. special buildings, areas or infrastructures, "tabu" sites, projects of economic significance, etc.)

4. People in your community who are especially at risk when a natural hazard arrives, perhaps because they cannot help themselves or cannot walk. Examples would include babies and children, nursing or pregnant mothers, elderly people, the disabled, and poor people.

ASSESSMENT OF LEARNING

You will be given a short test to find out your learning from this Unit. Here are some of the questions that you might be asked. Before the test, carefully go through these questions and think about how you might answer them.

1. What is the difference between a hazard, an emergency and a disaster?
2. What is meant by a "disaster risk"?
3. Define "geological hazard" and give an actual example from Vanuatu
4. Define "hydro-meteorological hazard" and give an example from Vanuatu.
5. Define "biological hazard" and give an actual example from Vanuatu.
6. The magnitude or size of a disaster depends on three things. What are they?
7. Do you think that human actions can increase the vulnerability of a community to disasters? Give two examples to support your answer.
8. Why do tropical cyclones occur?
9. What causes a tsunami?
10. Why is an ash fall dangerous?
11. Why do fast-onset hazards generally cause greater loss of life than slow-onset hazards?
12. Which areas and people in your local community are most vulnerable to natural hazards, and why do you say this?
13. Explain why you should take responsibility to try to reduce disaster risks and increase community resilience.
14. List five disaster events that have taken place in Vanuatu, with dates.

Illustrations

Fig. number	Source
1.	Pierce, C., 2014, *Effects of deforestation on the water cycle*
2.	Pierce, C., 2011, *Coastal erosion at Mele Beach, Efate*
3.	Secretariat of the Pacific Community and Deutsche Gesellschaft für Internationale Zusammenarbait GmbH (SPC-GIZ) Coping with Climate Change in the Pacific Island Region (CCCPIR), 2014, *Food garden suffering from drought.*
4.	Land Atmosphere Near-real time Capability for EOS (LANCE) operated by the NASA/GSFC/Earth Science Data and Information System (ESDIS) with funding provided by National Aeronautics and Space Administration (NASA/HQ), 2007, *Cyclones Tomas and Ului,* accessed on 23 January 2015 at http://rapidfire.sci.gsfc.nasa. gov/gallery/?2010075-0316/Tomas_Ului.A2010075.0305.4km.jpg
5.	Secretariat of the Pacific Community and Deutsche Gesellschaft für Internationale Zusammenarbait GmbH (SPC-GIZ) Coping with Climate Change in the Pacific Island Region (CCCPIR), 2014, *Crossing a flooded river.*
6.	Pierce, C., 2014, *Map of active volcanoes in Vanuatu.*
7.	Vanuatu Meteorology and Geohazards Department, 2012, *Eruption of Marum and Benbow on 23rd February 2012.*
8.	Caminade, P., Charlie, D., Kanoglu, U., Koshimura, S-I, Matsutomi, H., Moore, A., Ruscher, C., Synolakis, C., and Takahashi, T., 2000, *Vanuatu earthquake and tsunami cause much damage, few casualties,* Eos Trans. American Geophysical Union (AGU), 81(52), 641–647, *doi:*10.1029/EO081i052p00641-02), accessed on 1 January 2015 at http://www.personal.kent.edu/~amoore5/Vanuatu_Eos.pdf
9.	Vanuatu Meteorology and Geohazards Department, 2002, *Damage to Lycée LAB caused by the earthquake of 3 January 2002.*
10.	Deamer, T., 2002, *Landslide on Wharf Road, Port Vila.*
11.	Pierce, C., 2014, *Questionnaire on biological and other hazards.*
12.	Pierce, C., 2014, *Diagram showing onset of natural hazards.*
13.	Pierce, C., 2014, *Map of Pinat village.*

Assessment Feedback Form

Comments/Remarks	
Feedback to learner on assessment and / or overall recommendations and action plan for competence:	
Feedback from learner to assessor:	
Assessment judgment You have been found: ◯ Competent ◯ Not yet competent in this unit standard	Action to follow: ◯ Assessor report to VIT ◯ Learner results and attendance certification issued
Learner's signature:	**Date:**
Assessor's signature:	**Date:**
Moderator' signature:	**Date:**

End of Document