

LANDSLIDE-HAZARD MAP - A LIFE-SAVING TOOL: A Concept Proposal for Preparedness in Chuuk



The Problem and Current Situation

Debris flows triggered by heavy rainfall from typhoons are responsible for many deaths on the small islands of Chuuk. Many personal and community dwellings are situated in the path of high risk areas.

Recognizing the potential value of mudslide hazard mapping, the US Geological Survey went to Chuuk to gather the necessary information to develop landslide hazard maps. Unfortunately, the produced maps were never used to develop community evacuation plans. Indeed, the landslide from Typhoon Chata'an in 2002 resulted in 43 deaths in the population of 40,000 on Chuuk. Most -if not all-of the deaths resulting from this typhoon could have been avoided if available hazard maps had been used to direct evacuation procedures. Still today, these valuable maps are not being used to develop life-saving evacuation plans.

Overall Project Goal

The overall goal of the one-year landslide-hazard-map implementation project in Chuuk is to build on existing knowledge and apply pre-existing basic hazard-mapping tools, existing hazard maps, and landslide vulnerability assessments, to develop evacuation plans and procedures and raise hazard and evacuation awareness in the community. A further purpose of this project is to develop a model that can be used on other islands of the Pacific to deal with various disasters requiring evacuation.

Objectives, Activities and Indicators

Objective 1: Partnerships are established between the Federated States of Micronesia (FSM) Ministry of Health; identified Village Leadership/Counsels; U.S. Forest Service, National Mapping Discipline of the U. S. Geological Survey, Honolulu, Hawaii; U.S. Peace Corps; and the Centers for Disease Control/ Pacific Emergency

Health Initiative (CDC/PEHI) to ensure the provision of technical assistance.

1. The different organizations listed above will be contacted by CDC/PEHI to: assess interest in collaborating, determine the resources that can be provided by each, and brainstorm other potential collaborators located on the islands of Chuuk.
2. A memorandum of understanding (MOU) will be drafted between the FSM Ministry of Health and the National Mapping Discipline of the USGS. The National Mapping Discipline of the USGS will assist the FSM Ministry of Health to determine the location of hazard and evacuation sites by plotting the households, buildings, and joining roads of the islands of Chuuk.
3. A MOU will be drafted between the FSM Ministry of Health and the U.S. Peace Corps and other community organizations that will: provide basic field work and community training on basic emergency preparedness and response (to include what to do during heavy rains), plan meetings, and hold regular drills.
4. A core group composed of members of the different organizations listed above will be formed by CDC/PEHI.
5. Expected Outcomes:
 - 1) MOUs will have been written between the FSM Ministry of Health and the U.S. Forests Service; the National Mapping Division of the U.S. Geological Survey, Honolulu; and the US Peace Corps, and will have been signed by all parties within 1 month of start of project.
 - 2) A list of members of the core group will be compiled by CDC/PEHI

Objective 2: Villages, individual houses and other community buildings are plotted on existing landslide hazard maps of Chuuk.

1. Villages will be plotted on a 1:25,000 scale map by the U.S. Forest Service and the National Mapping Discipline of the USGS of Honolulu after consultation with the U.S. Geological Survey and each village leadership.
2. For each individual village situated in a hazard zone, individual households and other community buildings will be plotted on a 1: 6,000 scale enlargement of the landslide hazard map of each village.

3. Expected Outcomes:

- 1) Within 2 months of the start of the project, the U.S. Forest Service and the National Mapping Discipline of the USGS of Honolulu will produce a landslide hazard map of Chuuk with the locations and names of all villages of the island.
- 2) Within 6 months of the start of the project, the U.S. Forest Service and the National Mapping Discipline of the USGS of Honolulu will produce a 1: 6,000 scale enlargement of the landslide hazard map for each village that is located in a high risk area of Chuuk islands. Each map will label individual households and community buildings.

Objective 3: Evacuation sites are identified for the different villages, individual households and community building employees.

1. In consultation with village leadership, the U.S. Peace Corp field representative will utilize the maps developed in Objective #2 to identify sites or buildings situated in the safety zone that could accommodate the population at risk.
2. The U.S. Peace Corps field representative, in collaboration with the village leadership, will complete an inventory of: 1) the services each site/building can provide (e.g. bathrooms, food, water), 2) the number of people each can hold for 24 hours, and 3) the improvements that could be made to improve each site/building capacity. If families will evacuate to other relatives or friends homes it will be noted in the inventory.
3. A team composed of community leaders and the U.S. Peace Corps field representative will survey each village and produce a list of all the possible evacuation sites and which household/ people would go to which site.
4. MOUs will be drafted with the owners of selected evacuation sites.
5. Expected Outcomes: Within six months of the start of the project, the following documents will be produced
 - 1) a color coded map of the population and their respective evacuation sites
 - 2) a table of all evacuation sites, the services they are equipped to provide, and the potential improvements that could be made to improve their capacity.
 - 3) MOUs with the owners of the selected evacuation sites.

Objective 4: A plan of action including contacts and procedure for declaring an evacuation is made.

1. The rainfall measurement that will prompt the declaration of an evacuation following the National Oceanic and Atmospheric Administration's (NOAA) forecast will be determined.

2. Who will collect rainfall measurements will be identified and trained.
3. A list of contacts and alternate contacts detailing who should be advised when the agreed-upon rainfall level is reached will be made.
4. A list of community leaders and organizations that must be notified when an evacuation is declared will be compiled through a survey done by U.S. Peace Corps in each at-risk community. The list must include information that allows for contacting on a 7-days-a-week/ 24 hours-a-day basis.
5. A compilation of Standard Operating Procedures (SOPs) will be developed using the gathered data.
6. Expected Outcomes: By the end of the one-year project
 - 1) a list of organizations and community leaders that must be notified when the agreed-upon rainfall level is reached and when an evacuation is declared will have been compiled by U.S. Peace Corps.
 - 2) a SOP will have been developed for the declaration and execution of an evacuation for the high risk areas of Chuuk Islands.

Objective 5: Community leaders and educational institutions will be familiar with proper evacuation procedures and drills.

1. An initial meeting, sponsored by the FSM Ministry of Health, will be held with community leaders to involve them in the project and receive guidance from them.
2. A one day workshop, facilitated by U.S. Peace Corps and CDC/PEHI will be conducted with the selected community, organization, educational leaders and their alternates to educate them about landslide hazards, and proper evacuation procedures and drills.
3. Proper materials that can be used to teach at the community level and organize evacuation drills will be provided by U.S. Peace Corps to the community, organization leaders, and the U.S. Peace Corps field representative
4. Expected Outcomes:
 - 1) Within two years, a curriculum will be given to community leaders U.S. Peace Corps, and community and organization leaders will have reported that they have received all needed materials for teaching about evacuation and conducting drills.
 - 2) Within three years, evidence that community and organization leaders are using the provided tools at locations will have been gathered and a final report written.

Collaborating Agencies

Efforts will be coordinated and monitored by the CDC/ PEHI team which will act as a coordinating body between the numerous agencies, as follow:

- * FSM Ministry of Health
- * Identified Village Leadership/ Counsels
- * U.S. Forest Service
- * National Mapping Discipline of the U.S. Geological Survey, Honolulu, Hawaii
- * U.S. Peace Corps

Monitoring/ Evaluation Methodology

The CDC/PEHI team will produce a formative and summative progress report. The Minister of Health will assigned responsibility to a senior staff member to monitor and provide a progress report at 2 months, 6 months and at project completion.

Budget Summary

Category	Project Expense	In-Kind Contribution	Total Budget (US \$)
Personnel (Salary/Benefits) (pay individual(s) to identify households and community buildings Project coordinator (20hrs/week)			5,000 (local) 5,000 (outside agency) 20,000
Travel			
1. Project coordinator from CDC/PEHI visit to Chuuk			5,000
2. National Mapping Division coordinator from Honolulu			5,000
3. USGS scientist from Denver		Transport in country-\$5,000	2,500
4. From community to community			2,000
Direct Implementation Costs : Office supplies			2,000
Equipment			5,000
❖ PPT Projector			
❖ Screen			
❖ Laptop			
Operational Costs			10,000
❖ GIS Mapping and Plotting	\$3000/ workshop	\$5,000	15,000
Workshops -			
Contingency 10%			7,650
Total Project Expenses			84,150

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