



Rural Training Center-Thailand

2010 RTC-TH Aug Update

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Community-based environmental education for the self-sufficiency and sustainability of small rural family farms
ชุมชนตามสิ่งแวดล้อมศึกษาเพื่อการพึ่งตัวเองและยั่งยืนชนบทขนาดเล็กครอบครัวฟาร์ม

You may post questions / comments to the Discussion area of our website

Our Farm #1 in Our District; #2 in Province



Pi Oi honored at District Mother's Day Ceremony



Saifon and Pi Oi at home with the award



Pi Oi at the ceremony

On Thai Mother's Day, Pi Oi, our farm manager, received special recognition for the top farm in the Thawangpha District. We took second place at the Provincial level by default as we declined the added expenses needed to complete the competition.

For those who have been following our progress, recognition for our efforts in self-sufficiency and sustainability for small rural family farms is not a high priority. While



Pi Oi at home with award

recognition helps publicize our work, the real goal has been the acceptance and wider spread implementation of the King's Theory of self-sufficiency.

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Preparing for Floods

Be Informed:

- Know flood risk in your area: check with local government officials; talk with neighbors about past flooding events. Once you know the risk, start to prepare.

Prepare a disaster supply kit:

- Min. 3-days up to 1-2 weeks supply of non-perishable food with manual can opener. Canned goods are best as they won't be destroyed if they get wet.
- Clean water supply: estimate 4 liters drink water minimum for each person/day (12 liters for 3 days). Store in safe dry place that will not be submerged under flood water. [Note: Learn how to purify water for drinking. Have necessary items to do this in your disaster supply kit.]
- Personal hygiene supplies: soap, toothpaste, sanitary napkins.
- Camping gear: tent, sleeping bag, blankets, mosquito nets, traps / plastic sheets & bags.
- Extra clothes; rubber boots, rain gear, rubber gloves.
- First aid kit with prescription medications.
- Flashlight and portable radio with spare batteries.
- Waterproof container with vital documents (e.g. insurance policies, deeds, licenses, birth certificates, bank books, passports, etc.) and emergency cash (in small bills)
- Rope: Handy to have for safety (e.g. helping others to safety, etc) and to secure people and materials.
- Field sanitation: You still need to go to the toilet, so prepare equipment and supplies to do this as though you were camping

Protect Home contents:

- Move furniture and appliances to 2nd floor to avoid getting them flooded
- Before evacuating: turn off all utilities (gas, water, power)
- Secure loose/unstable equipment inside the house.
- Secure loose/unstable items outside the house

Protect Your Home

- If your home is in a flood prone area, consider modifications to better protect your home from flooding (e.g. berms, dikes, drains, etc.)
- Elevate the house by filling the foundation to a greater height or using stilts.



Sand being brought in for Pua emergency crews to bag.



Crews rush to fill sand bags in Pua for flood control work.



Filled sand bags are rushed for placement...



...in an effort to contain the Nan River in Pua District.

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- Protect the foundation and structure with berms/dikes to prevent the direct force of flowing flood water hitting the structure.
- Look up hill or upstream for dams, reservoirs, berms/dikes that could fail and send a sudden torrent of flood water toward your location. Avoid building or buying a home here.
- Consider access for rescue and evacuation routes. Avoid being in an area with only one road in or out of the area.
- Get flood insurance. This may not be included as part of regular homeowners insurance. Find out how to get flood insurance coverage.

Prepare for Evacuation

- Look for "safe" areas to evacuate to in the event of severe flooding. Know the fastest and safest route to the safe zone. Know alternative routes as well.
- If flooding is possible, park your vehicle pointing toward the exit / evacuation route so you can pull out directly and not have to back up to get out.
- Have emergency supplies in containers ready to easily load into your vehicle.
- Practice to see how much time is needed to load your emergency supplies into the vehicle for evacuation.

Driving and Personal Safety During Floods.

- Never drive into flooded areas. You cannot see what is or is not under the water. Avoid walking in flood waters. Flood waters can be a mixture of rainwater, sewerage, animal wastes / dead animals, as well as many chemicals and organisms not normally found in rivers and streams. Thoroughly wash all skin areas exposed to flood waters.
- Avoid getting into any moving/flowing flood water. The force of the water can easily sweep vehicles away. You are not as heavy as a vehicle.
- Be careful of natural and man-made hazards. Many animals are also flood victims (e.g. snakes, scorpions, rats, etc.) seeking refuge and may be in places they don't normally occur. Avoid contact fallen power lines. Watch for overhead objects that could be falling (e.g. power poles, trees, signs and sign posts, etc.)
- Wash all food containers and utensils thoroughly before use (including canned goods before opening). 



Photo by J. Aguilera

The flood marker pole in Provincial capital of Nan.



Photo by J. Aguilera

This man seems better prepared than others in Nan.



Photo by J. Aguilera

What is under the muddy water in front of this motorbike?

Once the flooding begins, you have run out of time to prepare for the emergency.

More Flood Photos

Photos of the flooding in Nan's Provincial Capital (~36 km south of us)



Photo by J. Aguilera

Bridge (in background) over the Nan River



Photo by J. Aguilera

Water level 8.2 m



Photo by J. Aguilera

Boats are better than motorbikes



Photo by J. Aguilera

Flooded homes



Photo by J. Aguilera

Flooded streets

No Flooding in Thawangpha.....So Far.....



A huge puddle in the field at Thawangpha District Office which would affect its use during flood emergencies.



Debris 1.5 m above the current river level on the water department river intake tower.

Heavy Rain Fill Our Ponds



West Fish Pond



Middle Fish Pond



East Fish Pond



The West holding pond with the fish ponds in the back.



The Central Gully holding pond above the animal pens.

Landslide Hazard Awareness

Landslides are a real hazard in mountain areas. The rainy season is a prime time for landslides. Gravity is the main driving force for landslides. Water is a major contributing factor. Other factors involved are slope angle, land materials and their condition, and vegetation cover. There are many technical details involved, but this article will give some basic guidelines of features to watch for in the local landscape.

The photo on the right shows hills with generally rounded shapes. The landslide occurred on the steeper slope. Slopes of 15° or less are no likely to have landslides. Slopes between 15° -45° are at moderate risk. Slope more than 45° are at high risk.

Rain soaked into the soil making it heavier and also made the soil particles easier to slide past one another. Gently falling rain over a few hours soaks into the ground more than a short heavy rain.

Vegetation (especially trees) help to hold soil in place and control the amount of soil moisture. So areas of good tree cover are less like to have landslides. Areas with bare soil are more likely to have landslides.



Landslides occur more often in the rainy season in Nan.



Photo from internet by educational use clause.

Look for landslide scars of past activity in your area.

Landslides can also destroy homes and villages. (See photo on right.)

During times of emergencies, road closures due to flooding and landslides can impair the arrival of relief workers, equipment, and supplies to the disaster area. Before disaster strikes, it is good to know which roads might be closed. Seek alternative routes and know the potential for landslide hazards for them as well. 🌐



Photo from internet by educational use clause.

Landslides can undercut support for roads.



Photo from internet by educational use clause.

Slopes Agriculture & Landslides



This simple spirit level on a stick with a tape measure makes slope measurements fast and easy.

The leveling stick is a simple low cost slope measuring. It can be made using bamboo and a discarded water bottle. Since we had scrap PVC and an extra spirit level, we used these materials to make a compact and easily back packable unit.

	<p>Equipment Needed:</p> <ul style="list-style-type: none"> • Leveling stick • Short tape measure • Note pad • Pen or pencil 																																	
<p>Step 1. Get the “Leveling Stick” and a tape measure with a centimeter scale.</p> <p>Step 2. Assemble the “Leveling Stick” by inserting the handle into the end with the spirit level. There is a short tether to keep the two pieces together when stored.</p> <p>Step 3. Use the tape measure to check the total length of the Leveling Stick is 50 cm.</p> <p>Step 4. Rest the plain end of the “Level Stick” on the uphill side of the slope.</p> <p>Step 5. Lift the downhill side of the “Level Stick” until the bubble in the spirit level is centered.</p> <p>Step 6. Measure the height from the ground to the bottom edge of the “Level Stick” using the <i>centimeter</i> scale on your ruler. The number of centimeters multiplied by 2 is equal to the “percent” slope. This is because the “Level Stick” is made 50 cm long. “Per cent slope” is a measure of the vertical change for every 100 cm of horizontal distance. So if the height of the “A” in the diagram was 8 cm, the slope is 16%.</p>																																		
<p>Note: You must multiply 8 cm X 2 because the Leveling Stick is only 50 cm long. Percent means “part of 100”. So to make 50 cm = 100, you must multiply by 2. Use the table on the right to convert your slope measurements.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>% Grade</th> <th>Ratio</th> <th>Degrees</th> </tr> </thead> <tbody> <tr><td>100.0%</td><td>1:1</td><td>45.0°</td></tr> <tr><td>50.0%</td><td>1:2</td><td>26.6°</td></tr> <tr><td>33.3%</td><td>1:3</td><td>18.4°</td></tr> <tr><td>25.0%</td><td>1:4</td><td>14.0°</td></tr> <tr><td>20.0%</td><td>1:5</td><td>11.3°</td></tr> <tr><td>16.7%</td><td>1:6</td><td>09.5°</td></tr> <tr><td>14.3%</td><td>1:7</td><td>08.1°</td></tr> <tr><td>12.5%</td><td>1:8</td><td>07.1°</td></tr> <tr><td>11.1%</td><td>1:9</td><td>06.3°</td></tr> <tr><td>10.0%</td><td>1:10</td><td>05.7°</td></tr> </tbody> </table>	% Grade	Ratio	Degrees	100.0%	1:1	45.0°	50.0%	1:2	26.6°	33.3%	1:3	18.4°	25.0%	1:4	14.0°	20.0%	1:5	11.3°	16.7%	1:6	09.5°	14.3%	1:7	08.1°	12.5%	1:8	07.1°	11.1%	1:9	06.3°	10.0%	1:10	05.7°
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This summary table is generalized and does not account for soil/rock types, vegetation cover, soil moisture, and other local factors that could affect landslides.

Definitions of slope classes					
General slope classes		Slope gradient limits		Agricultural Use	Landslide Hazard
Simple slopes	Complex slopes	Lower %	Upper %		
Nearly level	Nearly level	0	3	Row crops	Low
Gently sloping	Undulating	1	8		
Strongly sloping	Rolling	4	16	Terraced crops & orchards	Moderate
Moderately steep	Hilly	10	30		
Steep	Steep	20	60		
Very steep	Very steep	>45		Trees	High

The RTC-TH Rapid Recon Landslide Hazard Relative Risk Assessment technical paper is undergoing a final review and will be available soon on the website.



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Rapid Recon Landslide Hazard Relative Risk Assessment

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Landslide hazard potential assessment is a very technical engineering challenge. This rapid recon assessment is relative and subjective. It is meant as a screening tool to quickly identify possible sites where more detailed technical studies could be done. It is NOT intended to replace field engineering assessments of land slide hazards. Lay people can use this method to identify sites to avoid when constructing trails, roads, structures. In emergency planning, this method can help select "safe" areas for temporary relief shelter areas and assess the suitability of evacuation / relief supply access roads. This kind of fore knowledge can be used to plan the pre-positioning or staging of equipment, supplies, and personnel for more effective response in times of emergencies.

Definitions of slope classes					Environmental Sphere											
Landslide Hazard	General slope classes		Slope limits		Lithosphere					Biosphere			Atmosphere			
	Simple slopes	Complex slopes	Lower %	Upper %	Strata Dip		Surface Rock / Soil		Soil Type		Vegetation Cover		Soil Moisture			
	Very steep	Very steep	>45		6		6		6		6		6			
	Steep	Steep	20	60	5		5		5		5		5		Bare ground	5
	Moderately steep	Hilly	10	30	4		4		4		4		4		Grasses	4
	Strongly sloping	Rolling	4	16	3		3		3		3		3			3
	Gently sloping	Undulating	1	8	2		2		2		2		2		Trees	2
Low	Nearly level	Nearly level	0	3	1	1	1	1	1	1	1	1	1			
Relative Scale Subjective Field Assessment <ul style="list-style-type: none"> Measure the slope angle using whatever means you have available. Actual measurement is better than an estimate. For each location of interests, use the relative scale numbers to rate the environmental factors that affect the landslide hazard. Add the rankings and divide the sum by 5 to get an average score. The higher the score, the higher the potential landslide risk. 					Rocks / soil strata parallel to the slope tend to move along bedding planes down slope. Bedding planes against the slope (going into the slope) tend to resist down slope movement.		Broken / fragmented rocks are less consolidated and weakened relative to consolidated rocks of the same type. Sedimentary and some metamorphic rocks are weaker than most igneous rocks.		Highly weathered / decomposed rocks and soil (clays) are less consolidated than similar unweathered materials. Vegetation helps to anchor unconsolidated materials.		If bare ground, look carefully at Lithosphere factors to determine the easy for water to penetrate and soak into the soil and the general overall stability of the slope to resist failing.		Slow, steady, prolonged rainfall tends to saturate soils more than intense heavy rainfall (which may erode and undercut to cause collapse). (In rain event se slope aspect data,.)			

- Tips / Hints:**
- Site Location:** Use maps, aerial / satellite photos, GPS, highway / road mileage posts, vehicle odometer, and relative positions (e.g. 2 km N of Jct 1180/1072, east side of road) to identify the potential landslide hazard site. Without a good location, the value identification of the potential hazard is greatly diminished.
 - Photo Documentation:** Take photos not only of the potential landslide hazard site, but significant landscape features associated with it (e.g. nearby highway / road markers, signage, prominent landscape features, bends in the road, etc.) to aid field workers to easily find and identify the site. Make good notes about the azimuth direction of the photos; so make sure you have a magnetic compass with you).
 - Landslide Evidence:** Freshly fallen rocks/soil are obvious things to look for after storms in your areas. But keep an eye out for and photograph any evidence of past landslides. Older landslide scars (e.g. exposed soil/rock on slopes) and "out of place" patches of vegetation are landscape clues to long past landslides.
 - Local Interviews:** Ask local area residents if they know of or can recall any landslides in the area. Never assume they don't know anything of value. Talk with highway and road maintenance workers about the roads under their jurisdiction.
 - Potential Risk:** A landslide may not have occurred yet in the area; but that doesn't mean it can't happen. Preparing a potential landslide hazard assessment helps to minimize "surprises" during an actual emergency / relief operation and increases the odds of an effective emergency response.