



RTC-TH Aug 2011 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

Emergency Preparation Lessons Launched

The first 5 lessons of the RTC-TH Emergency Preparedness Lesson Series have been released. They can be found at http://www.neighborhoodlink.com/RTC-TH_Tech/pages under the RTC-TH Emergency Preparedness (EmPrep) section heading. These lessons compliment the efforts of the RTC-TH EmComm (Emergency Communications) program. The EmPrep series is part of our community service effort and is consistent with sustainable living.




The remaining 7 lessons are scheduled for release in late Fall 2011 or early 2012.

Lesson 1 is a general introduction to the idea of preparing for emergencies. Lessons 2-5 follow the pattern of the Geographic Systems Model for describing a habitat: shelter, water, food, and space. This order also parallels the critical survival factors for humans. These 5 lessons are the general foundation.

The series was initially planned and started in Fall 2009. Work proceeded slowly with frequent interruptions with other projects. We hope to complete the remainder of the 12 lesson series this year or in the first half of 2012.

The upcoming 7 lessons give more specific emergency preparation information for specific geo-hazards for Nan Province, Thailand (severe storms, floods, landslides, lightning, wildfires, disease, and earthquakes). People living in other places can use the 5 basic general lessons and adapt the specific geohazard lessons to their area by researching their local geohazards.

All lessons are posted as PDFs on the RTC-TH Tech site. The lessons are intended for individual study via computer display. The text density on some of the slides may not be suitable for projection display for larger groups. 

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Mosquito Awareness & Abatement Is Vital

It is estimated that 87% of the people living in Southeast Asia are exposed to the risk of Dengue Fever. The Thai Public Health Ministry issued a warning of a Dengue Fever outbreak. The monsoon rainy season and warmer temperatures cause an explosion in mosquito populations.

There is no reliable diagnostic test, no vaccine, and no cure for this disease. [Note: Hopefully help is on the way as there were reports of advances toward a possible vaccine.] The very young and the very old are the most susceptible to infection. Though recently, Thai Public Health officials noticed increased infections among teen females and suggest fashion trends of shorts, short skirts and black stockings are making them more susceptible to bites. [Note: Mosquitoes tend to be harder to detect against dark clothes.]

Dengue Fever Symptoms: Get medical attention immediately if symptoms appear. Do not take aspirin or Ibuprofen as these tend to thin the blood and this disease can cause internal bleeding.

To complicate matters, Dengue fever symptoms are similar to those of malaria and influenza. Malaria is caused by a parasite; Dengue fever is a virus. Symptoms usually start to appear between 8-30 days after being bitten. The symptoms for the 3 phases of Dengue fever are shown in the diagram on the right.

Know The Enemy:

Life is all about change; adapt to change or get removed from life. It's nothing new for organisms on Earth. *Aedes aegypti* and *Aedes albopictus* are the Dengue vectors in Thailand. They



Aedes aegypti feeding.



Aedes albopictus, Asian Tiger Mosquito



Symptoms of dengue fever. Artwork: Mikael Häggström

For more information about Dengue Fever visit www.cdc.gov/Dengue/



are linked to 4 forms of Dengue Fever (aka “Break Bone Fever”). And recent research in Thailand reveals that 2 mosquito vectors in Thailand are adapting. *Aedes aegypti* and *Aedes albopictus* are expanding their ranges and changing their feeding habits. Disturbing findings revealed both mosquitoes used to live below 500m elevation. They are now found as high as 1,509 m in Chiang Rai and 1,928 m in Chaing Mai Provinces. Whereas both used to be active (i.e. feeding) in the daytime, now both are also active at night. Peak feeding seems to be dusk and dawn. As you can well imagine, it isn't easy to keep from being bitten. *A. albopictus* females are small (1-10 mm long) and feed very lightly and depart very quickly making them hard to detect and swat. I call them “ghost mosquitoes” as I only know they were there because I discover a new bite AFTER the fact.

Breeding Habitats:

Aedes aegypti: uncovered water storage containers.

Aedes albopictus: water in broken containers, shallow depressions.

Both mosquitoes tend to lay eggs next to abundant standing water found during the rainy season. They are urban dwellers, but are spreading to the rural areas. Imagine any place that rain water can be trapped, even in the tiniest amounts, and it invites females to lay eggs. In Thailand, wet or damp bathrooms are great for the mosquitoes.

A. albopictus has a limited flight range of ~200 m. This ranges from uncovered rainwater storage tanks, to old tires, shallow depressions, flower pots or the pan under them, water in flower vases, water trapped in items in the trash, hollows in tree stumps, etc. People need to be diligent about eliminating these breeding places. Eggs can survive for a year until temperature / moisture conditions are right to hatch.

We avoid using organophosphate-type larvicides. We prefer *Bacillus Thuringiensis israelensis* (Bti) a microbial agent. Bti does not affect the intestines of mammals, birds and fish. This makes it ideal for use on the farm. 🌐



Uncovered water storage tanks can breed mosquitoes



Old tires can trap rain water for mosquito breeding



Water in flower pots can be a breeding place.

How To “Grow” Soil



You can't go wrong by adding compost to existing soil removed faster than it is being made.

With a garden or a small rural family farm (in Thailand that would be about 4 rai or ~6,400 sq m) it is possible to “grow” your own soil or take simple steps to improve the the soil you have on site. Any seemingly large task can be effectively tackled if you take it a small step at a time. It may take a while, but you can't rush mother nature, right?

First, you need to know what kind of soil you have. You can learn the basic soil testing methods in the RTC-TH “AG 2010-2 Natural Terrain Study Guide” and “AG 2006-1 Basic Recon Soil Survey Methods available from the Applied Geography section at the RTC-TH website

www.neighborhoodlink.com/org/RTC-TH_Tech/pages

As a rule of thumb, you can never go wrong by adding compost to your soil. Cover bare soil with a 15-20 cm layer of mulch. This will protect bare soil from erosion. It reduces both soil temperature and evaporation thus boosts the soil moisture content. As the mulch decays it becomes compost and adds organic matter to your soil. Together the moisture and organics

will help increase earthworm populations in your soil. Consider earthworms are free biological tractors to turn and mix your soil.

Add any fallen fruit to your compost pile to gain vital minerals for your soil. You can start in a small garden plot or a series of small garden plots with space between them. Alternate the garden plots with the empty space for the next round of mulching / composting and gardening. Eventually the whole farm can be done. The soil you create will be better able to resist erosion and provide a better growth medium for your

Soil is a mixture of small fragments of rock, water, air, and decomposed organic matter. Solid rock is broken in small pieces by physical / mechanical and chemical weathering when it is exposed to air and water near the surface of the Earth. In warm-moist climates, it may be possible to produce 25mm of soil in a year. On a global average, about 12 mm of soil is made each year. In cold climates it is slow and slowest in dry climates. Erosion is a more rapid process. So it is easy to find places where soil is being



Mulch reduces soil evaporation, improves soil moisture retention, prevents weeds, and breaks down to become compost encouraging earthworm populations.



Earthworms are free farm workers

plants. Healthier soil generally means healthier plants. Healthier plants mean less insect pest problems reducing / eliminating the need for chemical pesticides.

To learn more about composting, the RTC-TH REEEPP at Ban Na Fa Elementary School section at this web page www.neighborhoodlink.com/org/RTC-TH_Tech/pages and look for lessons H2 Making Compost (2005r) and H6 Why Make Compost? (2005r).

We advocate “cold / worm composting” on our farm because it is less labor intensive than “hot composting”. We let nature, EM bacteria and the earthworms do the work. As an added benefit, when the compost is ready (often in 3-6 months depending on temperature and moisture conditions) it is loaded with earthworm eggs. Wherever we put the compost, we are also distributing free farm workers to till the soil. Gradually over time there will be more and more free workers all over our farm.



Cold composting is letting nature do its work

Since the farm house fire, we have made good use of the charcoal fragments (biochar) from the fire as an additive to our compost mix. We started using one 4 liter bucket of biochar to a bag of aged cow manure added to the equivalent of 2 bags of compost. The biochar acts as a time release capsule. Soil moisture and nutrients cling to the biochar and are slowly released into the soil. The more we can increase soil moisture retention the better. This reduces the amount of irrigation we need to do and helps get us through the dry season.



Biochar piled between manure and peanut shells.



Composting and gardening in containers is a way to start with minimal effort and materials

Container gardening is another way to start off small. Begin with a small amount of soil, manure, dry and fresh vegetative materials, and some water. By composting in the container, you create the soil needed to start your container garden. Keep the containers in easy distance of your kitchen and you have shortened the distance from farm to fork. This approach makes it easier for the elderly and the very young to be part of the family soil and food producers, too.

Anytime you see a stream or river turn red, precious soil is being lost. Minimizing soil losses begins with developing health soil to resist erosion.🌍



Simple Small Cash Sales



Cutting sugar cane for small sales

According to the King's Theory, surplus farm produce can be sold in local markets if conditions are suitable. This helps rural farm families to generate extra cash for their subsistence needs. You certainly don't get rich this way, but subsistence farming is like teaching. No one gets into these jobs to become a Bill Gates.

The ease of small sales is evident by the simplicity of many roadside stands set up to sell a wide variety of farm / forest produce as well as prepared foods.



Picking lemons in the West Orchard



Collecting mangos from trees along our farm driveway



Ripening Dragon fruit in the garden



Sugar cane and lemons going to be sold.



Harvesting "Hed loom" in the mushroom house.



In contrast to the US, life in rural Thailand can be characterized by its direct simplicity. In the case of small road side vendors, no business license is needed. It can be as simple as putting a table next to the road showing your goods for sale. Many folks go about their work at home and just wait for a customer to call out to get attention. After making a sale, the seller pockets the money and continues their daily routine.



All you need is a table and something to sell.



Or you can be more elaborate and add an umbrella.



Our extra lemons, sugar cane, and dragon fruit for sale.

We team up with Cousin Kai and supply an assortment of produce for her fruit stand along the highway in front of our town business location. From the farm, we cut sugar cane, pick lemons, mangos, papayas, and when they are ripe, we can also supply rambutan and long an. Our gardens provide passion fruit, dragon fruit, and guava, too. Kai also buys fruits from other farmers and suppliers to stock her stand. Depending on availability, she sells various melons, pineapples, avocados, and even fried and dried bananas. 🌐

Na Fa Elementary School Face Lift



New paint for the classrooms brightens up the campus. New garden beds are also laid out.



New computers in the lab with Internet connectivity.

The Thai Government has been striving to improve education. Education technology has been a focal point. Na Fa Elementary has received new computers, internet connectivity, and educational satellite TV programming. Each classroom now has a TV so students can see nationally presented lessons.

In addition to a new classroom building, a new arts and music practice building was constructed. It is stocked with various traditional Thai musical instruments. Art and music programs are an integral part of



The new arts and music building with the Nam Yang River in the background.

In contrast to US schools, the furnishings are rudimentary. The students' desks and chairs are simple wooden ones similar to those used when Saifon attended classes here. Though some of her former teachers are still teaching here, the building, lighting, ventilation are much improved over the old wooden buildings. 🌐



The older classrooms (above left) and the newer classrooms using similar desks and chairs.



All classrooms are equipped with a TV.



The Education Ministry has satellite TV lessons.



Traditional Thai musical instruments



Saifon visiting teachers and students.

Places in Thawangpha: Bus Station & Market

Some friends have asked to see some of the places in and around Thawangpha. A good starting point is the main point of arrival, the town bus station just off the main road, Highway 1040. The highway trends North to South. The Nan River is to the west of the highway with the town and bus station between the river and the highway.

The police mannequin on the highway at the intersection to the main access road to the market is on duty day and night, 24/7. The access road descends 3-5 m to the market parking area. Most of the local flooding occurs 1-2 blocks from the market closer toward the Nan river (which is several blocks off the top of the photo).



Thawangpha bus station (lower left) and the main market (large central building).



Panorama view showing Thawangpha bus station to the main market.



The Thawangpha long distance bus station.



The hardest working policeman: 24/7 rain or shine.

Ancient City Wall of Nan

It seems most people take the ancient city wall in the provincial capital for granted. Nan's ruler, *Chao Anantavorarittidet*, constructed the old stone wall in 1885 to replace of a log wall destroyed by flood in 1817. Remnants of the stone wall - around 400 m out of the original 3,600 m - can be seen at the junction of the *Th Mahawong* and the *Th Rob Muang*, at the South-West end of the town. (Look for the Isuzu dealer near the corner. There is a park along the wall, but there aren't many signs of use. It's a nice quiet place in the hustle and bustle of the capitol. If you service your vehicle at the Isuzu dealer, pack along a book and lunch and have a pleasant wait until your vehicle is ready.🌐



Aerial view of a section of the ancient Nan city wall. (The Isuzu dealer is the large white roof on the left.)



#1 View along the outside of the wall



#2 View along the inside of the wall



#3 Inner wall looking back toward #2



#4 Inner wall, upper parapet