RTC-TH Mar 2014 Update

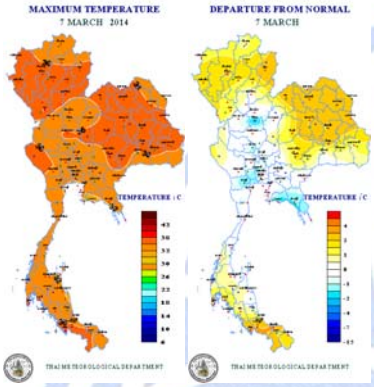
Community-based environmental education for the self-sufficiency and sustainability of small rural family farms

ชุมชนตามสิ่งแวดล้อมศึกษาเพื่อการพึ่งตัวเองและยั่งยืนชนบทขนาดเล็กครอบครัวฟาร์ม

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

www.neighborhoodlink.com/org/rtcth E-mail: rtc2k5@gmail.com

Heat, No Rain, Fire, Smoke, & Drought



These maps show the high temperature for 7 Mar (left map) and the difference with the climate norm (right map). This leads meteorologists to expect Thailand (and indeed much of SE Asia) will have higher temperatures than normal. Long range forecasts indicate temperatures in northern Thailand will be in the low to mid 40°C (104°F+) rather than the usual mid-30°C (80°F+). As the dry season progresses and farmers begin burning to clear their land, the, air quality will decline and become a serious health hazard. Dry vegetation will also make it easier for fires to burn out of control. Combined with a lack of rainfall, drought is a threat.

No rain fell in northern Thailand for Jan and Feb. The long-range forecast shows little chance of rain for Mar. Rainfall probability increases to 5% chance of rain in May (the traditional start of the SW monsoon rainy season. Major dam reservoirs are below 50% capactiy. Farmers upstream were asked to have consideration for downstream users. The dry conditions of January forced the Royal Irrigation Department to reduce water volumes released to farmers from the dams. The low river levels and poor air quality prompted the planning cloud seeding operations. The Northern Royal Rainmaking Center planned operations for February. But, low humidity postponed the flights. They began monitoring weather conditions hourly and will start as conditions are favorable.

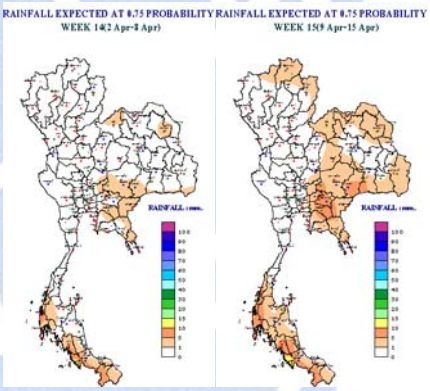


Image from the Internet: educational fair use clause

In This Issue

RTC-TH Co-founders

Saifon & Greg Lee

Water levels in local rivers are lower than normal. (See photos below.) You may recall photos of the Nan River at flood stage (note yellow line) when it overflowed its banks. At flood stage, the water depth can be 11 m. At the start of March, the water was about 1.0-1.5 m deep. The Nam Yang is only about 0.5 m deep. (It looks full upstream of the bridge due to recent dredging making it uniformly shallow.)

The Nan River at the Hwy 1148 bridge

Nam Yang at the Ban Na Fa bridge

Ash-blackened soil indicates the recent burning to clear the land on land to the West of our farm.

The dry season is characterized by fire and smoke as farmers clear their fields. The drier than normal conditions could see an increase in wildfires if any of these agricultural fires get out of control.

In early March, a fire crept into our upper terraces from the forested area of Ban Sali East of our farm. The origin is under investigation. All we know is the fire crept onto our farm at night. The fire spread through our upper terraces.

Old habits die hard: our farm workers burnt our field

A fire hits our upper terraces.

We were fortunate. A creeping fire is usually of low intensity and low height. It doesn't get up into the tree crowns. We planted teak on the upper terraces. Teak is relatively fire resistant. This helped to reduced potential fire damage. The terraces look bleak. But the teak will survive and thrive once the rainy season begins in May.

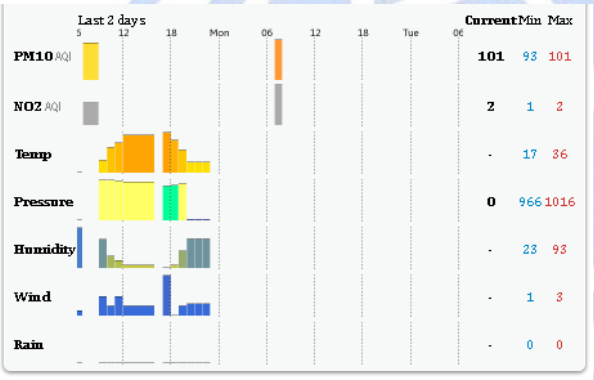
Burning in our local area has caused hazy days. The three photos below were taken early in the morning, at mid-morning, and early afternoon. Visibility improves only slightly through the day. This also means air quality declines significantly during this season. An air quality report for Nan Province shows the extent of the problem,

Taken 06:59 hours

Taken 10:17 hours

Taken 14:02 hours

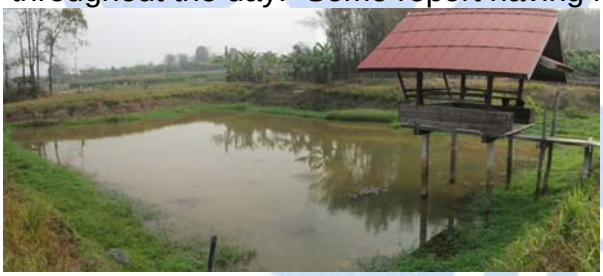
101	**Unhealthy** for sensitive groups



The negative aspects of this long-standing Thai agricultural practice are many. Some of these are:

- Increasing greenhouse gases (contributing to climate change)
- Loss of soil organic nutrients (increasing need to use more fertilizers adding to food production costs)
- Increased health risk for outdoor workers
- Increased costs for health care for sensitive people (e.g. elderly, infants, those with respiratory illness, etc.)
- Loss income from tourism
- Decreased visibility increases risks for aviation operations.

On a more personal level, some of our family members seem to be coughing more throughout the day. Some report having more post nasal drip and running noses.



The East Fishpond is slow to refill from ground seep

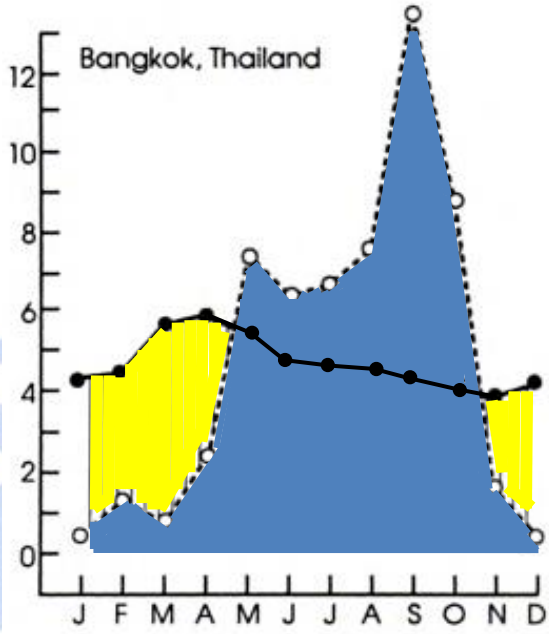
On the farm, our fishponds are low. We had drained the East pond during the past ric growing season. This assured our annual supply of sticky rice (the basic staple for our family). It is slowly refilling. It increased 10-15 cm in depth in 3 months and is about 0.6 m deep. The Central pond is down about 1.5m from full and is now about 2.0-2.5m deep. The West pond (our smallest fishpond) is down about 2.0-2.5 m. This leaves an estimated 1.5-2.0 m of water.

The Central Fishpond is our main farm water reservoir

The West pond is significantly lower than normal

Mention the hot, dry season and evaporation comes to mind (more precisely evapotranspiration). A quick look at the annual curves for evaporation and precipitation in Thailand shows a counter intuitive fact: In a humid place such as Thailand, rain falling into a pond barely replaces evaporative losses on an annual basis!

Calculating or estimating water losses due to evaporation is very complex. Add to it the losses due to plant transpiration and pond seepage make it even more complicated. But it should be obvious that if evaporation exceeds precipitation, farmers will have trouble getting water to grow food.



A water surplus occurs when precipitation (blue) is more than evaporation (yellow).

The Thai Department of Disaster Prevention and Mitigation declared 18 provinces are drought-affected areas. Farmers are being urged to curtail "off-season rice crops, to use water sparingly, and to prepare water reserves for general consumption."

In Nan Province, water tanker trucks began deliveries to villages in 2 sub-districts (Chalermprakiat and Pua). Local water wells dried up leaving local villagers without water. Some villagers switched from planting rice to soybeans and corn. But they report even these crops are dying due to lack of water.

It seems to be obvious that drought means you run out of water. But there are many different technical definitions for the term. A lot depends on the government policy and agency involved. Whatever the definition, measuring drought and predicting it is not easy. In hydrology and meteorology, drought is a long-term phenomenon with many complex variables. This makes it hard for common people to understand. Mass media isn't always helpful. Most reporters lack the scientific / technical training to effectively write about the topic in easy to understand terms.

We might be oversimplifying the situation. To better prepare, we feel all farmers need to reduce water use and increase water storage capacity. This also includes improving soil moisture retention capacity. This involves making swales and increasing soil organic content (which is why we disagree with burning crop residues).

Nam Yang Levee Update

With current funds drained, no riprap got installed on our river bank (left in photo).

Our hopes for having a strong riverside defense are put on hold: the riprap installation project has run out of funds for now. So far there is no news when they may get more funding or if / when the work will continue. The dredging work built up the levee in front of our station. This removed the vegetative barrier along our riverside boundary. We put up a bamboo fence to temporarily secure the yard.

We have to wait and see the final levee / riprap situation before deciding on a more permanent boundary fence or wall. A critical concern is the street drain and how it will meet the levee and get to the river. It currently terminates at the bridge abutment. During the rainy season, the high volume of street runoff discharge has undercut the corner of the retaining wall (see yellow circle in photo below left).

If left as it is, the street runoff will continue to undercut the front corner of our land. It will also erode the back of the levee. The only place the water can go is to erode the foundation of the south bridge abutment. Ironically, the riprap work stopped without protecting the south abutment. However, riprap was installed further downstream from the bridge! I guess we should have prepared a "white envelope" for the riprap contractor!

We aren't sure about the budget situation. The rainy season often starts in May. So we have a couple of months before the wet monsoon kicks in to create new problems. Meanwhile, we have time to save up and think about various options for the new boundary fence or wall.

From Our Farm & Garden

Like many Thai farm families, we also have a garden at home and fruit trees around the house. We have lemons in containers at the farm and in the front yard. There is another lemon tree (in front of the Star apple tree) outside the carport window of our ham radio station.

Fresh lemons from the farm's container lemon trees

Two types of eggplant from the farm gardens

The Star apple tree outside our ham radio carport station window is producing a bountiful harvest of fruit.

Behind the kitchen are two trees that are reliable fruit producers. All year long the papaya tree gives us some of the sweetest papayas. Many times they weigh in at 2 kgs or more. Next to the papaya tree is a Jackfruit tree. This fruit can grow quite large. It is the largest tree-borne fruit. They can weigh from 4or 5 kg up to 27 kgs!!

Jackfruit is on the way

Sweet backyard papayas still producing

RTC-TH Thoughts on Resilience

Resilience is the ability to become strong, healthy, or successful again after something bad happens. News reports of disasters and unusually severe weather brings the topics of emergency preparedness and emergency communications to the front burner for many folks. Immediately following the emergency event are stories of rescue, relief, and dramatic stories of survival. These dramatic tales sell newspapers and propel news agencies and reporters upward on the accounting sheets. The longer term recovery "story" doesn't seem to capture the headlines, so don't help increase profits.

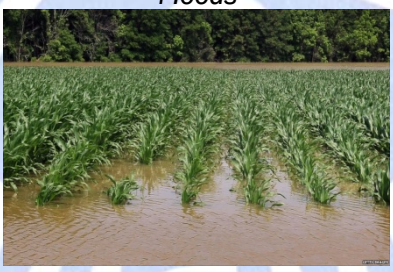
Resilience is the ability to return to "normal".

For the RTC-TH, resilience is a long word (it has more than 3 syllables). So to us, this implies using a longer time horizon for both planning and execution. Most people may do this unconsciously. But people tend to be focused on the immediacy of their lives. Long range planning is often pushed to the back burner for so many reasons we all know too well: (procrastination, denial, lack of funds, being overwhelmed with "doom and gloom" scenarios, and getting tired of being the lone voice in the wilderness, etc.).

Bringing the discussion closer to home, we look at 3 common natural disasters in the Ban Na Fa area. We hope these examples will illustrate a systematic approach for others to adapt to their local situation.

We use the Geographic Systems Model to make people aware of local geo-hazards. The strategies are: 1) avoidance; 2) relocation; and 3) risk taking based on fore knowledge. Avoidance is best. Relocation involves financial costs. It also requires people to overcome inertia and resistance to change. Many people cannot conceive of "giving up" their ancestral or traditional homeland. Risk taking is a very common default strategy. Some people do this knowingly. Others feel stuck in place and feel powerless to make a change. Poverty has a way of being a self- fulfilling

Storms (wind) *Floods* *Droughts*


Short-term impacts are the immediate loss of the current crop, reduced income, and accelerated poverty. Long-term impacts can be extensive environmental damage that could ultimately eliminate agricultural production.



Typhoon storm surge of salt water destroyed soils for agriculture; recovery may take 6+ years.

Extensive soil erosion by floodwaters destroyed the farmland. It is hard to imagine any recovery at all.

Prolonged drought and dust storms permanently removed topsoil. Recovery is beyond a lifetime.

Images above are from the Internet: educational fair use clause.

Prophecy: “I am helpless and can do nothing. I am a victim of fate.”

Total or near total environmental destruction may force people to relocate. Some will be pushed into abject poverty. Others may have a chance to use the Geographic Systems Model to relocate and avoid geo-hazards in their new area. There may be a smaller number of people with the financial resources to “weather” the storm or the relocate with a greater range of options.

Local officials are quick to respond to disasters

In Thailand, most farmers don’t have insurance. When disaster strikes, the government mobilizes to help the people. This system has been in place and works. [The floods of 2011 severely stressed the system nationwide.] So Thais, like many people around the world, rely on government aid for natural disasters. Our concern is the increasing frequency and intensity of recent natural disasters and forecasts. When government resources are stretched to the limit, people will be left to fend for themselves for longer and longer periods of time before help arrives.

Taking lessons from these recent events, the RTC-TH ideas for local resilience stem from the King’s Theory of the Sufficiency Economy. Security and safety begin at home. This is not to say you cannot rely on the government. Our position is simply that each individual and family has a responsibility to do as much as possible to be responsible for their own security and safety within their ability and means BEFORE turning to the government. We operate at the local scale. The government is responsible for all the people but at regional, national, and international scales.

The RTC-TH Resilience Mandala Model

For example, at the local level, one person / family deals with their home and farm, first. Then they take on responsibilities in their village and local community. National governments coordinate the civil affairs mainly above the local level. These levels are not mutually exclusive and do overlap somewhat. National governments reach down into the local levels affecting villages and individuals. But their primary activity is usually above the local level.

Individual & family security & safety

Individual and family security and safety involves the daily life activities of shelter, water, food, and space to maintain life. Home safety includes locks, insect screens / nets, electrical safety, and keeping dangerous tools, materials, and supplies away from children. On the farm, it means avoiding the use of toxic synthetic chemicals and sustainable agricultural practices to assure

producing safe food for the family.

Being aware of local geo-hazards empowers you to either avoid putting yourself, your family, home and farm in harm's way. If you cannot avoid these, then you must take appropriate action to recover when disaster strikes. Avoidance and recover are not free of financial or emotional costs. No one gets a free ride. [**Note:** The 2011 floods in Thailand stretched government resources very thin. People in some areas waited for weeks to get any aid.] If people were better prepared, they would be better equipped and provisioned to wait for help to arrive. In our area, we suggest having adequate shelter, water, food, and space to hold out for at least 1-2 weeks.

Some surplus rice is held in reserve for mutual aid.

Our family usually grows to meet our family's annual consumption. We often have several bags more than we need. These are held in reserve for mutual aid. It is an individual choice as to how much you are willing to share, but the mutual support system is in place and adds to village security in times of need.

The table below covers some of the major points we considered for increasing our farm's resilience to potential local disasters.

	Storms (wind)[1]	*Floods*[2]	*Droughts*[3]
Short -term	Attempt to prop plants up and salvage as much crop as possible	Check dams, planted flow paths, flow diversions to swales for infiltration.	Rainwater harvesting, increase water storage capacity and soil moisture retention.
Long-term	We had considered windbreaks, but the increased shade would reduce crop area causing a loss in productivity.	The upper slopes of the farm were terraced (to slow water flow and increase infiltration) and planted with teak to increase the farm watershed	Reduce water use (e.g. drip irrigation, seek drought / heat tolerant crops, etc.) Construct surface flow diversions to concentrate water collection, swales, etc.
Notes	1) Storms / winds are so variable it is next to impossible to plan for them. 2) Our farm is not susceptible to floods; however heavy rains can threaten to overfill our fishponds 3) Regional and local climate change trends forecast droughts will be longer and more frequent.		

The next level of resilience for an individual or family involves their neighbors and the village. Problems too big for one person or family to handle might be easily resolved by a local group. Ban Na Fa is a clan village. It's like being in a very large extended family. Of course there are differences of opinion and disagreements. But in times of need, mutual assistance is the norm. At the village level, relief assistance is readily connected to the Sub-District. Here, the Thai government involvement quickly links to the District and Provincial levels, and then to the Central Government. This is where the vulnerability of our resilience is exposed.

Village security & safety

When local supply sources are depleted, re-supply is possible by 3 main road and air (by the only major airport at the provincial capital---see red star on the map on page 10). River transport is not likely (during floods in Nan there are often shortages

of boats). All roads are vulnerable to landslides (especially in the rainy season). Highways 1091 and 1148 extend west across north-south trending mountains. These are winding roads with steep grades. The routes are more hazardous in the rainy season when disasters are more likely to happen. Highway 1080 is the main preferred route. However, in addition to landslide risks, there are some critical bridges that could be choke points or points of failure. Re-supply by air will be costly. But it also faces the problem of distribution by road or added cost of helicopters.

Many emergency preparedness kits are available. The 72-hour kit is a popular one. Statistically, help arrives within 24-72 hours. Our situation in Nan seems to suggest preparing for 1-2 weeks may be more reasonable. But this must also be adjusted by considering the rural nature of our situation.

The majority of villages in our area are farming communities. They live closer to their sources of food than city residents. Many make use of "forest food" and insects are a matter of routine in their daily diet. Drinking water supplies come from wells and village-based reverse osmosis (RO) water facilities. These depend on electrical power to operate. If the power grid is knocked out, clean drinking water supplies may be severely limited.

Most villagers use wood for cooking

A key advantage villagers have is that many can still remember how to live without electricity, phones, TV and cooking without LP gas. Many do not have hot running water in their homes. They prefer to take traditional cold water "splash baths". While doing without these are inconvenient, it is not as much of a hardship as it would be for city dwellers.

Help from outside the local village area will come and be coordinated by the Sub-District Administrative Office. They are backed-up by the District Office and, when needed, the Provincial government and the Thai military. Reading about past disasters (both in and out of Thailand) shows this simple fact: the farther you live from a major population center, the longer it may take for help to arrive. This basic fact should help you know how well to prepare and how long you may have to wait for help to arrive.

Blossoms & Fruits on Our Farm

Many trees have shed their leaves at the start of the dry season. And now, the various trees are moving toward another stage of life: blossoming, fruiting, and eventually harvest. The most noticeable blossoms are in the Long an in the East and Central orchards. Lemons and Wood apple blossoms are in the West orchard. Pineapples are forming along the driveway near the main farm gate.

Bananas and papayas grow year round on our farm. We were pleasantly surprised to see pineapples emerging!

Wood apple blossoms grace the West orchard.

Long' an blossoms set the East orchard buzzing

Lemon blossoms and buds in the West orchard

"Baby" pineapple along the driveway fence.

Bananas are available year-round

Papayas near the old cow shed.

Mangos in the making

More 21st Century Geo-Cards

Several years ago, we compiled some cards along the theme of the 21st Century was starting off as the Century of the 50%. We recently came across additional statistics consistent with that idea. And there were two that were over the 50% mark. So, here are the latest additions to that card series.

We make no claim for originality of thought. We certainly have no insight or ability to predict the future. [**Note:** In all fairness, it should be said that data collection of the past (and even the present) may not have enabled these kinds of statistics. And even today, it is hard to imagine the completeness of the data sets used to produce these statistics.] For sake of argument, let's assume these statistics are meaningful. They should give us reason to pause and reflect on our own experiences and observations. We will leave it to you to decide what you will do.