



# RTC-TH Oct 2012 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

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## Dragon Boat Races: 'Tis the Season



*Ban Wangwa's Dragon Boat team going upriver to the starting point for another heat at Muang Nan.*



*Teams are paired for heats going downstream with the current*

It's time for the annual Dragon Boat races on the Nan River. The weekend of Oct 15-16, races were held in Muang Nan (the Nan Provincial capital). The next weekend races were on the Nan River at Thawangpha.

As with any major festivity, parking becomes scarce and clear weather brings a good turn-out. But shade is at a premium.



*Parking is hard for motorbikes & cars.*



*Shade is a premium item on race day.*





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<b><i>Think careful-Lee, speak soft-Lee, work effective-Lee.</i></b>	
-----RTC-TH saying.	



*Some folks will need a lot of patience if they want to leave early*



*If you don't like crowds, race day is not for you.*



*It is a mix of sensory stimuli.*

Vendors sell everything from food, soft drinks, clothing, shoes, CD/DVDs, lottery tickets, umbrellas, small tools, toiletries, and a wide variety of household goods. The sights, sounds, and smells provide unending sensory stimulation. 🌐



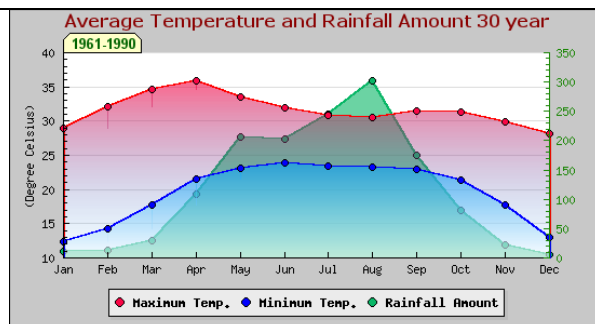
*Fresh cut fruit vendors abound.*



*There seems to be unlimited food choices.*



## Accumulated 2012 Weather Data



The chart on the left shows the 30 year climate summary for Thawangpha. The table below shows the numerical data for the 30 year average, rainfall data and number of rainy days for each month of 2011 and score card for 2012 that we've filled in as the months passed. Sep was off the mark from the 30

30 Yr Average			2011		2012	
Month	Rainfall (mm)	Rainy days	Rainfall (mm)	Rainy days	Rainfall (mm)	Rainy days
Jan	11.0	2	1.52	3	17.78	3
Feb	12.6	2	14.48	2	1.01	1
Mar	29.2	3	69.33	6	31.24	2
Apr	108.0	9	98.55	10	163.32	8
May	206.2	17	208.53	22	205.21	10
Jun	202.4	17	396.20	17	100.31	10
Jul	244.1	21	340.87	19	175.01	23
Aug	302.3	22	321.05	18	303.2	23
Sep	175.6	16	371.08	20	131.06	11
Oct	80.4	9	147.57	7		
Nov	22.7	4	8.12	2		
Dec	5.9	1	0	0		
Total	1400.4	123	1977.3	126		

Blue Box = northern Thai SW Monsoon Season  
Green shading = data above 30 year average for Thawangpha  
Red shading = data below 30 year average for Thawangpha

Year climatic averages. We got only 74.6% of the monthly average rainfall and 68.75 % of the average days of rain for Sep.

The accumulated total rainfall so far for 2012 is 1128.14 mm or 87.3% of the 30-year average in contrast to the 30-year average of 1291.4 mm.

It seems an understatement to say it was a dry year for Nan Province. Looking at the score card, 5 of the 9 months of this year have rainfall totals less than the 30-year average. That points to a dry year. We have one more month of the SW

monsoon season left. So, it isn't over until it is over.

The 30-year climatic summary shows we are on the downward trend for annual rainfall. The contrast between 2011 and 2012 is stark. As we approach Nov and Dec, the probability of getting rain normally diminishes significantly.

So far, the precipitation results for 2012 give us pause to rethink our rainwater harvesting plans. There is a general feeling in the family that we need to find ways to store more water for drip irrigation. This will protect the long term

viability of the trees in the orchard and areas near the fishponds and farmhouse site.

It seems obvious the higher up on the terraces we can catch and hold water the better. Then we can take advantage of gravity flow to distribute the water. This would reduce energy demand to pump water. 🌍



Clear weather dominated Sep 2012 over the farm



## Small Local Flash Flood



*Evidence of a small flash flood along a local stream on the way to our farm.*

Heavy rains on a recently clear slope combined to produce a small local flash flood. This happened along the road from our village to our farm. Luckily, the road was not affected. The flash flood met the drainage gully next to the road. A culvert allowed water and sediments to cross under the road. Nearby fields were covered with fresh sediments and rocks.



*The wide range of rock sizes in the dry streambed is a clue to the passing of a flash flood.*

A close look at the streambed reveals a wide range of rock sizes. The force of the water varies with the volume, slope, and other factors. When the force is strong, the water can carry larger rocks. When the force is less, the water can only carry smaller rocks. In a normal stream, larger rocks occur nearer the headwaters in mountainous terrain. Finer sands and sediments are found in the flood plains and deltas when the stream velocity gets slower.



The scenario has played out numerous times over the years in Thailand and other countries. Farmers seeking more land clear hillsides of the natural vegetation. This exposes the soil to raindrop impact and more soil erosion. The loss of the soil is counter to the goal of growing more crops. On slopes, terracing and / or other land uses would be practices that are more appropriate. 🌍



## Soil Erosion Issues on the Farm

Soil erosion is a continuous natural force affecting the surface of the Earth. There are 5 areas of the farm with soil erosion issues:

- The East Fish Pond (which contributed to the demise of the first pig shed) and has led to further collapse of the pond bank nearest to the East Longan Orchard.
- The Central Fish Pond (which led to the loss of the second pig shed) and is causing the collapse of the pond bank nearest to the East Longan Orchard.
- The West Gully: Recent heavy rains stimulated the head ward erosion of the gully.
- The Terraces: Water flow during periods of heavy rain and runoff causes erosion of the terraces along the axis of the Central Gully.
- The East Orchard: Following the recent heavy rains, there is evidence that surface runoff began to form a shallow gully along a PVC water pipe coming down the slope of the orchard.

### The East & Central Fish Ponds

It seems that the underground seepage that supplies the fish ponds is contributing to the collapse of the pond bank. Over the years the erosion has cut about 2.5 m into the bank.

Part of the problem seems related to the poor drainage of the level “access” road between the orchard and the pond. We think diverting the runoff to the East Gully during



heavy rains will help.

Erosion undermined the second pig-shed foundation and continues. Underground seepage seems to be the source of the problem.

In both cases, some kind of properly drained retaining wall is needed. We are in the process of planning a combination solution. It uses French drains, staggered tiers of old tires with drain pipes, and plants to anchor the soil. The tires will be filled with dirt-

crete and steel reinforcing to tie them together. We have some local sources willing to give us the tires for free. It a mutually beneficial arrangement. They need a “free” way to get rid of old tires, and we need the tires.



### The West Gully

Surface runoff during recent heavy rains contributed to the head ward erosion of the West Gully (right photo). The gully divides the West orchard from the East Orchard (which is mainly Longan).

The photo below shows the area of recent erosion relative to the seep flowing into the West Gully (yellow arrow in photo below). You can also see the effectiveness of the banana trees in trapping the sediments from the erosion site (yellow circle). This is why green or planted flow paths are beneficial in managing erosion.

The steep slope makes this problem difficult to handle. The added weight of the rain as it soaks into the ground changes the balance of forces acting on the soil. When gravity exceeds resistance, the soil gives way and collapses.

Our instinctive response is to anchor the soil in place with King's grass. Fast growing King's Grass ( ) will be planted above and in the active erosion site. The deep roots of this grass may help hold the remaining soil in place. A thick layer of coarse mulch will be laid over all the bare exposed soil to protect the surface from rain drop impact. Rain drop impact is the first step in soil surface erosion. Additional banana trees will be planted closer to the erosion site. This will further obstruct the flow of water in the gully during heavy rain and trapping the sediments closer to the erosion area.





We took King Grass cuttings from the West Terrace road edge. We put a row of cuttings above the erosion face. We took banana shoots from the trees already growing in the West Gully. We looked for traces of the flow path. Then we planted banana shoots directly in the long axis of the flow path. These trees will slow the flow of water. As the trees grow, they will help to anchor the soil in the upper part of the West Gully.



During the next rain, we need to monitor the effectiveness of our efforts. Thank goodness, there is only one more month of the rainy season to go. If these plants survive, they should be well established before the next rainy season. Let's hope this solves our West Gully problem.





### The Terraces

Rainwater running on the surface from the forest crosses over the top terrace and erodes the outer terrace edge. The thick cover of grass was not sufficient to anchor the soil in place.

We are considering a small check dam at the edge of the forest to slow the water velocity. Then divert the flow along the inner edge of the terrace. This keeps water from flowing across the

terrace and over the outer edge. Planting King's grass and a ground cover or a thick layer of mulch to protect the exposed soil is a quick fix for this rainy season. The long term solution may be a combination of water diversion and/or some water storage tanks on the top terrace.

### The East Orchard

We discovered this problem area after the heavy rains. The indirect evidence was clear (see photo on the left): The damaged vegetation, exposed bare soil along the flow path, and the deposition at the bottom of the slope.

The long term plan is corn cob mulch throughout the orchard. The short term plan calls for a series of mini-check dams along the axis of the flow path. These will slow the flow velocity and let the water soak into the orchard. We are looking for something to plant in the flow path. It must be shade tolerant.



We are looking for something We'd like it to be edible. Does anyone have suggestions?

Soil erosion is a dynamic and never-ending process. It isn't something that can be eliminated entirely. It affects all farms to some degree or another. Each farm and farmer's situation is unique. We hope to share our trials and experiences with others. The power of knowledge is fully realized when it's shared. 🌐





## ***RTC-TH Relevance to 21<sup>st</sup> Century Issues***

We may be old fashioned, but relevance is a key word in our vocabulary. In recent years, the following issues seem to be on lists for the 21<sup>st</sup> century. We thought it would be an interesting exercise to see if our work in the RTC-TH is relevant to some of the key concerns of our time. (The list in the table on the right is in alphabetical order.)

21 <sup>st</sup> Century Key Issue In The Media	RTC-TH Activities	
	Direct	Indirect
Climate Change	X	X
Conflict		X
Food Security	X	
Human Rights Abuse		X
Natural Disasters	X	
Population Pressure		X
Refugees		X
Water Scarcity	X	



**Climate Change:** We see our practices in sustainable agriculture are playing a role in reducing green house emissions both directly and indirectly. The direct actions involve planting of trees, protecting forest areas, reducing use of fossil fuels and related emissions, shifting to cleaner alternative energy sources, and actively reducing/re-using/recycling wastes. Indirectly, composting reduces use of synthetic chemical fertilizers. IPM (integrated Pest Management) eliminates using pesticides spun off from fossil fuels.

**Conflict:** We are not actively engaged in conflicts or conflict resolution. Indirectly, sustainable agriculture could lead to food security. Food scarcity (and resource scarcity in general) often underlay many conflicts.

**Food Security:** We believe the King's Sufficiency Economy is a moderate and realistic path to food security for many impoverished rural farm families. Food riots of recent years are a preview of the civil unrest that tends to destabilize governments and could push nations to the brink of war. Food production depends on many factors, both natural and social. The active RTC-TH programs try to address growing food through an integrated approach of understanding the physical / ecological environment and local customs.



**Human Rights Abuse:** We consider our actions indirect in that we follow and are guided by the Basic 5 Sila and the Kalama Sutta as part of our training programs. We also see food security for small rural families as a way to curb the need for people to become part of the human trafficking issue in SE Asia and the world.

***A thought: We try to avoid being the problem and actively strive to be part of the solution.***



**Natural Disasters:** RTC-TH educational programs in EmComm (Emergency Communications) and EmPrep (Emergency Preparedness) directly deal with empowering the local community members to develop resilience to local natural disasters in Nan Province. After the 2001 Thai floods, lack of education for emergency preparedness was cited as a critical shortcoming. All RTC-TH lessons are available on-line free for educational and non-commercial use.



**Refugees:** We are indirectly involved in the refugee issue via the Global Butterfly group in Salt Lake City, UT. They replicate our efforts. Using much of our materials and methods, they help re-settled refugees from all over the world. Teaching refugees sustainable gardening and helping them establish local community gardens empowers them to grow vegetables relevant to their own cultures and preferences.



**Population Pressure:** Our efforts in this category are indirect. We are not engaged in family planning. However, our FUNDS (Farming Under a No Debt System) firmly advocates living within your means. Food security may be easier to achieve with smaller family sizes. Each family needs to decide how to balance the labor / production challenge for their household when it comes to the number of children they can adequately support.



**Water Security:** The RTC-TH water resource management practices and lessons directly deal with water security. We can't make more water, but we provide training in rain water harvesting, soil moisture retention and enhancement, water conservation, water purification, and solar water pasteurization (for emergencies). As farmers, water is vital to us. Without it we cannot grow crops to feed ourselves. 🌍

*A thought: **We endeavor to be prudent, wise and public-minded.***



## Some Traditional Thai Measurements



Image from the internet: educational fair use clause.

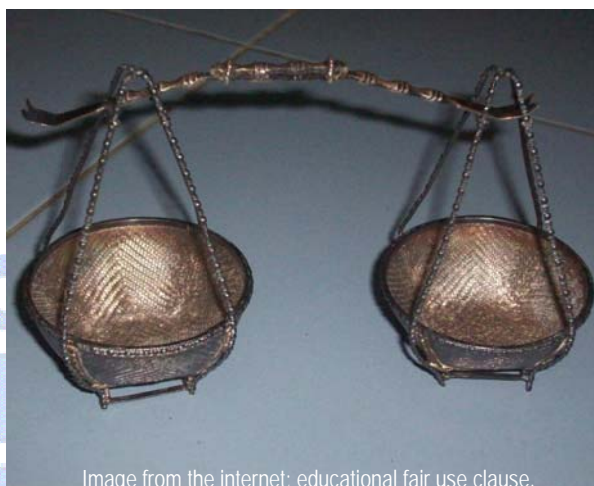
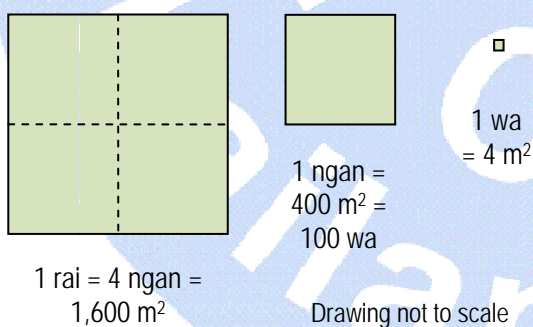


Image from the internet: educational fair use clause.

Traditions tend to persist in rural areas a bit longer than in cities. When harvest time rolls around, the traditional measurement unit used for rice is the *hap* (หาบ; IPA pronunciation [hà : p]). The literal translation from Thai is “to carry on the shoulders”. You can clearly see this in the archival photos we found on the internet (above and to the right). For example, for our farm, Mom’s notes for 2010 recorded our paddy rice harvest as 112 หาบ. In 2011, we got 120 หาบ of rice from our paddies. This is 60 kg in modern terms. If the conversion values are used, we got 6,722 kg and 7,200 kg or rice in those years.



Image from the internet: educational fair use clause.



The traditional land measurement unit is the *rai* (ไร่; IPA pronunciation [râi]) which is about 1,600 m<sup>2</sup>. This is subdivided into 4 *ngan* (งาน; IPA [ŋā : n]) each equal to about 400 m<sup>2</sup>. One *ngan* is made up of 100 *tarangwa* (wa for short; ตารางวา; IPA [tā : .rā : ŋ wā : ]). One *tarangwa* is about 4 m<sup>2</sup>. On a human scale 4 square meters is functionally easy to envision.

Our farm is about 26.2 rai (~41,936 m<sup>2</sup> or ~10 acres. Sometimes it is hard to picture an acre. For me, it is easier to picture 4 m<sup>2</sup>. An acre is 4,046.85 m<sup>2</sup>. Trying to picture over 1,000 units each 4 m<sup>2</sup> makes my head spin. What is interesting is that many buildings here use a post / lintel construction. The spacing of the posts is often 4 wa or a 4m x 4m square. 🌐



Our farm began with the rice paddies and expanded to its present boundaries over about 30 years.



## ***RTC-TH MEWS Submitted to GAREC 2012***

We submitted a paper about MEWS (Mobile Emergency Weather Station) to the Global Amateur Radio Emergency Communications (GAREC) 2012 conference to be held in Malaysia in November. Supporting letters from Phat (HS1WFK) and Mark (NWØF) two supporters of MEWS and keen advocates of EmComm accompanied our submission.

The GAREC committee has yet to make final decisions as to which papers will be selected for presentation. However, all submitted papers will be compiled on disk and given to all GAREC attendees. Regardless of whether we are invited to present or not, word about MEWS will be distributed to more hams worldwide.



*Sparky: MEWS capable at Basic & Advanced levels.*

as a Thai New Year's gift to the Radio Amateur Society of Thailand and hams worldwide, free for private, education, and non-commercial use. QRZ.COM and Hamuniverse.com (two widely read ham radio internet sites) responded to our letters of introduction and featured MEWS on their sites. Introductory emails were sent to amateur radio societies in the International Amateur Radio Union regions. A handful of national groups responded expressing interest in MEWS.

GAREC 2012 is a giant step up for helping spread the word about MEWS. What sets MEWS apart from other weather observation programs is weather reports relevant to emergency relief helicopter flight safety and empowering disaster survivors to actively participate in the rescue / relief efforts by providing needed weather data that affects the priority of relief supplies and operations. Flying into unfamiliar terrain with NO weather data greatly increases the risk. Just ask a pilot if they want to fly into a disaster zone with or without current weather data. Hams can use MEWS to provide the data. It is up to the pilots how they use it. 🌐



The call for papers specifically asked for presentations about actual EmComm activities. MEWS does not fit that profile. But feedback from hams in Malaysia indicated they felt MEWS was touching on "new" topics and conference participants deserved the chance "to hear about it from the person who designed it".

MEWS (consisting of 3 orientation lessons, 8 Basic lessons, 6 Advanced lessons, and an Observer's Handbook) was completed and released in Apr 2011

