



Oxfam Disaster Risk Reduction and Climate Change Adaptation Resources: Case Study

**Jasmine Rice in the Weeping Plain:
Adapting Rice Farming to Climate Change in Northeast Thailand**

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Introduction

In 2007, farmers in Yasothorn Province, north-east Thailand, experienced the longest dry spell during a rainy season in decades. The dry spell, lasting from June until late August, reduced crop yields, lowering farmers' income and reducing their food security.

Yasothorn, one of the 10 poorest provinces in the country, is part of the legendary 'Weeping Plain' named after its barren landscape. The Plain spans five provinces, covering more than 2.1 million rai (829,500 acres). The Plain's dry conditions have made it suitable for growing the world-famous fragrant jasmine rice.

However, statistics from the Meteorological Department suggest that the dry spell that occurred in 2007 is not a one-off phenomenon, but part of a gradual trend that has developed in the past decade, due to rising temperatures and changes in rainfall patterns caused by climate change. Rainfall records for Yasothorn in the last decade show that the rains are arriving later and later each year, from a few days late to many weeks.¹

A recent study has confirmed that the phenomenon is real. It shows that the annual number of tropical depressions in Thailand in the last 30 years fell from 30 to 10; tropical storms declined from 55 to 35, and typhoons from 70–80 to 45–50.² The reduction in the frequency of depressions is significant, because without them tropical storms and typhoons do not provide enough rain during the dry season.

Almost 90 per cent of people living in Yasothorn Province are farmers.³ Most farms in Yasothorn are rain-fed, with no irrigation facilities. Jasmine rice is light-sensitive and has to be grown during particular months of the year; so when there is no rain, rice plants are left to wither in the scorching sun.

When seasons start late and rain does not fall, the impact on rice yields is significant. Combined with rises in temperature, this means that Thailand's biggest production hub suffers greatly. Irregular weather in the form of hot and cold spells also causes pest attacks on rice crops and fungal disease, reducing the quantity and quality of the crops.

Climate change in Thailand⁴

- Temperature increases
- Changes in rainfall patterns (frequency and intensity)
- Prolonged drought
- Intense rainfall events, leading to flooding and storm surges
- Reduced agricultural production, including lower rice yields
- Impacts on food and water security, health, settlements, forests



Pictured above and below: Planting small rice plants into the paddy fields.





		Month				
		April	May-June	July-September	October	November
Activity	'Normal' climate	Prepare soil	Plant seedlings	Transplant seedlings	Seedlings flower and grow	Harvest jasmine rice
	Climate now	Starts raining	Little or no rain	Rain comes at the end of August, heavy in September	Rain continues	Rain continues even heavier, stops at the end of November
	Effects		Drought	Drought		Water logging
	Effects on crops			Seedlings wilt, hard to transplant		Grain quality affected by high moisture and a lack of colder, dry weather

Table 1: Changes in rainfall patterns according to jasmine rice farmers in Yasothorn Province, northeast Thailand, 2008

Pictured above: An example of one of a number of integrated farming systems designed and implemented as part of the programme: Bung-On Phungkit working in her vegetable garden beside the paddy field.

Oxfam takes action

Oxfam has been working with local organisation Earth Net Foundation (ENF) since 2004, promoting organic agricultural production and fair-trade marketing with farmers in Yasothorn Province. Compared with conventional chemical-based farming, organic farming is less dependent on off-farm inputs, requires less energy, and is more environmentally sound. In 2007, ENF was working with three farmers' groups in Yasothorn, consisting of 509 families certified as organic farmers.

A combination of scientific findings and observed changes by communities and programme staff prompted Oxfam to take action to safeguard the livelihoods of farmers. In consultation with farming communities and ENF, Oxfam decided to implement an initial one-year pilot climate-change adaptation project for organic rice (May 2008 – March 2009). Fifty-seven out of the 509 organic-farming households decided to join the scheme. They included:

- 20 families belonging to the Bak Reua Rice Farmers' Group of Sanam Chai District, Yasothorn
- 25 families from the Nature Care Club, Kut Chum District, Yasothorn
- 12 families from the Lerng Nok Tha and Thai Chareon Organic Farming Co-operative.

Project objectives:

- Support farmers to recognise and understand the impacts of global warming and climate change.
- Support farmers with appropriate water-management systems for their organic farms.
- Promote selected farmers as role models and catalysts for change, by means of sharing their knowledge and experience with other farmers in Yasothorn.
- Study the impact of climate change on women.

Of the 285 beneficiaries, 57 were female.

The project also received support from START (Global Change Systems for Analysis, Research and Training), which provided technical input on climate-change issues and supervised/commented on the adaptation process, as well as training project extension officers to interpret weather forecasts.

Project activities

1. Provision of climate-change information to farmers; participatory decision making

Men, women, and children were educated about climate change and its potential impacts in Thailand. Using this information, participants shared ideas about how they could adapt their farming practices to cope with these changes, and they designed their own on-farm water-management systems. In designing these systems, they took into consideration their own farm sizes, energy-saving opportunities, and household labour force, making sure that the systems were convenient for women and children, who are key sources of labour for rice farming and vegetable gardening.

In addition to designing their own water-management systems, they discussed how they could adapt to climate change in the longer term, beyond next year's harvest, using other adaptation strategies.

2. Provision of loans to project participants

ENF established the Water Management in Organic Agriculture Fund, which provided loans of up to 30,000 baht (US\$ 880) to each household, to assist in the construction of on-farm water-management systems. The loans are offered at low interest rates (1–3 per cent) for 1–6 years. The Fund lent money to all 57 project households: 1,400,000 baht (US\$ 41,000) in total.



Pictured above: Noograi Sangsri working in her paddy fields. The integrated farming systems that were designed as part of the programme took into consideration the needs of women by piping water directly into the fields, thereby reducing the amount of time women spend in the field.

Area	No. of families	Activities				Loan from Fund
		Pond	Underground water	Water-distribution system	Pump	
Bak Ruea	20	10	8	13	1	564,000 baht
Kut Chum	25	3	12	20	9	496,000 baht
Loeng Nok Tha	12	10	4	12	0	340,000 baht
Total	57	23	24	45	10	1,400,000 baht

Table 2: Loans made from the Water Management in Organic Agriculture Fund

3. Implementation of on-farm water-management systems

Among the 57 farm households that took part in the project, the majority of on-farm water-management systems were constructed in time for the growing season. In total, 23 stock ponds, 24 wells, 44 water-drainage systems (ditch, sprinkle, pipe), and 14 water pumps were designed, built, and installed.

Because of the uncertain impact of climate change on rice production, farmers also diversified their food crops. Many farmers, especially women, grew vegetables and planted fruit trees as alternative crops, earning households between 500 to 1,500 baht (US\$ 15-40) per week. Growing vegetables and fruit can provide food and economic security, a particular concern of women who have to take care of family members.

4. Farmers as catalysts for change in sharing knowledge and experience with other farmers

Female and male farmers who took part in the project met with other farmers and households to share their experiences, in order to help others to find better solutions to the problems posed by a changing climate. Several workshops took place, including:

- one on agricultural models and techniques to reduce climate risks;
- three on the impact of climate change on female farmers' roles;
- three on on-farm product management and seed management for female farmers;
- one on principles and techniques for sustainable agriculture, and
- one on multiple crops in organic farming systems.

5. Project monitoring and evaluation

To ensure that the project was monitored and evaluated effectively, on-going and post-project implementation monitoring and evaluation was conducted, involving both project participants and ENF staff. The details of monitoring and evaluation activities are as follows:

- A meeting to design project-evaluation activities by project participants and ENF staff.
- The creation of a database with information on 57 households participating in the project.
- Quarterly meetings of the board of the Water Management in Organic Agriculture Fund to follow up progress and consider the issues raised by the project.
- Monthly farm visits by ENF to provide advisory support and knowledge exchange.
- Farm-to-farm visits by project participants to share knowledge and experiences.
- Data collection from focus-group discussions, individual interviews, and questionnaires during and after project implementation.
- Final report on the one-year pilot project.

Key Outcomes

As expected and feared, 2008 saw Yasothorn hit by drought – the ‘worst in 57 years’, according to, 65-year-old Moon Polchai, a village elder in Kut Chum district. The drought, which began in June and continued until the end of August, made rice cultivation very difficult. The problem was exacerbated by rain during the harvesting months, which drowned many of the rice crops in the low-lying plains that had managed to survive the drought.

1. Food security

After harvesting it was found that all 57 households were more food-secure than they had been before the start of the project. Of the rice, vegetables, meat, and fruits consumed, more than 90 per cent was grown by the families, and less than 10 per cent purchased from outside.

2. Reduced decline in rice production

Despite the year’s harsh conditions, 51 out of the 57 programme participants were able to maintain an output of rice that was at least sufficient for their own household consumption, with 14 producing a surplus to sell at market. Only six households suffered losses in rice yield, because their water systems were not established in time. Overall rice production fell by almost 16 per cent – in stark contrast to farms that did not take part in the project, whose production fell by 40 per cent overall.

3. Diversity of crops

Apart from applying appropriate rice-planting and water-management techniques, programme participants adopted crop diversification as a way to attain food security and economic security in times of rice-production uncertainty. Farmers, especially women, planted fruits and vegetables during and after rice cultivation; the produce not consumed by their households could be sold at local markets, earning them around 500–1,500 baht (US\$ 15–40) a week. More than 90 different types of plant were grown across the project area, and trees were used to shade certain plants from the harsh temperatures, with an apparent improvement in growing conditions.

“Climate adaptation, in my opinion, is the ability to be flexible in dealing with climate shocks. Putting your eggs in one basket – or, in agricultural terms, monoculture farming – would be too risky; but integrated farming, for example, is a wise thing to do because your livelihood is not based on one crop.”

Dr Anond Snidvongs, START



“Even with the water we have, it is not enough for both jasmine-rice and sticky-rice cultivation. We decided to keep sticky rice for our family consumption. Instead of jasmine rice, we grow organic watermelon, vegetables, and some other fruits which do not require much water, for family consumption and to sell to the local market. Even though we do not have enough rice for sale next year, we are still in a better situation when compared with other farmers who did not prepare themselves for the drought of this year.”

Thongsa Juansang, Kham-kuen
Kaew district

Pictured left: A windmill is used to pump water into a large storage tank to supply water to Manoon Phupa's farm.

Pictured above right: Reducing dependence on fossil fuels, Orawan Thongnoi, one of the farmers in the programme, designed and installed her own hand-pump well in her vegetable garden.



4. On-farm water management systems

More than 90 per cent of participants agreed that the water-management systems reduced the impacts of drought and long dry spells. Almost 90 per cent believed that the systems were appropriate for women and children to use, although many stated that improvements could be made to reduce the volume of water carried from ponds to the vegetable gardens.

Manoon Phupa, a farmer who joined the project, creatively designed his own windmill pump from old billboard cut-outs to drain and irrigate water from a new well that Oxfam helped to build. The new well, in addition to his existing pond, was used to flood his paddy fields during the prolonged dry spells. He also constructed dykes inside his paddy fields to drain water from the pond to supply the paddies. Not only has he learned how to grow rice with limited water, he has also diversified his food crops to include vegetables and fruit.

Even though the droughts in 2008 were more severe than in previous years, Manoon's water-management system has helped him to gain higher yields of both jasmine rice and sticky rice for his household's consumption, with a surplus for the market.

Thongsa Juansang, a farmer who has been practising organic rice farming for several years (sticky rice for home consumption and jasmine rice for commercial sale), has found that in the last few years the rainfall patterns have changed. As a consequence she has been experiencing low yields of both jasmine rice and sticky rice.

Since joining the Oxfam project, her family has learned more about the impacts of climate change and ways in which they can adapt their farming methods. Her family has received a small revolving fund from the project to improve the water-supply system on their farm, which they used to dig a new well. Like Manoon, they used a windmill-powered pump to supply the paddies with water during the drought period. Their on-farm water-supply system is simple, energy-efficient, and convenient for women and children to use.

However, despite these improvements, the drought in 2008 was too severe for Thongsa's family and their rice paddies. Even with their water-management system, they were unable to provide enough water for all of the rice paddies, and they had to give up jasmine rice farming, leaving only their sticky rice paddies. Due to these extreme losses, women have had to work harder to meet their families' economic needs. "The lack of rain has forced me to find extra income as a labourer on other people's farms. This is in addition to helping my husband to maintain the paddy field and taking care of the home and children." Thongsa Juansang

Organic farming better than chemical farming

Outside the programme, organic-farming households produced better yields than their chemical-intensive counterparts. This is because organic plants, especially rice, are physically healthier and stronger. Organic fields are also more fertile and can retain more moisture.⁵ Chemical-intensive farms suffered losses of 50–90 per cent in 2008.

Lessons Learned

1. Participation of farmers in every stage of the project

- The participation of farmers in all stages of the project was high and contributed to the success of the project. As an example, the satisfaction level on learning process support was as high as 96.49 per cent, as a result of farmers' participation in designing the learning process.





Pictured above: This water system was designed with the needs of women in mind.

Pictured below left: Noograi Sangsri weeding her vegetable garden.

- Of the farmers who took part in managing the budget of the water-management fund, 100 per cent of project participants were able to return the money as agreed. The returned money will be lent to new members to invest in their own water-management systems, and to existing members to develop their systems further.
- The participatory evaluation system enabled project participants to work and learn together. Consequently, they could effectively solve problems together as a group, rather than trying to cope alone.

2. Use of scientific data

Real and scientific data collected by farmers, government officials, and scientists were important for all steps of project implementation. The data helped project staff and farmers to understand and analyse the situation and to select effective methods to adapt their farming practices to climate change.

3. Loans for farmers

Loans to farmers should be small, so that the borrowers can repay them without incurring further debt.

4. New knowledge

During project implementation, farmers were able to improve their knowledge continually and apply this to their existing experience and practice. This enabled them to design and implement appropriate and effective farming and water-management systems.

Innovation that needs replication

The Oxfam and Earth Net Foundation climate-change adaptation project was unique. It brought together local 'know how' with NGO and academic expertise, resulting in mutual learning and understanding on climate change and ways of reducing its impacts.

Through collaboration with the model communities, Oxfam has shown that climate-adaptation projects can be implemented with limited resources, and that what is most important is placing community needs at the heart of everything that we do.

However, to achieve large-scale success, government and the public sector need to provide financing and resources so that climate-adaptation methodology can be adopted on a bigger scale.

What's next?

Oxfam, in partnership with START, has produced a short film documenting the project which is available from the Oxfam website. We hope to use it to help to publicise and disseminate our experiences to other relevant people and organisations. The film is also being used for communicating with the provincial authority, in the expectation that policy will be developed to further assist small-scale farmers to adapt to climate change.

In terms of the programme itself, we are planning on a second phase, which will:

1. increase the number of farmers participating in project activities;
2. provide additional training on climate change and its impacts, including conducting farmer-to-farmer training;
3. seek and identify additional adaptation methods which are appropriate for all family members: women, men, and children.

Oxfam, ENF, START, and Healthy Policy Foundation will also conduct in-depth research on the project impacts, with the following objectives:

1. To study the impact of climate change on rice production in Yasothorn Province.
2. To compare the productivity, food security, and economic stability of project and non-project families.
3. To provide strategic advice and guidelines for improving the productivity of small-scale farms and their ability to adapt to climate change.

Lastly, Oxfam and ENF plan to conduct dialogue with local government authorities, the provincial governor, district and sub-district administrative committees, including the Agriculture and Cooperatives Bank, in order to secure support and resources for the expansion of the project activities in Yasathorn Province, as well as promoting policy change.



Pictured above: Integrated farming system: Moon Phonchai has diversified his livelihood by raising poultry and fish, and growing fruit and vegetables, alongside his paddy fields.

Thailand currently has a five-year National Agenda (2007–2012) for climate-change management. Two of its six plans discuss the impacts of climate change on the agriculture sector and consider the kinds of adaptation method that are needed. These include providing irrigation, developing drought-resistant crops, and forest conservation. The Agenda explains the need to conduct low-carbon-intensive agriculture, and the importance of educating the public about the impacts of climate change on a range of agricultural commodities.

In support of the National Agenda on climate change, a National Recommendation is being produced with the support of various stakeholders, in addition to the United Nations Framework Convention on Climate Change (UNFCCC). It will contain a section on 'Impacts, Vulnerability and Adaptation', which will provide more concrete recommendations on the actions needed to combat climate change in the agriculture sector. The National Recommendation is scheduled to be finalised by 2010

Notes

- ¹ Pannee Samerpak, Director of Yasothorn Organic Center, Earth Net Foundation, October 2008.
- ² Anond Snidvongs, Director of Global Change System for Analysis, Research and Training (START). Southeast Asia Regional Research Centre, November 2008.
- ³ Pannee Samerpak, 2006, A Strategy for Sustainable Agricultural System by Rakthammachat Club in Kudchum District, Yasothorn Province, Thailand, MDM, Asian Institute of Management.
- ⁴ K. Kansri Boonprakrob and S. Hattirat (2006) Crisis or Opportunity: Climate Change and Thailand, Greenpeace.
- ⁵ Pannee Samerpak, Director of Yasothorn Organic Center, Earth Net Foundation, October 2008.

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Links

START Website <http://www.start.org/>
 Earth Net Foundation <http://www.greennet.or.th>

Acronyms

ENF	Earth Net Foundation
NGO	Non-government organisation
START	Global Change Systems for Analysis, Research and Training
UNFCCC	United Nations Framework Convention on Climate Change

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Disaster Risk Reduction and Climate Change Adaptation are corporate priorities for Oxfam GB. The case studies are a set of articles, which provide accessible and practical guidance to Oxfam staff and others wishing to integrate Disaster Risk Reduction and Climate Change adaptation approaches into programming. To find out about other resources on Disaster Risk Reduction and Climate Change Adaptation, and to give us your feedback on these resources, please contact the Programme Resource Centre. Email: phd@oxfam.org.uk

Front cover image: Tending banana plants growing next to the paddy fields, part of the crop diversification taking place as part of the programme.

Pictured above: A water storage point located in the middle of some thriving organic paddy fields.

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