

Farmers and Fertilizers: A Socio-ecological Exploration of the Alternative Agriculture Movement in Northeastern Thailand

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Abstract

Despite the urgency of reducing the environmental impacts of food production, the public and private sector continues to promote intensive agriculture methods. Studies show that input substitution strategies have led small-scale farmers into a cycle of debt and degraded soil fertility. In Thailand, non-governmental organizations have assisted farmers through organic extension programs. This research examined the socio-ecological benefits of organic production to rice farmers through a mixed methods approach. Coding and categorizing of semi-structured interviews with 50 Northeastern Thai organic farmers' sheds light on shared values, perceptions, and actions towards nature. Through grounded theory I discovered the salience of fertilizing practices as a medium of associations between farmers and nature. A subsequent phase of structured interviews with 75 members of organic farmer groups investigated the ways that informants improved soil fertility. Organic farmers perceived bountiful rice and good health as externalities of nurturing the soil. By engaging in organic fertilizer practices respondents came to see themselves as part of an extended community of life. Data analysis reveals that participation in fertilizer groups contributes to improved health, well-being, and the long-term sustainability of organic farms.

Key Words: Agriculture/ Food/ Fertilizer/ Organic/ Microorganism

1. Introduction

Recent technological approaches to the cultivation of fruit, grain, vegetables, fodder and fiber employ genetically modified organisms, irrigated water, herbicides, pesticides and fertilizer to increase productivity (UNDP, 1994). The same methods designed to boost food production have contributed to a multitude of ecological problems: erosion, deforestation, water pollution and the loss of biodiversity (UNEP, 2007). Research shows that these technological changes in the treatment of food production have dislocated people from farming communities (Pretty, 2003; Rigg, 1997).

Numerous proposals have emerged to provide an alternative to conventional food production: community food systems, community-supported

agriculture, organic agriculture¹ and shortened food chains (Feagan, 2007). In Europe and globally, the *Slow Food* movement has gained popularity through advocacy of *terroir* (protective legislation) and designations of origin (e.g. Parmesan Cheese, Champagne sparkling wine and Welsh Lamb) (Morgan et. al, 2008). These schemes possess a shared objective of ecosystems preservation, local economic development and the retention of local food-cultures (Pretty, 2003). Parallel to these proposals, alternative agro-researchers theorize the potential advantages of embedding food production within human communities.

¹ This article employs the term 'organic' as defined by the International Federation of Organic Agricultural Movements: "Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects" (IFOAM, 2010).

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Research that reports on financially successful sustainable agriculture ventures has made an important contribution to the literature. However, we still know very little about the less tangible benefits of alternative agriculture (e.g. social relations, trust, and well-being). Although the alternative agriculture movement advocates a closer connection to our food systems (Feagan, 2007), there are few empirical studies in this field.

Thailand offers an attractive location for the examination of farmer associations to the natural environment as the majority of the population engage in agriculture and live in rural communities. In Thailand, religion has a strong influence on culture and language. The practice of Theravada Buddhism by the Thai people is multi-faceted, particularly in the rural North and Northeastern regions where Buddhism has retained many of its early Brahman rituals. Ceremonies that deify aspects of nature are common practice, with farmers paying reverence to a life force embodied in *Mae Phosop*, the Rice Mother and *Mae Thoranee*, the Earth Mother (Falvey, 2000; Sirisai, 1990). Panya and Sirisai's (2003) more recent work explored the existence of an "eco-consciousness" amongst Thai rural agriculturists.

Building upon prior socio-ecological studies of rice growing communities in Thailand, I aimed to uncover the characteristics of organic farmers' connections to the natural environment through a mixed methods approach. Semi-structured interviews explored the factors that hold together organic farmer groups in Yasothon province. Through grounded theory analysis, I discovered the salience of organic fertilizers as a medium of associations between farmers and nature (Callon 1986). In the final phase of field work, I examined the ways organic farmers are linked to nature through fertilizer practices. Research questions

addressed: In what ways are organic farmers' bound to the natural world through their work? What are the dynamics of the relationships between organic farmers and nonhuman agents?

1.1 Thailand's Alternative Agriculture Movement

In the 1970s, Asian and Western non-governmental organizations (NGOs) expanded into Thailand to assist farmers with rising agricultural debts and damaged soil fertility caused by decades of conventional agriculture. Foreign and Thai alternative agriculturists collaborated to deliver participatory organic extension programs in the impoverished rural areas of North and Northeastern Thailand (Od-ompanch et. al, 2009). Subsequently, local and foreign non-profit organizations were launched to support diverse forms of organic farming (Setboonsarng and Gilman, 1999). Agencies under Thai Royal Patronage began to extend assistance to sustainable agriculture initiatives. In Bangkok, proponents and NGOs eventually created the Alternative Agriculture Network (AAN) to support "a national forum of non-governmental organizations, academics, and farmer leaders" (Samerak, 2006: 27).

The Agri-nature Foundation (AF) is an important actor within the Thai alternative agriculture movement and aims to disseminate the main tenets of King Bhumibol Adulyadej's Sufficiency Economy (SE) and New Theory Agriculture (NTA). SE philosophy advocates moderation, self-sufficiency and reasonable consumption patterns to Thai farmers and the general populous. NTA is aimed at farmers operating small-scale integrated farms at a ratio of 30% for water storage, 30% for rice cultivation, 30% for crops and 10% for raising animals. AF specializes in training programs throughout Thailand and places particular emphasis on

the use of effective microorganisms (EM)² for building soil fertility. The AF motto is “feed the soil and let the soil feed the plants”.

From the standpoint of economic self-reliance, the Bangkok based Green Net Cooperative/Earth Net Foundation is a pioneer in the Thai organic movement. Green Net started by assisting small-scale farmers in seeking organic certification and access to the European market. Green Net programs promote self-consumption of agricultural products as a central tenet of their extension policy (Samerak, 2006). Outreach programs concentrate on attracting new “partners” and sustaining organic producer groups.

1.2 Yasothon Province’s Alternative Agriculture Extension Organizations

Yasothon is a rural agricultural province located 534 kilometers from Bangkok in the Northeastern Region of Thailand (Figure 2). *Homali* rice is the principal agricultural product in this region and the main industrial activity is milling rice. Farmers grapple with sandy, salinated and rocky soil, unpredictable rainfall patterns, and minimal access to formal irrigation systems (Boonman and Anpim, 2006).

Academic studies that examined organic farming in Northeastern Thailand’s Yasothon province primarily concentrated on economic evaluations of agriculture methods. Becchetti’s (et. al, 2010) university-based research concluded that despite a rise in per capita income, Northeastern organic farmers experienced low levels of productivity due to high person-labor hours. Samerak (2006) uncovered the positive financial outcomes of organic extension programs with a secondary mention of social benefits.

Kiatsuphimol (2002) investigated the advantages of access to Green Net marketing channels in Kudchum District. Boonman and Anpim’s (2006) found that the costs of organic rice production outweighed the benefits of chemical supported rice growing schemes.

2. Methodology

From 2007 to 2010, I conducted fieldwork with organic FARMERS in Yasothon province in Northeastern Thailand through three interrelated phases: Phase 1) semi-structured interviews with organic extension organizations; Phase 2) unstructured interviews with organic farmers; Phase 3) structured interviews with organic farmers.

In Phase 1, I interviewed academics and non-governmental organizations (NGOs) concerning their objectives and spheres of influence. I reviewed secondary data in English and Thai (e.g. organizational leaflets, self-published texts and websites). Informants provided an overview of extension programs and identified locations with a high density of organic farmers in Northeastern Thailand.

In Phase 2, through a process of chain referral sampling I conducted interviews with 50 organic farmers. I engaged informants in semi-structured in-depth interviews about agriculture methods and community life. After coding and categorizing these data, I developed a set of new questions to probe areas of relevance. Six months later, I returned to the same locations to interview 20 additional informants. After returning from the field, I conducted a further round of coding and categorizing. Grounded theory analysis revealed the particular significance of fertilizers to the organic farmers’ way of life (Glaser, 1978).

In Phase 3, I crafted a board game as an interactive research method for collecting data that would be suitable for

² Micro-organic agriculture was originally brought to Thailand by a Japanese missionary in the 1960s, who was affiliated with the Kyusei Natural Farming group (Setboonsarng and Gilman, 1999).

the participants' educational levels, visually undemanding, and appealed to the "Thais' sense of fun" (Mock, 2000). I revisited study sites to interview 75 organic farmers. As participants moved along the game pathway, they received a picture card (with a point value) that pertained to an area of fertilizer production and were asked a related question. Information from the game was augmented through a farm profile, and additional queries were enlarged on to an 8' by 11' plastic board for clarity.

I analyzed the farm profile, multiple-choice and scale items to generate descriptive statistics with SPSS v.14. I examined the frequency distribution of responses. I re-analyzed data from Phase 2 and triangulated results with quantitative findings.

3. Results

My field work covered three well-established farmer groups in Yasothon Province: Nature Care Club Rice Mill, Pak Reua Rice Mill, and the Dharma Garden Temple. Farmers selected for this study were in the process or had attained IFOAM certification of their rice production. Interviews exposed the ecological, social, and spiritual forces that bear upon Northeastern organic farmers' way of life. Queries were formulated to explore the myriad ways that farmers are linked to each other and the natural world through fertilizers.

3.1 Farmer Groups

Through semi-structured interviews, I exhibited the characteristics of the three aforementioned farmer groups. Farmer-leaders and *kruba* (monk-teachers) articulated the importance of farmer associations, the origins of their groups and the history of their development. Farmers provided supporting information about membership in these collectives.

3.1.1 Pak Reua Rice Mill

At Pak Reua Rice Mill there are five Green Net representatives, three were born in the village and two come from another province. In 2008, there were 941 members at the rice mill. Staff members explained that the farmers' group started in 1996 when GN came to work with the villagers and convinced them to join the organic program. In 1999, the Organic Agriculture Certification of Thailand (ACT) came to audit and gave a certificate to qualified farmers.

3.1.2 Don Pung Village

Despite the early successes of farmer groups in this area, Don Pung Village suffered a significant decrease in members during the course of my research. Interviews with their rice mill president revealed that in 2008 there were 30 families certified to produce organic rice. By March of 2010, only 5 families continued to pursue organic rice farming methods. When I queried about the reasons for this decision, the rice mill president communicated that farmers were motivated by *na prang* (multiple rice crops through the application of commercial fertilizers) due to an increase in rice prices on the global market.

3.1.3 Heaven's Farmer Group

The Heaven's Farmers group at the neighboring Dong Yang Village emerged through the efforts of a small group of farmers. With only forty members, they owe their success to several factors: Green Net, Dong Yang *Ao Bor Tor* (sub-district administrative office) and strong community-based leadership. From interviews, Elder At (pseudonyms), a co-founder of Heaven's Farmers group, appeared to have persuaded many farmers to 'go organic'. Mother Bee explained their origins:

Heaven's group started with 21 members in the year 2000 as a sub-group

under the Pak Reua Rice Mill. They started activities by exchanging labor to build the fertilizer warehouse on Elder At's property. And we put in 300 baht per person as a fund to buy the equipment, material for making organic fertilizer.

Organic farmers from nearby villages also purchased fertilizer from their cooperative. However, the arduous work of making fertilizer is carried out by contract workers due to the high age of members. Heaven's Group also exhibited close ties among members or what Thais refer to as *kalayanamitta* (Pali for good friendship; good company; association with the virtuous, Payutto, 1998).

3.2 The Nature Care Club

The District of Kudchum has a long history of organic food production, and was better documented by researchers than other locations in Thailand due to the activities of international and domestic NGOs (Boonmin and Anpim, 2006; Samerak, 2006). Extension groups in this study point to Kudchum as a principal hub of Yasothon's organic farming network. In the 1970s, farmers and the Abbot of Talaad Temple in Kudchum

initiated the protection of a communal forest zone and cultivated medicinal plants (Od-ompanich et. al, 2007). A high incidence of health problems appeared to have forewarned farmers to the hazards of conventional agriculture methods. According to interviews, fear of deteriorating health motivated many farmers to undergo the shift to organic production methods. The Nature Care Club received considerable support from Green Net/Earth Net throughout the course of their development. Elder Mun explained the structure of their organization:

The Rice Mill has three connections: producer, manager and exporter. Producers provide support through the Learning Center which utilizes the following inputs: knowledge, technology, leadership, local wisdom and investment. Producer members are made up of other smaller rice mills and farmers.

In 2009, the Nature Care Club Rice Mill maintained a membership of over 1000 members, with 250 organic farmers throughout the area. In the early days the Mill received help from an onsite Green Net officer, but more recently they hired their own liaison.

3.3 The Dharma Garden Temple Group

Dharma Garden Temple in Patiew District, exemplifies the Thai alternative agriculture movement's hybrid format, serving both as a spiritual center and an organic training hub. Elder Wit related their origins, "Organic farming started at the Dharma Garden Temple in 1972 by Monk Sak, and he expanded this knowledge to the villagers, for these actions he was named the Nature Abbot".

The temple community encompasses rice lands, fruit trees, vegetable gardens, a mill, a fertilizer center, a learning center, a cooperative store and a radio station. Temple staff point to the community radio station 91.5 MHz as the cornerstone of their networking activities. Their social welfare fund has over a thousand registered members, despite this broad base only 20% have completed the transition to organic agriculture.

Fertilizer training represented a significant portion of the Temple's extension work and a sub-group on-site manufactures fertilizer for the temple, and sells to members and outsiders. Both members and non-members labored in the collective, compensation is monetary or used as a credit on fertilizer purchases. The members of the collective freely disseminated fertilizer recipes and informants reported that they sell it at no profit.

The Dharma Garden Temple developed an alternative form of organic certification called *Khunatham* (moral) Rice. According to Elder Wit, the *Khunatham* certification program is carried out by fellow members who monitor each other to ensure that guidelines are followed properly. The core mandate is that members follow the Five Precepts³ of Buddhism as a guide to farming and daily life. As part of the certification process, farmers should not 'kill living beings' as laid out in the First Precept, and avoid the individual sins of Precepts Two to Four.

3.4 Socio-ecological Relations

This section provides an overview of results from structured interviews with 75 organic farmers (Phase 3): the majority of which were female (72%), married (82%), over the age of forty (85%), and Buddhist (100%). Informants that participated in the survey were small-holders (less than 50 rai⁴) and 91% practiced mixed farming (Table 1). Queries aimed to examine how and why organic farmers produced fertilizer, and to explore the way these tasks brought them into close contact with the natural environment.

³ I was assisted with interviews in the Thai and Issan language by my wife and co-researcher, Ubol Kaufman.

⁴ The Five Precepts of the Pali canon: not to kill, not to steal, not to engage in sexual misconduct, not to lie, not to engage in consumption of intoxicants (Payutto, 1998)

Table 1: Demographic Characteristics of 75 Organic Farmers

Demographics	(I) %		(II) %		(III) %				
Age	21-30	1	1.3	Crop Diversity	7	9.3	Land Farmed (in rai)**	5	6.7
	31-40	10	13.3	Rice only	5	6.7	0-5	11	14.7
	41-50	30	40	Rice and Fruit	35	46.7	6-10	18	24
	51-60	27	36	Rice, fruit and vegetables	7	9.3	11-15	12	16
	61+		9.3	Rice, fruit and veg., and other	8	10.7	16-20	11	14.7
Gender	male	21	28	Rice and other	13	17.3	21-25	14	18.7
	female	54	72	Rice and veg.			26-45	5	6.7
Religion	Buddhist	75	100	Animal Husbandry**			Fertilizer Usage****		
	other	0	0	buffaloes	16	21.3	Effective Microorganisms	75	100
Marital status	single	3	38.7	cows	61	81.3	Animal manure	68	90.7
	married	69	30.7	poultry	68	90.7	Green Manure	50	66.7
	widow	3	30.7	fish	20	26.7	Organic Coop fertilizer	38	57
				pigs	2	2.7			

*N=75 informants

**one rai = 1.6 hectares

***Animal Husbandry: the percentage of animals raised in combination.

****Fertilizer Usage: as a combination of methods

The majority of organic farmers in this study justified the use of organic fertilizers through the First Precept of the Pali canon. When asked about the basis of their approach to farming, 47% of informants chose the response “I try hard

not to harm living creatures”. When asked why they selected organic fertilizers, 56% of informants selected “to support soil life” over other responses related to the costs and hazards of chemicals fertilizers (Table 2).

Table 2: Key question on decisions behind choice of fertilizer usage

Why do you use organic fertilizer?	%	(N)
1) chemical fertilizer hazardous to health	24	18
2) it supports soil life	56	42
3) chemical fertilizer damages soil life	10.7	8
4) costs less than chemical fertilizer	9.3	7
Total	100	75

Effective microorganisms (EM) or “feeding the soil” were the most popular fertilizer method among informants, with 100% of informants applying EM to their rice paddies directly, or as an ingredient in their fertilizer. All but 1% of organic farmers knew how to produce EM at home. Despite the popularity of EM, no

scientific evidence is available that proves the effectiveness of this method.

As manure is another key component of fertilizer, several questions asked about animal husbandry. Among the farmers I interviewed, 92% had made a conscious decision to rear animals to acquire manure and earn additional income (Table 1). Farmers raised a variety of animals, the breakdown as follows: cows (81%), poultry

(68%), buffaloes (21%) and fish (27%). Although, fish is a minor source of fertilizer, informants responded that they occur naturally in the rice paddies during the rainy season.

The use of green manure is another common method promoted by local organic extension programs. More than half of the organic farmers surveyed

(67%) grow legumes in their fields after the rice crops (Table 1). Farmers reported that cow peas and sword beans were effective, and researchers have reported that these varieties are drought resistant, adapt to marginal soil and are high in protein (International Institute of Tropical Agriculture, 2010).

Table 3: Key question on fertilizer collectives

Why do you join a fertilizer group?	%	(N)
1) too much work do by myself	2.6	2
2) kalayanamitta (association of the virtuous)	48	36
3) saves money/expenditures	14.6	11
4) access to machinery	5.3	4
5) can get organic fertilizer	9.3	7
6) not a member	20	15
Total	100	75

Of the 75 farmers I interviewed in Phase 3, 80% joined fertilizer collectives. When queried about the decision to join collectives, 48% of informants selected *kalayanamitta* over cost, labor, access to machinery and fertilizer. Furthermore, informants stated that they enter into collectives to access fertilizer ingredients and to pool the capital and manpower necessary to acquire appropriate technology (e.g. knowledge, machinery and warehouses). Many participants in this study also chose to produce their own organic fertilizer. Another impediment to membership mentioned by informants was that no collectives were located nearby their homes.

4. Discussion

Through the continuous act of nurturing the soil, organic farmers develop a physical relationship with nature that leads to a shift in their values. By virtue of their embeddedness in the land, organic farmers undergo a metaphysical shift in their relationship with nature (Curry, 2000; Pretty, 2003). In the words of one organic farmer, "I see

nature all over my farm, green, animals, and it brings me peace and happiness." This newly formed perception of the environment and a mutually-supportive belief system give way to the development of a "collective eco-consciousness" (Panya and Sirisai, 2003).

The Five Precepts serves as the foundation of the organic farmers' belief system and guides their actions towards nature. Informants substantiate organic agriculture as a component of the Buddhist practice. Through the act of organic farming, respondents come to see themselves as part of an extended community of life. The farmers in these communities call upon a new interpretation of the First Precept to justify organic fertilizer methods (Falvey, 2000). A devotion to Buddhist practice emerges as a key factor in farmers' decisions to adopt organic fertilizer methods.

As organic farmers work together to sustain their farms, they establish "relations of trust" (Jarocz, 2000) and build strong collectives to serve their needs. Members of these collectives demonstrated a willingness to share knowledge with fellow farmers and

outsiders in a spirit of *kalayanamitta* (Prayukvong, 2005). Despite the importance of social relations, organic farmers groups depend on strong leadership, local experts, labor and technical resources (e.g. machinery and a location for production and storage).

The methods employed in this research were constructed from the ground up through several rounds of exploratory interviews. Advice from outside experts ensured questions were culturally suitable and terminology was understandable to informants. However, structured questions that sought after abstract meanings of nature proved challenging for some informants. As I attempted to draw out farmer connections to nature, it proved most reliable to triangulate structured responses with surveys of farming methods, in depth interviews and observations.

5. Conclusion

Chemical-assisted farmers throughout Thailand perform rituals to call upon the rain, appease the rice gods and plead for a bountiful harvest (Falvey, 2000). In spite of these religious customs, the majority have failed to link Buddhist teachings with a reduction in agro-chemical use. Quick financial returns through the latest in agro-technology appear to have captured the hearts of Thai farmers hoping to send their children to university and acquire modern amenities.

Health is another important concern of the farmers in Yasothon province and more data is needed to ascertain the long-term effects of chemical fertilizers, pesticides and herbicides on both consumers and farmers. Furthermore, organic farmers in Yasothon are predominately in their 40s and 50s, leaving a bleak future for the alternative agriculture movement. I recommend that studies of the Northeastern region should look into the obstacles that prevent

conventional Thai farmers from adopting organic methods.

The results of this research point to the need for capacity-building projects aimed at the creation of small-scale organic fertilizer collectives. As farmers come together they tackle their own problems and sustain the momentum of the collective with the help of "good friends". In spite of these recommendations, a shift to organic farming methods necessitates more than seed funds, or a new set of tools, it demands a paradigm shift rooted in an ecological worldview.

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