Graduate School of Development Studies

Implications of organic farming in development: experiences from organic rice farms in Northeastern Thailand

A Research Paper presented by:

Itthiphon Woranoot
(Thailand)

in partial fulfillment of the requirements for obtaining the degree of
MASTERS OF ARTS IN DEVELOPMENT STUDIES

Specialisation:
Poverty Studies and Policy Analysis
(POV)

Members of the examining committee:

Dr. Andrew Fischer (supervisor)
Dr. David Dunham (reader)

The Hague, The Netherlands
November, 2009

Disclaimer:

This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

Research papers are not made available for circulation outside of the Institute.

Inquiries:

Postal address:	Institute of Social Studies P.O. Box 29776 2502 LT The Hague The Netherlands
Location:	Kortenaerkade 12 2518 AX The Hague The Netherlands
Telephone:	+31 70 426 0460
Fax:	+31 70 426 0799

Contents

List of Tables

List of Figures

List of Acronyms

AAN	Alternative Agriculture Network
BAAC	Bank for Agriculture and Agricultural cooperatives
IFOAM	International Federation of Organic Agriculture Movements
RTC	Rak Thammachat Club
NAG	Natural Agriculture Group
SFS	Surin Farmer Support
ACT	Organic Agriculture Certification Thailand
NOP	National Organic Program
USDA	United States Department of Agriculture
JAS	Japan Agriculture Standard
FAO	Food and Agriculture Organization
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
IRRI	International Rice Research Institute

Abstract

The paper contains the ethical concepts of organic agriculture as well as arguments on organic farming and organic trade. Furthermore, the notions of value chain and livelihood strategies of small farmers are included in an analysis of implications of organic farming on rice growers. It is found that organic agriculture has limited economic implications on rice farming due to the risk in conversion period, labor intensity and limitations of small farmers. Since rice growing is mainly for household consumption and subsistence, organic rice growing which is mostly for sell tends not to be an attractive livelihood strategy for most small rice farmers. Social factors are the main driver behind the success of organic farmers who have positive attitudes to alternative agriculture before adopting organic methods.

The role of farmers in the organic rice chain is different from the conventional chain, and the relationships within organic chain are characterized mainly by ethical trade networks and certification organizations. The higher market price of organic rice leads to questions about fairness to consumers and the influence of traders in markets which may result in constraints on domestic organic growth. In this sense, the organic movement in rural development will be limited in the long term, and it implies that the worthy idea of organic agriculture in rural development is flawed in practice.

Keywords

organic agriculture, rice farming, value chain, ethical trade, rural development, small farms, livelihood strategies

Chapter 1

1.1 Introduction

This study investigates the implications of organic farming methods on rice farming, and whether it is a viable tool for rural development in the context of rice farming in the northern region of Thailand. Two organic rice growers in Yasothon Province and Surin Province were selected as case studies. The implications of organic methods are investigated in terms of productivity and in trading sphere through value chain of rice.

1.2 Relevance and justification

Organic agriculture is a way of farm management that concerns about the local ecology, health of producers and consumers, as well as care and fairness at all levels of relationships and all parties involved (www.ifoam.org). The definition and principles of organic agriculture are quite complex and holistic since it involves both tangible and intangible concepts. Organic approaches include soil conservation, crop rotation and the use of green manure (www.ifad.org).

In terms of trade, the market for organic products has been growing rapidly since 1990 along with the concerns about health and environment among consumers. The estimated international sales reached US$ 38.6 billion in 2006 comparing with US$ 18 billion in 2000, and global demand for organic products remains robust with sales increasing by over US$ 5 billion a year, especially in North America and Europe (Willer and et al (Eds.) 2008: 16). Organic markets in developing countries are still small but have been growing especially in upper-income developing countries. Unlike conventional agricultural goods, organic products are labelled by certification organizations in order to certify the quality of products produced organically.

With its environmental and ethical sound methods and the growing market, organic farming has been promoted and supported by many organizations. The International Federation of Organic Agriculture Movements (IFOAM), an NGO established in 1972, is the spearhead of the movement and currently unites 750 member organizations in 108 countries (www.ifoam.org). The organic movement led by IFOAM has been supported by various international organizations under the UN, such as FAO, UNCTAD, UNEP and ECOSOC, and IFOAM also works together with other movements like The World Fair Trade Organization (WFTO), The International Social and Environmental Labeling Alliance (ISEAL) and The World Conservation Union (IUCN) (Ibid.).

In the context of development policy, organic agriculture has been supported by several organizations. For example, UNCTAD and UNEP stated in its publication that organic agriculture offers developing countries a wide range of economic, environmental, social and cultural benefits, and some

modern techniques have the potential to maintain or increase yields as well as help in improving soil fertility, biodiversity and ecosystem of agriculture.

"Organic production is particularly well suited for smallholder farmers, who comprise the majority of the world's poor. It makes resource-poor farmers less dependent on external resources and helps them enjoy higher and more stable yields and incomes, which enhances food security. … This evidence clearly shows that organic agriculture is a promising trade and sustainable development opportunity and a powerful tool for achieving the Millennium Development Goals, particularly those related to poverty reduction and the environment."

(UNCTAD- UNEP 2008)

In Thailand, organic movement has been driven mainly by grass-roots NGOs who facilitate conversion to organic methods, organize farmer groups, and provide training and marketing support for small farmers. In terms of policy, Thai government has supported organic agriculture and allocated budgets for projects and initiatives under a National Organic Agenda as well as a four-year strategic plan and action plan that aims at development of organic sectors in terms of products, certification and inspection, markets and training and extension (Lorlowhakarn, et al 2008).

Although organic farming consists of many good concepts and principles, it is questionable whether it is a viable tool to enhance farmers' livelihood by offering them an alternative way in farming in today's world which has been dominated by neoliberalism. To search an answer, it is therefore important to learn from real-life experiences of farmers.

1.3 Objectives of the Research

The objective of this study is to investigate the viability and implications of organic farming on small-scale rice farmers in the northeastern region of Thailand. It aims to elaborate socio-economic dimensions in rural livelihoods and discusses effects of organic agriculture on farmers' ways of life in present context. In the end of this paper, some evaluations will be proposed in order to answer the research questions.

1.4 Research Questions

Main question

Is organic agriculture a viable alternative for rice farmers? Why?

Sub-questions

- Why do farmers grow organic rice?
- What are the implications of organic methods on rice growing?
- Why is organic agriculture not attractive to most rice farmers?
- Why are some farmers successful in growing organic rice while some are not?
- How different between the mainstream rice chain and organic rice chain?

- How organic rice farmers benefit from the chain?

1.5 Methodology

This paper uses both primary and secondary data. Documents and information concerning the concepts of organic agriculture and organic rice in Thailand were explored as secondary source of data. The fieldwork was carried out between the mid of July and August 2009, using observation, in-dept interview and informal interview with the heads of the farmer groups, group members and non-members of organic farming groups and involved NGO staff members. There are two villages I visited:

1) Kud Hin Village, Kud Chum District, Yasothon Province: A researcher and NGO coordinator involving in alternative and organic agriculture in northeastern provinces for twenty years was interviewed and consulted before I went to the village. In the field, the head of the group, 5 members and 2 non-member participants were interviewed, and 21 members participated in an informal group interview. Observation in rice fields and rice price survey were also conducted during four days of the visit.

2) Donlaeng Tai Village, Prasat District, Surin Province: The leader of the group, 5 members and 2 non-member participants were interviewed.

1.6 Ethical dilemmas in fieldwork

Most interviewees in this paper are rice farmers who were very busy with their farms in the monsoon; therefore talking with them was quite difficult. I had to manage the interview while they were working in the field, and some of them were interviewed in the night after whole-day hard working. I still remember the group leader of Kud Hin Village who fell to sleep during conversation. This makes me feel very thankful for their kind.

I found that searching information about organic rice prices is not easy. I was refused by an NGO staff who told me that she can tell me everything about organic rice promotion of her firm except the price structure. 'It is business secrecy', she said. With the same reason, I was asked to get out a big supermarket in Bangkok while I was checking prices of organic rice on shelves, so I had to act as a spy and managed to get the needed data from that shop in two days after.

1.7 Limitations of the research

This paper focuses on the implications of organic farming in rice farming in selected area only. Some of the results of the case study may not be generalized to organic farming practices in other areas or to other kinds of crops. However, some lessons from the field might be used to explain farming situations in other places.

Chapter 2
Literature Review

2.1 Organic agriculture

Concepts and principles

According to IFOAM, organic agriculture can be defined as following:

"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. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."
(IFOAM, annual report 2007: 4).

The roots of organic agriculture development can be separated into the following principles:

- the principle of health refers to the sustainability and enhancement the well-being of human, soil, animal and plant and planet;

- the principle of ecology means that organic farming is based on ecological systems which should be sustained and balanced;

- the principle of fairness emphasizes on the relationship between all parties at all levels (farmers, workers, processors, distributors, traders and consumers) that should be conducted in a fair manner, and provide them with a good quality of life, and contribute to food sovereignty and reduction of poverty;

- the principle of care refers to the responsibility to protect the health and well-being of current and future generations as well as the environment

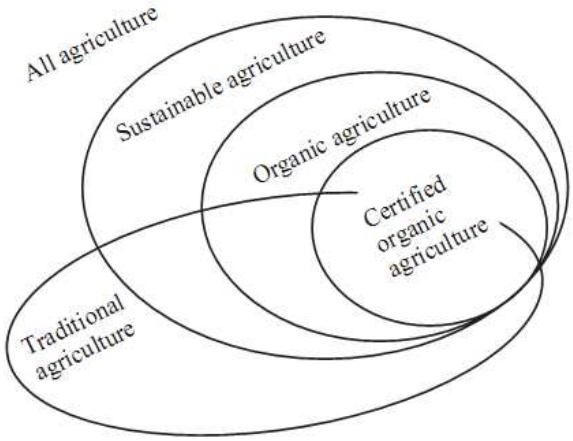
(adapted from 'The Principles of Organic Agriculture' in www.ifoam.org).

As it can be seen, the definition and principles of organic agriculture is holistic and quite difficult to capture even for the IFOAM community itself that used almost two years, from 2006-2008, to consult and create a common definition of organic agriculture (www.ifoam.org).

There are a number of definitions of organic agriculture. It can be defined in terms of the regulatory, agronomic or holistic aspects, and this usually leads to misconceptions about organic agriculture (Giovannucci 2006, Twarog 2006). Furthermore, there are categories of alternative agricultural approaches that have similar methods to organic farming e.g. traditional agriculture, Low External Input and Sustainable Agriculture (LEISA) and sustainable agriculture.

However we can distinguish organic agriculture in several ways such as using a holistic approach to manage farm, genetically modified organisms (GMOs) or synthetic agro-chemicals are not permitted in farming, and being involved in production standards (UNDP, 2006). According to Twarog (2006), organic agricultural produces can be divided into two categories: uncertified and certified. Uncertified organic goods are produced organically but are not certified as organic by a certification body. On the other hand, products checked and certified as organic are produced and processed by using organic methods in accordance with organic standards. In order to notice consumers, the standard label will be shown on the package of certified products which are more expensive than conventional agricultural produces (see figure 1).

Figure 1: Two categories of organic farming and types of agricultural practices



Source: Twarog 2006: 144

According to the above figure, it can be seen that organic agriculture is not just about the final product but it is related to the process of standard and certification, and this these are among the essential elements distinguishing organics from most other forms of agriculture (Giovannucci 2006: 2). Organic certifications and inspection systems were established to ensure that the process of cultivation, e.g. using pesticides and fertilizers, crop protection, is free from contaminants or synthetic chemicals that may harm the health of ecology, producers, consumers and all parties involved (www.ifoam.org, Giovannucci 2006: 3).

With its core principles and the growing market trend, organic agriculture movement has been broadening its perspectives to issues related to agriculture and rural development such as local enterprise development, sustainable development, climate change, food security and gender (see more in www.ifoam.org).

Markets and certifications

The market for organic products is relatively small. i.e. niche markets, when compared with conventional agriculture markets. However, the size of organic market has been growing fast along with increasing demand especially markets in developed countries like the US, EU states and Japan. In 2006 international sales are estimated to be US$ 38.6 billion compared to US$ 18 billion in 2000, and the market volume has increased by around US$ 5 billion a year (Willer et al 2008).

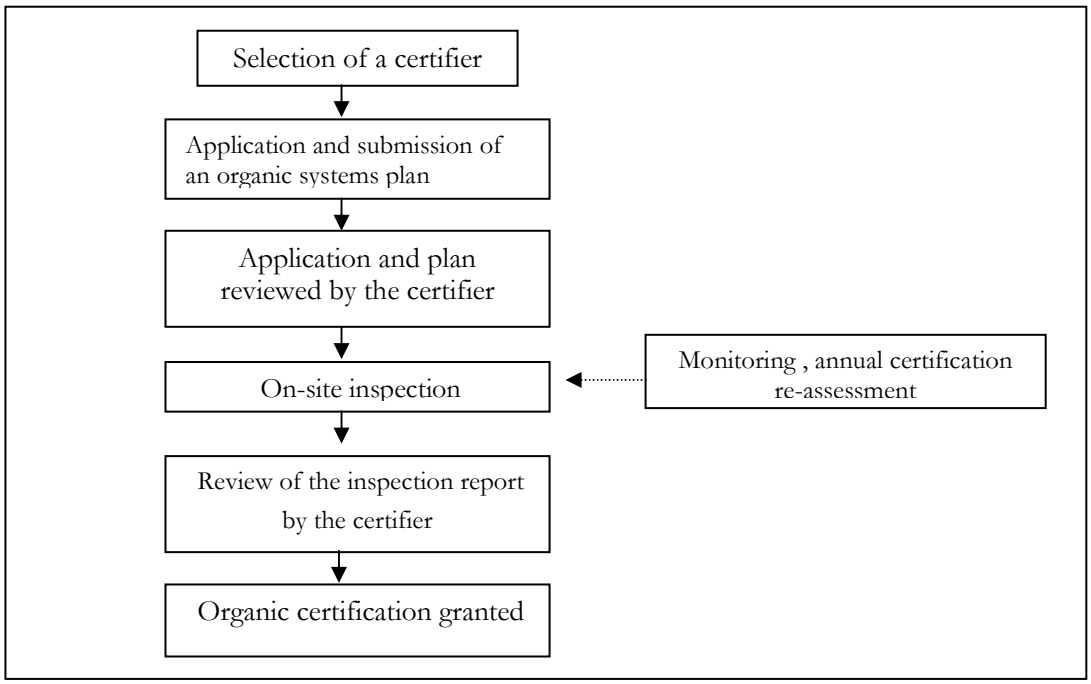
Organic goods in niche markets are accredited with certification bodies with their own standards and organic labels. In terms of marketing, the organic standard is not just quality and ethical labeling, but it has shifted from being neutral market lubricants to a tool for product differentiation and market penetration in niche markets of high-value products (Ibid.).

The organic certification systems can be classified into three types depending on the size of markets: first-party, second-party and third-party certification. In the context of today's global trade, however, the third-party certification, by public or private certifiers, is required before a product can be labeled as organic and sold globally, thus this type of certification is an efficient tool for organic agricultural development (Setboonsarng, 2006).

Figure 2: Examples of organic certification body

In order to be accepted in organic markets producers have to be certified by an organic certification body. There are several steps to follow before the certification is granted (see figure 3). As a gateway to markets, the process of inspection is very important for farmers. There are a number of lists that have to be checked by the certifier. For example, type of crops, history of farming, field activity records, sources of farming inputs, soil and pest management activities, as well as documents showing that contamination can be avoided (http://attra.ncat.org).

Figure 3: Certification process for organic producers



Source: National Sustainable Agriculture Information Service at http://attra.ncat.org/attra-pub/PDF/organic_certification.pdf, own addition

Constraints on organic farming

There are constraints for producers to adopt and benefit from organic markets especially for those in developing countries. Firstly, organic farming requires a long time for learning, planning and managing farms. In the transition period, which may be several years, farmers usually face the problem of yield decreasing. The second obstacle is the lack of institutional supports, policies and incentives such as research, training, subsidies and marketing information. Political advantage of non-organic farming in extension services is also an institutional obstacle. Thirdly the organic standard may be too complicated and difficult for farmers to comply. The last constraint is the size of local organic market is small, in turn, advantages for producers are limited. Therefore, supports from involved parties is crucial for organic farming development especially agricultural policies of the state, investment in research and partnerships between farmers, farmer groups, NGOs, CBOs, organic movements, and certification bodies (Giovannucci 2006, Johannsen et al 2005, UNCTAD-UNEP 2008: 39-40).

Arguments on organic farming

There are various pros and cons about organic agriculture. In the positive side, besides IFOAM and its alliances, it can be obviously seen that there are many publications by developmental organizations indicate benefits, as well as constraints, of organic agriculture for farmers especially small-holder producers. Several big international organizations such as FAO, UNCTAD or even the World Bank, especially in its World Development Report 2008 which refocuses on the issue of agriculture and development, mentioned certified organic farming as a new tool for development policy (Egelyng 2009).

For instance, recent publications by UNCTAD and UNEP indicate that organic production systems offer a wide range of economic, social and environmental advantages as well as food security for developing countries (UNCTAD-UNEP 2008). In their report based on a program called Capacity-building Task Force or CBTF which has been implementing organic farming in Africa since 2004 concludes that organic methods with low external inputs and appropriate technologies in the local can help in increasing productivity per hectare of food crops and income for producers as well as improving quality of natural resources and strengthening human capacity. Furthermore, farmers will be able to access markets with their certified organic products and, hence, poverty would be reduced among them because they can gain more income from higher prices and organic methods are less energy and external input dependent (Ibid.).

In the negative side, organic farming has been investigated or even criticized by various perspectives. For instance, organic foods are not healthier, increases the risk of food poisoning, consumers pay too high and organic methods cannot feed world hungers. But a booklet by Soil Association, a UK-based NGO (formed in 1946) which promotes organic agriculture and now the UK's leading organic organisation with its own certification system, claimed that most statements were not true, and some critics tried to attack organic movement especially from free-market think tanks, non-organic farming associations and companies (Soil Association 2001).

The arguments are not just about cultivation system but also on issues of trade. According to interesting studies by Michael Sligh and Carolyn Christman (2003) and Philip Howard (2009) show that governments in developed countries, certification organizations and giant agribusiness are true owners of organic food industries.

A recent hot debate on organic agriculture was brought to public in 2007 when Soil Association tried to launch a campaign that aims to reduce a carbon footprint emitted from organic food air freight. This measurement will not allow air freighted organic products to carry the Soil Association's certified organic mark unless they have ethical trade or Fairtrade certification (www.soilassociation.org). This means organic foods from developing countries, especially fresh fruits and vegetables from Africa, will not be able to sell their high value goods in the UK organic market. After an 18-month of public discussion, criticize and debate, the Association decided not to use such

campaign and not to require air freight to have ethical trade or Fairtrade certification because:

"The strongest view expressed was that, when addressing air freight, organic agriculture's potential to alleviate poverty and enhance the local environment in developing countries should be a key consideration."

(www.soilassociation.org)

However,

"The Standards Board will be reviewing their position on air freight annually in relation to progress in East Africa and ethical trade generally… The proposal to link air freight with ethical trade was always set alongside the long term intention for ethical trade certification of all organic products…"

(Ibid.)

This latest debate reveals a high business tone of certified organic products and the influence of certification and standard holders in ethical trade over producer countries.

2.2 Value chain

The word value chain refers to the full range of activities and services in producing, processing and distributing a product from beginning to its end use. Within a value chain, there are actors involved in processes of the chain, and there are linkages between them, directly and indirectly and vertically and horizontally. Values are added or created by activities these actors performed. In this sense, value chains include all activities in all markets as well as the final markets (local, regional, national or global) in which products are sold. (Gereffi et al 2005, Humphrey 2005).

Value chain analysis was developed to analyze trends of global manufacturing especially in the processes of upgrading and the increasing role of retailers and brand-making companies in global markets (Humphrey, 2005). Different from global commodity chain analysis, value chain analysis focuses mainly on the relationships and linkages between actors along the chain as well as the role of lead firms in determining what is to be produced, how and by whom, who is to perform what role are in its focus (i.e. 'value chain governance' or inter-firm relationships which can be linked to a broader institutional concept of 'the rules of the game') (Ibid.). A value chain may link to other chains in its value adding processes, and in this sense an actor can be connected to more than one value chain and it plays different roles in different chains. It can be seen that value chain analysis is not just about commodities processed by a production line, but it includes analysis of patterns of relationships, coordination and network integrations of involved actors in various dimensions in order to be competitive in business.

Not only in the business world, value chain approach has been also applied as a tool for development policy analysis and intervention that aims to link marginalized people into value chains, or, in other words, to make values chain work for the poor. This approach helps in analyzing possible links in

value chain that the poor can engage and gain advantages from growth, and it can also be used in targeting the poor within the network of chains. The clearer view from the analysis helps policy makers in planning, supporting and complementing projects and interventions (ODI, 2009).

2.3 Small farms: importance, efficiency and challenges

The importance of small farms in agricultural development has long been realized by literatures and policy makers since it is concerned with most of poor population in this world. Besides the vital roles in subsistence economy, small farms have also played an important part in the local non-farm economy through the demand of labor-intensive goods and services. This in turn creates linkages of growth between villages and towns as well as provides economic opportunities for the locals (Hazell 2007, and see more discussions in Lipton 2005 and DFID 2005).

The efficiency of small farms is other important issue. The argument of efficiency is based on the inverse relationship in small farms which yield more physical productivity per unit of area than in large farms. The inverse relationship results from intensity in small farms owned by families that prefer to use household labor and their own resources intensively rather than hire wage laborers or purchase external inputs in order to reduce the cost of inputs. This is related closely to the issue of scarcity of smallholders and risks in agriculture which induce small-farm owners to averse and reduce their vulnerabilities in markets by using their own resources and effort intensively (self exploitation). Under the same conditions, the reaction of big-farm owners to risks and uncertainties is different from small farms i.e. they use more labor saving technologies to cut down operational costs per unit and increase area productivity in order to maintain their market competitiveness and maximize the return from investment. However, the diseconomies of scale will occur when production exceeds the capacity of small farms. In this sense, the advantages of small farms in agriculture will move to large farms who tend to be 'the net sellers' in markets, while small farms are the net buyers (Hazell 2007, Barrett 1996, Eastwood et al 2005).

Nevertheless, there are factors that help to explain 'why and how' in inverse relationship and intensity in small farms rather than using economic assumptions which is mainly based on classical works by Amartya Sen's efficiency of small farms as well as Ester Boserup's labor productivity declined with farming intensification. According Dyer (1997), it is more important to consider dynamic 'driving forces' behind smallholders to intensify their labor and effort in farming rather than focusing just on 'factors' that allow them to do so, such as the issue of subsistence and household survival, exploitation and class relationship in production.

Other factor that affects efficiency of small farms is institutional supports. With poor institutional settings, consequently, the stress-induced responses and effort in small farming within the context of market imperfections will lead to situations of efficiency losses and poverty traps especially in developing countries (Mendola 2007).

Yet, there are challenges for small farms in today's globalized world that effect small farms especially in the agricultural trading arena which determines shares to small producers. This implies the need of roles of joint institutional supports and innovation between farmers, NGOs, private companies and governments as well as public policies that aim to foster small farm development and link them to growth (Hazell 2007). The standards environment in agribusiness is an important issue in this respect since it increasingly determines shares and benefits in modern markets. The notions of standards are not about technical and physical specifications only, but some 'values' are also included within standards (e.g. environmental friendly processes, food-safety management in production system and child labor). This makes standards become more complex with more important roles in shaping value chains with economic, social and political perspectives included within standard settings. (Ibid., Humphrey 2006).

Standards in agribusiness in practice, however, bring some concerns for development arena because there are several implications that constrain developing countries from being advantaged from trade. For instance, standards are the cause of increased production costs, there are few actors who govern value chains and reap benefits through standards. These concerns can be obvious even in ethical trading chains (Humphrey 2006, Ellis K. and Jodie Keane 2008, Reynolds 2004, Sligh M. and Carolyn Christman 2003)

2.4 Livelihood strategies and decision making of smallholders

To understand rural livelihood and strategies of making a living is not easy since it is complicated, dynamic and contextual based on historical facts and related factors in each society. Any attempts to generalize data across communities may result in fallacies of policies and interventions. The diversification of rural livelihood is related to a range of activities, full time and part time in both on-farm and off-farm sectors, as well as social support capabilities for household survival. These activities are dependent on resources accessed by households and options of strategy people have chosen (Ellis 1999). However it is important to note that strategies for a better living are changed constantly as environments in the rural, as well as the urban and links between them, become more complicated (Garrett 2005).

Agriculture, as a part of rural livelihood, is much more complex when combined with the notion of 'livelihood strategies' which links to the issue of choices in agriculture. There are attempts of economists and policy makers to explore the reasons behind behaviors of farmers by using economic concepts such as rationality, profit and utility maximization, and risk aversion. However some of these concepts have been criticized as they have been generalized and adapted to fit realities in the local because there are still some facts ignored and overlooked, such as local class stratification, institutional contexts and economic inequality among farmers (Barlett 1980: 1-14, Schultz 1980, Mendola 2007, and see more discussions in Hill 1986: 16-65).

This does not mean that rural people are irrational economic men, but it implies the complexity of behaviors in realities which is not necessarily illogical in terms of economics. In this sense, their choices and determinations

in farming are not always dependent on cash or outputs, but might based on uncertain surrounding situations and other social factors. Fischer (2006), for instance, investigated the capacities of subsistence among of rural Tibetans, who are poor in China but possess sufficient assets for household survival, and suggested that cultural perspectives and asset-based wealth are factors behind labor behaviors in wage employment. Subsistence capacities help to secure them to low-wage employment and offer them independence from force selling of produce at inopportune times, but this seems to be irrational in economic senses since such freedom and dignity imply that they exclude themselves from other productive activities.

Chapter 3
Organic rice in the northeast of Thailand : case studies

Figure 4: Map of Thailand illustrates the northern region and area of case studies

Source: www.thailand-map.net, own addition

3.1 Background of the story: rice growing in the northeast

Rice is the most important staple in Thailand. With approximately 9.78 million hectares of rice growing area or 48.8% of country's agricultural land, about 32.1 million tons of rice is annually produced; and with roughly 9-10 million tons of milled rice exported, Thailand is a leader in world rice market (www.oae.go.th, www.fao.org, www.irri.org).

The level of yield productivity is a serious problem for rice farming in Thailand. According International Rice Research Institute website (IRRI) database, which refers to FAO and USDA statistics, in 2006 the average yield of rice production is about 2.7-2.95 ton/hectare, which is relatively low when compared with neighbor countries such as Vietnam (approximately 4.7-4.9 t/ha), China (6.2-6.3 t/ha), Indonesia (4.6-4.8 t/ha), the Philippines (3.7 t/ha), Laos (3.5 t/ha) and Cambodia (2.5 t/ha). However, the quality and aromatic varieties are the strength of Thai rice, and the improvement in farm

mechanization helps to maintain labor productivity and profitability of Thai rice in the world market (www.irri.org).

This problem is obvious in the northeast region (or in Thai, Isaan) which is the largest region and the main rice growing area of the country especially Jasmine rice or Hom Mali[1], the most famous Thai rice. The major problems of rice production in this region are ranged from the small size of farms which is three times smaller than in the central and the lower north, poor soil quality on plateau, and the small amount of irrigated area which is about 20% of total area comparing with more than 75% in the central where the main rice surplus of the country comes from (ibid.).

With the largest agricultural area (about 9.24 million hectares or 44.3% of the country's total farming area) and the highest number of rice farming area (nearly 5.94 million hectares or 64.3% of total farming area in this region, and it constitutes about 58.4% of Thai total rice area), people in the northeast are dependent on rice farming (www.oae.go.th).

When we consider the fact that rice surplus is not from this main rice production region and the number of population of about 22.8 million or 34% of 67 million Thailand's population, it can be clearly seen that rice grown in this region is generally for household consumption (www.nso.go.th, www.irri.org). Like in many rice growing countries, rice cultivation is not just about household economy but it is a way of life for millions of Thai people, and there are beliefs, traditions and cultures embedded in it (www.thairice.org, FAO 2003, Lecomte 2008).

3.2 Organic rice growing

In the northeastern part of Thailand, rice is normally cultivated once a year in the monsoon season i.e rain-fed farming, but there are two or three times in irrigated areas. Although it takes 3-4 months for rice to mature, but the whole process of cultivation is ranged from 7-8 months.

The cultivation starts with rainfall in the beginning of the monsoon, usually in May, when farmers plough the land to remove the weed and prepare the soil. The next step is the preparation of seedling plot where rice seed will be spread on. The seedlings require about a month to grow before they are uprooted. Between this phrase, the second plough and harrowing will be done in order to loosen and flatten the field. After uprooting, the seedlings are transplanted to the rice field. Alternatively, farmers may broadcast seeds directly into the field; hence, with this method, the preparation of seedlings will be skipped. The rice plants require about 3-4 months to mature, usually from mid July to mid November. Water management, pest and weed control and fertilizers are vital between the growing period since these are factors that determine productivity and quality of rice yield. Harvesting is carried out by machine or human, usually in late November or December, when the grain is

[1] In Thai , meaning "the sweet smell of jasmine flower"

yellow. Then the rice grain will be threshed and dried before storing in granary for household consumption and selling in markets. Rice will be sold soon after harvesting, usually between late November and January, because most farmers do not have adequate places to store paddy and, of course, they want to see the returns from their effort spent during the past eight months; therefore, the surplus of paddy results in the lowest market price rate in this period of time. Market prices of paddy depend on various factors especially the moisture content and quality of grains. Generally, the cultivation of common and organic rice is very similar. Few differences can be remarked on the use of fertilizers, pesticides and farm management and inspection under organic norms (see table below).

(interview with Thong-aun Thetthai and Samriang and Phakphum Inpaen, Od-ompanich et al. 2007)

Table 1
Simple comparison of annual activities in organic and conventional rice cultivation[2]

Month	Activities	
	Conventional	**Organic**
January	- sell paddy rice - select and store rice seeds - grow vegetables or cash crops - work in off-farm sectors in Bangkok or cities	- sell paddy rice - select and store rice seeds - grow vegetables or cash crops (organically) - grow green manure crops - prepare organic fertilizers and compost
February	- grow vegetables or cash crops - work in off-farm sectors in Bangkok or cities	- grow vegetables or cash crops (organically) - grow green manure crops - produce organic fertilizers and compost
March	- grow vegetables or cash crops - work in off-farm sectors in Bangkok or cities	- grow vegetables or cash crops (organically) - grow green manure crops - produce organic fertilizers and compost
April	- harvest cash crops - work in off-farm sectors in Bangkok or cities	- grow vegetables or cash crops (organically) - grow green manure crops - harvest and collect seeds of green manure crops - produce organic fertilizers and compost - repair rice field fences and dykes - apply compost and manure on farmland
May	- harvest crops and repair dykes - first plough - buy manure and chemical fertilizers	- harvest crops - till the soil to cover green fertilizer plants - first plough and repair dykes

[2] Please note that this table is a simplified attempt to distinguish between activities practiced by farmers in conventional and organic rice farming. In reality, these are much more complex and varied contextually; for instance, some of conventional farmers may use chemical fertilizers, pesticides and herbicides in some plots but do not practice in the rest.

	- prepare seedling bed and apply fertilizer	- grow green manure crops - prepare seedling bed and apply fertilizer - training on organic standards and plans - organic inspection
June	- second plough and leveling the soil - broadcasting and/or transplanting - control water level	- apply compost and manure on farmland - till the soil to cover green fertilizer plants - second plough and leveling the soil - broadcasting and/or transplanting - control water level - organic inspection
July	- apply chemical fertilizers - broadcasting and/or transplanting - control water level and maintain dykes	- apply organic fertilizers and manure - broadcasting and/or transplanting - control water level and maintain dykes - organic inspection
August	- control weeds and pests (by manual or using chemicals) - control water level and repair dykes - apply chemical fertilizer	- control weeds and pests (by manual or using bio-herbicide and bio-pesticide) - control water level and repair dykes - apply organic fertilizer and manure - organic inspection
September	- control weeds and pests (by manual or using chemicals) - control water level - apply chemical fertilizers	- control weeds and pests (by manual or using bio-herbicide and bio-pesticide) - control water level and repair dykes - apply organic fertilizer and manure
October	- control weeds and pests (by manual or using chemicals) - control water level - apply chemical fertilizers	- control weeds and pests (by manual or using bio-herbicide and bio-pesticide) - control water level and repair dykes - apply organic fertilizer and manure - organic inspection
November	- harvesting, threshing and drying - sell paddy - store paddy in granary for consumption - select and store rice seeds	- harvesting, threshing and drying - sell paddy - store paddy in granary for consumption - select and store rice seeds - till soil to cover rice straw - grow green manure crops - organic inspection
December	- harvesting, threshing and drying - sell paddy - store paddy in granary for consumption - select and store rice seeds - collect rice straw for cattle - grow vegetables or cash crops	- harvesting, threshing and drying - sell paddy - store paddy in granary for consumption - select and store rice seeds - collect rice straw for cattle - grow vegetables or cash crops (organically) - till soil to cover rice straw - grow green manure crops

Source: applied from Od-ompanich et al. 2007, own addition based on interview

Although growing rice in both systems is quite similar, as mentioned earlier, there are differences between them that should be noted here. Firstly, the rice fields are prevented from chemical and genetically modified contaminants that may be used in nearby farms and can be easily spread through water and air. It is therefore necessary for farmers to draw a management plan of their farms and talk with farmers who have farms next to theirs. Moreover, field dykes are constructed higher and wider than usual; some farms are fenced, in order to prevent contaminants. Secondly, using chemical fertilizers, herbicides and pesticides, as well as GMO seeds, are not allowed in organic rice fields. Farmers have to use manure (green manure, chicken or pig droppings, buffalo dung) and compost as bio-fertilizers to improve soil quality and grow rice. They use herbal pesticides to control pests, uproot weeds by hand and manage water level to control pests and weeds. Thirdly, rice farms have to be examined by the certifier who inspects organic farms at least one time during the crop period. Organic rice farms are also monitored informally by members in the same farmer group and from other groups. Farmers usually exchange their knowledge and experiences during the monitoring. If a member is found not follow organic practices, he will be asked to leave the group; if wish, he has to submit an application again next year. The restart means several years to wait to be certified. Lastly, time allocated in organic farming is much greater than conventional farms because farmers have to devote their time in cultivation without using any chemical substances. Furthermore, they spend time in training, group meeting, preparing rice seeds for the next crop and preparing compost and manure. After harvesting, farmers will improve the soil by tilling the land to cover rice stalks, apply bio-fertilizers to the fields and grow crops (usually green bean, groundnut) which will be tilled over after harvest. Vegetables and cash crops are also grown organically in the rice fields and will be harvested before the next crop starts (Thong-aun, Samriang, Phakphum and Nirat Srichamni, researcher and coordinator, interview).

3.3 Case studies

1) Kud Hin Village, Kud Chum District, Yasothon Province

Background

The rice farmers in the village were formed in group in 1990 as a part of the Rak Thammachat Club (Nature Care Club), or RTC, that was established in the same year with an attempt to conserve the local environment, and to improve livelihood of rice farmers who had been suffering from low market prices, indebtedness and health problems caused by chemical substances in conventional farming. The RTC has promoted alternative agricultural practices in rice farming, including Masanobu Fukuoka's natural farming practice, System of Rice Intensification or SRI, non-toxic farming and organic farming, and has worked closely with the Alternative Agriculture Network (AAN) (Samerpak 2006).

The RTC has been certificated by Organic Agriculture Certification Thailand or ACT (group certification). In 2007 it had 266 members with about

1,150 ha of farm areas and 720 tons of organic paddy rice (www.actorganic-cert.or.th, RTC). Most of milled rice of RTC was exported through Green Net Cooperative, a Thai-based NGO group under Earth Net Foundation that promotes organic agriculture and Fairtrade movement for almost 20 years, and some was sold domestically.

In 1995 the Kud Hin Farmer Group[3] was established but still operated as an RTC partner until in the year 2006 when the group decided to separate from RTC network due to a problem of trust. At the present there are about 200 members in Kud Hin Farmer group, 75 produce organically and the rest are conventional with non-toxic farming practices. With the help from local government, NGOs and researchers, the group has its own storage and a small rice milling machine (Suwit Thanakun, head of the group and Nirat, interview).

Like in most northeastern areas, farmers in Kud Hin grow two types of swampy lowland rice: Hom Mali rice which grown mainly for selling and glutinous rice (aka sticky rice) for household consumption and for sell. Rice is cultivated only once in a year since there is no irrigation system available in the village. Almost all the households have their own land, with an average of 15-30 rai[4] or 6-12 acres, and most of them own more than a plot of land (3-5 plots are common, and at least one plot is for growing rice). (Ibid.)

Implications

Productivity

All interviewed farmers feel that they do not have any problems in growing rice with organic methods since they have been experienced in alternative farming practices for decades. All of them accepted that they have the experience of lower productivity in the transition period (the first two years); but the yield increased after 3 or 4 years of adoption. In every year, there are 2-3 farmers of the Kud Hin farmer group who fail to meet organic standard requirements and have to leave the organic group. Nearly all unsuccessful farmers were found that they used chemical fertilizers in farms (Suwit and Thong-aun, interview).

According to a group interview with 21 group member working together at the storage, the group was satisfied with organic method since they pay less for inputs, especially fertilizers. At the present, conventional rice farmers in the area have to pay not less than 900 baht for a 50-kilogram sack of chemical fertilizer or more than 18,000 baht/ton, while the price of manure such as chicken droppings is about 900-1,300 baht/ton, and the price of organic fertilizers and chicken droppings range from 3,000 to 4,500 baht/ton. In their opinion, however, organic farming is not easy for most farmers since it requires time, knowledge and experiences to grow rice and use natural

[3] The Nongyoa Natural Agriculture Group is the other name of the group. "Nongyao" is the name of lowlands where their rice farms situated.

[4] "Rai" is a Thai unit of area, equals to 1600 m^2 or 0.16 hectare or about 0.4 acre

fertilizers in rice fields properly. Moreover, it needs a long time for non-chemical manure to take effect, and this makes organic methods not attractive for conventional rice farmers who are not patient and diligent enough. (Kud Hin Farmer Group, group interview)

On the topic of recent productivity, responses from participants were varied. Nevertheless, the trend of rice productivity can be estimated at around 350-400 kilograms/rai (or about 2.19-2.5 t/ha), which is about the same as yields in their neighbors' conventional rice farms. The amount of paddy yields depends on the amount of land, experience and farm environments in each plot. Besides the problem of flooding in some years, one serious trouble for them is the shortage of labor in the peak seasons (i.e. during transplanting and harvesting time) when all farmers are busying with their own farms. Today there are few young people working in the village since most of them are either working in big cities like Bangkok and another big cities or studying in school. When discussed about factors of their success in organic, the group mentioned the diligence, attitude towards alternative farming, and working in group (Ibid.).

At the present, this 200-member farmer group produce 1,000 tons of rice each year of which about 80-90 tons are organic (Suwit, interview).

The implication of organic farming methods in rice productivity in this group is similar to the results of an 18-month study by Chaliaw Boonman and Uthai Unphim (2006) which claimed that the rice yields in conventional and organic system in Yasothon Province is not different significantly, but the productivity in conversion period is far less than usual. It is also found that rice farmers paid more input costs in organic farming than in conventional cultivation especially in cash costs (See table 2 below). This is because of costs paid in organic certification processes which directly increase the total input cost (Hutanuwatr 2006). The costs for certification[5] including 4,000 baht/group and 200 baht/individual for the enter fee, 2,500 baht/day for the inspection (www.surinorganic.com, and interview with Thong-auan, Suwit, Phakphum and Samriang).

[5] In the case of ACT certification

Table 2
Productivity, input costs and income of Hom Mali rice produced in different farming systems (crop year 2004/2005, Yasothon Province)

	conventional	conversion	organic	organic + integrated farming
Productivity (kg/rai)	384	314	402	401
Total input cost (baht/rai)	2825	2643	2880	2733
Cost per unit (baht/kg)	7.36	8.42	7.16	6.82
Net profit (baht/rai)[6]	820	422	1143	1280
----------(baht/kg)	2.14	1.34	2.84	3.19

Source: summarized and applied from Boonman, C. and Uthai Unphim (2006), table 6.7, 6.8 (p.86, 88)

It can be seen in the table that organic farmers earn more profit when compare to common rice farmers. This results from the higher productivity and higher market price for organic produces (Hutanuwatr 2006). The rate of return will be higher when a cash premium is applied.

The hypothesis of decreasing yield during conversion time is clearly seen in this study. With nearly 20% of productivity dropped, it is reasonable to claim that organic method holds some risks for rice farmers, not just the lower yields and decreased income but also food security for their households.

Rice selling

After separating from RTC, the group has no contract with the Fairtrade network, which is a key actor in the organic value chain, and this leads to a new challenge for the group because it has to do business by itself. Leaders of the group have to seek buyers, mill rice, pack milled rice in sacks and transport their goods to traders in Bangkok without help from any governmental agencies. Fortunately, they managed to sell most of organic rice to private companies since the level of demand in markets is still high. The group, however, is facing financial problems in running the business, and it consequently has been indebted to Bank for Agriculture and Agricultural Cooperatives (BAAC) with nearly one million baht (Thong-auan, interview).

Recently the group has been helped by a group of researchers and Dharma Ruam Jai Foundation that established the Moral Rice Project with a hope to improve the livelihood of rice farmers by adding moral values to organic rice sold in domestic markets. Under this project, only organic rice produced by farmers who keep the Five Buddhist Precepts will be bought and sold in

[6] Based on 2005 average market prices for paddy in Yasothon Province; 9.50 baht/kg. for common jasmine rice, 9.75 baht/kg for rice in conversion period, and 10 baht/kg. for organic rice (Boonman, C. and Uthai Unphim 2006)

supermarkets in Bangkok. Moral farmers will be given a special higher price for their efforts (Ibid. and www.cai.ku.ac.th).

Although the group does not have the problem of selling organic rice, there are constraints on management especially in accounting and data recording. Market information and network is also a huge problem in this beginning period due to the loss connection with experienced network of RTC and Green Net.

2) Donlaeng Tai Village, Prasat District, Surin Province

Background

Donlaeng Tai is a small village situated 30 km. far from Surin Provice and 400 km. from Bangkok. As a part of ancient Khmer empire, all of villagers are capable to speak both Thai and Khmer language fluently, but the latter is their local language. Most of villagers are rice farmer with an average farm size of 15-30 rai (6-12 acres) per household, most of them own more than a plot of land and all farms are not irrigated. Rice grown in this village is Hom Mali rice.

The story of organic rice in Donlaeng Tai Village began in 1991 when a small group of rice famers started to think of problems in rice cultivation especially as indebtedness, low market prices and illness caused by pesticides, and tried to find a new way to grow rice. In 1992 the group became a part of The Natural Agriculture Group (NAG) with supports from NGOs especially Surin Farmer Support (SFS). Several alternative approaches were learned and practiced in their farms such as Fukuoka's principle, SRI technique, toxic-free farming and Santi Asok's Buddhist agriculture. Between 1997 and 1999 the group adopted organic methods to their rice farms with the help from SFS. Between the year 2000 and 2001 the village experienced a boom in organic farming after the local government had promoted and supported organic rice farming in Surin Province. About 200 farmers decided to switch their farms to organic; but three years later, nearly all were not successful and quit the group because the policy was changed, financial supports were cut. One more reason behind the drop of organic members is because there were more supports from central government especially the help from the Rice Department that provided high quality and high yielding jasmine rice seeds for free and bought back paddy rice from farmers without any quality standard. In 2005 the group comprised of 20 organic members but there are just 12 farmers farming organically at the present (Thongma Preab-ying, group leader, interview). (Thongma, interview).

Implications

Productivity

Generally, productivity of organic rice produced by the group is not different from conventional rice farms with an average of about 350-400 kg/rai (or about 2.2-2.5 t/ha) depending on soil fertility, farm management and environments of each plot of land, and farmers experienced the problem of yield reduction during the conversion (Phakphum Inpaen, interview). Big

problems for them are the shortage of water and labor scarcity in transplanting and harvesting time. The cost of inputs for organic rice farms is not far different from the conventional rice farming (interview with Phakphum, Thongma, Samriang and Huad Ngam-chalam). In addition, organic farmers in the village also grow native Jasmine varieties to preserve rice seeds and for household consumption. At the present there are about 20 local rice species preserved by the group.

A study on the topic of Hom Mali rice in organic farming in Surin Province shows that area productivity of organic rice is much greater than rice with conventional methods (Losirikul, M. and Prasit Kanjana 2006). However, the cost for growing organic rice is about 13% higher than ordinary rice, and the rice yield in conversion is not reduced. It is noticeable in the study that the net returns of organic farming to rice growers are much higher than the ordinary system especially in the case of organic rice grown in integrated farming system. This implies the importance of prices of organic markets as well as management in farms that help to increase both yields and net profit. At this point the role of institutions that link producers to markets is crucial[7].

Table 3
Productivity, input costs and income of Hom Mali rice produced in different farming systems (crop year 2004/2005, Surin Province)

	conventional	**conversion**	**organic**	**organic + integrated farming**
Productivity (kg/rai)	379	395	426	411
Total input cost (baht/rai)	2619	2712	2945	2330
Cost per unit (baht/kg)	6.91	6.86	6.91	5.66
Net profit (baht/rai)[8]	380	751	1319	1785
----------(baht/kg)	1.00	1.9	3.10	4.34

Source: summarized and applied from Losirikul, M. and Prasit Kanjana (2006), figure 6.1, 6.2 (p.64-65)

Rice selling

The group has no problem in selling their produce since they have a close connection with the Rice Fund Surin Organic Agriculture Cooperative (or the Rice Fund Coop.) that has been certified by ACT and FLO Fairtrade certification. After harvesting, organic paddy from members will be gathered

[7] Organic rice farms in Surin Province have been supported strongly from local governments and the Rice Fund Coop.

[8] Based on 2005 average market prices for paddy in Surin Province; 7.91 baht/kg. for common jasmine rice, 8.77 baht/kg for rice in conversion period, and 10 baht/kg. for organic rice (Losirikul, M. and Prasit Kanjana 2006)

and sold to the Rice Fund Coop. (Phakphum Inpaen, interview). The cooperative is responsible for milling, grading, packaging and distributing rice to domestic consumers, and exporting packaged produces directly to the US and EU markets through Fairtrade networks (Sompoi Chansaeng, the manager of the Rice Fund Surin Coop., informal interview).

Organic rice from Donlaeng Tai is a part of more than 2800 tons of paddy sold to the cooperative every year by about 340 organic rice farmers in Surin Province. The figure of cooperative members used to be much higher at more than 5oo until 231 member were asked to leave the cooperative because they were at in-transition for almost 10 years and could not end using chemical fertilizers (Lecomte 2008).

The price of paddy, which is around 10-20% higher than market price of normal rice, is determined year by year by the cooperative before harvesting time (usually in October or November). The premium will be calculated and paid by the Rice Fund after summarized its annual business performance. In this year each organic farmer in the village earns about 1 baht per a kilogram of paddy as the cash premium (Phakphum and Samriang, interview).

With a strong support from SFS, the Rice Fund Coop., AAN and local government, members of the group can sell other organic produces from their farms in the Green Market, a weekly open market at the center of Surin Province. More than 100 members of the cooperative[9] in all districts have participated in this small alternative market, and hundreds of consumers can buy fresh farm products directly from producers (www.surinfarmersupport.org).

[9] Each member has to hold at least one share in the Rice Fund Coop. (100 baht/share, each can hold not more than 5000 baht in share value)

Chapter 4
Value chain of organic rice

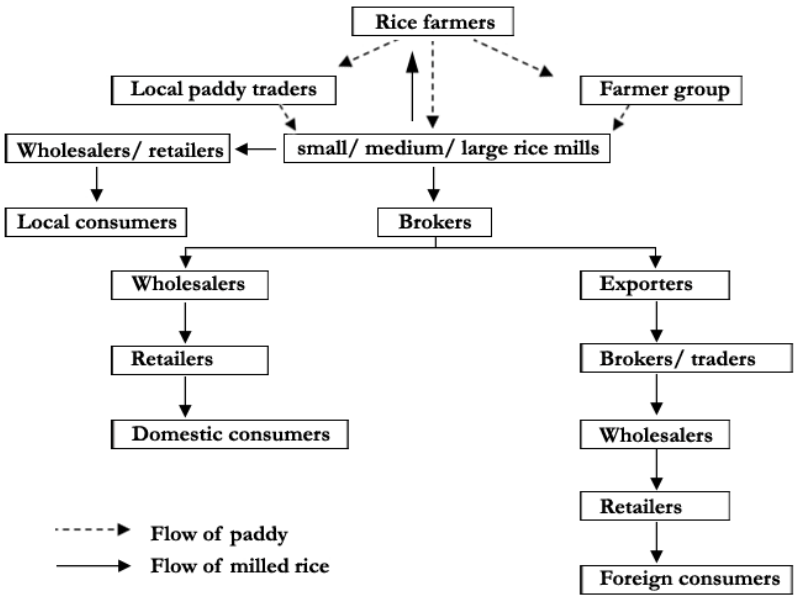
Characteristics of the chain

The chain of rice starts at rice field where famers grow rice plants and its end is on the plate in front of consumers in domestic and foreign countries. Various actors involved in the chain are mainly producers, traders, producer and trader organizations and consumers.

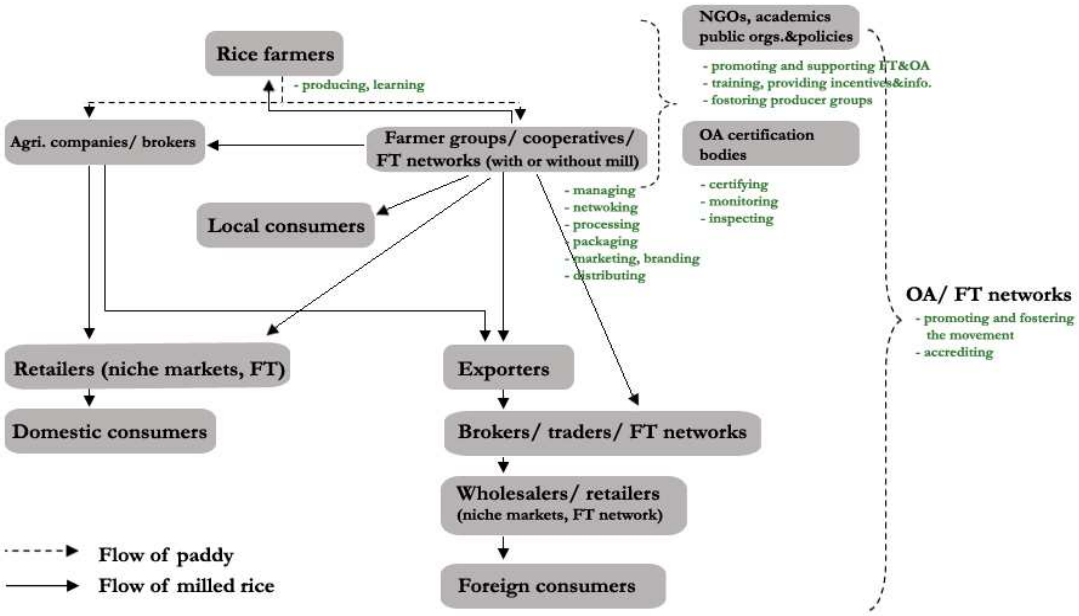
In the conventional rice chain, millers and traders, as the middlemen, play important intermediary roles and reap most benefits from the chain (CREM 2004, Udomkit and Adrian Winnett 2002). Millers transform paddy into milled rice before distributing to sellers, brokers as well as producers. Traders and brokers add value to milled rice through trade channels and marketing processes including packaging, branding, advertising and transporting rice to selling points in both domestic and foreign markets where consumers purchase produces.

For the chain of organic rice, the 'old middlemen' is less dominant since the high quality of the goods enables producers to have more choices in selling their rice. In case of Thailand organic rice is mainly sold to foreign markets through Fairtrade networks that work closely to producer groups (Udomkit 2002). Organic rice is also sold domestically by Fairtrade partners (Green Net and the Rice Fund), agricultural companies, producer groups, cooperatives, consumer groups and special projects.

Figure 5 : Simple comparison between the mainstream and organic rice chain



The main stream rice chain



The organic rice chain

Source: applied from Udomkit 2002, 151, own addition

Key players

The cooperative holds key roles in organic rice chain in both production phrase and market arena. These cooperatives have worked closely with producer groups, grassroots movements and NGOs that aim to improve livelihood and well-being of small-scale rice farmers. They promote and support rice farmers to farm with environmental friendly methods in order to reduce external input costs and to pull farmers out of debt cycle. In business area, cooperatives have tried to connect farmers to markets, such as in the case of the Rice Fund Coop., by playing roles of the middleman including processing, branding, packaging, marketing, distributing organic rice.

Another key actor in the certified organic chain is certification bodies. These organizations tend to be 'gatekeepers' that connect producers to trading sphere especially accrediting organizations in the North (Sligh, M. and Carolyn Christman 2003). The first type of certification is organic agriculture which involves both production and trading area. In case of Thai organic rice, ACT is the only institution which sets standards and monitors organic farming in the country. There are yet other certification bodies with different standards involved in organic farming in Thailand such as USDA's NOP, JAS and BIO SUISSE. The organic movement as well as organic standards and certification bodies have been driven by organic agriculture networks especially IFOAM with supports from governments in consumer countries especially in North America and Europe (Ibid.).

The second type of certification is Fairtrade which focuses on fairness in trading. Many organic rice farmers and producer groups are involved with cooperatives that have been certified as Fairtrade partners and have connected

with Fairtrade networks. In Thailand, Green Net Coop. and the Rice Fund Coop. are prominent Fairtrade partners that also support organic farming in the country. In the case of Green Net, its roles are very interesting since it is the pioneer of organic movement in Thailand and nearby countries. The Green Net network is huge, associated with grassroots movements, farmers, NGOs, traders and policy makers (http://greennet.or.th, www.nia.or.th, Lorlowhakarn, et al 2008, Udomkit and Adrian Winnett 2002 and Nirat, interview). The case studies in the last chapter were both involved Green Net.

Another two actors that play very crucial roles in today's trading is retailers in modern trade and agribusiness companies. There is less evidence available in the case of organic products in Thailand; however, the retail prices of organic rice shown in Table 4 may give us a hint about trading power of these actors in the organic value chain.

Patterns of relationships

The patterns of relationship between farmers, producer groups and trading intermediaries such as cooperatives, certification organizations and exporters are one of the main points that distinguish organic rice chain from ordinary chain. The relations between actors can be described in terms of contract, formal and informal. For farmers, each of them has to register as a member to a group of producer. This is important not just for production purposes e.g. being easier to access to credit resources, learning and exchanging knowledge and buying manures or fertilizers with cheaper prices, but also for the purpose of group certification that helps the group to bargain with other actors. In this sense, in the case of group certification, each farmer holds not just a group membership but also a client of organic certification. However some farmers may not belong to a group since they can register directly with a certification body and sell their paddy to organic traders or cooperatives with organic operating certification.

The relationships between growers, producer groups and traders are also characterized by contracts. Some sell produce directly to wholesalers or exporters with regular trading contracts e.g. in the case of Kud Hin farmer group, and some groups sell rice to Fair Trade partners with a minimum fair-trade price and the premium e.g. farmers in Don Laeng Tai who sell paddy to the Rice Fund Coop., and RTC mill that has a contract with Green Net.

Roles of moral supporters

In organic rice chain, there are roles of moral supporters of the organic movement that try to encourage rice farmers to grow premium products and benefit from organic market. For instance, the roles researchers and a Buddhism foundation that try to put the Five Precepts in organic rice farming in order to create a new market value for 'good farmers' in Yasothon Province; and the roles of the Rice Fund Coop. and NGOs in operating Surin Green Market.

It can be concluded here that although there are less actors and links in the organic rice chain, the relationship patterns within the chain tends to be more complicated with contracts and invisible links between actors.

Retail rice prices

The market retail prices of organic rice are higher that conventional rice. According to author's observations, the price gap between common white rice in Bangkok, which is average 40 baht/kg. (www.dit.go.th, author's survey), and types of organic rice ranges from about 0 to 10 baht/kg (0% to 25%) in case of organically certified rice and rice produced in conversion farms supported by Moral Rice Project and Bank for Agriculture and Agricultural Cooperative (BAAC) Surin. The gap is much wider in case of certified organic rice sold by Green Net and food businesses with 23- 49 baht/kg. (57.5% to 97.5%) higher than ordinary rice (see table below).

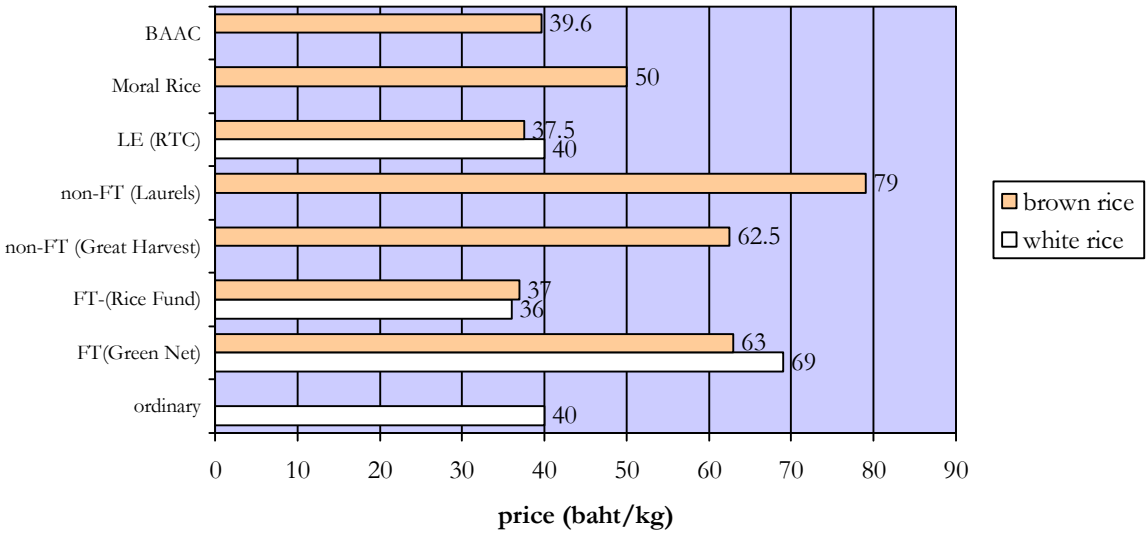
Table 4
Retail prices of organic rice in domestic markets

Places/Types of retailer	Types and prices (baht)	
	White	Brown
• BANGKOK		
Fair Trade		
- Green Net (1 kg.)	69	63
Non-Fair Trade		
- Great Harvest (2 kg.)	-	125
- Laurels (1 kg.)	-	79
Special projects		
- Moral Rice (1 kg.)	-	50
- BAAC Surin (5 kg)	-	198
• LOCAL MARKETS		
Fair Trade		
- Rice Fund Coop. (2 kg.) (at Kauw Hom Shop, Surin Province)	72	74
Producer group mills (local enterprise, Yasothon Province)		
- RTC Rice Mill (2 kg.)	80	75
- Bak-ruea Rice Mill (1 kg.)	40	39

Source: own survey[10]

[10] The price survey was conducted between 27-30 July 2009 in Yasothon Province and 16-20 August 2009 in Surin Province. The retail price survey in Bangkok was conducted between 24-29 August in 3 supermarkets: Tops, Villa Market and Gourmet Market. For the purpose of comparison, all prices were calculated and set in price-per-kilogram basis.

Figure 6: Comparison of domestic retail prices between common and organic Jasmine rice



Source: own survey

The much higher prices imply that certified organic rice has a high business tone when captured by private sectors that have power to command the price, while rice producers have limited roles to play, i.e. just to produce paddy, and earn smaller share from market prices. This picture is clearer when we compare market prices in Bangkok with prices of organic rice in local markets shown at the bottom of Table 4. A possible reason that helps to explain this phenomenon is the price of normal rice has been controlled by both governmental agencies and the demand and supply in market, while the organic market size is much smaller and the organic food is not mass product.

The high price of organic rice, as well as other organic goods, leads to questions about fairness to all parties involved especially end-consumers, and the limitation of domestic organic niche market caused by the price of organic products. Therefore, issues related to value chain analysis such as the role of public agencies, the price structure of actors in trade and the roles of organic businesses are recommended for further detailed studies.

Chapter 5
Discussion and conclusion

The following is a discussion about the implications of organic methods on rice faming as a rural development tool. It begins with the topic of efficiency and productivity in small rice farms then links to the issue of livelihood strategies in which productivity plays a vital role. The roles of small-scale producers and relations in the value chain are also discussed in order to explore a wider perspective on organic agriculture. In the last section, the paper draws a conclusion that aims to response to the research questions.

Efficiency of small rice farms: why do farmers grow organic rice?

Organic agriculture as a method of farming affects yields of rice directly. According to related studies, it can be seen that organic methods help farmers to increase rice yields, although the increased productivity is not different much from conventional farms, and this means addition income can be generated through higher market prices and premiums from ethical trade networks.

The increase in area productivity can be described in terms of efficiency in small farms i.e. rice growers use factors of production intensively (land, labor, time, local-available resources). This point is also proclaimed in studies by Songsrirote and Charuk Singhapreecha (2007) and Hutanuwatr (2006) who found that organic farmers use farming inputs more efficiently than conventional rice growers, and this results in the better quality of organic grains which is an obvious strong point of Thai organic jasmine rice. However the quality of produce depends on the length of time and the experience of producers in organic methods.

The good quality of paddy rice shows the efficiency of small farms who have been pressed by risks and uncertainties in rice growing. This also implies a problem of poverty trap caused by limitations of small farms and less bargaining power in the market which is considered as the stress in rice cultivation. As the market net buyers, smallholders have to use family labor and their own production resources extensively in order to reduce production costs. From the case of two organic rice growing groups in this paper, it is obviously seen that the problem of indebtedness is the main reason behind their decisions to change the way their cultivate rice from the conventional system to alternative agricultural methods. With these alternatives, the dependency on external inputs purchased from markets can be reduced and this will result in a decrease in production costs and a higher return from farming.

According to an interview with the head of Kud Hin farmer group, Suwit Thanakun, who has been farming rice for more than three decades, the implications of Green Revolution on rice farming, particularly the use of chemicals, is the root of poverty among rice farmers in his village. He argued that using chemicals may help to increase rice yields in the early years but the

productivity will be dropped in years later due to a decrease of soil fertility and environmental health caused by chemicals used in farms. In order to maintain or increase productivity, farmers have to use more chemical fertilizers and pesticides with prices getting higher every year, while the market prices of rice have been increased minimally. At the end farmers will find themselves poorer and deeply indebted. Moreover using chemicals makes the rice fields unsafe for their health, and it also affects the local food stocks.

In this sense, it implies that the shift from conventional system to alternative farming as well as organic agriculture is a way to reduce vulnerabilities and risks in small-scale farming, or in other words, a stress-driven decision making. However, moving towards alternatives which are more labor intensive with the risk of low yields between in-transition periods and a higher cost in organic certification processes also tells us about the livelihood strategy of smallholders that appears to be exposed to a new risk in order to deal with the existed risks (i.e. high input costs, low market prices and health problems).

The case of certified organic rice growing, as a livelihood strategy, is comprised of two key perspectives. The first view is based on the alternative method of farming that aims to reduce the cost of production and dependency on external inputs. This view also includes intangible values such as environmental conservation, health and quality of life. The second perspective of organic agriculture is about business. As it can be clearly seen that organic goods sold in 'niche' markets are certified and labeled in order to present and guarantee consumers 'the quality and safety' of organic products. This suggests that rice farmers who adopted organic methods are those with a positive attitude towards alternative farming, but farmers who have benefited from organic markets are those with capabilities to comply with organic standards and link themselves to organic trade channels. Thus certified organic rice farmers can be defined as those who have tried to reduce their risks in trade, not only in terms of input costs. In a sense, the high market price is a key factor that motivates rice farmers to adopt organic approach, under the supervisions and supports of NGOs and governments as well as certification organizations that play important institutional roles in the organic value chain.

In the context of rice farming in Thailand, it is noticeable that social and political factors are a prominent motivation behind alternative farming and organic agriculture movement. For example, in the case of Kud Hin grower group that has been driven and fostered by Buddhist belief and grassroots movement, and in Donlaeng Tai farmers that has been supported by NGOs and provincial and local governments. In a wider context, organic agriculture approach, as well as other alternative farming methods, has been supported by the National Economic and Social Development Plans (since the 8th plan (1997-2001) to the 10th plan (2007-2011)) that has been influenced by the sustainable development paradigm and the King' philosophy of sufficiency

economy or the middle path in development[11] (Lecomte 2008, Samerpak 2006).

However it does not mean that all rice farmers in alternative farming systems are eager to farm organically, as we can see in the case of Kud Hin village where about 75 members or 38% of 200 group members grow organic rice while the rest does not. The point is that they have capabilities in farming without the help of chemicals, thus they tend to be successful in certified organic farming if they are interested in doing organic business. This implies organic farming approach is quite difficult even for alternative farming believers to adopt, and it also shows the commercial dimension of organic farming introduced into the alternative agriculture sphere.

Productivity and livelihood strategies: why does organic approach unattractive to most rice farmers?

Productivity is vital for farmers' livelihood. In the case of rice, it is not just a staple for household consumption but also a means of direct income after harvesting and a reserve that can be sold for cash in needy times. However the situation seems to be more complex when the issue of livelihood strategies of smallholders and subsistence economy are included in our discussion.

The first argument is based on the fact that rice farming is mainly for household consumption, i.e. a means of subsistence. With this sense, the organic practice which affects productivity especially in conversion tend not to be favorable among farmers since it means their income and food security will be suffered. Another fact is that with the limitations in production factors of small farms, as well as similar methods used in both organic and conventional rice farms under uncertain environments, yields of organic rice will not be different much from productivity in conventional system. However, this does not mean rice farmers refuse to earn more income offered by the organic market, but it implies the importance of yields embedded in their household survival.

Besides the vital role of productivity in small farms in subsistence economy, it also suggests the limitation of small farms in markets which excludes farmers from growth generated in the sphere of trade. The limitation of small farms refers to the farm size which determines the returns to producers. Small farms are more efficient in terms of per unit productivity than

---

[11] The notion of the King's philosophy has long been recognized for years especially after the financial crisis erupted in 1997. He delivered a Royal Speech in that year: *'To be a tiger is not important. The important thing for us is to have a sufficiency economy, which means to have enough to survive.".*

In agriculture, the King himself illustrated how to manage farms for sufficiency in 'the New Theory'. The main concept of the King's philosophy, the middle way or doing with appropriate manners, implies the influence of Buddhism in Thai society. (see more details and arguments in Baker 2007, www.chaipat.or.th/chaipat/journal/aug99/eng/self.html, http://asiapacific.anu.edu.au/newmandala/2007/11/07/royalist-propaganda-and-policy-nonsense).

in large farms, but small farmers are disadvantaged in the market because less productivity can be produced and this makes small-scale farmers the net buyers. Therefore the role of small farms in subsistence economy is notable, and any change in faming that help to increase productivity is important for small holders' livelihood such as farming technologies, irrigation, and roles of science in Green Revolution.

The second point is the issue of labor productivity (output per hour) in rice cultivation. With the nature of labor intensity and long time cultivation of rice growing, labor productivity in the organic system seems to be lower, or at least about the same, than conventional farms which yields higher labor productivity with the assistance of farming technology, chemicals and high-yield seeds. Although there is no quantitative indicator shown in this study due to the limited time of field observation, all of interviewees in both villages accepted that growing organic rice requires a lot of time and patience, especially in growing green fertilizer crops, making compost, applying manure and weeding manually, in order to meet organic quality requirements and the quantity of rice. In this respect, therefore, organic farming makes time even more valuable precious for farmers to make a living. If they have other sources of income besides farming (e.g. remittances from their children working in non-farm sectors in big cities, opportunities to work full-time in less labor intensive jobs), they tend not to spent their extra time and efforts to farm organically.

Last but not least, the topic of labor intensity, time allocation and diversification strategy are closely related to migration i.e. moving to work in non-farm sectors. Although it is not the aim of this paper to elaborate these issues in details and there are insufficient data to do an in-depth analysis, the story from the field observation and interview with farmers in the two villages may help us to discuss some.

Even with a few days, I found that there are few young people in both villages. Most of young generations in the area are students in primary and secondary school situated in the local. For those attending in high schools or universities live in cities or Bangkok with their relatives or friends. Some of them work in non-farm sectors in the urban or in industrialized cities especially Bangkok. In the case of Kud Hin village, for instance, it is obviously seen that most of the group members are in old age (more than 40 years old). Two senior members of the group, Suwit and Thong-aun, told me that more than half of them are over 50 years. This phenomenon of drainage implies that rice farming, as well as other agricultural activities, is not attractive for them and their livelihood strategies have been diversifying into non-farm sectors. As a result, the shortage of labor is a big problem in farming and this means the costs of production will be increased. Thus rice farming and other farm-related activities will be in need for labor-saving technologies or techniques and other public services (e.g. irrigation schemes) that enable farmers to achieve sufficient productivity for consumption and sell to markets. In this sense, organic approach seems not to be a viable choice for most small farm owners.

Roles of producers in value chain

In terms of market, farmers can sell their organic rice through various channels, especially Fairtrade, with higher prices. The organic certification and standards are the key point that link abstracted values of organic agriculture to markets. Institutions are involved, and roles of producers were changed as well as patterns of relationship with other actors within the chain. At this point groups and cooperatives are crucial for farmers. However, it is found that farmers have limited capacities to manage their produce, therefore their roles as producers are not changed much.

Although the organic certification itself is not too strict with standards and most rice farmers can follow organic rules, its effects on farmer groups can be observed. In positive side, certification makes farmers to work in group and learn how to control the quality of rice which is important for local enterprise development.

Besides the effect on production cost, some negative effects of certification can be obviously noticed inside the producer group. For instance, in the case of Kud Hin village there is a group rule that does not allow its members to use any kind of chemical fertilizers and pesticides in any plot of land even in the backyard garden. If a member found not follow this rule, he will be asked to leave the organic group (but the general membership status is still valid). A group leader told me the reason behind this rule: *"If a member uses chemicals in farming, it means that he does not believe in natural agriculture and he is not trustful for other members. This may affect the group in the long run."* (Thong-aun, interview)

This implication shows that organic certification and standards are not just a market license but also a forceful tool that influence producers' behaviors directly and indirectly. It also implies that certification, to some extent, may be useful in market-led strategies in rural livelihood development, but its side-effect implications on agency in the local like farmers should be closely considered.

The issue of chain governance can be obviously seen through the gap between market prices of organic and common rice. The retail prices are determined by actors in trade who 'create and add' market values to organic rice i.e. branding, packaging and distributing. This leads to questions about fairness to consumers who are at the beginning and producers at the end of the value chain, as well as constraints on domestic market growth for organic products which will result in the stagnation of organic agriculture, alternative farming movement and organic business sector as a whole. In addition, the high price may be a negative factor that affects the implications of organic farming in rural development. This means institutional supports and monitoring should be provided in order to enable small farmers to engage and benefit more, and to protect consumers who are crucial in market development. Otherwise organic standards and certification will be just a tool of exploitation for traders and actors who control chains through standardized mechanisms.

Conclusion

Organic agriculture which comprises of various valuable principles and values of health, ecology, care and fairness in its movement is an interesting tool for rural development. With the high prices and growing market trend, organic farming has been in the spotlight of policymakers as well as developmental organizations that hope to use organic farming as a tool to deliver benefits to people involving in agriculture.

In the case of organic rice in northeast Thailand, the high market price is the pull factor that motivates rice farmers to adopt organic methods. Risks and uncertainties in rice farming are the root of problems that drive them to alternative farming methods including organic agriculture. However, the implications of organic methods on rice farming tend to be limited since it is unattractive for most smallholders due to risks of productivity drop in conversion and limitation of production factors of small farms. Furthermore, labor intensity and time allocation required in organic approach are another two factors that constrain farmers to adopt organic farming as a part of their livelihood strategies. Nevertheless, organic farming seems to be a good choice for farmers who are familiar with alternative ways of farming and interested in organic business. Social factors and values embedded in alternative farming approaches as well as political supports are forces behind the move of organic farming in Thailand.

The role of farmers in the organic rice chain is different from the conventional chain in terms of length, roles of middlemen and patterns of relationships between actors within the chain. The organic rice chain is characterized by certification and standards as well as the obvious role of actors in ethical trade like cooperatives with Fairtrade and organic certification that link rice growers to markets. However, on the whole, the role of farmers in value chain is not changed much since they are still the producer selling raw 'green' materials to other actors in the trade arena who increase values by packaging, branding and distributing. This suggests institutional supports and cooperation are needed in order to enable farmers to engage and benefit more from the market growth. The higher market price of organic rice leads to questions about fairness to consumers and the influence actors in modern trade. This may result in constraints on the growth of domestic organic markets in the long run, and the role organic movement in rural development will be limited by such limitation.

References

Barlett, P.F. (1980) 'Introduction: Development Issues and Economic Anthropology', in P. Barlett (ed.), *Agricultural Decision Making: Anthropological Contributions to Rural Development*. New York: Academic Press.

Barrett, C.B. (1996) 'On price risk and the inverse farm size-productivity relationship', *Journal of Development Economics* 51(2): 193-215.

Boonman, C., Uthai Unphim (2006) 'The Possibility of Hom Mali Rice Production in Organic Farming Systems as an Alternative Farming Career with Poverty Alleviation Potential for Lower-Northeastern Farmers : A Case study of Yasothon province ': The Thailand Research Fund (TRF). (in Thai)

CREM (2004) 'Rice: a first analysis for exporting to the EU'. Amsterdam: CREM.

DFID (2005) 'Growth and poverty reduction: the role of agriculture ' (policy paper). London: Department for International Development (DFID).

Dyer, G. (1997) *Class, State And Agricultural Productivity In Egypt: Study Of The Inverse Relationship Between Farm Size And Land Productivity*. London: Frank Cass.

Eastwood, R., Michael Lipton, Andrew Newell (2005) 'Farm size', in R. Evenson, Prabhu Pingali (ed.), *Handbook of Agricultural Economics*, Vol. 3. Amsterdam: North Holland.

Egelyng, H. (2009) 'Organic Agriculture: a new field of policy for international organizations', *ICROFS News* 3/2009: 7-9.

Ellis, F. (1999) 'Rural livelihood diversity in developing countries: Evidence and policy implications' (Briefing papers-Natural Resource Perspectives No. 40). London: Overseas Development Institute (ODI).

Ellis, K., Jodie Keane (2008) 'A review of ethical standards and labels: Is there a gap in the market for a new 'Good for Development' label?' (Working Paper No. 297). London: Overseas Development Institute (ODI).

FAO (2003) 'The International Year of Rice 2004: Concept Paper': FAO.

Fischer, A. (2006) 'Subsistence capacity: the commodification of rural labour re-examined through the case of Tibet' (Working paper series No. 06-75). London: DESTIN.

Gereffi, G., John Humphrey, Timothy Sturgeon (2005) 'The governance of global value chains', *Review of International Political Economy* 12(1): 78-104.

Garrett, J.L. (2005) 'Beyond rural urban: keeping up with changing realities': International Food Policy Research Institute (IFPRI).

Giovannucci, D. (2006) 'Salient Trends in Organic Standards: the Opportunities and Challenges for Developing Countries': University Library of Munich, Germany.

Hazell, P., Colin Poulton, Steve Wiggins, and Andrew Dorward (2007) 'The Future of Small Farms for Poverty Reduction and Growth' (Discussion Paper No. 42). Washington, D.C.: International Food Policy Research Institute (IFPRI).

Hill, P. (1986) *Development Economics on Trial: the Anthropological Case for a Prosecution*. Cambridge: Cambridge University Press: 16-65.

Howard, Philip H. (2009) 'Consolidation in the North American Organic Food Processing Sector, 1997 to 2007', *International Journal of Sociology of Agriculture and Food* 16(1): 13-30.

Humphrey, J. (2005) 'Shaping Value Chains for Development: Global Value Chains in Agribusiness '. Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH.

---------- (2006) 'Globalvalue chains in the agrifood sector' (working papers). Vienna: United Nations Industrial Development Organization (UNIDO).

Hutanuwatr, N. (2006) 'The Synthesis of the Research Results on Possibility of Hom Mali Rice Production in Organic Farming Systems as an Alternative Farming Career with Poverty Alleviation Potential for Lower-Northeastern Farmers': The Thailand Research Fund (TRF). (in Thai)

IFOAM (2007) 'Annual Report 2007'. Bonn: IFOAM.

Johannsen, J., Anja Mertineit, Birgit Wilhelm, Rudolf Buntzel-Cano, Florian Schöne, Martina Fleckenstein (2005) 'Organic farming: A contribution to sustainable poverty alleviation in developing countries?'. Bonn: German NGO Forum Environment & Development.

Lorlowhakarn, S., Kunawut Boonyanopakun, Wyn Ellis, Vitoon Panyakul, Daniel Vildozo, Alexander Kasterine (2008) 'Strengthening the Export Capacity of Thailand's Organic Agriculture'. Bangkok: National Innovation Agency (NIA).

Lecomte, T. (2008) 'ORFSC Thai jasmine rice supply chain (Surin Cooperative) Special focus : A model for food soveriegnty through the development of fully integrated organic agriculture' (observatory internal audit report): Alter Eco, Inc.

Lipton, M. (2005) 'The Family Farm in a Globalizing World: The Role of Crop Science in Alleviating Poverty' (2020 Discussion Paper No. 40). Washington, DC International Food Policy Research Institute (IFPRI).

Losirikul, M., Prasit Kanjana (2006) 'The Possibility of Hom Mali Rice Production in Organic Farming Systems as an Alternative Farming Career with Poverty Alleviation Potential for Lower-Northeastern Farmers : a Case of Surin Province': The Thailand Research Fund (TRF). (in Thai)

Mendola, M. (2007) 'Farm Household Production Theories: A Review of "Institutional" and "Behavioral" Responses', *Asian Development Review* 24(1): 49-68.

Od-ompanich, W., Areerat Kittisiri, Manitchara Thongnoi (2007) 'Organic and inorganic rice Production – a case study in Yasothon Province, Northeast Thailand'. Penang: Pesticide Action network Asia and the Pacifc.

Raynolds, L.T. (2004) 'The Globalization of Organic Agro-Food Networks', *World Development* 32(5): 725-743.

Samerpak, P. (2006) 'A strategy for sustainable agricultural system by Rak Thammachat Club in Kud Chum District, Yasothon Province, Thailand', Master thesis. Makati: Asian Institute of Management.

Schultz, T.W. (1980) 'Nobel Lecture: The Economics of Being Poor', *Journal of Political Economy* 88(4): 639-651.

Setboonsarng, S., PingSun Leung and Junning Cai (2006) 'Contract Farming and Poverty Reduction: the Case of Organic Rice Contract Farming in Thailand' (No. 49). Manila: ADB.

Sligh, M., Carolyn Christman (2003) 'Who Owns Organic? The Global Status, Prospects, and Challenges of a Changing Organic Market'. Pittsboro, NC: Rural Advancement Foundation International- USA.

Soil Association (2001) 'Organic Food and Farming – myth and reality'. Bristol: Soil Association.

Songsrirote, N. and Charuk Singhapreecha (2007) 'Technical Efficiency and Its determinants on Conventional and Certified Organic Jasmine Rice Farms in Yasothon Province', *Thammasat Economic Journal* 25(2): 96-133.

Twarog, S. (2006) 'Organic Agriculture: A Trade and sustainable development opportunity for developing countries', in UNDP *Trade and Environment Review* (Chapter 3: part I).

Udomkit, N. (2002) 'Three dimensions of Fair Trade: the analysis of financial, social, and environmental objectives of Fair Trade in organic rice', PhD thesis. University of Bath.

Udomkit, N., Adrian Winnett (2002) 'Fair trade in organic rice: a case study from Thailand', *Small Enterprise Development* 13(3): 45-53.

UNCTAD-UNEP (2008) 'Organic Agriculture and Food Security in Africa'. New York: United Nations.

UNDP (2008) 'Best Practices for Organic Policy: What developing country Governments can do to promote the organic agriculture sector'. New York: United Nations.

Willer, H.Y.-M., Minou and Sorensen, Neil (Eds.) (2008) 'The World of Organic Agriculture - Statistics and Emerging Trends 2008'. Bonn, Frick: IFOAM, FiBL.

Other sources of information

ODI (2009) 'Value chain analysis and poverty reduction at scale'. www.odi.org.uk/resources/download/2675.pdf (Accessed on 15 September 2009).

Baker, C. (2007) 'Thailand Human Development Report 2007: Sufficiency Economy and Human Development'. Bangkok: UNDP.

www.un.or.th/resourcecentre/NHDR2007bookENG.pdf.pdf (Accessed on 18 September 2009).

www.ifoam.org (accessed on 11 March 2009, 7 May 2009 and 2 September 2009)

www.ifad.org (accessed on 7 May 2009)

www.oae.go.th (accessed on 10 September 2009 and 5 October 2009)

www.fao.org (accessed on 10 September 2009)

www.nso.go.th (accessed on 10 September 2009)

www.greennet.or.th (accessed on 11 March 2009, 10 April 2009 and 3 June 2009)

www.nesdb.go.th (accessed on 10 April 2009)

www.ldd.go.th (accessed on 10 April 2009)

www.irri.org (accessed on 28 September 2009)

www.surinfarmersupport.org (accessed on 7 August 2009)

www.cai.ku.ac.th (accessed on 12 September 2009)

www.nia.or.th (accessed on 12 September 2009)

www.dit.go.th (accessed on 12 September 2009)

www.actorganic-cert.or.th (accessed on 12 September 2009 and 13 September 2009)

www.surinorganic.com (accessed on 13 September 2009)

http://attra.ncat.org (accessed on 19 April 2009)

www.soilassociation.org (accessed on 13 September 2009)

www.chaipat.or.th/chaipat/journal/aug99/eng/self.html (Accessed on 18 September 2009).

http://asiapacific.anu.edu.au/newmandala/2007/11/07/royalist-propaganda-and-policy-nonsense (Accessed on 18 September 2009).

Appendices

Kud Hin Village

Rice farmers in Kud Hin Village are transplanting the rice seedlings.

One month old rice plants in an organic rice farm

Organic rice grown in a farm with integrated farming management

Sacks of animal manure bought by Kud Hin grower group

Kud Hin group members are milling, grading and packaging their organic rice.

Group members are grading organic rice grains carefully before storing in 50-kilogram sacks

The small milling machine brought to the group by researchers

RTC mill, the former partner of the group

Donlaeng Tai Village

A sign warning the harm of pesticides used in rice farms

A rice granary where paddy is stored for household consumption and sell in needy times

A type of green fertilizer crop

A rice farmer is weeding manually in one of his organic rice plots.

Phakphum Inpaen is telling how he grows organic rice

Almost 20 native rice varieties have been preserved by Donlaeng Tai organic farmers

Surin Green Market in a Saturday morning

Organic farmers are selling their farm produces directly to consumers in Surin Green Market