

Husbandry and Trade of Cattle in the Northeastern Part of Thailand

¹Terdchai Panthachai, ²Songkoon Chantachon and ³Worapol Aengwanich

¹Maharakham University, Kantharawichai District, Maha Sarakham 44150, Thailand

²Research Institute of Northeastern Arts and Culture,

³Stress and Oxidative Stress Research Unit, Faculty of Veterinary Medicine and Animal Sciences, Maharakham University, Mueang District, Maha Sarakham 44000, Thailand

Abstract: This study aimed to investigate husbandry models, trade developments and market structures of trade of cattle in the northeastern part of Thailand by using the qualitative research method. The study results revealed the following information: Husbandry of cattle in the past began from keeping and letting cattle stray by allowing domestic animals to graze natural grass in rice fields, upland crop fields, groves and public land areas around the communities. It was husbandry of cattle with relationships with farmers' living-making. The major purposes of cattle husbandry were to use labor and manure for cultivation and to be savings sources. Therefore, cattle then were regarded as valuable animals for the society. When economic and social structures changed from sustainable husbandry to commercial husbandry and marketing systems, the method of cattle husbandry gradually changed from allowing animals to stray to husbandry by tying them in the personal land areas because of land limitation. At present, cattle husbandry is a type of keeping animals in the cattle pens. Also, grass is grown in the space areas on the living place compounds or in the upland – crop and garden areas for their animals to eat. Due to having quite limited time husbandry of cattle for sale, the relationship is only being a kind of domestic animals which can make incomes for the owners. For trade of cattle in the northeastern part of Thailand, the trade began in Thailand by Bowring Treaty in 1855. This increased the needs for cattle to be labor. It caused local cattle merchants (nai hoi in Isan dialect) to lead cattle to sell in the central part of the country. In the first period, the merchants drove cattle in herds by walking. Nai hoi led the cattle by themselves. Later, they changed to travel by train. The second period began approximately in 1968. It was an era of transportation of cattle by truck along the highway to the markets in the central part of the country. Mostly these cattle were taken to slaughter - houses rather than to use labor. And the third period is the present period of time, called an era of cattle fair. It has begun from about the year 1982. They use local places as sources of appointments for buying, selling and bartering cattle between nai hoi and farmers. The model of cattle trade in the northeastern part of Thailand in general has characteristics of open-free markets. The cattle market structure consists of market owner(s), farmers, merchants of cattle (nai hoi), management system, networks, state officials, politicians and village or community.

Key words: Husbandry, trade, market, cattle, the northeastern part of Thailand

INTRODUCTION

Thailand has had foundation from being a country with economic and social structure of agriculture. Most of its people earn their livings by farming (Loetphanitkun, 2001). Forty percent of Thai people chiefly make livings by forming (Chayaphuti *et al.*, 2001). The model of farming has developed from sustainable agriculture (Somindra, 1994). Sustainable farming aims to produce food to feed themselves. The center of production is in the community

of each village by using traditional producing technique relying on nature including mainly on human and animal labor. Therefore, cattle are important labor animals in agriculture, particularly buffaloes which are useful in labor for ploughing rice fields, providing manure and many other things (Thongdee, 1997). From traditional agricultures, it has become advanced agriculture by relying on present market mechanisms (Somindra, 1994). Thus it may be said that cattle have been national animals of Thailand with so close relationships with Thai rice

Corresponding Author: Worapol Aengwanich, Stress and Oxidative Stress Research Unit, Faculty of Veterinary Medicine and Animal Sciences, Maharakham University, Mueang District, Maha Sarakham 44000, Thailand

farmers that it has become a pattern of the way of life between humans and animals tied together to become culture of Thai rice farmers in the agricultural production system both in royal traditions and people's traditions (Pralomkan, 2000). These are some examples: Royal Ploughing Ceremony, bull running race sport, bull fighting sport, buffalo soul calling ceremony, buffalo running tradition and so forth. These events have become Thai culture and traditions adhered from the past to present (Sakunman, 2003).

When economic and social systems have changed, especially green revolution since 1960, there have been changes in models of agricultures in all developing countries including Thailand. Because green revolution can cause discoveries of new food products which can provide high product, farming machines have been used instead of human and animal labor (Thongdee, 2004). As a result, changes in the uses of cattle emerged. Formerly, cattle were animals with important roles in being used as labor for farming. However, since the green revolution, farmers have turned to use farming machines instead of animal labor. For example, one tractor can plough the field in an hour for 24-36 times of the area that a buffalo or an ox can do (Falvey, 2000). In addition, farmers turned to use tillers or iron buffaloes which could work more than cattle (Chanthalakkhana, 2001). The phenomena mentioned can clearly indicate the influence of the uses of labor-saving devices in the agricultural sector of Thailand.

Isan region (the northeastern part of Thailand) is a part of Thailand which is the largest part in terms of size of area with the largest population, comprising 33% of the entire area of the country and 34.2% of the whole population of the country (Thongyu, 2003). Moreover, Isan region is an important source of cattle husbandry in the country. It has been found that at present the use of cattle has changed from before, therefore; the role of cattle which was as animal labor in the agricultural sector has changed to be goods in the cattle market system instead (Yomaanat *et al.*, 2005). From the issues mentioned, the phenomena reflect the villagers, economic, social and cultural. Changes in cattle husbandry of the communities in the northeastern part of Thailand in a wider angle. However, the body of knowledge of cattle husbandry and developments of cattle trade including the structure of cattle trade market system at the community level in the northeastern part of Thailand are still limited. Therefore, the purpose of this study was to examine methods of husbandry, developments of trade of cattle and structure of cattle trade markets in the community in the northeastern part of Thailand. The body of knowledge gained will be an important foundation of management and development of a model of the use of cattle in Thailand and other developing countries.

MATERIALS AND METHODS

This study was conducted in the central area of the northeastern part of Thailand in these 5 provinces: Roi Et, Maha Sarakham, Kalasin, Yasothon and Amnat Charoen from January to July 2007. For this qualitative research study, the researcher collected field data which were in congruence with the study purpose in the issues involving background of the relationships between cattle and the agricultural sector, husbandry and trade of cattle from the past to the present. The techniques used for collecting data were in-depth interviews both in structured interviews and unstructured interviews, participant observations and non participants operations, focused group discourse and workshop with the sample population in the area of study. The data collected from the field study would be used in a typology analysis in categories according to the issues of study and to analyze the data according to the established study purpose. The results of the study were presented by means of a descriptive analysis.

RESULTS AND DISCUSSION

Evaluation of cattle husbandry in the community in the northeastern part of Thailand: Developments of cattle husbandry in the northeastern part of Thailand in the past began from cattle husbandry by allowing them to stray in a type of being looked after by individual owners, using the method of allowing their animals to graze in the natural food sources in general animal husbandry places such as upland-crop fields and rice fields, waste are as and public land from morning to twilight. Their owners drove the cattle home and watched the animals so that they would not damage other people's crops and plants both from and to the animal pens. At present, for cattle husbandry in the northeastern part of Thailand, there are 3 models. First, it is straying-husbandry with a system of husbandry of cattle among relatives upholding brotherhood principle by regarding seniority. In each group, members are assigned rotate to look after the cattle. Most of the cattle herdmen in this model are aged people. People in this group give a reason that most of these aged people's children have families or have moved to work in other places. They have no burdens to carry, so they have turned to look after buffaloes as major work. Second, it is animal husbandry of tying them. For this model, most of the cow owners are middle - aged people. They tie their own cows in their own upland-crop fields and rice field or they keep their animals in the areas where there are clear fences around to eat grass, or the cow owners bring in grass or straws for cows. From noon to 1 o'clock the cow owners bring buckets of approximately

20-30 L of water for each cow to drink. On hot days, cows are moved to be under the tree shade. In the evening, cows are kept in the pen with no waste of time to look after them like allowing them to stray. Third, it is a model of fattening cows for sale. They keep cows in the pen to be fattened for sale. Rather their cows are bought at low prices. The new owners of cows have to keep their cows in the pen. The cow pen is about 3-5 m from the house or the shed is attached to the living house. The cow owners keep the cows there and feed them with grass and supplementary food to fatten them. Approximately 2-3 week after that, these fattened cows can be taken to sell at the cattle market again. Most of the farmers' cattle disease healing relies on modern science such as having mosquito nets to prevent mosquitoes and insects. It has been also found that some villages grow grass to feed cattle, particularly in the communities with husbandry of beautiful cows (Indu-Brazil breed) for sale. These beautiful cows are kept in the pen up to husbandry of cows on large-sized farms with 3-20 cows. They feed these cows with grass and supplementary food. However, some communities still have husbandry of native cows because they are easy to keep and they can grow well in the condition of husbandry in the model of allowing them to graze naturally and each cow can give a baby cow every year.

Developments of cattle trade in the northeastern part of Thailand:

In the northeastern part of Thailand, cattle trade has earnestly begun since right after the year 1855. Cattle trade could be divided into 3 periods of time. The first period was called the period of driving cattle. It was the period when nai hoi (local cattle merchants) collected buffaloes from villagers at nearby villages or from buffalo consignments based on trust in one another. When the buffaloes were adequately collected, there was a leader who was a route expert and was respected by other merchants, called nai hoi yai, led the caravan of cattle to sell. There were 2 types of driving animals. The first type was the driving of herds of buffaloes by walking. Bull-drawn carts were used as vehicles for carrying different burdens and supplies. It was found from this study that all the nai hoi from the 5 provinces mentioned above had to cross Thug Kula Honghai Great Plain. Often these nai hoi met in Thug Pa LAN Plain, Phayakkhaphum Phisai district, Maha Sarakham province before heading to selling sources in the Central part and the Eastern part of Thailand. The second type was the driving of herds of buffaloes by walking to get on the train in Ban Phai district, Khon Kaen province before heading the cattle market in the Central part of Thailand. In both types of cattle driving, it took approximately 3-4 months to arrive home.

The second period was called the period of driving cattle to get on the truck. It has begun since about 1968. There have been road communication routes throughout Isan region, particularly Friendship Highway. This caused the merchants to change their routes from walking to traveling by truck. They collected cattle from different villages by using trucks to carry cattle from the farmers' homes. The merchants paid in cash or made a part of payment and then they carried the cattle on the truck from the 5 provinces mentioned along Chaeng Sanit road and Friendship Highway to the Central part of the country. The animals had to be examined at Nakhon Ratchasima Quarantine before going farther. It took 2-3 days from and back home.

The third period was called the period of staying at home (market fair period). Approximately during 1982-1986, some nai hoi determined local places to be sources of trade and bartering cattle among merchants or nai hoi. This caused the northeastern part of the country to become cattle markets with not only nai hoi coming to these market but also villagers and farmers who had cattle husbandry being able to take their cattle for trade and bartering. It has become so popular that cattle markets emerge in every province. These markets are open and closed on different days in order for the cattle trade to go on regularly. The development will increasingly continue becoming big business with a current of several million baht per cattle market fair. Also, other businesses involved will have better effect.

Cattle market structures in the northeastern part of Thailand:

From examining the context of cattle markets in the northeastern part of Thailand, the following was found. These have been a model of cattle trade in the type of market fair with free trade. The market owners will provide places of appointments for nai hoi or merchants of different goods and farmers to bring their cattle for agreeing to trade and barter on the appointed dates and time at each place. This type of trade is greatly popular at present. Establishments of cattle marketing in this part of the country have operation of marketing activities, beginning from market owners most of whom used to be merchants or nai hoi and farmers, causing them to accumulate experiences and the body of knowledge until they can apply their knowledge to operation of cattle market management to respond to the needs for cattle trade and bartering of the group of merchants and farmers. At the same time, there are interactions in the network system from the family level to relatives, friends, merchants groups, the state sector and farmers in general. The current components of the cattle markets in the northeastern part of Thailand are as follows:

- The market owner must have important leadership for his family, relatives and the community; must be the person with more special characteristics than people in general including: intelligence, bravery, enthusiasm, good personalities, smartness, trustworthiness, fairness, etc. More importantly, the cattle market owner must have the following basic factors of managerial fundamentals:

Planning includes: Preparing operation in different aspects for facilitation and to generate operational efficiency by having the following planning:

Planning for the use of space by providing operational area for cattle trade at least 10 rai (4 acres) for appropriateness,

Planning in terms of clerks by providing and selecting adequate persons to suit job nature and functions.

Planning in terms of materials and supplies by the cattle market owner emphasizing adequately available materials and supplies, particularly cheap and quality local materials for work use.

Marketing includes operation in buying, selling and bartering in the cattle market leading to goals and with channels of market operation as follows:

For products, types of cattle in the market must be provided adequately and variously with different breeds for buying selling or bartering. There are 500 cows and 50 buffaloes per week.

For prices, the prices of cattle trade or bartering must be fair and must emerge from satisfaction of both sides. There must be prices for selecting and bargaining.

For places for organizing market, the market owners must provide areas clearly and proportionally among the areas for cattle trade, the areas must be clearly categorized. There must be a fixed directing building as a center for coordination in cattle trade.

For public relations, the market owners rely on 2 methods of their own market public relations. The first method is the public relations within the market by using loud-speakers to inform of cattle trade, different requirements and regulations. The second method is the public relations by passing words from person to person. That is by talking among merchants, nai hoi and farmers about cattle trade or bartering in the market. The latter is more effective in making trade lively each time.

For follow-ups or evaluation, there must be questioning and follow-ups of work performance of the market personnel in regularity. Another important thing is follow-up. If corruption occurs between a buyer and a sellers, the market owner must check for the truth and follow up for being fined according to the market regulations by upholding the sale agreement with identity

the number and address on the identification card.

Other aspects include having habitual morality of the market owners such as honesty which is regarded as the most important thing for those who are market owners. The characteristic mentioned has been transferred from the generation of parents or relatives who used to be nai hoi. For another important thing about being market owners is participation of persons entering cattle trade market by providing opportunities for all involved to discuss together and to work together to be part of existence of cattle market in the future.

- Farmers and merchants are persons who do their duties as both buyers and sellers or consumers. They are regarded as persons with important parts to generate economic activities including production, consumption, bartering and distribution in the cattle market. Also, market owners must coordinate interaction in the type of network of farmers and merchants. These farmers and merchants can be categorized as:

Farmers are those whose occupation cattle husbandry either a chief career or a supplementary career. Here they are divided into these 2 categories.

Subfarmers are farmers who have sustainable cattle husbandry often as a supplementary career apart from the chief career of rice farming. They enter cattle market mainly to buy and sell cattle. In case of buying cattle, most of them buy cattle for husbandry and waiting to sell when they can make profits. Very few subfarmers buy cattle to use labor. In case of selling cattle, most of these take their cattle to sell to local merchants who personally know each other. Mostly they live in the same community, or they communicate with nai hoi in the village to come to the market, beginning with having nai hoi sell the cattle for them. They divide profits half by half. Later, these subfarmers begin trade by themselves. Also, what has been found in the market is often the farmers who have experiences in cattle trade before.

Professional farmers are farmers who have cattle husbandry as a chief career. There are appropriate cattle husbandry systems. They have good knowledge and understanding of advanced principles of cattle husbandry, beginning from selecting breeds, feeding and medical care, to farming groups of cattle husbandry farmers. Most of these farmers at present popularly have husbandry of beautiful cattle breeds, especially Indu Brazil cow breed. A few years ago, cows of this breed were very expensive, at least 100,000 baht each. At present they are much cheaper, though. Cattle come to the cattle for selling by expecting profits as a main purpose.

Most farmers come to the market by themselves or communicating on internet on web at home or at the market on appointment. These groups are so modernized at present. It has been found that most of these farmers used to be government officials.

Merchants are those who have trade career by buying, selling and bartering cattle in particular and as their own major incomes. These merchants can be divided into 2 categories.

Local merchants are those who live near the cattle market and buy cattle from farmers in the villages to sell in the cattle market on the market open days by chiefly expecting profits. They sell cattle to farmers and merchants from other places who buy cattle. They are both regular and occasional customers. The prices are told or bargained and sold in cash only. These merchants are highly experienced and often involved in *nai hoi* life before. For example, some merchants used to be *nai hoi* who drove cattle to get on the truck to sell, or some are heirs of *nai hoi* in the early period. Therefore, local merchants have folk wisdom about examining characteristic of the cattle in such different aspects as characteristics of cattle for labor use or for slaughtering. They can estimate the weight of each animal meat to gain profit or not. Or some merchants sell cattle by standing upon the rope in the cattle market, meaning that the merchant buys a cow or a buffalo from the farmer at one price and shortly sells it to another merchant at a higher price. The difference in the two prices will be the merchant's money. Or they sell the cattle here and buy them here and then take the cattle to sell at another cattle market. This category of merchants is often called *nai hoi* as well.

Merchants from other places are those from different parts of the country. They are not people in the northeastern part of Thailand. These merchants can be divided into 2 categories.

Rich merchants are those who want to buy a large number of cattle to sell to their own slaughterhouses which are located in the central part of the country. Their needs focus on buffaloes. They spray color on the side of each buffalo, showing that buffalos or that herd of buffaloes belongs to them and the merchants have paid in cash. The farmers and merchants in the cattle market often call the merchants of this category "*nai hang*" (Big Boss of the store).

Middlemen are merchants who come to the cattle market to buy, sell and barter cattle to sell in other cattle markets or in their own provinces. Most of these middlemen are from the northern part of Thailand. They mostly want to buy buffaloes to sell to farmers for husbandry and then sell them to slaughterhouses, or to

sell directly to the slaughterhouses. This is because northern people prefer having buffalo beef to cow beef. Sometimes they bring cows from the northern part of the country to sell to the cattle market in the northeastern part of Thailand. They often stay overnight at the cattle market.

- The management system is the principle of management within their own market organization which can cause operation of different activities of the organization to lead to the established goals through the systematic process. There are coordination and cooperation from important persons from 4 sectors: market owners and personnel, farmers, merchants and state officials. All these 4 sectors have to cooperate in operating activities for buying, selling and bartering cattle with model, stages and being in conformity with efficient management system of cattle trade and going on smoothly.
- For the network, formation of the cattle market in the first period and connection with the business involved relate to the growth of the market in the type with trade activities and benefits together. In the context of qualifications of the market owners with being the same group of people through the network of people at the same village, there are characteristics of people who used to be *nai hoi* and used to have relations with one another in the local village or community. Also, they generate activities of relationships among groups of *nai hoi* in their local area to determine activities for cattle trade without seeking unnecessary profits in order for groups of people or members who have relationships and do activities together to have jobs to do and to survive together. Five important characteristics found in the cattle markets are as follows:

For the relationships of network, the relationships of market owners, farmers, merchants, businessmen involved and state officials in the cattle market systems have systems of relationships of being informal network. That is, it is operation of activities in the type of helping and relying on one another. When a problem arises, they will jointly follow up and solve the problem or suggest a channel for trade to each other. This causes more farmers to enter cattle market.

Commitments of the network have been the commitments from the part up to the present. These include friendship in the same career, kinship and relatives or neighborhood, being people in the same locality. All these lead to trust in each other ultimately in

the type of the same party. They can easily generate social relationships, leading to helping one another in different forms service in the market such as friendliness.

The operation of network activities includes cattle buying and selling. The operation at this stage of buying and selling in the market is in the type of relying on one another, helping each other and creating acquaintance to each other. This type of operation can cause different activities to go on rapidly and accurately. Each side can receive benefits with satisfaction and the operation of activities can go on continuously and existing.

Culturalization of network includes behavioral expressions of groups of people. The cattle trade network which has had its basis from acceptance and trust in each other, particularly, having morality honesty, fairness and responsibility, are what the network needs. Each person must sincerely express characteristics for making this career together exist.

- State officials are government officials who take part in supporting the operation and looking after the cattle trade as well as in facilitation and safety of people who come to operate economic activities in the market. These officials comprise:

Livestock officials from the office Livestock district in that each district consist of at least 3 officials as administrative officials and as a veterinarian. They work as regular cattle market officials who issue certificates of vaccination to prevent animal pest, animal movement licenses and animal trade licenses.

For police officers, at least 2 police officers from provincial police headquarters come to work as regular officers at the cattle market to keep safety in life and property of groups of people, people in the cattle market peace in groups of people, people in the cattle market peace in the market and traffic in front of the market. The market owner pays 500 baht as compensation per each.

- Politics includes the policy of each government which administers the country by determining its own policy with an emphasis on promoting and supporting cattle husbandry with political stability of the government. This will have both direct and indirect impacts on cattle trade. Some direct impacts are: cattle trade business becomes wider and approximately one hundred million baht circulates in the cattle market on each market day. Some indirect impacts are: The businesses involved expand rapidly and people's incomes increase. During 2001-2006, cattle markets in the northeastern part of Thailand extremely bloomed. In particular, the government had a project for promoting million households to keep

cows. As a result, cattle were much more expensive and were needed by people in general, particularly beautiful cows. The cost of each cow increased from 10,000 baht to many hundred thousands of baht or even many millions of baht. Cattle merchants said that it was so because the government had the most political stability in several decades; there was no disunion in the government systems which would lead to parliament dissolution; the government policies were favored by most people, causing effective operation according to the government policies and particularly the village fund policy, people had money to circulate in running their own business in cattle trade. National - level politicians, definitely people's representatives, at the provinces level, were interested in the cattle trade business or had cattle husbandry together with using strategies for making cattle costs go up very high by price spinning. That was politicians' close friends contacted merchants and farmers in buying cows at very high prices. Other people were interested and they wanted and bought these cows. The prices increased very high within a short time. Government officials and farmers were in a group of people who make the prices of cow up very high. These officials were interested in cow husbandry in order to increase their own status to become more dignity. These farmers wanted to increase their incomes immediately, so they sought cows to keep for the purposes mentioned.

Late in 2006, the stream of needs for cows decreased sharply due to the political crisis. The government was dissolved by a revolutionary party. There was a new military government and it did not continue the policy. Cow prices decreased because the farmers and merchants did not have funds to circulate in cattle trade. The needs for cows for husbandry were full and it was difficult to find market to buy cows. There have been impacts on the cattle trade market up to the present. Now the cattle markets are quiet. Some cattle markets have to close earlier. Before that, the markets were open all day long.

- Village or community includes the context of the village or the community. The villagers have to adjust themselves to the cattle husbandry culture according to the commercial economic system. The real goals of the villagers are to bring cattle into the market and to create incomes to make stable status. At the villages or in the community, it has been found that the people who have the career of cattle husbandry consist of the following.

Farmers are most of the people who have a career of cattle husbandry both as a chief career and as a supplementary career to create incomes for themselves.

Government pensioners include mostly ex-teacher officials. Cattle husbandry is their own supplementary career to increase additional incomes besides regular pensions.

Cattle husbandry by the persons mentioned has had developments from sustainable husbandry to commercial husbandry. They have more neatness of cattle husbandry. They grow grass to feed cattle. They have integrated systems of health care between folk wisdom and modern science with an emphasis on decrement of cost of investment in husbandry to be in accordance with the community context, ecosystem, economy and needs of the community. All of what have been mentioned above are important components of the cattle market with connections to the model of cattle trade in the northeastern part of Thailand.

CONCLUSION

Most of the people in the northeastern part of Thailand earn their livings by farming such as rice farming, Upland-crop farming and animal husbandry, especially cattle. Cattle were important domestic animals during the age of sustainable cultivation. Most of the farmers keep cattle for labor use in rice farming, upland-crop farming and for source of manure. Most of the model of cattle husbandry was the husbandry by allowing cattle to graze natural grass in rice fields, groves and public land around the community and it was husbandry with relationships with making livings of farmers. Therefore, cattle were regarded as valuable animals of the society during that time. When the economic and social structures changed from the sustainable structure to the commercial structure and the market system, the model of cattle husbandry gradually changed from allowing animals to go to eat grass to model of tying animals in the personal land area due to limited land. At present, cattle husbandry is in the model of keeping animals in the pen. Grass is grown in the vacant area on the dwelling compounds or in the rice fields and upland - crop fields. Then the grass is taken to feed the animals due to limited time. During 1955-1959, there were more needs for cattle labor use in cultivation in the Central part of the country. This led to driving a number of cattle by local merchants (nai hoi) from the northeastern part of the country to sell in the central part. When commercial economy has come, machines are used instead of human and animal labor, causing economic and social conditions in Thailand

including the northeastern part of the country to change. The roles of cattle have been decreased. Ultimately, cattle are raised chiefly for sale. Currently, in the northeastern part of Thailand there have been establishments of cattle markets as centers for cattle trade. The components of forming cattle markets of this model are market owners, farmers, cattle merchants, management systems, networks, state officials, politicians and village or community. At present, cattle markets have been formed as networks throughout this region.

REFERENCES

- Chanthalakkhana, C., 2001. Thai buffaloes turn crisis to opportunity. *Folk Technol.*, 258: 50-55.
- Chayaphuti, P., P. Katchamant, S. Srisontisuk and P. Pakdee, 2001. The Study of the Socio-Economic Status of the Ultra Poors' Households in the Northeast. *J. Human. Soc. Sci.*, 19: 54-67.
- Falvey, L., 2000. *Thai Agriculture: Golden Cradle of Millennia*. Kasetsart University Press, Bangkok.
- Loetphanitkun, S., 2001. Document in Supplement to Instruction of Thai Economy Course, Units 1-2. Chuanphim Printing House, Bangkok.
- Pralomkan, W., 2000. *Folk Animal Breeds*, Document in Supplement to Instruction of Animal Breed Improvement and Reproduction, Units 1-7. Sukhothai Thammathirat Open University Printing House, Bangkok.
- Sakunman, P., 2003. *Mud Buffaloes. Water Buffaloes and Big Mixed Bred Buffaloes, Which are Better? and How ?* "Thai Wisdom about Buffaloes. The Printing House of Agricultural Cooperative Community of Thailand, Bangkok.
- Somindra, A., 1994. *Isan Worldviews*. Prasarn Printing, Kalasin.
- Thongdee, I., 1997. *Thai Buffaloes*. Love and Live Press Company Limited, Bangkok.
- Thongyu, M., 2003. *The Change of Isan Rice Farmers' Economy: A Case Study of the Phong Basin*. Pimdee Company Limited, Bangkok.
- Thongdee, I., 2004. *Buffalo, Rice, Monk, Spirit and Rite in the Process of Thai Rural Development*. Sakathamik Printing House, Bangkok.
- Yomanat, Prasong, Purothkanon, Pokpong, Luesopha, Chandee, Khammasorn, Phoenphis and HueKhumueang., 2005. *A Report on Research for Local Development in Complete Project Version : A study of the Body of Knowledge of cattle Nai Hoi's Wisdom in the Thung Kula Ronghai Plain Region*. The Thailand Research Fund, Bangkok.