Beef Cattle Production In Northeast Thailand

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Abstract

Northeast Thailand, a large plateau of relatively infertile soils, is an area of traditional beef cattle farming. The region has undergone a rapid process of physical, social and economic change in the past forty years. Clearing of forests during this period and the development of new infrastructure, particularly roading, has increased the level of human settlement and opened new agricultural areas for cropping. Agricultural growth has been maintained by opening up new land areas, increasing the production of rice, the predominant crop and diversifying into new commodity crops such as cassava and kenaf. While agricultural growth has been substantial during this period, industrial growth has been higher. Increasingly, many farm families from the Northeast now work for part of the year in urban employment often temporarily migrating to Bangkok, the centre of industrial activity.

The government has sought to diversify agricultural production away from rice and other commodity crops towards more intensive and high value agricultural activities. One focus of diversification activity has been in the promotion of beef cattle farming to meet increasing demand for beef from urban consumers. This thesis reviews some of the several projects which have been implemented to do so and the socioeconomic context within which they have occurred. Detailed research was carried out in six villages in Northeast Thailand during the period 1993-1995 with a follow up visit in June and July 1997. Changing patterns of land use, social and economic conditions have altered the way in which cattle are farmed. Cattle now have less access to common grazing land and are farmed as an adjunct to cropping activities. Their ability to utilise crop by-products and act as a store of future income are seen as important by farmers.

Two critical issues were identified that have relevance to this region and elsewhere. The first is the identification of the appropriate role of beef cattle within agriculture and within local and national systems of development. The second is the development of structures to assist both farmers and governments to meet their objectives. Within these two issues the ways in which resources, technology, culture, and institutions interact and are modified as a result of the process of change is extremely important to the success of development initiatives.

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Table of Contents

List of Tables

List of Figures

Abbreviations

AIT	Asian Institute of Technology
BMA	The Bangkok Metropolitan Authority
CIDA	Canadian International Development Association
CIF	Cost, Insurance, Freight
CUSO	Canadian NGO Development Organisation
DLD	The Department of Livestock Development
DOAE	The Department of Agricultural Extension
DSE	Deutsche Stiftung fur Internationale Entwicklung (German Foundation for International Development)
FAO	Food and Agriculture Organisation of the United Nations
FSR	Farming Systems Research
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
IBRD	International Bank for Reconstruction and Development
ILCA	International Livestock Centre for Africa
IRR	Internal Rate of Return
JICA	Japan International Cooperation Agency
KKU	Khon Kaen University
NESDB	National Economic and Social Development Board
NET	North East Thailand Foundation
NEWMASIP	North-East Water Management and System Improvement Project
PRA	Participatory Rural Appraisal
RAPA	FAO Regional Office for Asia and the Pacific
RDI	Research and Development Institute
RRA	Rapid Rural Appraisal
RSPR	Special Research Project
SEASAN	Southeast Asia Sustainable Agriculture Network
SUAN	Sustainable Upland Agriculture Network
TDRI	Thailand Development Research Institute Foundation

Glossary

Amphur	District within a Province
Baht	Unit of Currency. For the period of research the Baht was pegged to the United States Dollar (1USD:25.4).
Ban	Village
Changwat	Province
Issan	Term referring to Northeast Thailand, encompassing region, language and cultural identity. Sometimes seen as Esarn, Isan , Isarn or Issan depending on the transliteration from Thai script
Issan Khieow	Project implemented to develop the Northeast. Literally 'Green Northeast'
Rai	Measurement of Area. One rai is the equivalent of 1600 square metres or 0.16 of a hectare. 6.25 rai is the equivalent of one hectare
Sapa Tambon	Sub-district Councils
Satang	Unit of currency. 100 Satang is the equivalent of 1 Baht
Tambon	Group of villages within a district
Wat	Temple
Paddy	Refers to rice growing land

Chapter One
Introduction

In recent years there have been concerted efforts to boost cattle production in Northeast Thailand. This thesis focuses on the role of beef cattle within present agricultural systems and on initiatives to boost beef cattle production in Northeast Thailand. The objective of this thesis is to establish the constraints that exist to improving beef cattle production, why they are limiting and what strategies may be followed to improve present and future initiatives. It considers that macro and micro policies implemented to promote increased farming of beef cattle may not have fully accounted for changed socioeconomic conditions among the villagers they have targeted. Specifically, the effects of past government agricultural and industrial development policy, and pricing policy on inputs and outputs may have led villagers to maximise farm and household income in areas not foreseen or intended.

In order to reach an informed understanding of the topic, the following factors which have proved critical to the overall growth of the beef cattle industry are discussed in detail. First, institutional strengths and weaknesses, particularly in the Livestock Department, exist which consequently impact on the industry. Secondly, the crucial links between research and the extension and training made available to farmers must be considered. Thirdly, the expansion of herds or numbers of people farming cattle requires the availability of sufficient numbers of cattle. Fourthly, how do cattle fit within Thai farming practices, their suitability and their complementary relationship with other activities? The profitability of farming cattle and linkages to marketing and processing outlets is also an important consideration. Finally the constraints of labour availability, land tenure and credit are also explored.

This focus on beef cattle as one aspect of agricultural production and on this region is for three main reasons. First, the area has a tradition of cattle and buffalo farming, both for draught purposes and for sale as meat. Cattle have generally been farmed as one aspect of a diversified portfolio of activities undertaken by Thai farmers. There is therefore some

experience of traditional cattle farming to compare with present day production. Secondly, as economically the poorest region in Thailand it has become the focus of national efforts to "seek more urgent and effective measures to undertake to relieve the plight of the Northeast villagers" (Grandstaff, 1988:11). One of the main policy initiatives has been to promote an increase in cattle farming giving a present relevance to this investigation. To be useful to the farmer, however, these projects have to be designed in a way that caters to the needs and interests of the target groups. Besides being target group specific, the projects also need to be context specific, that is they need to fit in to the agricultural systems in which they are operating. Thirdly, for two years and six months during the period July 1993 to November 1995, the author worked in Thailand as a livestock specialist (primarily with beef cattle) with the NET (North East Thailand) Foundation, a Thai-based NGO (Non Government Organisation), in Surin province. A follow up visit was made in June and July 1997 to carry out further field work.

Northeast Thailand, occupying an area of 170,000 square kilometres, is the largest of Thailand's five main regions. The population of the Northeast is estimated at 19 million people with the majority living in clustered rural villages or on the peri urban fringe (NESDB/JICA, 1993). Temporary migration for work outside the village or region is common. The region is a large plateau with low natural soil fertility, bordered on two sides by hills and on the other two by the Mekong river. It is bisected by two main river systems. Much of the area has recently been logged of native timber. The effects of this deforestation has led to a lowered water table in many areas and has also exacerbated soil saline problems (Grandstaff, 1988). The region has three distinct climatic seasons, rainy, cold and hot, each of approximately four months in duration.

The main agricultural activity focuses on one rain-fed rice crop. There is little irrigation available for dry season crops. Upland crops such as maize, kenaf and cassava are grown on land unsuitable for rice. Livestock raising is common with pork, poultry, beef cattle, buffalo and some dairy cattle. Buffalo which have been traditionally used for ploughing have declined in numbers during the last five years with an increase in mechanised ploughing. While the primary focus of this theseis is on beef cattle, the impact of dairy cattle farming and the numbers of buffalo farmed is also relevant. Some mention will be

made of these livestock classes, but this thesis does not detail their development. Both production and prices of crops and livestock in recent years have declined. At the same time rural borrowing has increased leading to real financial difficulties for many households (Janchitfah, 1995). Reafforestation with a short rotation eucalyptus regime is increasing and in some cases this has caused controversy as business people with influence have gained title to the degraded forest. This land nominally assigned to the Department of Forestry has been used by surrounding villages for grazing or in many cases for establishing new villages by those who have cropped the land. There have also been allegations that the eucalyptus planting has further lowered the water tables.

For many years this region was perceived by the government as an area of communist insurgency. One outcome of government efforts to quell any insurgency or threat of insurgency was an accelerated roading and infrastructure development programme which has helped to stimulate growth (Muscat, 1994). Much of the roading and infrastructure has resulted in resources moving out of the region to the capital, Bangkok. Most industrial development has taken place in the capital. The government is now trying to encourage growth of industry away from Bangkok with incentives to set up new industry in the Northeast and other regions. Comparatively recent political stability in the adjoining countries of Laos and Cambodia and in the nearby countries of Vietnam, Southern China and to a lesser extent Burma is leading to new development initiatives in the region (NESDB/JICA, 1993).

Many challenges to increasing and improving cattle production have been identified. These range from locally climatic or on-farm difficulties to national policy issues. To analyse these challenges requires an investigation of many of the social, economic and cultural factors relating to rural life and development in Thailand. Chapter Two examines the key factors involved in promoting beef cattle development. This chapter also outlines various systems of cattle production operating globally. Chapter Three discusses the methodology involved in researching this subject. Chapter Four considers how Thailand has developed, its comparative advantages and how these have changed and are changing. This chapter will also examine the region of Northeast Thailand in more detail and in particular the role of culture, technology, resources and institutions in shaping land

use patterns and policies and the roles that beef cattle farming have had within this framework. Chapter Five identifies the key constraints to increasing or intensifying cattle production in the Northeast within the current socioeconomic framework. This is achieved by detailing and discussing data from research carried out by the author in six villages in Northeast Thailand. Discussion and research carried out with extension people and policy makers is also discussed. An outline of various project initiatives taken in this region are presented and discussed. Chapter Six concludes with a summary review of past initiatives to increase beef cattle production and conclusions drawn from the research presented.

Chapter Two
Key Factors in Promoting Beef Cattle Development and Systems of Production

This chapter examines the role of beef cattle, primarily in developing countries, through an analysis of two themes: first, the key factors involved in promoting beef cattle development and secondly, a brief analysis of systems of beef cattle production operating globally. The chapter will finish with a summary and an outline of the key issues raised. These key issues are investigated in more detail in the research outlined and discussed in subsequent chapters.

Key Factors

It is difficult to isolate those issues that are the most critical to the promotion of beef cattle development. There is a complex interplay of factors that is unique to each situation. The interrelationship of these factors changes constantly as circumstances change. However, those projects that can most effectively cope with changing scenarios over a wide range of issues will be generally more successful than those that target one or two factors only. For example, many projects have invested in improving the health status of cattle. The success of these projects may have resulted in greater survival rates. However, this may lead to more pressure on feed resources and the environment (Stone, 1990).

The issues discussed in this chapter are those considered of most relevance in the context of this thesis. Changed circumstances in other situations may make other issues more relevant than those discussed here. The key factors outlined in this chapter are loosely grouped according to headings related to a) culture and tradition, b) resources c) institutional factors and, d) technology. There is considerable interrelationship between all these factors and success, as mentioned, requires an optimal combination.

Culture and Tradition

Incentives

The incentives for farming beef cattle and the role which beef cattle play in farming systems have many dimensions. Prima facie, the only role for farming beef cattle is in their ability to provide an economic return. However, while farming cattle has a strong relationship to economic returns, there are often other important factors involved. First, the symbiotic nature of relationships between humans and animals in developing countries must be appreciated in determining the role of animals in the developing country (McDowell, 1980). This interdependence may satisfy direct food needs for meat, milk or blood. It may also extend to other non food areas. These may include the provision of draught power, hides, manure for fertiliser or fuel, the ability to accumulate capital and the satisfaction of cultural needs (Food and Agriculture Organisation [FAO],1989). Secondly, introduced changes representing new economic opportunities must consider the interrelationships of internal and external factors. Oritz's statement (in Long 1977:52) that "individuals behave in such a way as to maximise satisfaction within a framework defined by change and opportunities as well as by social norms and cultural values," reinforces the fact that more than just money is involved in the change process.

Social and Cultural Incentives

Cultural needs often provide strong reasons for decisions to run beef cattle and can represent strong justification for continuing to farm beef cattle when economic analysis may indicate alternative options as more profitable.

> Livestock (in Africa) are a multiple value, not a single value. They do not merely stand for, and so are not always readily translatable into, a money value but may represent various combinations of power, prestige, prerequisites of adulthood, marriage or parenthood, a means of establishing social relationships and forms of self identification. (Pino in Baker, 1976:363)

Similarly, in a study in the Puerco area of New Mexico, Estellie-Smith (1983) found that while economic responses were important in the decision to farm cattle, it also enabled people from the community to maintain historic continuity from one generation to the next. They were also able to sustain personally satisfying relations with kin and friends against the threatened anonymity and isolation of life in a rapidly growing urban centre.

Cultural change and the role of culture in terms of livestock development may be identified within both of the two main theoretical streams of socioeconomic development. The first of these are referred to in Stevens and Jabara (1988), as evolutionary modernisation theories. These theories, as the name implies, see society as moving toward a modern state of development. The implication is that by following an ideal model from a developed country, the developing country would achieve the same "happy" state of development. Values, customs and social institutions of traditional societies are seen as obstacles to development. In other words there is a need to change the culture of a country to help in its economic development (Hoselitz in Stevens and Jabara, 1988:126).

Initial attempts to modify pastoral cattle farming in Africa, for example, followed these theories and centred on transplanting the technology of the West into Africa. The result was a breakdown of the ecological relationships but also disruption to socioeconomic structures.

> There was a supreme self confidence that the uncivilised world could be jerked into modernity by its bootstraps using the impetus of technology. The man / cattle / land equation was, after all, a familiar one which had been revolutionised in Western Europe by applied technology at the end of the 18th century. A failure to appreciate the fundamentally different socioeconomic context of cattle raising in Norfolk and pastoral management in Africa was to lie at the root of the whole sad experience of development which followed. (Baker, 1976:363)

Where change has been resisted and those targeted have been labelled "conservative" the proposed changes have usually been inappropriate to the local systems, incomprehensible

or ill conceived. Two examples are provided by Baker (1976). The first involved a vaccinations programme for cattle in East Africa where initial doses of incorrectly mixed vaccine caused cattle deaths. There was extreme reluctance by the villagers to continue with the programme, even though the initial problem was immediately rectified and the correct vaccine was supplied. The second example was a group ranching scheme in Northern Kenya which aimed to shift grazing to more productive areas and also ease environmental damage. However, the scheme led to long periods of separation of those herding cattle from their families who did not shift to new areas. Cernea (1991:135) also refers to the same group ranching project as an attempt to impose a foreign system of livestock control on a population which traditionally used different methods and consequently ran into problems.

Thailand has, from a theoretical perspective, essentially followed a modernisation approach in its development (Dwight,1994). However, the second mainstream of theories known as Marxist or conflict theories, may also offer some insights into Thailand's recent past. These theories emphasise the need to understand the historical context of the developing countries and how dominance by developed countries led to their underdevelopment. They do not consider that there is such a thing as a 'typical' developing country. Exploration of issues is made further than the village framework to consider relationships between the village and the wider economy. Change is recommended by severing ties with the dominating and exploiting developed countries (Long, 1977). In Thailand conflict theory may be used as an explanation of how certain situations have developed. Nalinee (1994) outlines the experiences of a livestock raising group in Northeast Thailand who see their poverty as caused by the capitalist system, supported by state policies. This system is summarised by Prasartset.

> The Thailand development model is technically founded on the ideology of developmentalism, consumerism and militarism. The Thai state has committed itself to an economic policy which is mainly growth oriented, urban biased and externally focussed. (Prasartset, 1995:75)

The result from Prasartset's perspective has seen power concentrated in the hands of

certain social groups, marginalisation and disempowerment of certain sectors, widening gaps in the regional and sectoral gains from development, a depletion of natural resources and an erosion of the environment and ecology. Within the results of this system the villagers in Nalinee's study see themselves as a disempowered group and they see a need to create their own economic and cultural space. The desire to promote national self sufficiency in beef production may also be related to the Marxist approach and is discussed in the section relating to import substitution.

Cattle and Culture

While acknowledging that culture does play an important part in the decision to run cattle it is, however, also important to consider the interaction of other factors, (technology, resources and institutions) and not overweigh the effects of culture.

> The great value assigned to cattle has been widely interpreted as being a function of their ritual worth, deriving from their roles as symbols of status. A more adequate interpretation would seem to be that the prestige of livestock wealth is of the same order as the prestige gained through the control of resources in any market economy. (Schneider in Baker, 1976:365)

The implication in this statement is that the role of cattle in an agricultural or household income earning system must consider more than just the sole contribution of cattle from either a social or economic perspective. While this thesis focuses on beef cattle farming, it must be acknowledged that farming cattle is only one part of the milieu of agricultural development activities and is not held as paramount above other aspects of development. Indeed in many instances cattle and culture may have become overriding factors to the exclusion of others to the detriment of successful implementation of many projects. Herkovitz in 1926 (Baker, 1976:366) coined the term "cattle complex" from his studies in East Africa which emphasised a preoccupation with ritual and mysticism with cattle. This cattle complex suggests that people's economic concern is overlaid by mystical and ritual devotion to their stock and by their desire to accumulate merely for prestige. Dolberg (1993:27) citing a review of aid projects, found that Dutch assistance narrowly focussed on

cattle with practically no attention to other animals such as pigs or donkeys, which are important to many farmers in developing countries. This led Chambers (in Dolberg,1993) to wonder whether is it only "Masai and Hindu" who have a cattle complex. It is important that projects involving beef cattle consider a wider perspective within other livestock and agricultural systems. Similarly, such projects should consider cultural implications as a part of, but not an overriding factor in how such projects should be developed.

A guide to understanding the interaction of culture with other factors has been provided in the economic model of induced innovation developed primarily by Hayami and Ruttan (1985).

> Cultural endowments (social and cultural variables) are seen as an endogenous part of change and act as possible aids to, or brakes on agricultural development. This model also sees the interaction of technical, resources and institutional factors as also part of the change process. (Stevens and Jabara, 1988:89).

This model helps to identify aspects of development that are not directly economic in nature but do have an impact on economic and social change. While Hayami and Ruttan (1985:114) considered that there are insufficient empirical tests to identify the relative significance of relationships between cultural endowments and technology, resources and institutions, they acknowledge the importance of culture as an important part of development and change. This thesis discusses many aspects of change in resources, technology and institutions of which cultural aspects form an integral component.

Location Incentives

Climate and topography may dictate that the farming system favours livestock rather than cropping. For example, in extensive pastoral systems in Africa, where rainfall is less than 600mm or in mountainous regions of South America or Asia where less than 5% of the land is cropped (McDowell, 1980:108). In many areas of the world cattle provide income from native pastures that would otherwise be unproductive or would yield little return. For example Von Kaufman (1976) mentions that in Kenya more than 80% of the land area is

unsuited to arable farming and intensive livestock production because there is too little rain or insufficient water. However, high numbers of cattle are farmed on native pastures in the area.

Where infrastructures in terms of roads and crop storage facilities are limited and remote from urban areas, cattle may improve the viability of a farming system. For example, "In Northeast Brazil the singular advantage of beef cattle appears to be that they can transport themselves to market and, unlike crops, their sales can be timed to yield a steadier flow of income" (Kutcher and Scandizzo, 1981:60). Similarly cattle may form part of a farming system near urban areas. Farmers near urban centres have more contact with and access to markets for their meat or other produce. This can lead to more intensive systems of production, particularly where the infrastructure in the form of slaughter facilities and live markets are able to support their production systems. However, alternative employment provided by urban centres may also mean a move out of cattle farming or a move to more extensive management. This may mean the cattle maintain a performance of low productivity. However, the overall combined income of urban job plus cattle income means a higher overall income for the whole household. Estellie Smith (1983:165), confirmed these economic responses in that the farming of cattle "...permitted absentee ranching, minimal reciprocity obligation and allowed for more individualised production patterns."

Resources

Land Availability and Land Tenure

"Fragmented land holdings and insecurity of tenure are inimical to most systems of beef production." (Ayre-Smith, 1976:451). In areas that have traditionally grazed cattle, such as Northeast Thailand and parts of the African continent, access to common grazing has been one of the most important factors in the production system. Access in traditional systems is tightly controlled by local institutions comprising members of the community. The institutions are the structure on which production hinges, providing a source of daily

cooperation and long term security (Grandin, 1991:25). This control is most effective under conditions of low population density, subsistence production and where sufficient land enables mobility to new areas of grazing. With increasing population and the intensifying of agricultural production, particularly involving cropping, existing communal systems are put under pressure. Crotty (1980:60) states that "an important omission in the analysis of many cattle production systems is the failure to appreciate the distinction between individual and communal grazing." Where grazing land is not individually owned, and access is available, farmers are able to invest in cattle to generate income from communal land. The income generated belongs to the individual farmer. However, communal grazing must be managed well to maintain sustainable systems. Berleant-Schiller (1977) observed that during a sustained drought on Barbuda island in the Carribean cattle numbers increased and crop production declined. This was so because of a communal grazing system that enabled the community to manage the livestock and cropping systems to their advantage. The key point here is that the community actively worked together to manage the system. This is reinforced by de Haan (1993) and Cernea (1991), who advocate full participation and consultation within existing structures when planning and implementing livestock intervention programmes.

The commercialisation of land and creation of individual property rights is an important aspect of many livestock projects. Feder (1993:259) notes "that titling can create in land a form of collateral that relaxes the constraints that many farmers would otherwise face in the formal credit market." While this is a key issue two other factors are important. One is that titling of land may fragment what was traditionally common grazing land and lead to overstocking in those areas that remain. The other factor is to whom the title rights are allocated. Title may not devolve to those who have been using the land, but to powerful elites with political connections. This second factor is important in relation to Northeast Thailand and is discussed in Chapter Four.

Credit

There are several aspects regarding the availability of rural credit that are important. First, it enables farmers to access new and improved technologies. Secondly, it is a means of

redistributing savings to those who see opportunities for high return investments. Thirdly it enables farmers to manage risk by giving them more flexibility (Stevens and Jabara, 1988:263). Credit may be made available from government institutions or via informal lending sources. In the case of government credit, it is often subsidised. Stevens and Jabara (1988:264) note that subsidised credit often favours the largest and most influential farmers, who have the greatest access to loans. Access to loans also favours those who have land title with greater access to public sector lower interest credit (Feder, 1993). Subsidisation of credit may encourage farmers to expand into new technologies. However, ultimately the new technologies must yield productive returns to ensure sustainable benefits. This is emphasised by Adams and Vogel (1990:358) who note that "the well being of financial markets depends on the economic viability of the clients they serve."

> If farmers receive low prices for their products because of distorted exchange rates, food price controls, imports of cheap food, or inefficient markets, their ability to use financial markets will be diminished; they will be less willing to borrow, less able to repay loans, and will have less capacity to save. (Adams and Vogel, 1990:358)

These points are all valid in Thailand where, combined with encouragement to borrow via subsidised interest rates rural borrowing has reached unsustainably high levels (Janchitfah, 1995). The implications of credit availability on beef cattle projects in Northeast Thailand are detailed and discussed in this thesis.

Two other aspects of rural credit are important. The first applying to many loans, is that it is difficult to monitor where the money is used. This fungibility makes it difficult to effectively target specific aspects of production. The second, particularly relevant to borrowing for cattle production, is the interval between investment and return. The need for a profitable return highlights the need for effective systems of production with good supporting infrastructure.

Labour

Labour, its availability and the way it is used, is one of the key resources involved in agricultural development. Koppel (1995:4) talks of the economic relationship between land and labour and how supply relationships affect or induce changes in the productive capacity for labour. This section will consider labour's productive capacity with a focus on two aspects of labour resource allocation. First, the seasonality of rural labour opportunities and secondly, the input of female labour.

Eicher and Staatz (1990:17) reporting on the performance of labour markets found "that at peak periods of the agricultural cycle there was little unemployment in rural areas, while at other periods of the year there were labour surpluses." This seasonality is related to the biological process of crop production linked to the periods of wet and dry in tropical agriculture. In an area where one crop is dominant and there is little diversification this effect will be most pronounced. The primary effect in this instance is significant unemployment or underemployment in rural areas. If there are opportunities to earn income elsewhere, or by other means, these opportunities will be taken. Many people will diversify production or migrate to these other opportunities. Binswanger and Rosenweig (1986:503) refer to individuals' desire to maximise their incomes and to even out income to avoid risk and disaster. Diversification into new crops or livestock within the current land resource is one means to achieve this desire.

Migration, either temporary or permanent, is another means to improve income and obtain greater use of labour resources.

> Whilst for such households migration provides an important 'safety net', affording some measure of protection in difficult times, it does little to foster a self reliant or self generated form of development. (Parnwell, 1986:99)

While migration, particularly short term, may be seen as a strategy for economic survival it puts pressure on resources and institutions in the area that has been left and in the migrants destination.

Often the strain on resources of those left behind is borne by women. Migration to other work is not exclusively carried out by males, however, they tend to dominate. Parnwell (1986) puts the figure in the four villages in his study in Northeast Thailand at 60% of males. The women who remain continue in these situations with their traditional work pattern and also undertake additional duties normally carried out by the men. Chambers, Longhurst and Pacey (1981:194) refer to the often excessive burdens imposed by these seasonal patterns of migration. With respect to livestock development, animals need year round feeding and much of this work is carried out by women. This is important in designing research into new technologies. It is important to target those who actually carry out the day to day livestock management. Similarly, it is important in the design and delivery of training and extension, both in terms of content and timing of training.

Diversification

Diversification can be seen as a means of spreading risk among portfolios of activities and making more effective use of labour. In national terms concentration on only a few crops may pose a risk if terms of trade change for these crops bringing decreased export tax revenues. Farmers and governments may view diversification and the management of risk quite differently leading to different reactions and policy initiatives (Thailand Development Research Institute Foundation [TDRI], 1995:iii). Diversification is normally induced by changes in factor prices. These may arise from changes in government policies and institutional structures to encourage diversification (Burch, Rickson and Lawrence, 1996:324). Diversification may involve new crops or livestock systems on existing land areas or on land not previously farmed. Growth in infrastructure, particularly roads, may facilitate this growth (Rigg, 1987, Askwith, 1973). This in turn will lead to a demand for new processing and marketing facilities for crops or livestock. This thesis considers the impact of cattle production in particular and efforts to increase production in terms of a government led initiative in Northeast Thailand. To be successful diversification must produce net tangible benefits to participants if it is to become part of a sustained system of production.

Institutional factors

Livestock projects have become increasingly complex and require a range of social, economic and scientific disciplines. Often institutions responsible for implementing projects have evolved with a specific target focus of activities. This is shown in fig 4.3 which details the structure and relatively task specific nature of government departments in Thailand. Cooperation is often difficult between these departments, requiring levels of management skills not always available or well developed within these departments. Private institutions in Thailand have evolved alongside those of the public sector, often involving the same personnel. For example, most private veterinary clinics in Thailand are operated by government vets who provide evening and weekend clinics as an adjunct to their main work.

This section will examine three key factors as they relate to beef cattle development. a) research and extension, b) marketing and processing and c) changes induced by macroeconomic factors.

Research and Extension

An important part of any beef cattle intervention programme, as with all agricultural systems, is how research is organised and the results of that research extended to farmers. Stevens and Jabara (1988:296) rank agricultural and social research together with agricultural and general education and methods of communication and extension as three of the most important sources of agricultural growth.

In respect to cattle research there are two issues of relevance. One is the long term nature of research given the breeding interval of cattle relative to other livestock. The second is the need for some adaption to specific locations. Much research has been done with cattle on genetic improvement within and between breeds, breeding and feeding regimes, animal health care, and the production of beef to market specifications. However, much of this research has been conducted in more developed countries. It has generally been designed

for large herds fed a diet of improved grasses and legumes or grain. Some of this research can be directly adapted at a technical level to lesser developed countries. However, the technology may not be adaptable in a different climatic regime or different economic circumstances. To be effective some local research must be carried out, and, with the complex systems and wide range of production options on most small farms, local adaption is essential. Research involving an integrated and multi disciplinary approach adopts a more holistic view of agricultural and social systems. Research of this nature is often referred to as Farming Systems Research (FSR). It recognises that farmers produce a range of commodities as part of their complex systems whereas most conventional research is organised only along commodity lines (Tripp, Anandajayasekeram, Byerlee and Harrington, 1988:384). The FSR system as outlined by Hildebrand (1986:13), comprises a complete development concept integrated with farmer consultation and trials. Tripp, et al. (1988), see a problem integrating FSR with conventional research in that it is more expensive to carry out and requires an integration of many factors outside of the normal clear scientific boundaries of individual scientific disciplines. If research is to be successful, however, it must consider the complex regime within which farmers operate.

> An efficient extension service, supported by dynamic research groups provided by government, universities and other institutions can do much to expose beef producers to innovations and to the benefits to be obtained from adopting them. (Jones in Ayre-Smith, 1976:452)

For extension to farmers several factors are important. First the extension agent must have some knowledge of the farmers production and economic systems. Secondly, they must have an empathy for what the farmer is trying to achieve. Thirdly, training and extension programmes need to be designed to target the participation of those who farm the cattle and time visits and training accordingly (Heim, Rabibhadana, and Pintong, 1986). Mention has been made already of the role that women take in animal management, and extension programmes need to allow them the opportunity for full participation.

Marketing and Processing

The infrastructure surrounding the output of beef cattle production is important to the success of initiatives to increase production. Marketing in this context is defined as the activities required in moving a product from the point of production to the final consumer. Animals may be sold at local livestock markets. This forum brings groups of sellers and buyers together and also helps to set benchmark prices for sales that take place directly from villages. Cattle may also be sold directly to merchants who deliver them straight to slaughter facilities.

Important steps in the marketing process involve, transport, slaughter, grading, processing, packaging, storage and delivery (Baconawa, 1994:29). Finance at all points of this chain is involved; both capital expenditure for buildings, plant and machinery and also operational expenditure to purchase animals or meat and to maintain the operation. As meat is also a perishable product, sanitation procedures are critical to enable the delivery of a safe quality product.

The important issue is to match the infrastructure described to growth in demand from consumers or in production. Until sufficient demand is shown, investment by the private sector is unlikely. Governments often provide the initial investment until demand grows. The provision of clean efficient facilities can help give consumers assurance of safe and quality products. This assists in building demand and encourages further production. In Belize an abattoir constructed to United States Department of Agriculture (USDA) specifications and approval enabled exports to the American market. Within one year of the start of this trade, the farm gate price of cattle had risen by 20%. This attracted more capital to the industry and permitted more expenditure on pasture management and animal husbandry (Ayre-Smith, 1976:451). This is important for domestic as well as export supply. The Asian Productivity Organisation (1997:27) note that "meat will become an increasingly important source of nutrients for the Asian diet." To meet increased demand will require sufficient capability in terms of production, marketing and processing structures.

Macroeconomic Factors

There are a number of wider issues that need to be considered in relation to cattle production systems. These are described here as macroeconomic factors and they have some relevance to the day to day concerns of beef cattle production and their impact must be considered at the planning and monitoring stages of a projects development. The issues discussed here are a) food consumption patterns, b) import substitution c) subsidies and economic incentives and d) international trade and cycles of cattle production.

Food Consumption Trends

Discussed earlier was the role that cattle can play in providing a link back to the land for those who have moved to the city. Another important factor of urbanisation is that food consumption patterns change, "Notably an increase in the consumption of livestock products" (Cunningham, 1992:49), of which consumption of beef forms an important part. Growing urbanisation, economic development and rising per capita incomes have increased demand for livestock product. The FAO (1989) notes that "the income elasticity for livestock products (meat, milk and eggs) is higher than it is for non livestock products."

Import Substitution

Import substitution aims to limit the requirement to import products that are in demand within a country. Policies involving import substitution are a response to increased domestic demand for livestock products and have led government efforts to foster beef cattle development. These efforts have largely centred on improving domestic production to substitute for costly imports. It has also led to the promotion of exports to boost economic development. It is important to distinguish between those countries that favoured import protection rather than export expansion. Myint (1990), stated that those countries which advocated policies of freer trade and export expansion fared better in the preceding two decades than those who advocated policies of protection and import substitution. Baker (1976) certainly considered this an important factor in Botswana's economic development which placed a heavy reliance on cattle exports. In the context of this thesis

import substitution is considered an important issue in the development of Thailand's cattle sector. Thailand is an export focussed economy but has not been able to develop an export beef industry because endemic foot and mouth disease prevents exports. However, imports of meat have a high tariff imposed at 60% of cost, insurance, freight (CIF) values (TRADENZ, 1997). This tariff has effectively shielded the Thai domestic cattle industry from real world prices.

Subsidies and Economic Incentives

Incentives provided to farmers have been identified as one of the main factors determining success or failure of World Bank approved livestock projects (de Haan, 1993). These incentives may take the form of price controls to keep produce prices low in order to provide cheap food to urban consumers (Hubbard, 1986). Alternatively the price to producers may be subsidised to promote self sufficiency. In Thailand, the price subsidy is in the form of high import tariffs. These effectively shield the local producer from real world prices. These tariffs will reduce under new World Trade Organisation regulations exposing the domestic producer to greater pressure (Gingrich, 1994). Other incentives comprise subsidies on inputs and subsidies. These may be in the form of subsidised interest rates which "...have had a negative impact on project performance especially in Latin America and sub Saharan Africa ... they have frequently benefited the wealthiest part of the population and not necessarily those who could have made the best use of funds" (de Haan, 1993:130). Food supplies to cattle may be also subsidised as can services in the form of animal health, breeding, water supplies and land. Many of these subsidies are production incentives implemented in the initial stages of a project which have led to successful results. However, they are costly to maintain and may lead to a dependency on free or subsidised services. To be sustainable projects must be able to recover the real costs of services from participants.

International Trade and Cycles of Cattle Production

Only 8% of the world's production of red meat is traded between countries. (Lesser 1993:77). Despite this small percentage, red meat exports represent a billion dollar industry. Production of red meat and its export are related to the gains to be made from

trading, represented by a comparative advantage in one country or region compared to another.

> Trade allows a country to specialise in the production of the goods in which it is a relatively low cost producer and to import the products for which it is a relatively high cost producer. Specialisation in production and trade permits higher real incomes in both nations than would be possible without trade. (Stevens and Jabara, 1988:362)

Comparative advantage does change over time as a country develops. Anderson, 1986 (in Stevens and Jabara, 1988) shows that as income grows and capital is accumulated labour will be attracted to the manufacturing sector which will expand relative to the agricultural sector. Figure 4.4 which shows the percentage share of Thailand's GDP in agriculture compared to manufacturing over a number of years demonstrates this fact. This does not necessarily negatively affect cattle farming which may operate (albeit at varying levels of efficiency) within the parameters of alternative employment by one or more members of the household. In Botswana for example, Hubbard (1986:7), found that farming cattle "...is a growth industry which households find compatible with full time employment. It has continued to be the main investment outlet for the increased personal savings generated since independence."

Cycles of cattle production exist in many countries, and are typified by a period of expansion in herd numbers followed by a liquidation. "The persistence and regularity of these cycles suggest - even to the casual observer - the existence of causes neither random nor totally exogenous" (Lesser, 1993:188). Cattle cycles at an international level are driven by changes in the terms of trade by large producers of grain and meat such as the United States, Argentina and Russia (Hubbard, 1986). However, variations in numbers within a country may also result from local causes such as disease or inter drought cycles of cattle production (Coppock, 1993). Within differing stages of these cycles of production there is an impact on farmers, production and marketing infrastructures and consumers. Farmers react to changes in profitability by varying their production. The infrastructure surrounding production is affected with reduced throughput for slaughter and processing facilities, and

reduced demand for inputs and services. Consumers are affected by supply and price changes at various stages of the cycle.

Technology

An understanding of farmers' objectives and constraints is necessary to the successful transfer of new technology. "Producers only adopt improved technology if it contributes to meeting their objectives (more income, leisure time, prestige or reduction of risk) and matches their resources (labour, inputs)" (de Haan.1993:133). Technology has a strong relationship to the other key factors of production. In this section three aspects of technology will be discussed, a) mechanised traction, b) improved animal health systems and, c) improved and indigenous breeds of cattle.

Mechanised Traction

The impact of mechanised traction affects cattle production in two ways. One is that cattle are often used in production systems as draught power. This may affect an animals individual performance in terms of reproduction or growth rate. Mechanisation of this process may enable more productive cattle management. The second aspect is that the use of mechanised traction frees up labour for other activities. This may allow more time for cattle management or other employment options. Of course, if these alternative employment options are off farm there may be less time for cattle management. The work of cattle rearing may be shared with others and the system maintained as one of low inputs and low productivity. This low productivity system may allow some capital accumulation in the value of cattle while allowing regular income from other sources of employment.

Improved Animal Health Systems

The constraints on cattle production caused by disease can take many forms depending on the nature of the disease and type of production system. Direct effects of disease may limit weight gain, fertility, milk yield or draught output, or at worst, result in the death of

animals. Diseases, such as anthrax may also be transmitted from animals to humans and may prevent consumption of the meat locally or for export. More indirect effects of disease may be the inability of farmers to utilise grazing resources and prevent the introduction of replacement animals or new breeds. Treatment of animals may depress production and the cost of treatment may be high. Treatments that involve compulsory slaughter or movement control and quarantines are particularly costly and disruptive. (Putt and Hanks, 1993:94). Proper diagnosis is necessary to develop a treatment and prevention strategy. This may involve the use of testing methods and materials not widely available in developing countries. Effective means of disseminating the treatment and extending knowledge about prevention strategies are also required. Governments have a major role to play in providing a treatment and prevention service for major diseases. Other areas where governments can facilitate improved practices is in research and extension for farmers.

Prevention and treatment must be appropriate for the system. Many farmers cannot pay for expensive imported drugs or for a trained vet to treat animals. One area of extension that allows some participation by farmers is in the training of selected farmers as livestock resource people within a village. Following training and with support from veterinary services they could carry out basic treatment and prevention operations. As a means of ameliorating the cost of expensive drugs farmers may be able to use traditional remedies to augment more modern treatment.

Improved and Indigenous Breeds of Cattle

In many projects that have aimed to boost cattle numbers priority has often been given to importing new and improved breeds. Otim (1993), suggests there is much to be gained from exploiting the genotypes and natural adaptations of indigenous cattle before introducing new types via cross breeding. This is reinforced by Maule (1993:172), who discusses the higher cost of maintaining cross bred cattle and the fact that, indigenous cattle live longer, have higher fertility and lower calf mortality. While importing cattle may be necessary to increase numbers quickly the existing resources are often cheaper to buy initially and to maintain. This aspect of improving cattle production has direct relevance to this thesis and is discussed further when the various projects implemented in Northeast Thailand are discussed.

Production systems

Overview

> Livestock production systems of the developing member countries operate in a complex and dynamic environment that interacts with many other systems both inside and outside the country...development of the sector must be preceded by a holistic examination and detailed review of existing systems for any positive impact to be ensured (Asian Development Bank, 1991:12).

Many of the factors that relate to the 'complex and dynamic environment' have been discussed earlier. This section concentrates on the main categories of existing systems. These are linked, interlinked and interact with other livestock , cropping and industrial systems and subsystems.

The primary economic purpose in farming cattle is to make money. This may be by optimising seasonal income through sales of cattle and cattle produce or by building a capital asset and accumulating numbers of cattle for future sale. The means by which this is achieved varies and many of the options relate to the type and location of production system. As many farmers operate a complex income earning system their strategies for maximising income often involve both on and off farm occupations (Boonpakdie, 1993).

In humid areas with adequate rainfall, agricultural production systems have many cropping and livestock options. Cattle often receive little labour input and are virtually left to scavenge. This leads to low productivity, but despite this they are profitable, especially in terms of return to labour. Better returns to increase productivity are necessary if farmers are to adopt higher input innovations (von Kauffman and Fitzhugh, 1993). This is particularly so for low input systems. Cattle are often integrated with cropping systems and used for draught purposes. Farmers place a high value on livestock's role in reducing the risks of poor crop yields, and generally want as large an inventory of animals as possible (McDowell,1972). This in itself contributes to low performance because more animals are

usually kept than resources will adequately support. This emphasis on quantity of animals rather than quality is also a factor in drier areas where climate favours livestock farming rather than cropping.

> In the arid zones the herd owners have every incentive to enlarge their herds as much as possible. There is very little opportunity cost, to the individual, in keeping an extra animal since there is no land limit. There are few available alternative investments and none that can maintain real value in times of inflation. (von Kaufman and Fitzhugh, 1993:15)

Orskov (1993) outlines six types of farmers or production systems involving cattle and other livestock species. The first four mentioned involve interaction of crop and livestock systems or utilise the product of cropping systems. These, or combinations of these systems, are most prevalent in the study area of this research thesis. They involve systems comprising (1) landless owners of livestock, (2) arable crop farmers with some livestock - usually buffalo or cattle for traction (3) livestock keeping crop farmers, and (4) arable cropping, livestock farmers. Orskov mentions two other systems involving (5) transhumance pastoralists and (6) nomadic pastoralists but these are less common in Thailand. In addition to these systems Payne (1976) describes commercial ranching, that is, managing cattle on an extensive basis, as an optional system for many developing countries in Africa, South East Asia and South America. Table 2.1 summarises these production systems, their usual location, the role of cattle within them. This table also shows the primary characteristics of these systems and the level of risk involved.

Table 2.1: Types of Cattle and Livestock Production Systems.

Production system	Usual location	Role of cattle	Characteristics and risk involved
Landless owners	Peri-urban / feedlot	Beef / milk	High risk, sensitive to price changes
Crop predominant	Cropping areas	Traction mainly	Moderate risk, affected by alternative employment, land use options and availability of machine traction
Livestock / crop	Marginal cropping areas	Animal products more than traction	Low risk, low input. Long interval between investment and return
Crop / livestock	Cropping areas	Animal product, security, status	Low risk, systems often emphasise quantity rather than quality
Transhumance pastoralists	Transient	Animal product, security, transport	Low to moderate risk, affected by access to grazing and alternative employment
Nomadic pastoralists	Arid areas	Animal product, security, status	Low to moderate risk, affected by access to grazing and water
Commercial ranching	Arid, semi arid or newly developed areas	Animal product, security, status	Low risk, capital intensive

Source: Orskov, 1993
Payne, 1976

Landless Owners of Livestock

Systems of production involving landless owners of cattle are often located near urban centres or factories, for example sugar factories producing cheap sources of feed as byproducts of their operation. Cattle are generally maintained in a feedlot with all food transported to the animals. Production is often for beef alone or beef and milk. All feed and other inputs are purchased for these systems making their operations both capital and labour intensive and also sensitive to any movement in input or output prices.

Arable Crop Farmers

Cattle or buffalo in arable crop farming systems are kept mainly for draught purposes. Crop production is the primary emphasis for income generation. Numbers of animals in these systems has declined in recent years as small tractors have become more popular. Although sensitive to fuel price increases tractor use provides quicker land preparation, and frees farm labour for other economic opportunities off the farm (Tokrisna and Panayotou, 1982).

Livestock Keeping Crop Farmers

Farmers in these systems rely on livestock more for their production of meat, milk, skins or manure than for their use as draught animals. The interaction with cropping is in the livestock's use of crop byproducts such as rice straw or maize stover. In most cases, however, the productivity and net returns from livestock are low even with zero cash inputs for labour and feed. The interval involved between investment and return is higher than for most cropping systems, and if productivity is poor the situation is exacerbated (FAO, 1989).

Cropping Systems with Livestock

Arable cropping livestock farmers rely on the animals production, but also for their ability to provide for security, status or wealth. There is often an emphasis on quantity over quality with consequent overstocking (Orskov,1993). Farmers operating a mix of livestock and cropping systems recognise that draught animal power is often essential for crop production, but the animals are kept year round for just a few weeks work. "Alternative feeding and marketing arrangements may enable draught power to be derived as a by-product of profitable small holder fattening systems (von Kaufmann & Fitzhugh 1993, 18)". A stall feeding cattle system for beef production was started in Malawi in 1957.

> The purpose was to produce beef for the domestic market using locally available food resources and the consequent savings in foreign exchange. Animals are provided on credit at a fixed price per kilogram of live weight which includes charges for interest, transport and handling. On slaughter the farmer is paid on the basis of the cold dressed weight and grade. (Jayasuriya, 1993:51).

This system has been adapted and is used in Northeast Thailand and is discussed in chapter Five. It appears to provide an option where the production and marketing infrastructure exists and alternative and more profitable employment is not available.

Many governments have also realised that cattle farming offers potential for increasing employment and income of small scale farmers who have limited access to land (FAO, 1989). Another important aspect is that further processing of crops in developing countries provides a source of relatively cheap crop by-products for utilisation by cattle and other livestock classes. (Cunningham,1992)

Nomadic and Transhumance Pastoralists

Transhumance pastoralists commonly move between areas of seasonally lush grazing. Their animals represent security, and a source of many products and may also provide some transport or pack value. Nomadic pastoralists use an established pattern of grazing management. Animals, particularly cattle in these systems are sensitive to drought stress. Combinations of grazing and water requirements has in many instances put pressure on water and grazing resources (Sandford, 1983). There were examples in Thailand of farmers who moved cattle seasonally from one to another area of common grazing, or who owned no land and grazed only roadsides. However, it is not considered farmers operating these systems could be considered nomads or transhumance pastoralists in the context of the systems described above.

Commercial Ranching

Where land is an abundant resource, labour scarce and the land unsuitable for cropping commercial ranching offers an opportunity for expanding beef production. "Productivity could be rapidly improved by an increase in the total land utilised for ranching, by intensification on existing ranches and by technical innovation (Payne, 1976). De Boer (1982) notes that commercial ranches have had mixed success in the Philippines, Indonesia, Malaysia and Northeast Thailand. The main advantage sought by these operations is to buy cheap animals from surrounding small holders, improve the animals with cross breeding and use the scale of operation to maximise income. Reasons given for lack of or limited success apply to commercial ranching as to all the other systems described. These were that projects lacked certain aspects of the infrastructure or support described above as key factors for promoting beef cattle development.

Commercial ranching and feedlots run by landless or landed owners are more intensive than traditional mixed cropping and livestock systems. While Alexandratos (1995:196) sees both evolving to meet growing consumer demand he sees the intensive systems as more responsive to change. This does not diminish the importance of mixed systems but acknowledges that their improvement is more challenging within the interaction of all the factors outlined in this chapter.

Summary

This chapter has examined a range of critical issues for promoting the farming of beef cattle. In many instances cultural or traditional preferences for farming cattle are being modified by changes in household, regional or national economies. Change and the impact of change is a key factor in how cattle farming systems have and are developing within the range of systems outlined. The key factors discussed in this chapter relate to how change is occurring within the total interaction of technical, economic, cultural and institutional factors. Within this interaction the author considers two issues of critical importance to the

development of beef cattle as part of agricultural systems.

1) The identification of the appropriate role of beef cattle within agriculture and within local and national systems of development.

2) The development of structures to assist both governments and farmers to meet their objectives.

Cattle may be seen as a means of diversification away from a reliance on a single crop or enterprise. However, the level of intensity at which cattle are farmed may have a different emphasis at the farm than it does at regional or national level. Nationally the emphasis may be to increase beef production to provide for rising domestic demand or to provide revenue from exports. They may see this as most effectively achieved with commercial ranches and intensive feedlots. However, at a local level farmers may be more focussed on maximising household income. This may involve beef cattle as a flexible investment in a low input, low productivity system, providing some income and also a store of future wealth. Failure to recognise differences between how they are operated compared to how they are planned could lead to failures in the planning of appropriate structures to assist both farmers and governments meet their objectives. Issues of land titles and access to grazing land, availability of credit and locally adapted research and extension are important. Equally important are pricing policies that reflect real costs and infrastructure that supports cattle development.

These issues cover major considerations in the global context of beef cattle production The means by which the integration of these factors are achieved give rise to a number of research questions which are addressed in this thesis in relation to beef cattle production in Northeast Thailand. The next chapter outlines the location and methods of research undertaken in Northeast Thailand.

Chapter Three
Research Methodology

This chapter examines the reasons for choosing this subject and study area, the data collected, and methods used for collecting data. Chapter One outlined the fact that Northeast Thailand has a tradition of farming buffalo and cattle. As early as the 1890's (Smyth in Keyes 1982:255) there is a reference to the potential for farming cattle in this region. This was reinforced with a recommendation to expand production following a visit from the International Bank for Reconstruction and Development in 1959 (International Bank for Reconstruction and Development [IBRD], 1959).

Since the IBRD visit cattle numbers have grown and specifically during the past fifteen years there have been a number of projects implemented to boost cattle production in the region. Many of these projects are outlined and reviewed in this thesis. This subject area was chosen as the author worked in this region as a livestock specialist, working primarily with beef cattle. It was considered timely to review these projects implemented in an area of traditional cattle farming but within a context of changing social and economic conditions. To investigate these changing conditions and the constraints and opportunities for increasing beef production required an examination and understanding by the author of socioeconomic conditions in villages in the region. It also required a wider understanding of social and economic development theory and current issues.

Selection of the Target Villages

The six villages selected for this study are some of the 100 villages targeted by the Northeast Thailand Foundation (NET). NET is a Thai based non government organisation formerly supported by the Canadian Institute for Development Administration (CIDA), but now self funding. It operates a range of rural development projects emphasising self reliance of village groups. Planning and implementation of projects emphasises the participation of those who will benefit at all stages. During the period that the author worked in Thailand he was closely associated with six of these villages. The main focus

was with beef cattle in these villages, however, an understanding of all aspects of rural, regional and national development was necessary to understand why farmers chose or were induced to make certain decisions.

While these villages were not associated with all the projects described later, it is considered their responses would have been similar in the same circumstances. The author considers these study villages, in effect, a microcosm with minor regional variations, of other villages throughout Northeast Thailand.

Orientation and Institutional Links

On arrival in Thailand and the Northeast, the author was not familiar with the area in which the research was carried out. To gain an initial understanding, an orientation period of two months intensive study of Thai language and a cultural and agricultural orientation was undertaken at Khon Kaen university. This university, based in the province of the same name, amongst other faculties has an agricultural faculty which provides a significant input into agricultural training and extension for the region. This university has strong links to New Zealand. The agricultural faculty was financed by the New Zealand government under the Colombo plan in 1967. Many current staff at the university have completed post graduate studies in New Zealand. In addition to several return visits to this institution during the period of research, the author also visited a wide range of institutions in the Northeast and also Bangkok which are detailed in table 3.1. Discussions were held with the personnel from many of these institutions. Secondary material relating to this thesis was also collected. This material is cited throughout this thesis and documented in the reference section. This material also helped to guide and validate the primary research carried out in the target villages.

Table 3.1 Institutions Visited During Research Completed 1993-1995 and 1997

Institution	Region	Province
Khon Kaen University	Northeast	Khon Kaen
Tha Phra Animal Nutrition and Forage Research Station	Northeast	Khon Kaen
NEWMASIP (North East Water Management and Systems Improvement Project)	Northeast	Khon Kaen
Ubon Ratchathani University	Northeast	Ubon Ratchathani
Tung Kula Rong Hai Seed Research Station	Northeast	Roi Et
Suranee University	Northeast	Nakhon Ratchasima
Sisaket Agricultural College	Northeast	Sisaket
Surin Animal Breeding Station	Northeast	Surin
Surin Institute of Technology	Northeast	Surin
The Department of Agricultural Extension	Northeast	Surin
The Department of Agriculture	Northeast	Surin
The Department of Livestock Development	Northeast and Bangkok	Surin, Khon Kaen and Bangkok
The Asian Institute of Technology		Bangkok
Kasetsart University		Bangkok
National Agricultural Training Centre	Central	Kanchanaburi
Thailand Development Research Institute Foundation		Bangkok
Chulalongkorn University Social Science Research Centre		Bangkok
Thammasat University		Bangkok
The Department of Accelerated Rural Development	Northeast	Khon Kaen
The Agricultural Land Reform Office	Northeast	Surin
The Chieng Yeun Animal Nutrition Station	Northeast	Mahasarakham
The National Forage Research Centre	Northeast	Nakhon Ratchasima

In addition to these institutional visits was the research and vital discussion held with the target villages in Surin province. To gain a wider perspective visits were also made to other villages throughout the Northeast, and in other areas particularly in the North and Central regions.

Primary Research

An essential means of gaining an understanding of the multitude of factors affecting village life and development was the use of a number of participatory rural appraisal (PRA) techniques to collect data. The aim was to obtain as much information as possible about the community from the community. The underlying tenet of this approach is that those who live in the area are best placed to identify its limitations and potential.

> Local people are well placed to identify and understand development problems, and to identify potential solutions. It is widely agreed that their knowledge and perceptions are essential but it is not easy to elicit their opinions in a representative manner. Public meetings tend to be dominated by one or two people who are often not representative of the community as a whole, with voices of women and the poorest rarely being heard. Questioning by technical staff often produces answers which reflect mainly the respondent's expectation of what is on offer. Besides, it is an illusion to expect communities, stratified by age, gender and occupation, to have a single view of priorities. (Swift and Umar, 1994:138)

Three main tools were used to gather primary information during this period of research. First was informal discussion and observation, secondly a more semi structured interview technique and thirdly the use of a problem/solution game.

The first technique used throughout the research period included informal discussion and observation. This village observation included a number of overnight stays in the study villages. These extended visits enabled an understanding of not just how cattle were managed over a twenty four hour period, but also the whole interaction of factors that comprise village life. As an outsider working in this situation for a relatively brief period it

was impossible to gain a full understanding of how centuries of culture and change had shaped the prevailing conditions at the time of the research. However, by working with a Thai organisation and living 'immersed' in a Thai village - going to their weddings and funerals, their temple festivals and thanksgivings - enabled a greater understanding than a short term visit. The length of time involved in research and work in these villages helped focus on key issues from a villager perspective. Observation and discussion with villages combined with village walks at different times of the day, usually with one or two of the villagers provided an indication of many factors of production relating to cattle management. Many of the aspects of production observed which are discussed in this thesis related to the following factors; a) cattle housing systems b) the grazing and feeding strategy c) the care of young stock d) the members of the family responsible for the cattle at different times of the day and d) the health and condition of cattle in the village. The village walks enabled any current problems to be addressed in a more immediate manner and particularly in the early stages of language learning by the author was a more comfortable forum than a formal group discussion.

The second main information gathering technique was a village questionnaire and a questionnaire for those involved in developing agricultural policy and extension workers. Copies of these are attached as appendices one and two These were essential tools in gathering updated information in 1997. The responses to the questionnaire are reported in several sections of this thesis. This questionnaire in the villages was completed with the help of a translator. The primary reason was that it had been 18 months since the author had spoken any Thai and there was not the time available to fully regain previous fluency. The translator who assisted worked for the NET Foundation and both he and the author were known to the villagers from previous visits. With the questionnaire for the policy makers and extension workers the interviewees either spoke English or some assistance was provided by their colleagues. Both questionnaires were designed to gather both quantitative data in terms of numbers of cattle, areas farmed and so forth, and also qualitative data on attitudes to cattle farming. In general questions relating to straight data were more easily answered and analysed than those relating to attitudes. Data was validated by cross questioning in several villages and by reference to secondary data when available.

The Problem / Solution Game

During the primary period of research from 1993-1995 extensive work was carried out by the author to establish the major challenges faced by cattle farming groups in the villages. One of the most valuable methods used was the problem / solution game referred to earlier. The aim of the game is to get different, yet related, groups of farmers to identify and rank their own problems, and then suggest ways of solving them. "The game allows these groups to identify their problems, rank them and then list possible solutions in order of priority" (Swift and Umar,1994:139).

The game was played in the villages in the following manner. The author introduced the game stressing the participatory nature and requesting the full involvement of all those present. Six circles were drawn on a large sheet of paper and fixed on a wall where all could see it. The villagers were told that each circle represented a major problem to farming cattle. The author then asked one of the villagers, who had been briefed previously, to lead the discussion and encourage full participation, particularly from any women present. This facilitation by one of the villagers was done as it both enabled the author to observe and note points of discussion, while allowing for a smoother flow to the game given the author's outsider status and restricted language skills. The group was asked to give a problem label to each circle and were limited to six problems only. In each village this period of discussion lasted approximately 30 minutes and provided some lively debate amongst those present both male and female. Using a marker pen each participant was then asked to come forward and vote for the problems they saw as most limiting. They could vote by making a vertical dash in each circle. Each participant was allocated 10 votes in total, of which a maximum of five could be used for any one problem. The game then focussed on the two problems considered by the group to be the most challenging. Some possible solutions were requested and the group was asked to rank these in the same manner as the problems.

There were a number of aspects to this method of participatory rural appraisal which were of interest. First, in every instance the villagers appeared to genuinely enjoy the involvement and debate of the game. As Rogers (1989:50) states; "In common with most

other Thais the Northeasterner places a high value on his freedom to have fun and sees little merit in work for the sake of work." The second aspect of interest is that on several occasions the villagers either labelled certain issues as problems or considered them a higher priority than extension workers who visited the village. For example in Nong Waa village, one of the highest priority problems established by the villagers was the lack of access to genetically improved bull semen. This semen and the artificial insemination service provided by the Department of Livestock Development could not be accessed in sufficient time to enable a service to this village. The extension workers considered that a bull located in the village even if not of high genetic merit was better than not getting an animal in calf. However, the issue was considered sufficiently important by these villagers that they considered nominating someone from the village to train as an inseminator and provide a service to this and adjoining villages. The third aspect is that on every occasion this method was used by the author on solo visits to the village. Attempts to use the problem / solution game when the traditional extension workers were present was not favoured by the villagers or extension workers. When asked for an explanation of this the extension workers responded that while they encouraged the use of this method they themselves knew all about the village problems. Amongst the villagers their reluctance was explained by several as either that the extension workers already knew their problems, or that the conventional discussion forum was more appropriate when the extension workers were present. The actual results of the research completed in the village is discussed and summarised in Chapter Five.

While popular as a method of gaining information the problem / solution game was not uniformly accepted by all. However, the author observed that it did seem to encourage more discussion from men and women who were normally quiet during traditional discussion sessions. This method was used in this instance to gain information on problems relating to cattle production. A variation on the game that may have elicited different responses could have been to play the game in the same village separately with men and women. Alternatively, a separate wealth ranking exercise could have split the group into three groups of wealthy, middle ranking and poorer sections of the community. The game could then have been played with each group. These methods were not used in these villages as the author considered it may have been difficult to introduce too many

new techniques. An awareness that expectations may often be raised with PRA techniques that do not lead to any actual change in participants' circumstances was also a factor. Devavaram (1994:134) outlined a second evaluation of a buffalo project in Tamil Nadu, where the villagers were no longer willing to participate in PRA activities. The recommendations from the first PRA completed some years earlier had not been acted on. "As a result the villagers were disappointed and wished to withdraw from the project. They scorned any suggestion of 'playing games' claiming there had been no changes since the first evaluation."

Summary

The research for this thesis was completed was completed in Northeast Thailand from 1993 to 1995 with a follow up visit in 1997. The subject of the thesis, beef cattle production was chosen to review recent projects undertaken to increase beef cattle production. The author worked in this area as a livestock specialist during the period of research and immersed himself into village life as much as possible to strengthen his understanding of local issues. The Northeast has undergone considerable social and economic change and it was timely to review the impact of these projects within the wider context of change. Research was completed using participatory research methods coupled with more formal interviews and study of existing research literature and theory.

Chapter Four

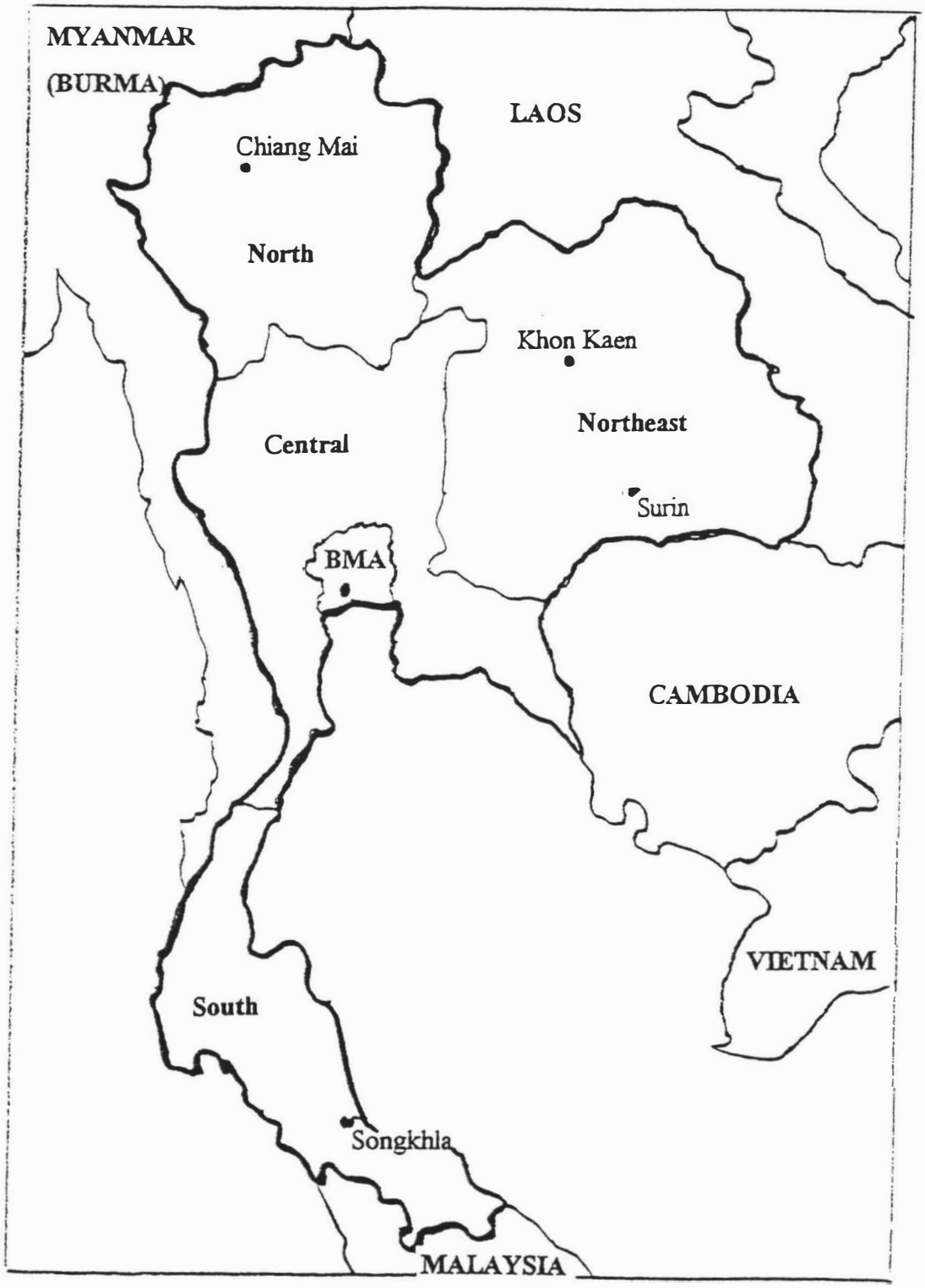
Thailand and the Northeast in Context

This chapter provides an overview of Thailand and in particular the Northeast region. It examines briefly the structure of Thai society, and the general structure of village management. The roles of various agencies working in the sphere of rural development is outlined as is the central role of rice production. The period of latest development in Thailand since the 1950's will then be examined. During this period Thailand has had a comprehensive national development planning process, implemented in a series of five year plans. The intention and the subsequent impact of these plans will be examined. National and regional cattle production, processing and marketing will be outlined. A summary of the key issues raised with respect to agricultural development in general and cattle in particular will provide the basis for the following chapters. These will analyse these issues in detail and discuss future strategies to optimise cattle production within the overall framework of agricultural and regional development.

Thailand

Figure 4.1 shows a map of Thailand outlining the five main administrative regions and bordering countries. Thailand with an area of 3,206 million rai (513,115 square kilometres) had a population estimated in 1993 at 58 million. The Northeast region is discussed in detail in this thesis, but is essentially an arid plateau. The predominant activity is the growing of one rain-fed rice crop per annum with some upland crops such as cassava and kenaf and livestock, predominantly cattle and buffalo. The North is an area of hills and mountains with only 10% lowland. Crops grown are upland rice and sub-tropical fruits and vegetables. The Central region is the most fertile largely comprised of irrigated river flats. The South comprises a hill area forming the boundary with Myanmar, but is predominantly lowland growing rubber, rice fruit and vegetables. This area has the majority of the Muslim population in the country and the highest concentration of small ruminants namely sheep and goats. With the largest coastal boundary of any region, ocean fishing and prawn farming are also important. The Bangkok Metropolitan Authority has the smallest area but the highest population density and most of the industrial activity (Muscat, 1994).

Figure 4.1: Map of Thailand Showing Adjoining Countries and the Five main Administrative Regions



Source: Assumption University, 1997b

Note: BMA - Bangkok Metropolitan Authority

Structure of Thai Society

Two critical elements underlie Thai society. First, Thailand is a constitutional monarchy and the present King is widely revered. He shows a keen interest in rural development and supports many development projects in rural areas. (Kiataprajuk, 1989 and Office of His Majesty's Principal Private Secretary, 1996). Secondly, 95% of the population are Buddhist. Central to Buddhist precepts is a belief in reincarnation (Sheehan, 1993:4). This belief has a material as well as a social dimension. Thai people are likely to accept personal differences in wealth and power as natural and based on meritorious, or bad deeds in present or past lives. This leads to patron - client relationships based on unequal exchange of benefits, be they economic, political or social (Heim, et al. 1986:6). This type of relationship was formally incorporated into Thai bureaucracy until the late 19th century with a governing class of nobles and princes and ordinary peasant and slave classes (Phongphaichit and Baker, 1995).

While officially now a classless society, it is clear when working in Thailand that many groups are formed on a paternal basis with leaders who protect and distribute benefits to clients. Everyone appears to be ranked by where they fit in a hierarchy which determines their ability to influence changes in current practices or the level at which they may derive benefit. Many factions may operate in a village, district, or regional area, on different social, political or economic levels.

Patterns of Behaviour in Thai Farmers

Among the challenges for farmers are that climate and market returns are both beyond their control and unpredictable and may fluctuate within and between seasons. These insecurities lead farmers to accept innovations or make decisions only when they can see direct and positive benefits to them.

> Because of their feeling that their fates are beyond their control they come to depend on outsiders. The paternalistic nature of the Thais, including the

> government, has also helped to increase such dependency. Farmers are spoiled by free subsidy programmes of the government and private donor agencies and have come to expect others to work for them. (Heim, et al. 1986:11)

A case study (Kaosa-ard, Rerkasem, and Roongruansee, 1989:134) revealed that farmers in less advantaged groups, such as those not belonging to economic or financial groups in the village and those not in contact with disseminators of information, tend to have less access to agricultural information. How the information is absorbed depends on the social infrastructure, which often determines who will get the information first. Their study on social infrastructures reveals groups in the village are generally formed by government agencies and commercial firms to disseminate information and facilitate technological transfer. The leaders of the group tend to come from within the village elite and act as regulators or gatekeepers of the information flow. Heim, et al. (1986), considered that farmer self help organisations are needed, not only for spreading new agricultural techniques, but also for farmers to gain bargaining power in the economic, political and social fields.

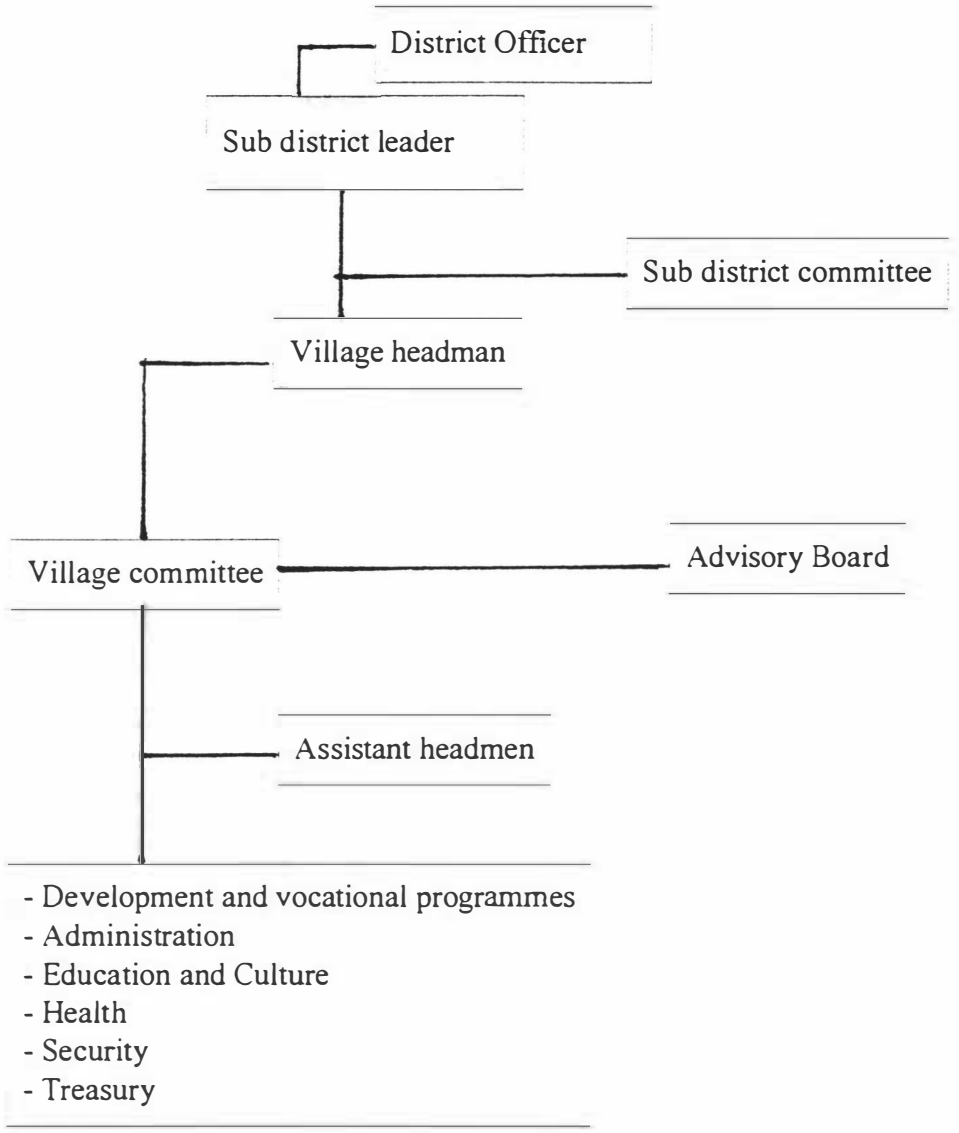
Village Management

Figure 4.2 shows the formal local administration structure, which operates throughout Thailand. The District officer, sub district leader and sub district committee operate outside the village boundary but include representatives from within villages.

> In many tambon councils around the country local leaders including the village headmen and sub-district heads come from within the circle of power elites and have close connections with the central authorities and business tycoons. These connections are very significant components of local politics in Thai society. (Ingavata, 1993:33)

Economically, many people do not have title rights to their land and are in debt. They are dependent on wealthy elites for their survival, which in turn may obligate them to support these local elites politically or in other ways that reinforce their prestige and power.

Figure 4.2: District and Village Administrative Structure within Thailand



Source: Kaosa-ard, et al. 1989.

Each village has a headman or woman who is elected by the village and as with the nominated assistant is a resident in the village. Both receive a small remuneration from the government. A range of other volunteers assists with village management.

> Group membership is generally based on voluntary participation. Grouping patterns vary and may be non structural such as kin, clique or neighbourhood. They may also be structured into groups based on various aspects of village development, or specific livestock or crop type groups. (Kaosa-ard, et al. 1989)

Other key influences in village activities are the head monk from the village temple and the headmaster of the local school. They usually sit on the advisory board for the village. The formal link to government is provided by a sub district committee (Sapa Tambon) which is made up from elected representatives of villages in the sub district and government officials.

Public Sector

Figure 4.3 shows the public sector agencies involved in some aspects of rural development in Thailand. Of the 14 government ministries there are six that work directly in the area of village based rural development and others that are involved in rural planning or infrastructure management. Included in these ministries are a number of departments. Many of these departments duplicate the roles of other departments. There are also a number of State Owned Enterprises which operate under the umbrella of various Ministries. The proliferation and expansion of bureaucracy as part of Thailand's development is seen as a negative effect of development (Prasartset, 1995). Onchan (1990), cites up to 16 organisations responsible for issuing land title or land use rights, which has led to bureaucratic delays and a great deal of confusion. Development project initiatives have often been department driven rather than an integrated package among several departments.

> The top Thai administration agencies are building their own empire. They do not trust each other. Because of the traditional belief that their power will be lessened if there is coordination, this leads to delays and overlapping in the working system. (Changrien, 1978:41)

These delays and overlapping remain evident and lead to situations where villagers are often visited by a succession of officials all with advice, grants or loans from their own department's perspective. Villagers are left to synthesise all information received and decide on an option from what may have become confusing signals. In particular research is an area of considerable duplication where an integrated approach would lead to a stronger base on which to formulate policy and extension advice.

Figure 4.3: Government Ministries, Departments and State Owned Enterprises Involved in Rural Development

The Ministry of the Interior
- The Department of Lands
- The Department of Land Administration
- The Office of Accelerated Rural Development
- Governors responsible for Provincial and District administration

The Ministry of Finance
- The Bank of Agriculture and Agricultural Cooperatives

The Ministry of Industry
- The Department of Mineral Resources
- The Department of Industrial Promotion

The Office of the Prime Minister
- The Budget Bureau
- The National Security Council
- The National Economic and Social Development Board
- The National Education Commission
- The Board of Investment
- The National Statistics Office
- The Department of Technical and Economic Cooperation

The Ministry of Labour
- Department of Public Welfare

The Ministry of Agriculture and Cooperatives
- The Department of Agriculture
- The Department of Agricultural Extension
- The Department of Livestock Development
- The Department of Fisheries
- The Land Development Department
- The Royal Forestry Department
- The Cooperative Promotion Department
- The Royal Irrigation Department
- The Department of Cooperative Auditing
- The Agricultural Land Reform Office
- The Office of Agricultural Economics

State Owned Enterprises
- The Dairy Farming Promotion Organisation
- The Forest Industry Organisation
- The Rubber Estate Organisation
- The Fish Marketing Organisation
- The Government Cold Storage Organisation
- The Office of the Rubber Replanting Aid Fund
- The Thai Plywood Company Limited
- The Marketing Organisation for Farmers

The Ministry of Science and the Environment
- The National Resources Council of Thailand
- The Office of the Environment Policy and Planning

State Owned Enterprises
- The Institute of Scientific and Technological Research
- The National Science and Technology Department Agency

The Ministry of Public Health
- The Department of Public Health

The Ministry of Industry
- The Department of Mineral Resources

The Ministry of Defence State Owned Enterprises
- The Preserved Food Organisation
- The Textile Organisation
- The Tanning Organisation

The Ministry of Commerce
- Marketing Organisation for Farmers

Source: - Assumption University, 1997a
- Limpinuntana, 1982.

Private Sector

In addition to these public organisations there are also others that interface at the village level. These fall into two main categories. First, are the commercial organisations, such as merchant traders who often supply crop and livestock requirements, act as a source of credit and a market purchaser of production. The second group are non government organisations (NGO's), which may operate in the same areas as public or merchant organisations and may or may not integrate with other agencies. Both categories of private organisations may be subject to political influence within pricing structures that may affect the sales of commercial organisations For NGO's there is a requirement that they be registered with the government (Sukjaimitr, personal communication, February 1994). These organisations in turn may influence government policy by direct lobbying for change in policy.

Land Titles

Discussion relating to the public sector mentioned the fact that up to 16 organisations in Thailand are responsible for issuing land use rights or land titles. Onchan (1990:xix) states that "..the problems of tenure and titling have reached critical proportions in Thailand." The right to the secure use of land is an important part of rural development particularly as it relates to borrowing for land improvement. Feder (1993:260), in a study of land titling in Thailand found that up to 21% of the land in private use may be occupied by squatters in forest reserves. While officially squatters land and land with certain title restrictions cannot be sold, transfers of land by sale or through informal mortgages are fairly common. Land reform in Thailand with the significant number of organisations involved is a complex issue. It is also a political issue as those who can gain the land use rights to an area can evict those who have been using the area without any guarantee of title. For cattle management villagers may often find that land they have used for common grazing by agreement within the village has been allocated to business interests from outside the community and is planted in eucalyptus and not available for grazing (Phanomwan, 1987). For those that have land documents that permit occupancy such as the Sor Por Kor documents issued by the Agricultural Land Reform Office, security of land use is more

assured. These documents cannot be openly traded but may be sold amongst family members. This can lead to further fragmentation of land available for grazing cattle.

Rice Production

A central part of Thailand's agriculture has been rice production - as a staple food, an earner of foreign exchange and significant source of government revenue (Marzouk, 1972). Despite an export tax on rice exports imposed by the government following the Second World War, which lowered domestic and farm gate prices, the area planted in rice continued to expand. This continued as new land areas were opened up for agriculture. Phongpaichit and Baker (1995) state that the export tax which became known as the rice premium was at times a significant earner of revenue for the government, reaching as high as 32% in 1953. This rice premium was finally abolished in 1985.

Table 4.1 shows the dramatic rise in paddy area and in particular the dramatic growth in the Northeast with 17.5 million rai added to the area cropped in the four decades from 1950 to 1990.

Table 4.1 Area sown in paddy rice, 1950-1990

Area: (million rai)

Region	Crop Years (First crop)			Second crop(1)
	1950-52	1965-67	1989-90	1989-90
Central	16.9	20.0	11.9 (2)	3.8
North	2.5	2.5	13.8	1.3
Northeast	13.1	16.3	30.6	0.6
South	2.5	3.8	3.1	-
Total	35.0	42.6	59.4	5.7

Source: National Statistics Office, 1994b.

Notes: (1) Second crop rice is dry season (irrigated) rice, area insignificant in earlier years.

(2) Some provinces, reclassified from Central to North between 1965 and 1989.

In 1958 rice comprised 70% of the cultivated area from which 66% of the population earned their living. Rice also comprised 40% of the total value of agricultural output (Krongkaew, 1995:332).

Rice Varieties

There are many varieties of rice grown in Thailand depending on season, dryland or irrigated land availability, market requirements and traditional consumption patterns. In the Northeast 60% of the rice grown is glutinous or sticky rice (National Statistics Office, 1995b). This rice can be grown on a wider range of soil types, has fewer input requirements and is preferred by those who live in or were born in the Northeast, particularly those of Lao origin. The other main variety grown predominantly for export in jasmine rice. This rice is the preferred rice crop in the southern Northeast where the tradition of eating sticky rice is not as high among those who have Khmer ancestry.

Rice and Diversification

Thailand's competitive advantage during the period of the last 40 years has been the availability of abundant land and relatively cheap labour. Land development, based on the extensive development of new areas coupled with infrastructure development, particularly roading has led to new areas being opened up for agriculture. This is particularly so in the Northeast and despite an increased emphasis on new crops and livestock options. Rice, however, has remained dominant. Land is now becoming more scarce and the terms of trade for rice are declining this is heightening the drive to diversify into new high value crop and livestock options.

Agricultural Diversification

During the 1950's, 60's and 70's surplus land and a demand for food exports encouraged a wave of diversification out of rice and rubber (which dominates in southern Thailand). Farmers expanded production of upland field crops, mostly cassava, kenaf, maize and sugar and also mung beans and sorghum. Expansion was achieved largely through

extensification, through large public investments in roads and primary irrigation projects which supported steady growth in output (Christensen, 1992:3)

Table 4.2 shows that the total area of farming land grew from 64 million rai in 1961 to 133 million rai in 1991. The percentage share of field crops, primarily, cassava, maize and sorghum grew from 14-25% over the same period and all cropping uses other than rice had a positive growth rate.

Table 4.2: National utilisation of cropping land, 1961-1991

Unit rai (000's)

Year	Paddy	Field crops	Tree crops	Vegetable and flower	Other (a)	Total
1961	37,948	9,023	9,496	na	7,996	64,463
1971	64,876	11,817	9,423	998	8,033	95,147
1981	73,523	27,384	11,411	300	8,673	121,293
1991	69,313	33,518	20,098	658	9,287	133,076
			Share in percent			
1961	58.9	14.0	14.7	na	12.4 (b)	100.0
1971	68.2	12.4	9.9	1.0	8.4	100.0
1976	63.0	18.9	9.1	0.3	8.7	100.0
1981	60.6	22.6	9.4	0.2	7.2	100.0
1986	57.2	24.7	10.7	0.4	7.0	100.0
1991	52.1	25.2	15.1	0.6	7.0	100.0
			Growth rates			
1961-67	0.103	0.102	0.100	na	0.100 (c)	0.102
1971-78	0.101	0.105	0.101	0.091	0.100 (c)	0.101
1980-85	0.170	3.460	3.740	9.660	1.480	1.410
1986-91	-1.340	0.610	7.060	7.090	0.500	0.410

Source: TDRI, 1995:15

Notes: (a) Other includes housing areas and idle land

(b) For 1961-1967 these figures include areas of vegetable crops and flowers

(c) Growth rates are obtained by regression

The rapid expansion in land areas shown above led not only to an expansion of total production but also to a diversification in the types of crops grown. Upland areas, particularly in the Northeast while not suited to rice due to topography were ideal for dryland crops such as cassava and kenaf (Rigg, 1987:371). These crops were and still are preferred because they require little input in terms of labour or fertiliser and they are drought tolerant. Table 4.3 shows detail of the crops grown for each region during the decades between 1961 and 1991. This shows the continuing dominance of rice in the Northeast compared to other regions, the dominance of cassava in this region also and the relative declines of other field crops in the Northeast.

The government would like to encourage production away from these traditional and dominant crops in the Northeast, particularly rice and cassava. Terms of trade for these crops has declined with a declining comparative advantage in rice exports and a smaller export quota for cassava chip in the European Union (TDRI, 1995). However, the government is finding it difficult to encourage diversification primarily because they send the wrong signal to producers. There is an inconsistency in policy that allows vested interests in the form of growers and exporters to lobby for price support to hold up prices when the policy is to lower production. As farmers make up the largest bloc of voters there is a tendency to "put in place short term measures to boost the markets without necessarily looking at the long term consequences." (Bangkok Post, 1997:8). Subsidies and price intervention programmes run the risk of distorting price and production structures for the crops and livestock systems they directly support and for those they are trying to encourage. A financial evaluation of a range of cropping and livestock options is presented and discussed in Chapter Five. It further shows that diversification in the economic conditions prevailing during the period of research, would be a low return option for most farmers.

Table 4.3: Share of selected crops by region

Percent of Cultivated Area

Crops		Year	Northeast	North	Central	South	Whole Country
Rice							
	Rice						
		1961	30.49	14.58	25.23	6.12	76.43
		1970	28.95	13.78	17.84	4.59	65.16
		1980	27.80	12.36	11.95	4.01	56.12
		1985	26.35	11.79	11.09	3.27	52.51
		1991	27.49	11.23	9.44	2.78	50.94
Field Crop							
	Cassava						
		1961	0.06	0.02	1.08	0.06	1.23
		1970	0.24	0.04	1.46	0.19	1.94
		1980	4.47	0.21	2.46	0.00	7.14
		1985	4.89	0.43	2.83	0.00	8.15
		1991	5.33	0.80	2.42	0.00	8.56
	Maize						
		1961	0.65	1.06	2.00	0.08	3.79
		1970	1.06	3.50	2.99	0.10	7.64
		1980	2.23	4.59	1.99	0.02	8.83
		1985	2.88	5.07	2.96	0.02	10.93
		1991	2.31	4.12	1.98	0.10	8.51
	Sugar Cane						
		1961	0.45	0.44	0.56	0.05	1.5
		1970	0.09	0.14	1.10	0.00	1.34
		1980	0.30	0.36	2.37	0.00	3.03
		1988	1.00	0.73	2.34	0.00	3.61
		1991	0.94	1.4	3.00	0.00	5.35
	Other Field Crops						
		1961	3.99	1.23	0.87	0.19	6.28
		1970	4.02	2.80	1.15	0.29	8.27
		1980	1.51	4.40	2.45	0.11	8.48
		1985	0.94	4.86	2.11	0.10	8.01
		1991	1.35	4.86	1.67	0.10	7.98
Tree							
	Rubber						
		1961	0.00	0.00	0.74	6.57	7.31
		1970	0.00	0.00	1.06	9.95	11.02
		1980	0.00	0.00	0.87	8.60	9.47
		1985	0.00	0.00	0.82	8.27	9.09
		1991	0.15	0.00	1.35	8.75	10.25
	Coffee						
		1980	0.00	0.02	0.00	0.20	0.23
		1985	0.00	0.01	0.00	0.23	0.25
		1991	0.00	0.02	0.01	0.45	0.48
Vegetable							
		1961	0.27	0.47	0.26	0.16	1.15
		1970	0.18	0.54	0.47	0.23	1.41
		1980	0.17	0.57	0.75	0.06	1.55
		1985	0.13	0.40	0.05	0.01	0.58
		1991	0.09	0.38	0.45	0.02	0.94

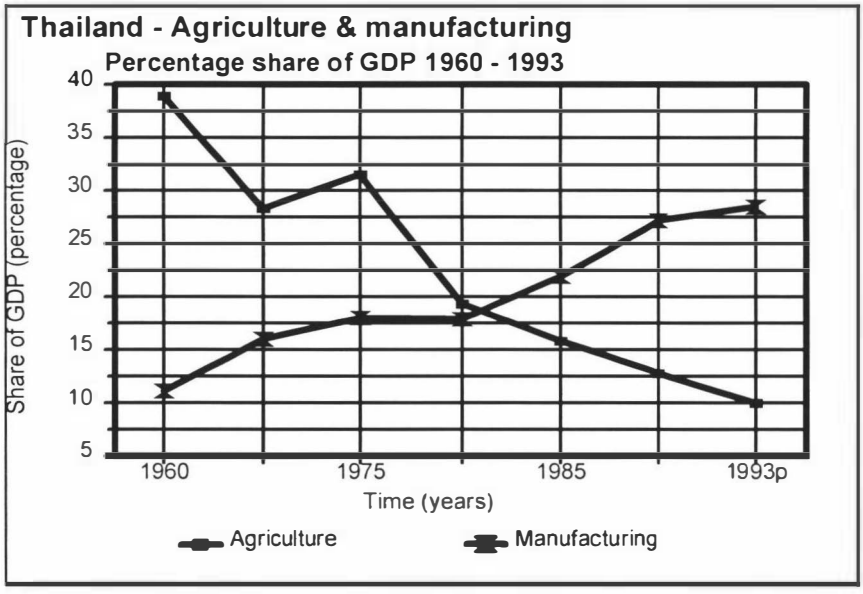
Source: TDRI, 1995:20

Notes: Other field crops include, mung bean, sorghum, soya bean.

National Development Plans

In 1961 Thailand began to implement a series of five yearly national development plans. To date seven such plans have been implemented. Despite apparently targeting all sectors of the economy the effect has been higher industrial than agricultural growth. Thailand's economy has grown rapidly during this period. Figure 4.4 shows that in terms of growth share manufacturing and other industry has grown at a greater percentage share of GDP than agriculture.

Figure 4.4: Percentage Distribution of Agriculture and Manufacturing GDP, 1960-1993



Source: - Krongkaew, 1995:337.

- Alpha Research Company and Manager Information Services Ltd, 1995.

Table 4.4 details the share of GDP by sector and shows the trend in real growth rates of these sectors. It shows that with constant prices in each decade high total growth rates have been maintained in all sectors. While agriculture has declined in its growth rate as a percentage of GDP it is still has a significant impact on total GDP.

Table 4.4: Gross Domestic Product (GDP) Share and Real Growth Rate by Sector

Period	Sector				(%)
1.Share (a)	Agriculture	Industry	Services	Others	Total
1961-65	36.1	20.4	37.7	5.7	100.0
1971-75	25.4	24.6	42.9	4.6	100.0
1981-85	19.4	30.1	44.9	5.6	100.0
1991-93	12.6	38.3	44.5	4.6	100.0
2. Growth (b)					(% pa)
1960-70	5.7	11.6	8.1	-	8.0
1970-80	4.2	8.9	7.1	-	6.9
1980-86	3.7	6.5	7.6	-	5.3
1986-91	4.5	14.6	5.8	-	10.7

Source: TDRI, 1995:6

Notes: (a) - Industry includes, manufacturing, construction, electricity and water
- Services include, transport and communications, wholesale and retail trade, banking, insurance and real estate, ownership of dwellings.
- Others include, mining and quarrying, public administration and defence.

(b) 1961-65 GDP based on 1962 prices
1971-75 GDP based on 1972 prices
1981-93 GDP based on 1988 prices

In broad summary the first plan emphasised infra structural needs for both urban and rural areas, roads, dams, electrification and limited irrigation. This was also the starting period for widespread commercial forestry. In the second plan (1967-71) the emphasis for agriculture's role in the plan was for cash crops, sugar, cassava, rice for both further processing and for export (Sriphal, 1987). For agriculture in the third and fourth plans (1972-81) "new agriculture" or the green revolution was emphasised. During this period

abundant land was available as forest clearing continued. There was a demand for the commodities produced by Thailand as it became the world's top rice exporter and a leader in cassava and sugar production. Research and extension facilities grew. However, despite these efforts results were variable with higher yields in some areas only where adequate extension, capital support and irrigation were provided. In other areas, notwithstanding initially good yields from recently cleared forest land, results were mixed and yields soon dropped. With variable climate, poorer soils, less infrastructure, less research and extension support, the successful results of the green revolution were less obvious (Asian Productivity Organisation, 1994). The fifth plan (1982-86) was called a rural development plan. It was recognised by the government "that rural problems were caused by past development strategies aimed at capitalising on rural resources to increase national income and products instead of regarding rural development as a basis for the countries economic and social development" (Sriphal, 1987:8).

Among the rural problems cited in the fifth plan were:

1) A slowing of growth in agriculture. As shown in Table 4.4
2) A widening gap in agricultural incomes which in 1961 were 16% of the rates paid in other sectors but in the 1980's had fallen to only 8%, with a rise in the level of rural poverty to an estimated 43% of rural households below the poverty line.
3) Large scale migration (temporary and permanent) to urban areas, almost exclusively Bangkok, with its 53% of the nations GDP, and the consequent social dislocations caused by that migration. (NESDB/JICA, 1994).

The emphasis for the sixth and seventh (1978-96) development plans for Thailand shifted towards the aim to become a newly industrialised country. Agricultural exports were targeted and rural growth was emphasised mainly as a means of decentralising production from Bangkok. In the newly released eighth plan (NESDB, 1997) a new paradigm has been signalled with a change from a sole focus on economic growth to the creation of an enabling environment to support and encourage human development.

Agriculture and Industrialisation

Some see the provision of food for urban needs as agriculture's sole purpose. During the period covered by Thailand's first five development plans there was abundant food. With the forest cover as a percentage of total land cover being depleted from an estimated 50% down to an estimated 28% in 1990 there were also abundant land resources (Phatumvanit and Panayotou, 1990:7). As stated previously, Thailand's agriculture provided exports of agricultural products. Also agriculture provided raw material for industrial production, e.g. cassava and rice for starch and alcohol production, rubber, sugar and timber.

Where Thailand's situation varied from other Asian countries, for example, Taiwan is that there was a great increase (due to deforestation) of cultivatable land area in Thailand. In Taiwan increases in yields came mainly from increases in cropping intensity rather than extra land. In Thailand there has not been the same need or incentive to increase yields per hectare (Asian Productivity Organisation, 1994).

The figures in Table 4.5 show a substantial decline in agriculture's share of GNP (Gross National Product) from 40.5% in 1960 to 32.2% and 24.9% in 1970 and 1980 respectively and a further decline to 12.9% in 1990. There is a rapid increase in the manufacturing share in the four periods shown. Yet the decline in the agriculture share of total employment has been as slow to drop as it has been to rise in the manufacturing sector. Thailand remains a rurally based economy (Hutaserani and Roumasset, 1991).

Table 4.5: Percentage Share of Gross National Product (GNP) and Employment by Sector, 1960-1990.

Sector	Agriculture		Manufacturing		Others	
	GNP share	Employment share	GNP share	Employment share	GNP share	Employment share
1960(1)	40.5	82.4	18.1	4.2	41.4	13.4
1970(1)	32.2	79.3	23.4	5.9	44.4	14.8
1980(1)	24.9	70.8	29.9	10.3	45.2	18.9
1990(2)	12.9	65.3	35.3	16.2	51.8	18.5

Source: (1) National Statistics Office, 1994b.
(2) Alpha Research Company and Manager Information Services Limited, 1995.

Notes: Agriculture includes, forestry, fisheries and primary processing of agricultural products.
Manufacturing includes, mining, quarrying and construction
Others include, public administration, defence and utility supply, wholesale and retail trade and services.

Thailand has made a contribution from agriculture to the economic development of other sectors, by providing food for domestic consumption and export, supplying labour and produce for industrial expansion and supplying capital to other sectors. In addition to a greater or lesser extent by providing a demand for products from other sectors for use in agriculture. For the past century, agriculture has been central to the Thai economy in terms of its contribution to growth, employment and foreign exchange earnings. Even in the 1990's when its GDP share shrank to less than 13%, the agricultural sector still accounted for more than 17% of export earnings and employed about 60% of the total labour force (TDRI, 1995). An important component of agricultures contribution to economic development has come from the cattle sector. This will become increasingly important as the government attempts to meet the growing demand for beef and supply viable diversification options for farmers.

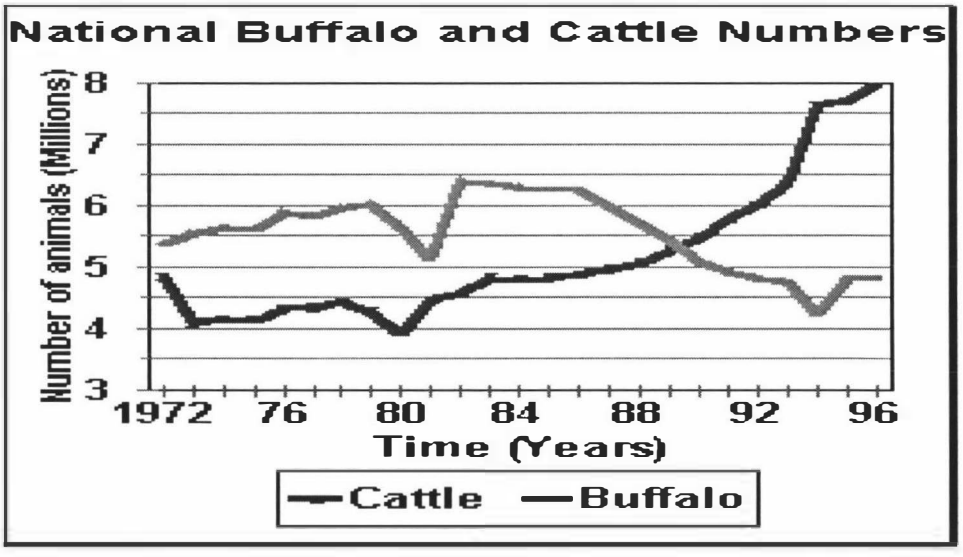
Cattle Infrastructure

This section examines the infrastructure surrounding the cattle industry. It does not attempt to define how the industry is structured over the whole country, but does use national and other regional figures as point of comparison to the Northeast. The main points covered include a) trends in total numbers over recent years, b) production systems c) marketing and processing infrastructure.

Cattle Numbers

Figure 4.5 shows the trends in national buffalo and cattle numbers from 1972 to 1996. During that period there has been a steady increase in cattle numbers and an overall decline in buffalo stocks.

Figure 4.5: Trends in National Buffalo and Cattle Numbers, 1972-1996.



Source: Food and Agriculture Organisation, 1997

Table 4.6 shows both cattle and buffalo numbers for the Northeast and the rest of the country for the period 1988 to 1996. It shows that in the Northeast total cattle numbers rose by 54% from 1,908,000 head in 1989 to a peak of 2,922,000 head in 1994. For the whole country cattle numbers have recorded a constant growth from 4,968,000 in 1988 through to 7,700,000 in 1996. The peak in numbers in 1994 in the Northeast is a direct

result of government efforts to boost cattle production. In one project alone, the Green Issan scheme described in Chapter Five, 19,750 head of cattle were imported into Thailand and distributed to farmers in the Northeast (Euroconsult Minster Agriculture Limited, 1992). The continued growth in national figures is as a result of many of these same animals leaving the Northeast for other regions in 1995 and 1996. The reasons for this decline are discussed in the section relating to projects in the Northeast. Buffalo numbers have shown a steady decline in both the Northeast and nationally during the period covered in Table 4.6. There are three reasons for this decline. First, as farmers access alternative and more lucrative employment in the growing industrial sector they can no longer afford the time to prepare land for planting with a buffalo. Secondly, growth in the number of small two wheel tractors and relatively cheap fuel has provided a quicker alternative for preparing land. Thirdly, with one or more members of a family working for periods of the year away from the village, the task of feeding the buffalo is harder. Fourthly, the price of buffalo meat has remained relatively high at a level comparable to beef. Buffalo meat is suited for the unsophisticated purposes for which much of the red meat in Thailand is used. (Asian Productivity Organisation, 1997). Significant quantities are used or consumed as meat balls and soup stocks.

Table 4.6: Cattle and Buffalo Numbers for Thailand and the Northeast, 1988-1996

Unit (000's)

	Cattle	Annual Trend		Annual Trend	Buffalo	Annual Trend		Annual Trend
	Northeast	(%)	Country	(%)	Northeast	(%)	Country	(%)
1988	1849		4968		4228		5998	
1989	1908	3.1	5072	2.0	4076	(3.7)	5708	(5.1)
1990	2006	5.1	5284	4.2	3777	(7.9)	5442	(4.8)
1991	2031	1.24	5481	3.7	3682	(2.6)	5094	(6.8)
1992	2097	3.2	5771	5.3	3597	(2.4)	4918	(3.6)
1993	2247	7.1	6023	4.4	3498	(2.8)	4804	(2.3)
1994	2922	30	6360	5.6	3460	(1.0)	4753	(1.0)
1995	2890	(1.2)	7037	10.6	3009	(14.9)	4224	(12.5)
1996	2820	(2.4)	7700	9.4	2942	(2.3)	4087	(3.3)

Source: National Statistics office, 1994a and 1995b
Food and Agriculture Organisation, 1997

Note: ( ) signifies a decreasing trend

Table 4.7 shows the trend in cattle and buffalo numbers in Surin Province since 1989. This shows an overall growth in cattle numbers over the past eight years of 74%, from 82,000 head in 1989 to 143,000 in 1997. There was a peak in numbers in 1995 and a decreasing trend from that point. The reason for the decline in numbers from 150,000 in 1995, is discussed in relation to the projects outlined in Chapter Five. The reasons are related to government policy and macro economic trends. It should also be noted that buffalo numbers rose from 227,000 head in 1989 to a peak of 318,000 in 1992 followed by a sharp fall to 190,000 in 1997. This represents an overall drop of 45% from 1989 and a 60% drop from 1992 numbers.

Table 4.7: Cattle and buffalo numbers for Surin province 1989-1997

(000's)

Year	Cattle	Buffalo
1989	82	277
1990	94	294
1991	100	255
1992	130	318
1993	127	301
1994	145	299
1995	150	263
1996	146	203
1997	143	190

Source: National Statistics Office, 1993
National Statistics Office, 1996
National Statistics Office, 1997
Department of Livestock Development, 1989-1997

Production Systems

Most cattle in Thailand, and particularly in the Northeast, are farmed in a mixed cropping and livestock regime. However, there are the full range of other systems operating as described in Chapter Two. These include feedlot systems that use by-products such as pineapple bran and sugar cane from factories near to their operation and extensive ranches farming cattle in mobs on open areas of pasture. This section will not discuss all the options again but will cover one system operating in the Northeast region. This system is chosen because it has structured an alliance between producer, processor and the market. The operation is known as the Thai French Consortium. Their system is vertically integrated from the breeding of animals through to the meat provided to the consumer. Farmers are provided with semen from meat producing European breeds of cattle for their cows. The progeny are reared in the village for two years using feed provided by the consortium. When killed and processed in their own facility the meat is sold on contract to restaurants and supermarkets in Bangkok and the Northeast. The system is interesting because it provides the farmer with animals, advice and a guaranteed return. Considerable hidden cost has been involved in setting up the operation and while the meat sells for a premium the real net margins barely compensate for the additional cost and risk. Nonetheless it shows that systems involving farmers producing to specification are possible in this region.

Marketing and Processing

Live cattle markets are widespread throughout the country and are held at several locations in all provinces. These hold regular weekly sales and the research carried out by the author in Surin show they are well supported by villagers. They not only provide a sale point for animals delivered to the sale but also help in setting benchmark prices for animals sold directly from villages. The bulk of animals are still sold directly from the village and several traders will regularly visit looking for cattle. Prapertchob and Kachamont (1983) describe the chain of custody from farm to consumer. This shows an animal passing through the hands of up to five brokers before sale. Sornnuwat in

Baconawa (1994:145), found that meat still passed through up to five brokers or agents. However, the percentage margin of the retail meat compared to the village price had dropped from 54% in 1978 to only 49% in 1991. Municipal abattoirs are available in most provinces but sanitation standards are quite primitive and there are plans to increase the quantity and quality of facilities (Supachai, personal communication, July 1997). This will involve a mix of both private sector and public sector investment. There is no standard grading system for cattle and the meat is usually sold unspecified as to type or quality. Cattle are transported to market and slaughter in open trucks, usually tied individually to the truck. Any animals transported across provincial boundaries must have a health certificate signed by a government veterinarian. All cattle sold at live markets in Surin were vaccinated before they were unloaded from the truck. In addition to abattoir slaughter there are estimates that up to 25% of the beef consumed in Thailand comes from illegal importation from adjoining countries particularly, Laos, Cambodia, Burma and to a lesser extent Malaysia (Supachai, personal communication, July 1997). Not only does this disrupt the local market but makes control of cattle diseases extremely difficult.

Characteristics of the Northeast

Figure 4.6 shows a map of the Northeast region with provincial boundaries. The province adjoins Laos on the North and East separated by the Mekong river. The Southern boundary adjoins Cambodia, and to the West the Central region.

Figure 4.6: Map of Northeast Thailand

Source: National Statistics Office, 1995b

Geography / Climate

Northeast Thailand is on a slightly elevated plateau of 106.25 million rai, 100-300 metres above sea level and between latitudes 14 and 19 degrees North. Most agricultural land is flat to gently rolling, with soils which are mostly sandy, acid and low in organic matter, plant nutrients (particularly nitrogen, phosphorus, sulphur) and water holding capacity (Hare, 1993). River flood plains with good alluvial soils account for only 8% of the area (Durno, 1992).

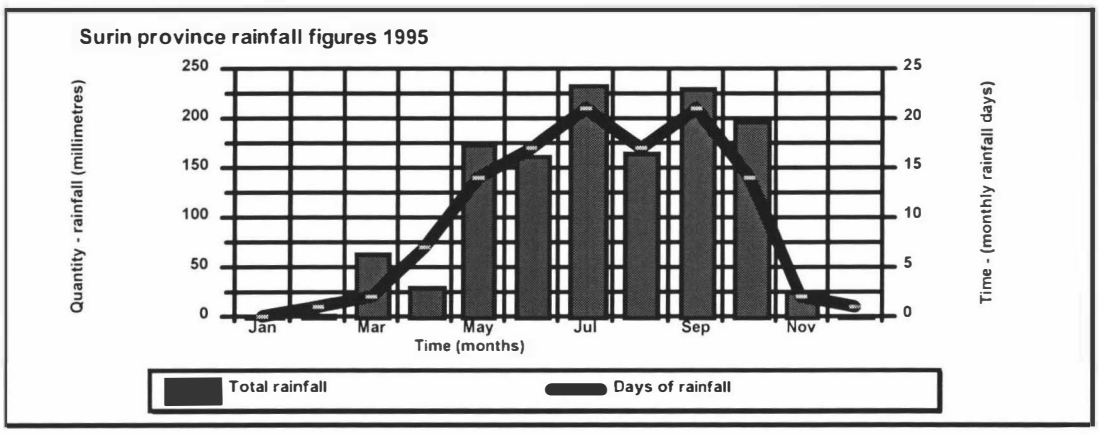
An extremely important characteristic of the natural resource base in the Northeast was recognised and documented from research carried out in the late 1970's and early 1980's by the Khon Kaen University and Ford Cropping Systems Research Project (Grandstaff, 1988). This was the concept of the mini watershed that recognises that in many parts of Northeast Thailand, upland, lowland and marginal paddy land exist side by side at the micro level. The difference in elevation may be only a few metres and the horizontal distance from less than 100 metres to a kilometre or two.

Categories such as these were found to be extremely important to the local inhabitants in organising how they utilised their resources.

> Most villagers find differences in their resource base and use different parts of the base differently, for example to plant different varieties of rice in different places at different times. Specific cropping and other land use patterns, in this regard, can differ from place to place, but the general characteristic of diversified land type and diversified cropping practices is very widespread. (Grandstaff, 1988:12).

Figure 4.7 shows that there is a pronounced seasonal rainfall with more than 80 percent of the annual rainfall (approximately 1250 mm) falling from May to October.

Figure 4.7: Surin Province. Total Rainfall and Days of Rain, 1995



Source: National Statistics Office, 1996.

From November to February there is a reliable cool dry season with shorter day lengths. Limpinuntana (1982:12), found that it was not so much the average annual rainfall that was limiting cropping in the Northeast, but rather the variation in rainfall from year to year. Indeed, the weekly and daily patterns during the growing season varied highly from year to year. Such highly erratic patterns mean that the farmers cropping strategy must be complex in order to contend with high uncertainty. The farmer cannot have just one seasonal strategy under such conditions, because each year the rainfall pattern may be different from that of the year before. Rainfall also differs from place to place during the same season, with varying effects, depending on topography and soil. The problem is most commonly due to drought but flooding may also be a problem, and often both occur in the same season. Low land and marginal paddy or upland are usually differentially affected by the rainfall extremes for example when lowland paddy is threatened by submergence rice on marginal paddy land may do well. In one year one village may do well, in another its neighbour.

Demography

The Northeast region, with an estimated population of 19 million people in 1990, has more than a third of Thailand's total population and 33% of its land area. It is the least developed region of the country. Per capita income was only 37% of the national average in 1990 (NESDB/JICA, 1995:1).

The region is traditionally a source of migrant labour for industrial enterprises in the Bangkok Metropolitan area and abroad. This migration is almost permanently seasonal. Few migrants settle permanently in Bangkok or other areas of seasonal employment. The bulk of the migrants return to their homes for at least part of the year. As a result, the population of the region has grown at about the same rate as that of Thailand despite low relative incomes. The low incomes in the region are due to a combination of reliance on agriculture, limited rainfall and its uneven distribution within the year, and problematic soil characteristics, particularly acidic and saline soils. Non agricultural employment and income opportunities are extremely limited. Industry accounted for 15% of regional income. Manufacturing was largely confined to rice and cassava milling, production of paper pulp, concrete products and light engineering (NESDB/JICA, 1995).

Regional Income

In Thailand, as in most developing countries, the bulk of the population live in rural areas. Krongkaew (1995) puts the figure at 65% of the labour force in farm households as at 1992. Table 4.8 details the average cash income of farm households for the whole country and for each region over a period from 1976-1992. The important points to note are that the Northeastern region has the lowest net cash farm household income in the country, with 25210 baht in 1991/92 compared with 34161 baht nationally for the same period. Of the portion derived from on farm income the percentage derived from livestock in the Northeast has been consistently higher than in other regions during the period studied. In 1991/92, 6.08% of cash farm income was derived from livestock against a national average of 3.47%. Also of significant note is that in 1991/92 almost 76% of all household income in the Northeast was derived from non farm sources. Again, this is higher than the national average of 67.12% during the same period. It is significant because it impacts on the amount of time available for on farm activities related to crop and livestock, production and marketing.

Table 4.8: Average Cash Income of Farm Households by Region, 1976/77 - 1991/92

Unit: Baht per household per annum

Period (year)	Farm household net cash income		Net farm cash income				Non farm cash Income	
	Amount (Baht)	Total (%)	Amount (Baht)	Total (%)	Crop (%)	Livestock (%)	Amount (Baht)	Total (%)
National								
1976/77	12190	100	6587	54.04	49.73	1.78	5603	45.96
1980/81	24683	100	13353	54.10	44.15	6.27	11329	45.90
1986/87	22306	100	9010	40.39	37.61	8.38	13296	59.61
1991/92	34161	100	11230	32.88	38.78	3.47	22930	67.12
Northeast								
1976/77	7319	100	2787	38.08	31.59	6.68	4532	61.92
1980/81	19067	100	9448	49.56	40.11	8.26	9618	50.44
1986/87	17910	100	6664	37.21	29.13	11.6	11246	62.79
1991/92	25210	100	6063	24.05	22.07	6.08	19147	75.95
North								
1976/77	13830	100	8537	61.73	56.73	5.01	5293	38.27
1980/81	23929	100	14129	59.05	47.55	7.58	9798	40.95
1986/87	18597	100	8652	46.52	47.55	6.37	9945	53.48
1991/92	31411	100	14134	45.00	85.97	2.77	17276	55.00
Central								
1976/77	20986	100	12646	60.26	16.53	6.12	8349	39.74
1980/81	33248	100	18933	56.95	46.32	6.23	14314	43.05
1986/87	30997	100	13392	43.21	44.76	5.33	17605	56.79
1991/92	55036	100	19299	35.07	47.71	-3.53	35736	64.93
South								
1976/77	11539	100	5827	50.50	44.2	4.65	5712	49.5
1980/81	30470	100	15117	49.61	42.27	5.36	15352	50.39
1986/87	33955	100	12268	36.13	33.66	8.28	21687	63.87
1991/92	49637	100	18579	37.43	36.68	-0.25	31057	62.57

Source: TDRI, 1995

Agricultural production, is also concentrated in few products with limited growth prospects. Paddy occupies 64% of agricultural land. Almost all of the balance is in

cassava, maize, kenaf and sugar cane. Fruit and vegetables, other food and feed grain and oil seed production is extremely limited. Paddy is by far the most dominant crop in the study area with a total harvested area of 28.7 million rai in 1994/95. Other important crops in terms of harvested area are cassava with 5.03 million rai, maize with 2.2 million rai, sugarcane with 1.85 million and kenaf with 0.45 million rai respectively.

Two of the major crops in the region are likely to face major price problems in the future. In addition to the declining trend in international rice prices (TDRI, 1995), Thailand will face increasing competition from the countries of Indochina (Cambodia, Vietnam, Laos) who have lower production costs. This is likely to result in lower paddy prices for Thai farmers. Most of the Thai cassava output is produced in the Northeast. Thai cassava farmers have benefited from substantial subsidies from the European Community over the last 10 years. This is likely to end over the next five years as a result of European Union reforms of the Common Agricultural Policy and reforms agreed to under the GATT (General Agreement on Tariffs and Trade).

Regional Strategy

A basic strategy for the Northeast was prepared by the NESDB (National Economic and Social Development Board) in 1989 with the following five aims. First, to promote international trade with adjoining countries; secondly, to establish itself as the centre for international cooperation in financing, technological and academic transactions; thirdly, to promote industrial development through effectively exploiting natural resources indigenous to the region such as natural gas, potash and rock salt; fourthly, to promote agricultural development with emphasis on livestock development, especially cattle raising; and fifthly, to promote tourism with strengthened linkages to Indochina (NESDB /JICA, 1993).

In a NESDB / JICA report in 1995 the government outlined that it will attempt to develop the Northeast region through three policy instruments. First, it will promote industrialisation of the region. Secondly, the region will receive priority in infrastructure development to support industrial development and intensive agriculture. Thirdly,

agriculture will be promoted through a combination of promoting productivity, agro-industry development, support services, and by taking advantage of new possibilities for trading with neighbouring Indochina countries. The stated strategies to achieve this were to aim for the future industrialisation of the region to be based on a combination of promoting Bangkok based companies to relocate to the lower Northeast and support of local entrepreneurs. Agro-industries are projected to be a major component of overall industrial development. They will continue to exploit export marketing opportunities, will serve the national market with livestock products, and will be based on a diversified and efficient agricultural base. A key component of the strategy is that livestock are projected to play a major role in the future agricultural development of the Northeast. the region has a major share of the cattle and pig population. In the case of cattle, however, productivity is very low and the quality of beef output is very poor. Much of the production is only suitable for making into traditional meat products such as meat balls and Chinese sausage. Thailand has to rely on imports to serve the tourist trade and Thai domestic demand for high quality beef. Despite a growing demand for good quality beef and milk of approximately 10% per annum, local production has remained low.

Summary

This chapter provides a social and economic outline of the past development and current situation in Thailand and the Northeast, with particular reference to agricultural and beef cattle development. The structure of society has formed a pattern of behaviour in farmers that relies on patron client relationships and relatively passive behaviour. There is a large public sector administration which extends down to the village level. Duplication of government department responsibilities leads to duplicated efforts and confused signals to villagers. Within agriculture, despite government efforts to diversify production, rice remains the primary crop. Successive development plans have led to industrial expansion which has exceeded agricultural growth. Widening income gaps between agriculture and industry means migration mostly seasonal between the annual rice crops is widespread. There are efforts to relocate more industry, particularly agro industry from its dominant location surrounding Bangkok to regions such as the Northeast.

Cattle have traditionally been farmed in the Northeast and have a complementary relationship with grazing of crop residues and the accumulation of capital. Productivity is generally low and most systems of production are low input. Pressure on land use which is limiting access to communal grazing and the opportunity to earn more income outside than inside the village hinders efforts to increase numbers. Key issues to investigate in following chapters are the competitive advantages that cattle farming holds, how the role of cattle is perceived by villagers and policy makers and how efforts to increase numbers and productivity have been attempted.

Chapter Five

Beef Cattle in Northeast Thailand

This chapter identifies the key constraints to increasing, or intensifying, cattle production within the current socioeconomic framework in Northeast Thailand. Two main areas will be covered; First, the results of research carried out by the author in six villages in Surin Province in the Northeast is detailed. This will include an analysis of cattle production, in context with other village activities to establish physical and economic interrelationships. Secondly, an outline and discussion of several projects that have been implemented in the Northeast to boost cattle production is presented. This chapter will summarise the research carried out and attitudes to farming beef cattle within the current socioeconomic framework.

Livestock sector overview

Cattle production is closely related to the crop production system in Issan. Traditionally each farm family owns a small number of animals and uses low-cost production technology. These are based on open access to common resources, the use of crop residue and family labour. During the dry season, animals are herded on harvested paddy fields with rice straw and native grasses used as supplementary feed. During the wet season animals are grazed on common or forest land and grass (native or improved species) is often cut and carried for animals to avoid damage to land being cropped. Very rarely does a Thai farmer allocate arable land to livestock husbandry unless it is fallow between planting seasons. Agricultural residues in the form of rice straw or other crop by-products are a main source of feed for animals. Other sources of feed are communal grazing land or forest. The main investment is in the purchase of livestock. Very little expenditure is allocated to animal husbandry and most labour is provided by under employed family members. Cattle can therefore be seen as a very cost effective means of converting agricultural waste and under employed labour into capital. It is also a means of converting common resources into private property. Farming cattle can thus be seen as a means of mitigating against an unequal distribution of income by converting under utilised

resources (labour and farm waste) into productive capital. However, for many farmers the opportunities for off farm employment provided in recent years together with the low productivity of cattle production has led to a decrease in numbers farmed. (Panayotou, 1985:209).

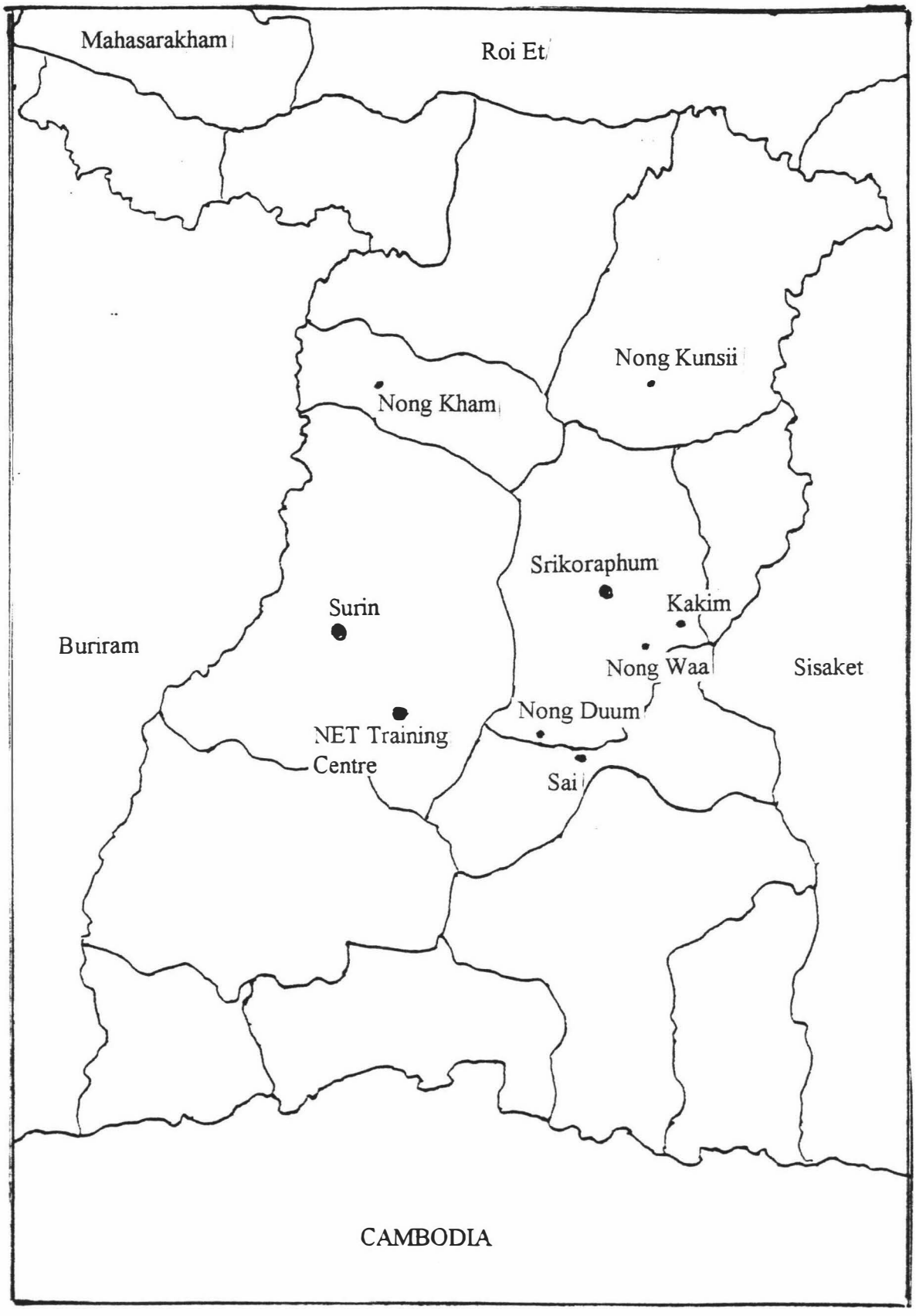
Village based research

Location of the Villages

Figure 5.1 shows the location of the study villages and their relationship to the main centres of commercial and administrative activity. These six villages are all located in Surin Province in four different Amphur (Districts). They represent a mix of lowland and upland with a range of cropping options and a varying availability of communal or forest land for cattle grazing. All of these villages, as with the bulk of Issan (Northeast Thailand), rely on rain fed agriculture only.

Nong Duum and Sai are located within 5 kilometres of each other, approximately 45 km from Surin. (The provincial capitals in Thailand are usually the largest cities and bear the same name as the province. The same rule applies to district and subdistrict areas). The closest produce, livestock market and railway station is at Srikoraphum 18 kilometres away. Both of these villages are in a lowland area which is flood prone in the wet season. There is little common or upland for cattle grazing and the sole crop grown is rice. Kakim and Nong Waa are similarly close to each other, approximately 20 km from Srikoraphum but further away from Surin. Rice is the dominant crop but cassava and kenaf are common on the upland or marginal lowland areas that cannot support a rice crop. Nong Kham is 52 km from Surin and 42 km from the nearest cattle market. The nearest produce market is at Jomphra 21 km from the village. This village has the greatest access to additional forest grazing which is a boost to cattle production. However, its location at the end of a 12 km road appears to limit the flow of market information, an aspect which will be discussed later. Nong Kunsii is the last study village and at 105 km from Surin, the furthest from the main town. However, it is in the direction of other centres of activity and located near main roads. It could be considered one of the more developed villages. Although 65 km from the nearest cattle market at Srikoraphum it lies close to a main feeder road from that district to the South and to other districts further North.

Figure 5.1 - Map of Surin province



Source: National Statistics Office, 1996

Demography

Table 5.1 summarises the number of households, village population and the ethnic and linguistic background of each village. The village size in terms of number of households varies from 56 at Nong Duum to 89 at Sai. This compares to the average village household of 130 in the 1,912 villages of Surin (National Statistics Office, 1996). Village populations vary from 384 at Nong Duum to 480 at Nong Waa. With only minor variations the populations are evenly split according to gender. Nong Duum has only been in existence for 20 years which is common to many villages in Issan due to villages expanding to newly cleared forest land. The other study villages are all between 60 and 80 years of age.

There are some minor variations in the ethnic and linguistic background of each village group. Throughout the country there are several languages or dialects spoken. Central Thai is the official language which was spoken by all the villagers. The majority of Issan is populated by people of Laotian descent, who speak Issan, a dialect closely related to Lao, the language spoken in neighbouring Laos. People who spoke Issan as their first language were represented in Nong Duum, Kakim and Nong Kunsii. Along the southern Issan border with Cambodia there are many villagers descended from families who emigrated from Cambodia. These villagers speak a Khmer dialect similar to that spoken in Northern Cambodia as their first language. These Khmer speakers were represented in Nong Waa and Nong Kham. A much smaller ethnic group with their own language are the Suay people. Suay is an ethnic group that came originally from an area encompassing Northern Cambodia, Southern Laos and the Southern area of Northeast Thailand. The villagers in Sai village speak Suay as their first language.

Table 5.1: Study Villages - Number of Households, Population, Age of Village and Ethnic / Linguistic Background

Village *	Nong Duum	Sai	Kakim	Nong Waa	Nong Kham	Nong Kunsii	Surin average **
Number of households	56	89	65	70	57	81	130
Population	384	438	392	480	409	442	668
Age of village (approx.)	20	80	60	80	-	70	-
Ethnic / Linguistic background	Issan	Suay	Issan	Khmer	Khmer	Issan	-

Source: * Village surveys 1993-1995 and 1997.
** National Statistical Office, 1996.
Note: Excludes municipal areas

Communication

In each village the everyday language used, was based on their original linguistic background. While ethnic origin is not considered significant in terms of farming patterns, it posed some challenges in terms of gathering research material. As the author spoke only central Thai, specific questions were required in most circumstances rather than picking up background conversations. The length of time spent in each village on many occasions enabled a rapport to be built up with many of the villagers and helped in gathering data. However, it would have been more difficult to elicit the same information if only short visits were paid to new villages.

Each village varied in the way they interacted with each other within the village and the orientation to how they approached the challenges of farming in developing their communities. These, it could be suggested, were more related to personalities within the village than ethnic background. However, linguistic background does have important implications in development work in this area. Villagers naturally question the motives of those who come from outside their area, particularly those from Bangkok (Heim, et al. 1986). If an 'outside' development worker fails to gain the respect and confidence of villagers they will find it very difficult to achieve results. The author also saw examples of the reverse situation where government officials considered themselves above the villagers in status and used only central Thai to lecture villagers.

Village Management

Figure 4.2 outlined a structure for village management. This hierarchy of headman and assistants with various committees was the same in all the study villages and is common throughout Thailand and the Northeast. In addition to this standard structure and because of their close involvement with NET Foundation, all the villages had some additional operating committees. A cattle committee operated in each village, the structure and operation of which is discussed in the next section. Other operational committees were task focussed and included groups for handicraft production and marketing, savings and revolving credit groups, rice and fertiliser banks. Agriculture groups in many villages focussed on integrating backyard fruit and vegetable cropping with aqua culture and small animal raising.

Village Areas

Generally the landscape could be divided into six areas. First, there was a group of houses with a temple, village store and often a school in the same area. Each house had some fruit trees and a small vegetable plot. Generally there was an animal shelter under or adjoining the house. The second main area was a lowland rice growing area. Most ,but not all, households had rice growing land (see Table 5.2). This area varied in size, was not

delineated and often was not contiguous. However, the areas and boundaries were well known by each family. The third area was marginal lowland which in each season may have been suitable for rice growing if sufficient rain had fallen. The fourth area, upland, was defined as not suitable for rice growing due to its topography or soil characteristics but suitable for other crops such as kenaf or cassava. A fifth area was common land, which was land available to everyone in the village but which may be used for cropping by agreement within the village. The sixth area, water resource land - usually regenerating forest adjoining a dam or reservoir - provided water to the village. Access, particularly grazing access, was tightly controlled by the village committee. Forest land was only available to villagers from Nong Kham. In the context of this thesis forest land was classified as degraded or cut over forest usually accessible to all, including other villages, but owned by the Royal Forestry Department.

Although the number of households and populations were relatively similar, the area farmed for paddy rice and the availability of common or forest land varied considerably. The quality of land in terms of soil characteristics and fertility was also highly varied. A straight line relationship between the size of areas farmed and the profitability of a village or farm was not possible. Table 5.2 summarises information on areas within different land resources. Nong Duum had 775 rai (a rai is 1600 square metres and 6.25 rai is the equivalent of one hectare) for paddy with no common or other grazing land apart from 12 rai which was a water resource area with tightly controlled grazing. Kakim had only 700 rai for rice but did have 65 rai of upland and approximately 100 rai of forest and riparian grazing. Sai had the largest number of households and only 1500 rai for paddy with no upland and only 40 rai of common and water resource area. Nong Kunsii with 81 households - the second highest number amongst the study villages, yet with only 800 rai for paddy had the biggest challenge in terms of land ratio per household. Nong Kunsii had 300 rai of other land, however, grazing access to this was limited as it was a water resource catchment. Nong Waa had the highest population of the study villages with 480 people in 70 households. They had available 2000 rai of paddy but only 12 rai of water resource and 6 rai of common forest. Nong Kham had the greatest resource in terms of land area with 3000 rai for paddy and at least 1000 rai of common forest access and 63 rai of tree plantation upland area.

The area available for paddy in each case is land that in a normal season is sufficiently low lying and has the correct soil properties to hold water for a crucial 3 month period during the rice growing season.

Table 5.2: Study Villages - Land Resource Areas

Unit: Area in rai

Village *	Nong Duum	Sai	Kakim	Nong Waa	Nong Kham	Nong Kunsii	Surin average **
Land resource area							
paddy	775	1500	700	2000	3000	800	1559
upland	0	0	65	0	63	300	152
common / water	12	40	100	6	300	0	21
forest	0	0	0	0	1000	0	92

Source: * Village surveys 1993-1995 and 1997.

** National Statistical Office, 1996

Note: Excludes municipal areas

Farm Size and Land Tenure

The area farmed by each individual family within each village varied considerably. A positive correlation was observed during my period in Thailand between increasing farm size and numbers of cattle farmed. However, it was not possible to formally quantify this during the follow up detailed research questionnaire. In the time available it was not possible to individually question each villager and in the group interviews the respondents were not able to give enough details.

Table 5.3 shows the range in individual farm size from the largest farmed area of 100 rai in Ban Kakim to the smallest area of 1 to 2 rai in most other villages. The average farm size varied from 8 rai to 30 rai. This table also shows those who held land title in each village.

Table 5.3: Study Villages - Range of Individual Farm Size and Land Title Detail

Village *	Nong Duum	Sai	Kakim	Nong Waa	Nong Kham	Nong Kunsii	Surin ** average
Farm size - paddy area							
Largest household (rai)	50	60	100	60	60	40	-
Smallest household	1	6	6	2	1	2	-
Average household	14	17	11	28	52	10	12
Land title detail							
Clear title	8	0	1	7	0	0	-
Sor por kor	38	83	54	61	56	76	-
House only (no title)	10	6	10	2	1	5	-

Source: * Village surveys 1993-1995 and 1997.

** National Statistical Office, 1996

Note: Excludes municipal areas

Of all the villages surveyed only a small percentage of farmers had clear and transferable title to their land. More common was what is known locally as Sor Por Kor title which gives nominal title to the land but prevents subdivision or sale of the land to other than family members.

Credit

In each study village the ability to pay back credit was mentioned as more of a problem than the ability to access credit. Villager interviews (Nong Kham, July 1997) outlined that

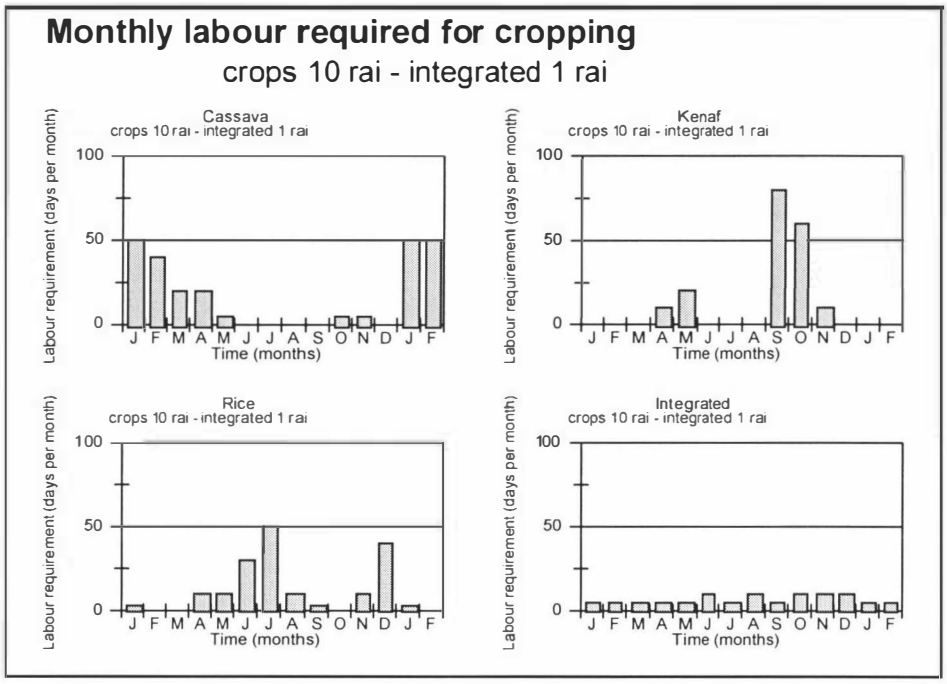
individual loans of less than 60,000 baht were available from the BAAC. If greater than this amount the BAAC would loan on a group responsibility system. There was no registration against the title. A major problem was in the payback of loans which was designated in April. This caused some problems if cattle had to be sold as it was the start of the dry season when market demand for other farmers to buy cattle was low.

Village Activities

The farmers in the study villages appeared to highly value independence and freedom. The growing of sufficient rice to feed their family was a major goal. They also tried to grow sufficient vegetables, fruit and poultry for their own subsistence needs. In addition they valued religious merit and needed cash to make gifts to the monks for upkeep of the wat (temple) and for ordination of the young men. Cash was also required for health and educational needs. Another basic desire appeared to be the requirement to be in good standing with neighbours and relatives.

Although small in scale of operation all the villages operated a significant number of diverse technologies. These were both to adapt to specific physical constraints in each location and to spread the risk of failure in any one operation. The villagers were not simply rice growers engaging in a single economic activity. In fact they were managing quite a complex resource system in which their interaction with one component was likely to affect their relationships with other components. Figure 5.2 shows a diagram of labour requirements for three cropping systems assuming 10 rai of each crop grown. The crops shown are rice, cassava and kenaf which represent the principal crops grown in the target villages. In addition the labour requirements in the cultivation of one rai of fruit, fish and vegetables often referred to as integrated farming is shown.

Figure 5.2: Cropping Calendar Showing Days of Labour Involved in Four Crop Systems



Source: Village surveys, 1993-1995 and 1997

Limpinuntana, 1982.

Notes: Labour required involves whole family or paid labour if necessary

Cassava is produced from a tuberous root and is a drought tolerant plant. Apart from planting and harvesting it has a low management input regime (Rigg, 1987). It grows on upland soils unsuitable for rice. The roots are usually sold from the village as wet roots. Kenaf is a fibre crop with similar properties to jute. It grows on upland soils and management is relatively simple once planted. However, harvesting is labour intensive and requires a supply of water not used for other purposes, for retting the stalks (Askwith, 1973). The kenef fibre is normally sold from the village dried and coiled in large bales. While all of the study villages grew rice as their principal crop none grew all three crops described here in the same year. Cattle and other livestock raising, aquaculture and vegetable growing also take place throughout the year with a more even labour demand. Figure 5.2 shows the highest labour demand for rice during the June and July period. The period was identified in all the study villages as the most difficult in which to allocate time for cattle raising.

Costs and Returns

Table 5.4 shows gross margin returns for individual crops and for a stand alone beef cattle system. The crops analysed are rice, cassava and an integrated farming operation. The results show figures for 20 rai apart from the fruit/fish and vegetable system which is calculated on one rai only. The figures indicate that rice and cassava have the best gross margin in monetary terms but that the integrated option and cattle have the best percentage return. The full gross margins are attached as Appendix Three.

Table 5.4: Predicted Annual Gross Margin Summary for Selected Crops

Activity	Gross margin (Baht)	Gross margin (%)
Rice (20 rai)	8500	37%
Cassava (20 rai)	5400	27%
Integrated (1 rai)	3320	66%
Cattle (20 rai)	4060	75%

These figures do provide some indication of the potential worth of each crop or enterprise. However, they do not allow for the integrated relationship within which most of the systems in the study villages operate. As Limpinuntana (1982:145) notes the "system properties are those properties unique to the system which are created by the interaction of the various components in the system."

To integrate these systems Table 5.5 shows annual household income based on three different simulated earning strategies. These scenarios are representative of systems carried out in the study villages. The calculations are based on actual costs and returns provided during the period of research by members of the study villages. All three scenarios assume a 20 rai plot of land of which 15 rai is lowland and five is upland. The full evaluation, notes and description of scenarios is provided in Appendix Five.

The first scenario involves the growing of 15 rai of rice, four rai of cassava and one rai of integrated farm which produces fruit, fish and vegetables for home consumption and sale. 45,000 baht is borrowed from the BAAC under the Agricultural Restructuring Programme (ARP). The second scenario also grows 15 rai of rice and the full five rai of upland is planted in cassava. One member of the family works off farm for 10 months of the year. In the first year 12,000 baht is borrowed at commercial rates from the BAAC and used to by three heifer calves to rear for breeding. In scenario three five rai of rice is planted for family use. The balance of lowland and upland is planted in grasses and legumes. 75,500 baht is borrowed from the BAAC under the ARP package (see Table 5.5) and five cows are purchased.

Table 5.5: Financial Evaluation of Three Different Livestock and Cropping Options

Enterprise	Cash flow (baht) Year 1	Year 2	Year 3	Year 4	Year 5	Internal rate of return (%)
Scenario 1	5254	10784	13284	11034	11034	16.2
Scenario 2	4555	4555	9555	4555	4555	45.2
Scenario 3	(3360)	(3360)	2640	7865	7865	(1.0)

Source: Appendix Five

Notes: ( ) represents a loss

The results show that while farming cattle may show a profitable return on a gross margin basis this is not the case if significant borrowing is required. Scenario two takes a more long term approach by borrowing a small amount to buy young cattle which are grown out over time. In addition while the cattle are growing to mature animals off farm income of 30,810 baht is earned per annum.

Beef Cattle

Table 4.6 showed that cattle numbers in the Northeast peaked in 1994, which was one year earlier than in Surin province. However, the subsequent decline followed the same trend. Cattle numbers nationwide, however, have continued to grow. The fact that growth was sustained in other areas of the country while the Northeast recorded a drop in numbers indicates that some strong regional factors led to the decline in the Northeast. The greater peak in the Northeast and subsequent decline compared to the rest of the country is a reflection of various projects implemented to boost cattle numbers. These regional factors and their impact are considered in an outline of the research carried out in the study villages. This chapter also outlines and discusses some of the projects implemented to boost cattle numbers in many areas of the Northeast.

The study villages have all been supported by the NET cattle raising project and other NET projects such as handicraft production and integrated farming. The format of these projects will be discussed later, but in many cases the money for buying cattle was obtained from both government and non government sources.

Village Observation

Table 5.6 outlines various production aspects observed during informal discussions and village walks in the study villages. As described in Chapter Three, these were one of the primary data gathering methods used in the study. It is difficult to synthesise observations regarding these production systems as they did vary according to land and labour availability and also the expertise of individual farmers. However, the following observations could be made that were either universal in all villages, or could be applied to the majority. Cattle housing was always adjacent to or underneath the villagers own house. The main reason given for this was fear of theft of the animals overnight.

The strategy for grazing and feeding the animals varied with the season. In general there was more feed available in the wet season, but access to this feed was restricted. Cattle

were either left at the house during the day and fed at night with 'cut and carry' grass or were tethered near the roadside or on paddy bunds. In the cool and dry season feed was less abundant. However, with little risk of trampling crops animals were able to range more freely. Animals were either grouped together and supervised during the day by one or two people or they were still tethered but on a longer rope than during the dry season. In the evening animals would receive some rice straw as supplementation. Dry season feeding relied on adequate water availability for animal needs which often seemed to be a factor limiting production.

Labour allocation also varied with the season. During rice field preparation prior to planting women and children were, in the main, responsible for cattle husbandry. In the cool and dry season following rice harvest and prior to the next planting men and women (but mostly men), migrated temporarily in search of work. Responsibility for cattle management in these cases was the responsibility of those left behind, women, children and elderly members of the family.

Village walks were also valuable for observing the health and condition of animals. Sunrise or sunset walks were particularly useful in this respect as a day time visit would normally find most animals grazing in numerous places in villagers fields. There was a range in the body condition of cattle in the study villages. This appeared to be dependant on both the knowledge and expertise of the individual farmer and the area available for grazing cattle. In general there was insufficient extra feed given to help lactating cows with calves at foot produce more milk. In none of the villages was there a strategy to produce calves at any particular time of the year. A cow calving at the beginning of the dry season with only rice straw for supplementation was particularly disadvantaged. This lack of supplementation for lactating cows was in some case due to lack of knowledge of the need to provide extra supplementation. In some case there was insufficient labour, time or indeed feed to cut and carry the extra feed required. Animal health, monitoring and treatment which can obviously affect the condition and performance of an animal also varied in the villages. Internal parasites were a problem in certain situations with high worm burdens causing ill thrift in animals. External parasites such as cattle ticks and lice were also problems in certain villages and seasons. Again, lack of knowledge of how to treat the animals was cited as a problem, as was the cost.

Table 5.6: Study Villages - Aspects of Cattle Production Observed on Village Walks

Production aspect	General observation
Cattle housing systems	Always adjacent to or beneath villagers own dwelling
Grazing and feeding strategy	Related to the seasons. More feed in the wet season but access restricted and the reverse in the cool and dry seasons. Little evidence of extra feed provided for lactating cows.
Labour allocation	Varied with each season. Women / children during rice field preparation. Men / children during rice harvest. Women / children / elderly during dry season
Cattle health and condition	Wide ranges within and between villages.

Source: Author observation during research completed 1993 - 1995 and 1997.

Problems and Solutions Analysis

This section summarises the results of the problem solution game played in the study villages during the study period. Table 5.7 details these results. The problem / solution game was completed in five of the villages on separate occasions over a period of five months. The methodology of the game is described in Chapter Three. It is designed to elicit the main challenges and possible solutions for a given subject from those within the community. In this instance the game was played with members of the cattle raising group in each village. Not all members were present during the exercise and while some of the female members were present and did participate each group was dominated by males. The gender balance on each occasion is given in Table 5.7. It was not possible in Nong Duum village to arrange for enough people at any one time to complete the game. For ease of presentation the problems have been grouped into four main areas; a) breeding, b) feeding, c) animal health and d) other.

Table 5.7: Study Villages - Identification and Ranking of Problems

Problem / solution	Villages				
	Sai	Kakim	Nong Waa	Nong Kham	Nong Kunsii
Cattle breeding	20	10	20	15	15
Cattle feeding					
Dry season	20	15	20	10	20
Wet season	15	15	10	20	10
Animal health	10	10	15	15	5
Other					
Yarding facilities	10	5		10	
Dog worrying young stock			10	5	
Labour for feeding cattle	10	20	10	15	25
Alternative employment	15	25	15	10	25
Total	100	100	100	100	100
Participant details					
Numbers attending	22	12	18	15	12
Male	16	10	13	9	10
Female	6	2	5	6	2
Attendees as % of total group	68	38	75	95	25

Source: Problem / solution game conducted by the author 1993 - 1994

Notes: (1) The rankings in each case show a percentage rather than actual votes in each village.

Those problems discussed that related to breeding revolved around two main problems, proper identification of cows on heat and the age or type of bull used. In the first instance, the recognition of animals on heat and ready for breeding, the villagers thought was more of a problem with Brahman and Brahman cross cows. The villagers suggested some training and explanation of what to look for when identifying these cows. The second main point was in regard to the type or age of bull, or in the case of artificial insemination the type of semen used. In two of the villages, Nong Waa and Sai, they had older bulls which

they considered too old to mate with their cows. In Nong Waa they wanted to use semen of higher genetic merit which was provided by the DLD. However, the technician who provided the artificial insemination service lived too far from the village to practically visit. A solution suggested was for someone from the village to train as a technician and provide the service for this and adjoining villages. To remedy the situation with the older bull, it was decided by the villages that they could hire a bull as and when required from a neighbouring village.

In the problem area of feeding animals the two main areas of concern were the wet season and the dry season. In the dry season there was plenty of growth and water but little labour for feeding cattle and in the dry season the reverse applied. The solution suggested in this instance was to plant or conserve a small area of better grass close to the house. This could then be more easily harvested after a days work than cutting less productive native grass from a wider area. In the case of dry season feed, the solutions suggested involved greater use of drought tolerant shrubs, tree legumes and grasses, greater access to forest areas and the use of protein supplements such as urea molasses blocks and urea treated rice straw.

Animal health was the third main category and problems focussed on the proper identification and treatment for sick animals. Solutions suggested included training to identify animal health problems and the free or subsidised provision of remedies and nutrient supplement salt blocks.

The final category comprised other concerns of the villages and covered some topical and village specific areas of concern, such as a spate of dog worrying of young cattle in Nong Waa, to more generic problems. In a wider context other problems revolved around some specific concerns such as yarding facilities to handle cattle to more general concerns such as labour availability for feeding cattle and the profitability of cattle. Solutions for the specific concerns were more easily solved by decisions to work together to jointly build new yards or protect young cattle. The solution to the labour allocation problem was more complicated and suggestions involved either scaling back numbers to more manageable proportions, or if land and capital were not limiting building up numbers to justify staying in the village to farm more cattle.

In general the game produced some useful focus on issues that the villagers considered important. In some cases, for instance free animal health treatment or the use of urea supplemented feed, these solutions may have been made because they had been the subject of recent training held in the village. Despite encouragement to do so, there was little discussion of some of the wider issues that may be affecting beef cattle production, such as infrastructure linkages for farming cattle or the state of agriculture within the economy.

Cattle Numbers

From 1993, when this research was commenced, until the most recent update in July 1997, there were a number of changes in both numbers of cattle farmed and households farming cattle in the six villages. Table 5.8 details the numbers and households involved in farming cattle in both 1993 and 1997.

Table 5.8: Study Villages - Number of Cattle and Households Farming Cattle in 1993 and 1997

	Nong Duum	Sai	Kakim	Nong Waa	Nong Kham	Nong Kunsii
Number of cattle 1993	51	52	61	40	16	75
Number of cattle 1997	48	65	50	70	110	50
Cattle households 1993	16	16	15	15	7	24
Cattle households 1997	12	27	20	50	23	20

Source: Village surveys 1993 and 1997

In Nong Duum the numbers farmed remained relatively stable at 51 head in 1993 down to 48 head in 1997. However, the number of families involved in cattle raising had dropped

by eight households from 16 to 12 in the intervening four years. In this case some villagers had become disillusioned with returns from cattle which was exacerbated by low animal productivity. This village was all lowland and had the lowest available farming area per family and no upland grazing land. In nearby Sai numbers had grown slightly from 52 to 65 head and the number of households involved had almost doubled from 16 to 27. Although lowland paddy with no upland area was available, the villagers had adopted a strategy of spreading numbers over more households. In comparison with the other villages surveyed, a stronger community spirit was more immediately apparent in Sai. Community spirit refers to the willingness shown by villagers to work together on community projects such as rebuilding the rice barn and village store. This had helped to spread the numbers being farmed amongst other families in the village many of whom were related to each other.

Numbers in Kakim had fallen from 61 head to 50 while the number of households farming cattle had grown by 25% to 20 from the 15 in 1993. This village had a high number of families who temporarily migrated. Some of these families had a sharing arrangement with others who remained in the village. Those who remained looked after the others cattle in return for some of the progeny, thus increasing the numbers of households involved. Nong Waa showed a phenomenal growth in the numbers of households farming cattle with an increase from 15 to 50 households. This is another example of smaller numbers of cattle being spread around more households with an average of less than 1.5 animals per household. In Nong Kham there had been a rise in both numbers farmed, from 16 to 110 head and households farming cattle, from 7 to 23. This village had the greatest access to forest grazing and also a large area of paddy. The paddy bunds provided cut and carry grass during the rice growing season and the whole area rice straw and free range grazing during the dry season. Nong Kunsii had dropped both cattle numbers, from 75 to 50 head and the numbers involved in cattle raising, from 24 to 20 households. While acknowledging that cattle and crops did have some synergy, a number of reasons were given for the decline. This village had the highest number of households and with only 800 rai of paddy the lowest ratio of farmed area per head of population. They also had some of the poorest soils in the study area. These soils had lower than normal levels of organic matter and higher soil acidity. This village always seemed the driest during the planting

season during the authors period of work and study in this area. With 60 of the 81 households temporarily migrating for other work opportunities the numbers left to farm cattle was reduced. Nong Kunsii had the highest number of people temporarily migrating from all the study villages. The respondents in Nong Kunsii were the only one to mention that many villagers this year were not returning to plant rice but were instead sending money to have their land planted on contract. It was not a specific question in the other villages so the scale of more permanent migration could not be established in this study, but was considered a significant issue in Nong Kunsii.

Village Cattle Management

There was a cattle committee operating in each of the study villages, comprising those who had borrowed money or animals from NET Foundation or other sources. The cattle committee was the main focus of extension activities concerning animal husbandry, collection of statistics and reconciliation of numbers and loan details. Detailed in Figure 4.3 is the involvement of other agencies in relation to village development. The only other main external input into cattle management in the study villages were visits from the Department of Livestock Development (DLD). They visited bi-annually to vaccinate cattle for foot and mouth disease and charged a nominal cost of 2 baht per animal. Despite some good initiatives in animal health strategies (Ingkasuwan. 1982), during the period of the authors research in Thailand there was little interaction between NET, DLD and the Department of Agricultural Extension (DOAE).

In general each family looked after their own animals. While there was much discussion and little agreement on whom mostly took care of the cattle many of the tasks seemed evenly split between men and women. This even split was confirmed by a study competed by the DOAE which showed that women completed 50% of the work involved in animal raising (McGrath, 1994). If men left the village for temporary work the full responsibility for cattle management was completed by women. If whole families left the cattle were cared for by relatives or others left behind in the village, often the elderly or young children.

Animal Health

There were a number of government initiated and supported animal health intervention programmes. One of the most important was a vaccination programme managed by the DLD for controlling foot and mouth disease. This was routinely completed in all the study villages. A charge of two baht per animal vaccinated was charged to the villager. Some villages close to the Cambodian and Laos borders and other high risk areas were also part of an anthrax vaccination programme. However, this did not apply in the study villages. Drench programmes for internal parasites were more casually monitored by the villagers themselves. In four of the study villages most animals were drenched on average once per year. Some cows were not drenched unless obviously affected although most younger animals were drenched twice per year. In Nong Kham and Nong Kunsii drenching was only carried out when deemed necessary. During the period of the authors work in Thailand several postmortems on cattle in the study area were carried out and high worm burdens were found in almost all cases. This indicated that worm burdens were probably higher than many villagers realised and that waiting for clinical signs may have affected animal productivity.

Another initiative of the DLD was the training and designation of villager livestock volunteers. The aim is to have volunteers that service their own and several adjoining villages with basic animal health care needs. Nong Kunsii had the only trained and DLD supported livestock volunteer in the study villages. In addition to his ongoing training he received a small stipend and reimbursement for petrol used. He worked with the cattle in Nong Kunsii and several adjoining villages and was the first point of reference for any villagers who had livestock related problems. The concept appeared to have some merit for treating basic animal health problems. However, it did not address the fact that many villagers could not pay for treatment of sick animals which often involved relatively expensive drenches and medication.

Production

The cattle in all six villages had irregular calving patterns. There was little effort to time the arrival of a calf with a period of maximum grass growth, which coincided in any case with the main cropping season. This meant less free range access to food and less labour to take care of cattle. Calving averaged a low 60% during the 1993-94 period. This gave no margin for selection of superior breeding females as herd replacements. It also meant poorer producing animals were maintained in the herd rather than culled. Some pregnancy testing and palpation work carried out by the author identified some cows as old as five years who had produced one calf only in their lifetime. In all the villages there was a minority of farmers who managed their herds well. Their cows generally produced a calf each year and both cow and calf were fed to maximise growth.

In all of the villages studied the most difficult period for farming cattle was identified by the villagers as August to November. This was the period of greatest grass growth coinciding with the rainy season. However, it was also the main rice planting season and this rice growing land was not available for grazing. With most labour occupied in planting rice, cattle were usually tethered during the day and much of their feed had to be cut and carried. None of the study villages had an area of improved grass that had been specifically planted for cattle. Areas such as these, with a greater bulk of high protein feed in a small area could be more easily harvested than native roadside pastures. Some attempts were made in the rainy season of 1994 to plant some grass plots. Small trial areas of grass and legumes of one rai in each village were planted in Kakim, Nong Kunsii and Sai. These trial plots, planted with both purchased private sector and free government seed were most successful in Nong Kunsii and Sai and due to a lack of rainfall following planting a complete failure in Kakim. Large groups of villagers turned out to help with the planting in each village and the plots were well cultivated prior to planting and well fertilised after planting. The following season more commercial scale planting was attempted in Nong Kham, Sai, Nong Waa and Nong Kunsii. Results were uniformly disappointing with low germination rates in the free government seed and an unwillingness by the villagers to commit any money to fertiliser for the new grass. As part of their

promotion of livestock development the government offered free grass seed to farmers. However, germination rates were variable and there was in any event little extension advice on the correct planting methods or fertiliser requirements.

The cattle price during 1994 dropped considerably by 5 baht per kilogram live weight from 25 down to 20 baht. The villagers considered it a rational economic decision not to over expend on additional fertiliser or take too much time preparing the land to feed resource returning less than its cost of production.

Other technologies introduced to the farmers were recognised as of productive benefit to their cattle, but without an immediate payback were not adopted. These included treating and ensiling rice straw with urea and water to raise the protein level of the feed and the use of home made urea and molasses blocks to provide nutrients and aid digestibility of roughage. Unless they were provided free, they were not used by farmers who could not see an immediate or sufficient return on these investments. For the same reasons no farmers in the study villages purchased any supplementary or concentrate feed for their cattle. This unwillingness to invest appeared part of a risk averse strategy to avoid any loss of income. However, it also appeared that free handouts from different sources had become in effect a sine qua non for encouraging villagers to pursue new initiatives. This created a certain dependency on handouts and reinforced the passive behaviour discussed in Chapter Four.

Marketing

All of those farming cattle in the study villages with the exception of those in Nong Kham sold cattle at the weekly Srikoraphum cattle and buffalo market. In Nong Kham villagers sold surplus cattle direct to merchants who visited them in the village. They considered the Srikoraphum market too far from their village and considered they sold their animals for the equivalent or better prices than at the market. They ascertained the value of their cattle by talking with other villagers and other merchants. They took the best price offered on the day but maintained they have some bargaining power because several merchants visited the village looking for cattle. The villagers at Nong Kham knew little about current prices

at the weekly Surin or Srikoraphum markets. In the other five villages trading merchants would still visit the village but for a variable commission would arrange the sale at the local market. Commission rates varied between 5 and 15% (500 -2000 baht) of the sale price. Other costs of selling at the local market involved approx. 1% of the sale price involving transport to the market of approximately 50 baht, a market fee of 20 baht and a vaccination certificate of 30 baht. It appeared that all animals going to the market were vaccinated on arrival at the market, even those who may have gone direct to slaughter the next day. None of the villagers sold animals direct to the local slaughter facility. However, in all the villages cattle were sold and traded locally for special village occasions and these animals were killed locally. The only locally based official slaughter facility was the Surin abattoir owned and managed by the municipal authority. Although health, sanitation and quality control was supervised by the DLD the facility was relatively basic.

Current Attitudes to Cattle

Members of each village acknowledged the role that cattle played in helping them to accumulate capital, while remaining readily saleable if some cash was required quickly. They also provided some collateral for small loans. All acknowledged the synergy with cattle and cropping in providing manure for crops and vegetable plots and in eating the crop residues, principally rice straw. None of the villagers were aware of current government programmes designed to increase cattle numbers. Only in Nong Duum and Nong Kunsii where numbers are declining was there no interest in increasing numbers. In all the other villagers they would have liked to raise numbers further. In Sai and Kakim they acknowledged that areas for farming more cattle were more limited. In Nong Waa where the area was also limited they had expressed an interest in raising numbers and returns by feedlotting animals with purchased concentrate feed. Although risk averse in terms of committing expenditure to cattle farming each village acknowledged that improved technologies as described previously would increase production.

Many of the villagers expressed a preference for the native breed of cattle, particularly for its apparent ability to get in calf more easily. Another factor was the cost to obtain native cattle was lower than purebred exotics. In an interview in Nong Waa (April, 1995) a

farmer revealed that he had started farming cattle five years beforehand. At that time he had little money or knowledge so he bought some native bred cows. He trained himself about cattle farming and now has six cows and no debt. While he may now consider using a more expensive Brahman cross bull to get a bigger calf he resisted this when he was new to cattle farming.

Beef Cattle Projects in the Northeast

This thesis has considered critical issues in promoting cattle development and has examined in detail the role that cattle play in six villages of the Northeast. The livestock sector is an important source of supplementary income and there is a tradition of cattle and buffalo raising. Several government and other agencies have encouraged and supported recent efforts to provide secondary and supplementary income. There have been a number of rural development projects in the Northeast, including several that have been aimed at beef cattle. The following section will describe four of these projects which have targeted several aspects of beef cattle production and marketing. Some such as the Bank of Agriculture and Agricultural Cooperatives (BAAC) - Military project were aimed at specific border areas. Others such as the current agricultural restructuring project were or are focussed on the Northeast but available to farmers throughout the country. Some of the projects have officially finished others are ongoing.

The objectives, beneficiaries, administration and performance of the projects will be discussed in some detail. The final chapter will then look at strategies that may assist in the planning and implementation of future projects and the improved delivery of the objectives in those still operating.

Project to Green Issan (Issan Khieow)

This project started in 1987 and was a central project of the DLD, supported by the BAAC and the Green Issan coordinating committee. Its specific objectives were twofold. First, to support government policy in accelerating beef cattle production and producing beef and

dairy cattle of a quality to meet internal demand. Secondly, to increase the income and employment of farmers in Northeast Thailand. The Green Issan committee was set up within the structural command of the Royal Thai Army. Chaired by the Prime Minister and directed by the Army supreme commander with the aim of coordinating government departments, private enterprise, financial institutions and farmers. (TDRI, 1995:60). Although multifaceted in its areas of operation, the main description here will be on how the project implemented initiatives relating to beef cattle.

From its official beginning in 1987 the project ran for a five year period until 1992, when it was absorbed or transformed into the current restructuring project. Criteria for selection into the project was that farmers owned, resided on and cultivated land in the project area. Farmers were to own sufficient land to enable pasture to be developed, have spare labour for cattle husbandry and be interested in the project. The BAAC was responsible for organising groups of project borrowers to ease project management and administration.

Project farmers were expected to manage five head of cattle in the initial stages and increase this to seven head over the 10 years of their loans. In addition each farmer was expected to develop 10 rai of pasture and construct a yard / shelter for the cattle. The DLD, the BAAC and the Green Issan committee were responsible for coordinating farmer groups, monitoring objectives, limitations and benefits. Specifically the DLD were responsible for 15 days initial free training on cattle management and feeding for the target farmers. This was to be followed up with ongoing advice on supplementary feeding, animal health and breeding management. The BAAC were responsible for providing the loans and advice on budgeting and the monitoring of expenditure. The Green Issan committee were responsible for importing and quarantine of cattle. They also had the responsibility of liaising with all government ministries involved in monitoring this rural development project. These included the Ministries of the Interior, Agriculture and Cooperatives, Public Health, Education, Industry and Commerce.

The project involved a loan of 140,000 baht per farmer to cover the following

Five imported Brahman cows at 22,500 each	112,500
Development costs for 10 rai of pasture	5,000
Construction of a cattle shed	5,000
Contribution to a project fund for animal health	7,500
Water development	10,000
	140,000

Repayment terms were set at 10 years at an interest rate of 9%. The first three years were interest free. Collateral for the loans was to be provided by group guarantee of five or more farmers, rather than a mortgage over the land assets. Projected returns were for a positive cash flow by year four with a net cash income per annum of between 5,200 and 10,000 baht per year between years 4-10. The most significant underlying assumptions were that there would be a 100% pregnancy rate in the cows with an 80% survival rate of calves and that prices would remain constant. All of these important assumptions turned out to be nowhere near reality.

> Obviously what the government officers and academics - both animal husbandry researchers and the economists - failed to realise is that the care of imported breeders is a care and feed intensive activity. When the underfed cows failed to reproduce they earned the nickname "plastic cows" and farmers began to panic because of the large amount of debt. They, therefore had no choice but to return the cattle en masse. (TDRI, 1995:142)

The level of borrowing was inflated by the high imported cost of these cattle which in turn (temporarily) inflated the market price of all cattle. As the reality of farming cattle in the harsh conditions of the Northeast with a high level of debt sank in many of these cattle were returned to government breeding stations and the market price for all cattle fell.

BAAC - Military project

This project which began in 1989 aimed to promote the rearing of beef cattle in border villages along the Thai - Cambodian border. Key support was provided by the BAAC, the Border Security Force (BSF) and the DLD. The purpose of the project was to provide crossbred (Thai native x Australian Brahman) cattle for distribution to villages in the border areas. The main aims were to help develop the villages, generate a supplementary source of income, prevent forest encroachment and instill a sense of patriotism in an area of recent Khmer Rouge activities (Borah, 1993).

Beneficiaries for the loans were selected by the villagers themselves based on their willingness to commit to the project objectives and loan conditions. The BSF as the central coordinator was responsible for producing and distributing the cross bred animals and monitoring the progress of the project. The military project centre maintained a breeding centre with Brahman bulls to be lent for breeding purposes. They also provided an assured market for any surplus female bred calves by buying them back from the project farmers. The DLD assisted the BSF in administration of the project and provided an advisory service to the project farmers. Each farmer was expected to rear two crossbred cows. The BAAC provided a loan of 24,000 baht to enable the purchase of two cows per participating farmer. The loans were secured by group guarantee with repayments from year three. The total loan was for eight years. Interest rates varied depending on stage of payback from 11 - 12.5% per annum.

The farmers in this project were not obliged to build a cattle shed nor plant specialised pasture as they were for the Green Issan project. In general in the target area there was considerable grazing in and around the forest areas adjoining the border. While these farmers were affected by the reduced prices for cattle during 1994-1995, several key factors have made the project more successful than Green Issan. First, they had more grazing land available for their cattle which reduced any pressure on land being used for cropping and meant the cattle were more productive overall. Secondly, an assured market had been provided for the female progeny. Thirdly, they did not have to provide an

additional shelter area for their cattle as a condition of the loan, thus saving additional capital expenditure.

Projects (NGO and Government) Involving Revolving Funds or Cattle Banks

These projects involved cooperative development among villagers to distribute funds or live animals from external and village sources to boost (in this case) the raising of cattle. Specifically they aimed to provide an additional means of income support for the target villagers and to assist villagers to develop skills in livestock management.

The following describes the operation of the Northeast Thailand (NET) Foundation cattle projects. NET is one of a number of NGO's operating in the area of rural development in Northeast Thailand. While NET's main focus is Surin province it has similar aims and objectives to other organisations operating in Surin and other provinces. NET began as a border relief organisation to assist local villages in Surin who were coming under pressure from refugees fleeing the Cambodian civil war in the late 1970's. Initially called the project towards self reliance in Northeast Thailand. The organisation has maintained a focus on self reliance through participatory development.

Villagers within NET's target area of 100 villages were asked if they had an interest in cattle farming. Participation was voluntary based on a willingness to commit to the project objectives. The project was an integral part of village development in that it operated in villages that also have other NET based projects. Within each participating village a cattle committee was formed. These committees coordinated extension advice, record keeping and requests for assistance. The cattle project which is on going began in 1991. There had been some assistance to buffalo groups operating in some villages prior to the cattle projects inception. The project had two means by which villagers could boost cattle numbers. First, members could borrow money directly from the revolving fund and purchase cattle. Secondly, members could borrow a cow or cows from the NET cattle bank. The first calf from these borrowed cows was retained by the villager and the second by NET. Third and subsequent calves were usually shared 50:50 with a villager paying NET half the value of these calves if they wanted to retain them in their herd or vice versa

if the villager did not want these calves (Chusakol, personal communication, October 1993).

NET provided advice on animal management, breeding and feeding and helped to access services provided by the DLD. There was no obligation on villagers to provide additional shelter or plant extra supplementary feed. NET extension staff monitored numbers in each village group and monitored loan expenditure and repayments for those who had borrowed money to buy cattle. For cattle bank animals NET monitored breeding performance and provided new animals if cows or bulls became sick or do not reproduce. NET maintained a training centre facility for treating sick animals. They also provided a market for surplus male and female animals. Surplus females were passed on to other villagers and the males were finished for slaughter a feedlot located at the training centre.

For those farmers who borrowed money rather than cattle, most borrowed 10,000 baht to buy two cows. The interest rate was 7% with no interest payable for the first two years. There was no obligation to borrow any capital other than the amount required to purchase cattle. Payback varied with each individual farmer and was variable over 3-5 years. The project was popular in the initial stages with equal numbers of farmers borrowing money and cattle. However, administration of the project in terms of monitoring cattle numbers and which calf belongs to who was unwieldy. In addition the distance between villages means extension advice on tending sick animals or on general breeding and feeding was not always available when required by the villagers. There was little integration of services with the DLD or other rural departments such as the DOAE.

For those who had borrowed cattle as part of the cattle bank it was easy to send cattle back to NET, and many did so when the cattle price dropped and they migrated temporarily to more economically rewarding opportunities. For those who had borrowed money, many saw the NET loan as the last they will pay back. They did not see NET as foreclosing on a loan for which they have taken no collateral.

Agricultural Restructuring Project

This project is the current main focus of government activities as it relates to agricultural development. The main objectives for the project are to reduce the reliance of farmers on rice and cassava as main sources of income (TDRI, 1995). This is a national project but is focussed on the Northeastern region. The reason for the Northeast focus is that this area has the highest proportion of marginal productivity rice growing area and also the largest area of cassava production. The project began in 1994 and is a five year project.

Beneficiaries are selected from those who express an interest in cattle farming. However, they must join a group which generally covers only one or two adjoining villages. The aim is to have one group in each provincial district in the Northeast. As part of their commitment farmers must agree to buy five head of cattle. The DLD is the primary coordinator of the cattle project but maintains a close link with the DOAE, the Department of Fisheries, the Department of Agriculture and the BAAC. These organisations are all closely involved in the implementation of the Agricultural Restructuring Project.

In additions to loans arranged through the BAAC the DLD provides the following grants:

Cash grant of 600 baht per farmer
20 kg of grass seed to plant 10 rai of pasture per farmer
Cash for urea and fertiliser for new grass of 600 baht per farmer
Group grant for animal health provision
Cash if required for shelter and yards of an unspecified amount
Five days training for each farmer to the value of 1,000 baht per farmer

Assistance is also provided with artificial insemination or natural service bulls, vaccination services and advice on animal health. Farmer groups manage their grants autonomously as does each farmer with their individual loan. Monthly visits are provided by the district livestock official who is available for more regular visits if requested. There is an annual meeting with representatives from the provincial offices of the DLD. Extension advice is provided for breeding feeding and management.

Farmers borrow 75,500 baht to buy five head of cattle. Collateral is provided by group responsibility. Payback is 13 years, with no interest payable for the first three years then interest only at (currently) 5% until year five with principal and interest payments over the next eight years. For those farmers who have made a commitment to cattle farming this project is an improvement on the Green Issan project. It requires less capital borrowing and the level of extension services and advice is greater. However, it does not mitigate against the wider impacts of socioeconomic trends that affect the profitability and ability of farming families to manage cattle.

Table 5.9: Projects Summary, Loan Provisions, Training and Assistance Provided

	Green Issan	BAAC / Military	Revolving fund	Cattle Banks	ARP
Loan amount	140,000	24,000	10,000	-	75,500
Interest rate	9%	11-12.5%	7%	-	5% variable
Payback	10yrs	8yrs	3-5yrs	-	13yrs
Number of cattle required	5	2	2	1-2	5
Training	Yes	Yes	Yes	Yes	Yes
Assistance provided	Breeding	Breeding, market outlet	Breeding, market outlet	Breeding, market outlet	Cash, grass seed, animal health, breeding

Source: Department of Livestock Development, 1989-1997.
Borah, 1993.
TDRI, 1995.

Institutional Approaches and Attitudes

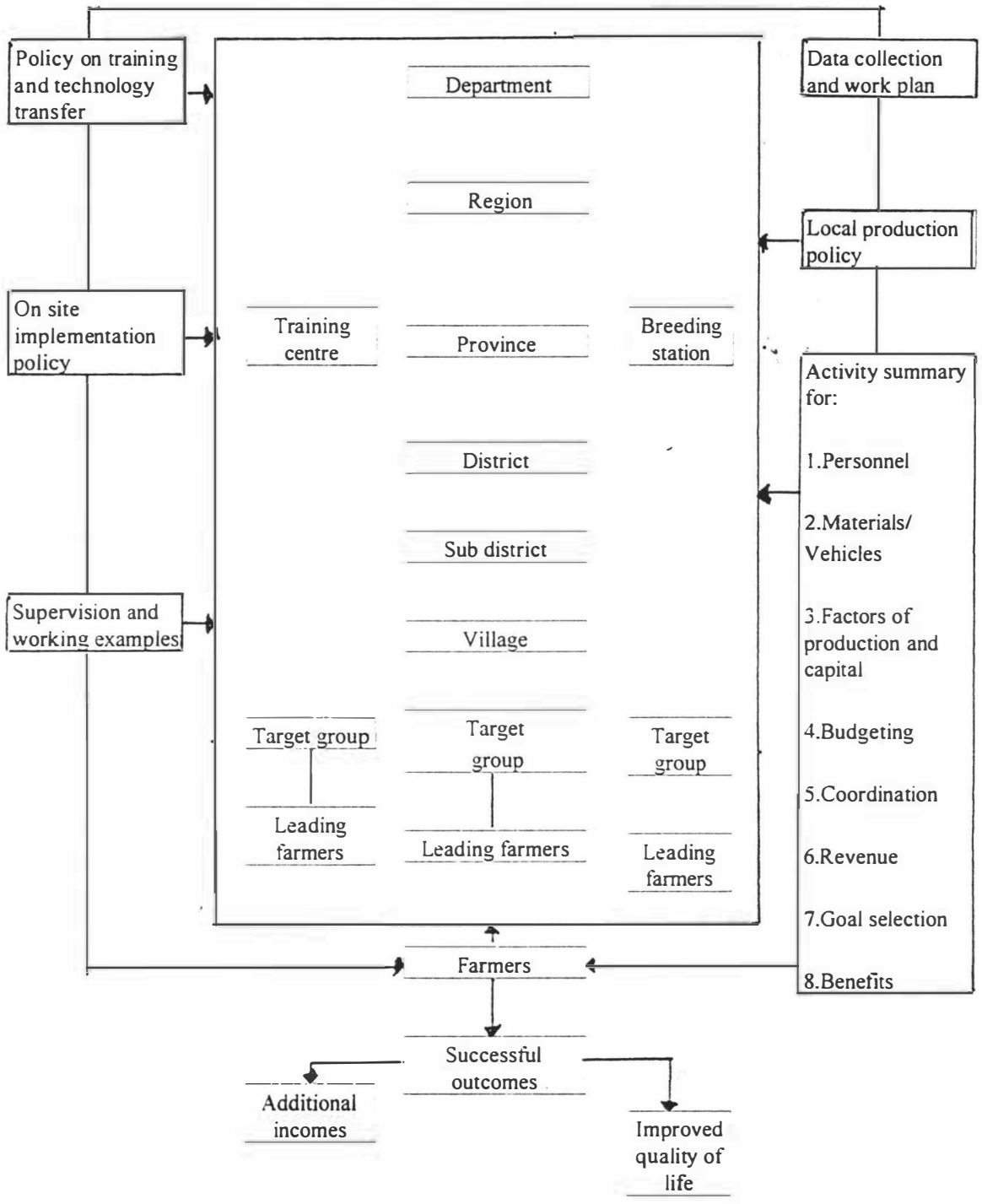
The attitudes to current policy on cattle farming varied among policy makers and extension people. There appeared to be a willingness to help farmers develop resources and expertise

for farming cattle. However, among DLD staff this was in the provision of resources, such as free seed, grants and soft loans. While the emphasis appeared to have shifted from emphasis on quantity of animals to issues of quality the institutional planning from the DLD still seemed top down. Figure 5.3 shows the livestock extension flow chart for the DLD as part of the ARP. Most policy and work plans flow down towards the farmers with little direction from them towards setting policy. However, some policy initiatives outlined to the author (Supachai, personal communication, July 1997) had been trialed in Khon Kaen. This involved village volunteers in the provision of feedback to the DLD on their local needs. This was being done on a more formal basis than ad hoc comments made to extension people and was seen as a positive move by local farmers

.

Among the NGO staff and some extension people there is an acknowledgement that wider fundamental economic issues, rather than just production issues are affecting the ability of farmers to run cattle. Issues of labour availability and migration were raised with comment that farming was becoming an "older person occupation" (Suwang, personal communication, July 1997). The research completed for this thesis shows that despite a decline in numbers there were many farmers running cattle and requesting knowledge on how they could best maximise production within their own systems. The research showed that at both the policy level and at the village level there was also an increasing desire to work together to solve problems regarding implementation of projects, conducting local research and effective extension.

Figure: 5.3 Policy and Implementation Plan for Livestock Extension in Agricultural Restructuring Project



Source: Rattanasawand, 1996:112

Notes: (1) In Thai, translated by the author

Summary

Farming cattle in the Northeast was seen by farmers as a complementary activity to cropping (principally of rice), and as a way of accumulating capital without the need for high expenditure on inputs. Six villages in Surin province of Northeast Thailand were selected for detailed investigation. Their main village activity was a single rain fed crop of jasmine rice. All were also involved in farming cattle but numbers between the villages have fluctuated during the period of the study, which was from July 1993 until November 1995 with a follow up visit in July 1997. Reasons given for decline in numbers in some villages were, first, a lack of grazing area particularly during the wet rice growing and planting season. Secondly, lack of labour to manage the cattle properly during this same busy period. Thirdly, some villagers had found greater earning opportunities off farm than by running cattle. Fourthly, others had been disillusioned by the low productivity of individual animals and the low sale prices of any animals they had sold. Two main reasons given by those villagers who had increased cattle numbers were first, the complementarity of cattle and crops with the consumption of crop byproducts by cattle and the return of manure to the cropping land. Secondly, they acknowledged the capital accumulation possible for cattle particularly if abundant grazing was available from nearby common forest or grazing land. All acknowledged the need for more advice on husbandry aspects particularly animal health and reproduction. There was little interest in committing capital expenditure to sowing new grass areas, or indeed operational expenditure for providing additional protein feed for urea treated straw or urea molasses blocks.

Four projects that have been implemented in the Northeast were described. These vary from the Green Issan project which was planned and implemented from a top down approach. Farmers were persuaded to borrow a significant amount above the current market rates for imported Brahman cattle. These cattle failed to perform and this coupled with a drop in market prices led to a collapse of the project with many of the cattle returned to government agencies. More successful projects such as the Military -BAAC project, NGO cattle banks and revolving fund loans had more realistic objectives. They

also had to a greater or lesser extent more participatory planning. However, low market prices and other factors affecting the rural economy limited the success of these projects.

The current main Agricultural Restructuring Project has recognised some of the deficiencies of previous projects particularly the Green Issan project. More care is taken in the selection of farmers and farming groups to ensure adequate advice and support can be given. More tangible grants and training courses are available. However, there are still some fundamental impediments to growth and profitability in the cattle industry. These exist at the local village level but also extend to national and international factors. These factors affect many aspects of agricultural development have been discussed with particular reference to the beef cattle industry. The next chapter provides a summary of the thesis together with conclusions from the research carried that may be considered in efforts to improve ongoing and future initiatives.

Chapter Six

Summary and Conclusions

This thesis has examined a wide range of issues relating to the development of Northeast Thailand, particularly in the development of beef cattle production. The Northeast region, a large plateau of relatively infertile soils, has lost a significant proportion of it's forest cover in the past forty years. These deforested areas coupled with infrastructure developments, especially roading, opened up many new areas for settlement and cropping. The influx of new settlers has altered the amount of grazing available, and patterns of traditional use of common land, once in forest. Economically Thailand has changed in the same period from a predominantly agricultural economy to a more industrial one. Agriculture, however, remains important for supplying the raw food materials to agro-industrial businesses such as rice mills, food canneries and sugar factories. The agricultural sector also provides food for the urban workers and increasingly the labour to work in those industries.

Lack of transferable land use rights or titles to land have led farmers to adopt agricultural practices that have depleted soils further. However, lack of title has not hindered access to formal or informal sources of credit. Rice is the predominant crop, with cassava and other upland crops grown on land not suitable for rice. Cattle and other livestock have been farmed as an adjunct to cropping activities. They are seen to have a complementary relationship to crop production and provide a means of building capital. Mostly cattle are farmed on a low input and low productivity system, with farmers unable to see sufficient benefit for any extra expenditure that cattle may require. Many villagers have taken the opportunity to work part of the year away from the village to earn more than they can earn from their farming activities. Financial analyses of farming options based on costs and returns in the study villages are presented in this thesis. They show that positive financial returns are extremely sensitive to the level of debt.

The structure of Thai society is based largely on patron - client relationships and this has created a pattern of dependency in some farmers. This patronage exists in both the public

and private sectors. Arphapirama (1990:252) refers to this as the "gift giving" method of development, providing roads, water supply and power but not the technical knowledge needed to effect real change in rural areas. In the public sector there is a plethora of Ministries, Departments, and State Owned Enterprises involved in rural development. Each tends to its own function and while there is evidence of positive change there are examples of protecting 'territory' rather than true integration of functions for the benefit of farmers. This lack of an integrated approach to policy or its implementation provides confusing signals to farmers. In the private sector inputs for farming are often tied to the supply of produce, thereby limiting marketing options. Cattle marketing is still relatively unsophisticated. Despite Government and other agencies having implemented a number of projects to boost cattle numbers, planning and implementation has not always been successful and the results have varied from those anticipated. Although livestock markets provide some price benchmark, many cattle are sold direct from the village. The influx of a large number of imported cattle in the early 1990's artificially inflated market prices. During the same period the economic environment encouraged or forced many farmers to work off farm, thus reducing the labour for farming cattle. The physical environment with changed and relatively harsh conditions for cattle farming could not sustain productivity improvements in animals or high input prices and the market collapsed. Despite these setbacks there is still interest at the farm, and at national level, in cattle farming.

Having examined the situation and challenges inherent in beef cattle farming in Northeast Thailand two factors are considered in this thesis to be critical to the formulation of more sustainable and profitable cattle enterprises in Northeast Thailand and elsewhere.

The first is the need to examine the resource base within which cattle are being farmed, and to recognise that this resource base is changing, physically, socially and economically. Less land is available for cattle and it is under increasing pressure from competing land uses. People leaving the land on a temporary or permanent basis for urban work mean changes in the social institutions within villages and less labour for farming cattle. Technological advances may replace this labour or in other ways optimise production, or systems may be adapted to retain cattle but at a lower input level. Farmers may see merit in retaining cattle as a flexible means of accumulating wealth but at a lower productive level

that still allows them to engage in off farm employment. This needs to be recognised and reconciled with national policy which may have different objectives.
The second factor is in the facilitation of systems of cattle farming that encourage changes in institutions that match or induce changes in the resources, technology and culture of rural life. In this respect government must facilitate development with appropriate and stable policies that allow farmers to operate sustainable systems.

Farmers are generally successful in adapting their own local resource base within the technology available. Reform that enables farmers to operate profitably within their systems will promote sustainable systems of development. Beef cattle can and do make a positive contribution to these systems.

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Author Note:

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Appendix: One

Village Questionnaire

Interviewees: Members of Village Cattle Committee, Head men, and Key informants

1.How many households in this village?

2. How long has this village existed?

3. What changes have occurred in this village in the last 5-10 years?

population, migration (temporary or permanent)
areas farmed
roads, power, water

4. How many families farm cattle?

5. Who mostly farms the cattle?

6. Why do you farm cattle?

7. What are the current prices to buy a breeding cow, a 1 yr heifer, a 1 yr steer, a breeding bull?

8. What animal health procedures do you carry out on your cattle? How much do they cost?

9. What affect does government policy have on your decision to run more or less cattle?

10. Do you farm more cattle than say 5 years ago?

If yes, what made you increase numbers?

If no, what made you farm less or stop running cattle?

11. Who gives you advice on farming cattle?

12. Do you pay for this advice?

13. Who owns the land that your cattle are farmed on?

14. How important is common grazing land for farming cattle? How has forestry affected this?

15. Does each family look after their own cattle?

16. Have you borrowed money to buy cattle? If so how much? Interest rate? Pay back?

17. What other crops or livestock are farmed in the village?

18. Do you think that cattle farming fits in well with other activities in the village?

19. During the year what is the most difficult period to farm cattle? Why?

20. Do you think you have all the technology you need to farm cattle effectively?

21. How do you sell your cattle? What are the current prices?

cattle

buffalo

rice

cassava

kenaf

maize

22. What would make cattle farming more successful in your village?

Appendix: Two

Institutional Questionnaire

Interviewees include staff from the DLD, Universities, and Extension Workers.

1. How many villagers/farmers are you involved with?

2. How often would you visit a target village?

3. Are your visits on a regular basis, or at the request of villagers?

4. What statistics do you have on the numbers of cattle and buffalo farmed now compared to say 5-10 years ago?

5. Who owns the land?

6. How important is common grazing land in cattle farming? How has forestry affected this?

7. Who farms the cattle in the village? Who do you mainly work with in the village? The Head Man / A committee / male farmers / female farmers / others?

8. Have you conducted any surveys in the villages you worked with on how many cattle they run and what information they would like? What were the results?

9. What are the main topics that villagers ask about when you visit?

10. Do the villagers pay for your advice?

11. What communication do you have with other departments or agencies involved in rural development?

12. Do you think that cattle farming fits in well with other activities in the village?

13. What do you consider your main role in working with the villagers?

14. What changes have you noticed in the villages you work with in the last 5-10 years?

15. Do you think that villagers have all the technology they need to farm cattle?

16. How does government policy affect the decisions to run cattle or increase/decrease numbers?

17. How do farmers sell their cattle? What are the current prices?

18. What improvements would make cattle farming more successful in Issan?

Appendix: Three

Gross Margin analysis for individual enterprises, based on 20 rai of production area, apart from integrated farming at one rai only

Assumes level of debt and labour is constant across all enterprises

Rice			
Income			
	4600 kg @ 5 Bt / kg		
	Total Income	23000	23000
Expenses			
	Ploughing	2400	
	Harrowing	2400	
	Fertiliser	1900	
	Chemical	1200	
	Harvest	6000	
	Threshing / Storage	600	
	Total Expenses	14500	14500
	Gross Margin		8500
	Gross Margin per rai		425
	Gross Margin percentage		36.96%

Cassava			
Income			
	36000 kg @ 55 satang / kg		
	Total Income	19800	19800
Expenses			
	Ploughing	2400	
	Harrowing	2400	
	Weeding	3600	
	Harvest	6000	
	Total Expenses	14400	14400
	Gross Margin		5400
	Gross Margin per rai		270
	Gross Margin percentage		27.27%

Cattle			
Income			
	Cattle 1.5 hd		
	Total Income	5350	5350
Expenses			
	Bull hire	500	
	Animal health	550	
	Marketing and Transport	240	
	Total Expenses	1290	1290
	Gross Margin		4060
	Gross Margin per rai		203
	Gross Margin percentage		75.89%

Integrated Farming (one rai only)			
Income			
	Fruit / Vegetables	2500	
	Fish	2500	
	Total Income	5000	5000
Expenses			
	Fertiliser	300	
	Fish food	300	
	Replacement fish	180	
	Chemicals	300	
	Marketing and Transport	600	
	Total Expenses	1680	1680
	Gross Margin		3320
	Gross Margin per rai		166
	Gross Margin percentage		66.40%

General production notes

- Rice production assumes contract labour for land preparation and hired labour at harvest
- Cassava assumes a minimum management regime, two weedings post planting, contract labour at harvest and no fertiliser
- Cattle, bull services are hired, calving percentage 60%, allows a credit for manure contribution to other production
- Integrated farming. Water is collected in rainy season for fish and to water plants in dry season Above option is status quo, normally no fruit sales until Year 3

Appendix: Four

Notes to accompany budgets and financial evaluation for simulated earning strategies

- Budgets include costs and prices prevailing at 1993/94 during the period of primary research.
- The simulations presented are based on examples that were present in all the study villages. Many other permutations of these strategies also exist and vary according to individual farmers objectives and strategies.
- The analysis uses IRR methodology as a means of financially evaluating individual strategies. It is not a cost benefit analysis in that it does not consider costs and benefits to the overall economy.
- No allowance has been made for depreciation or taxes.
- In some scenarios, such as the second example, considerable time is available within this system to allow for off farm employment. The income from this has not been included in the budgets or financial evaluation, but is a factor that obviously accounts for many decisions to work off farm if available. Similarly, other scenarios such as integrated farming or large numbers of cattle do not allow this opportunity.
- No allowance has been made for household expenditure other than that directly related to the enterprise. Other debt may be involved and individual household managements expenses may vary.

Appendix: Five

BUDGET FOR SIMULATED HOUSEHOLD EARNING STRATEGIES - NORTHEAST THAILAND

Scenario number **One**

Description: Growing rice for sale, money borrowed for cattle, fruit trees and fish pond under ARP. No pasture grown. No off farm work.

Status quo data	
Total area: (rai)	20
- lowland	15
- upland	5
Land use	
- rice	5
- fruit, vegetables, fish	
- cassava	
- pasture	15

Annual data	Year 1	Year 2	Year 3	Year 4	Year 5
Capital borrowed (Year 1)	45,000Bt				
Interest rate (5% from year 3)					
Value of investment (Year 5)					27,000Bt
Cattle farmed					
- cows	2	2	2	2	2
- younger cattle	0	1	1	1	1
Production (net kg sold)					
- rice	3450	3450	3450	3450	3450
- fruit, vegetables, fish	0	80	180	180	180
- cassava	7200	7200	7200	7200	7200
- cattle	0	1	1	1	1
Income (Baht total)					
- rice	17,250Bt	17,250Bt	17,250Bt	17,250Bt	17,250Bt
- fruit, vegetables, fish		2,000Bt	4,500Bt	4,500Bt	4,500Bt
- cassava	3,960Bt	3,960Bt	3,960Bt	3,960Bt	3,960Bt
- cattle		3,530Bt	3,530Bt	3,530Bt	3,530Bt
- off farm					
Total Income	21,210Bt	26,740Bt	29,240Bt	29,240Bt	29,240Bt
Expenditure (Baht total)					
- rice	10,845Bt	10,845Bt	10,845Bt	10,845Bt	10,845Bt
- fruit, vegetables, fish	1,380Bt	1,380Bt	1,380Bt	1,380Bt	1,380Bt
- cassava	2,880Bt	2,880Bt	2,880Bt	2,880Bt	2,880Bt
- cattle	851Bt	851Bt	851Bt	851Bt	851Bt
- pasture					
- debt servicing				2,250Bt	2,250Bt
Total Expenditure	15,956Bt	15,956Bt	15,956Bt	18,206Bt	18,206Bt
Operating cash surplus	5,254Bt	10,784Bt	13,284Bt	11,034Bt	11,034Bt

BUDGET FOR SIMULATED HOUSEHOLD EARNING STRATEGIES - NORTHEAST THAILAND

Scenario number **Two**

Description: Growing rice and cassava for sale, money borrowed for heifer calves at commercial rate no pasture grown. 1 person works off farm 10 months of the year.

Status quo data	
Total area: (rai)	20
- lowland	15
- upland	5
Land use	
- rice	15
- fruit, vegetables, fish	0
- cassava	5
- pasture	0

Annual data	Year 1	Year 2	Year 3	Year 4	Year 5
Capital borrowed (Year 1)	12,000Bt				
Interest rate (10.5% from year 1)					
Value of investment (Year 5)					12,000Bt
Cattle farmed					
- cows	0	0	0	0	0
- younger cattle					
Production (net kg sold)					
- rice	3450	3450	3450	3450	3450
- fruit, vegetables, fish	0	0	0	0	0
- cassava	9000	9000	9000	9000	9000
- cattle	0	0	0	0	0
Income (Baht total)					
- rice	17,250Bt	17,250Bt	17,250Bt	17,250Bt	17,250Bt
- fruit, vegetables, fish	0Bt	0Bt	0Bt	0Bt	0Bt
- cassava	4,950Bt	4,950Bt	4,950Bt	4,950Bt	4,950Bt
- cattle	0Bt	0Bt	5,000Bt	0Bt	0Bt
- off farm					
Total Income	22,200Bt	22,200Bt	27,200Bt	22,200Bt	22,200Bt
Expenditure (Baht total)					
- rice	10,845Bt	10,845Bt	10,845Bt	10,845Bt	10,845Bt
- fruit, vegetables, fish					
- cassava	3,600Bt	3,600Bt	3,600Bt	3,600Bt	3,600Bt
- cattle					
- pasture					
- debt servicing	3,200Bt	3,200Bt	3,200Bt	3,200Bt	3,200Bt
Total Expenditure	17,645Bt	17,645Bt	17,645Bt	17,645Bt	17,645Bt
Operating cash surplus	4,555Bt	4,555Bt	9,555Bt	4,555Bt	4,555Bt

BUDGET FOR SIMULATED HOUSEHOLD EARNING STRATEGIES - NORTHEAST THAILAND

Scenario number **Three**

Description: Growing rice only for own use, no cassava, money borrowed for 5 cows under ARP package, pasture sown and maintained for cattle feed.

Status quo data	
Total area: (rai)	20
- lowland	15
- upland	5
Land use	
- rice	5
- fruit, vegetables, fis	0
- cassava	0
- pasture	15

Annual data	Year 1	Year 2	Year 3	Year 4	Year 5
Capital borrowed (Year 1)	75,500Bt				
Interest rate (5% from year 3)					
Value of investment (Year 5)					60,000Bt
Cattle farmed					
- cows	5	5	5	7	8
- younger cattle	0	3	3	4	4
Production (net kg sold)					
- rice					
- fruit, vegetables, fish					
- cassava					
- cattle			2	3	3
Income (Baht total)					
- rice					
- fruit, vegetables, fish					
- cassava					
- cattle			6,000Bt	15,000Bt	15,000Bt
- off farm					
Total Income	0Bt	0Bt	6,000Bt	15,000Bt	15,000Bt
Expenditure (Baht total)					
- rice					
- fruit, vegetables, fish					
- cassava					
- cattle	1,500Bt	1,500Bt	1,500Bt	1,500Bt	1,500Bt
- pasture	1,860Bt	1,860Bt	1,860Bt	1,860Bt	1,860Bt
- debt servicing				3,775Bt	3,775Bt
Total Expenditure	3,360Bt	3,360Bt	3,360Bt	7,135Bt	7,135Bt
Operating cash surplus	-3,360Bt	-3,360Bt	2,640Bt	7,865Bt	7,865Bt

ANALYSIS OF SIMULATED HOUSEHOLD EARNING STRATEGIES - NORTHEAST THAILAND
(using Internal Rate of Return (IRR) analysis)

Scenario: **One**

Description: Growing rice for sale, money borrowed for cattle, fruit trees and fish pond under Agricultural restructuring project. No pasture grown. No off farm work.

Source of Funding Capital borrowing

CASH FLOW AND INTERNAL RATE OF RETURN ANALYSIS

INVESTMENT	Current	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
							0
Initial investment	-45,000Bt						-45,000Bt
Residual value at year 5						27,000Bt	27,000Bt
Total Investment "Cashflow"	-45,000Bt	0Bt	0Bt	0Bt	0Bt	27,000Bt	-18,000Bt
RETURN ON INVESTMENT							
Income		21,210Bt	26,740Bt	29,240Bt	29,240Bt	29,240Bt	135,670Bt
Expenditure		-15,956Bt	-15,956Bt	-15,956Bt	-18,206Bt	-18,206Bt	-84,280Bt
Investment "Cashflow"		5,254Bt	10,784Bt	13,284Bt	11,034Bt	11,034Bt	51,390Bt
CASH FLOW FOR IRR	-45,000Bt	5,254Bt	10,784Bt	13,284Bt	11,034Bt	38,034Bt	33,390Bt
CUMULATIVE CASH FLOW	-45,000Bt	-39,746Bt	-28,962Bt	-15,678Bt	-4,644Bt	33,390Bt	

PROJECT IRR	16.2%

ANALYSIS OF HOUSEHOLD EARNING STRATEGIES - NORTH EAST THAILAND
(using Internal Rate of Return (IRR) analysis)

Scenario: **Two**

Description: Growing rice and cassava for sale, money borrowed for heifer calves at commercial rates, no pasture
1 person works off farm 10 months of the year.

Source of Funding Capital borrowing

CASH FLOW AND INTERNAL RATE OF RETURN ANALYSIS

INVESTMENT	Current	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
							0
Initial investment	-12,000Bt						-12,000Bt
Residual value at year 5						12,000Bt	12,000Bt
Total Investment "Cashflow"	-12,000Bt	0Bt	0Bt	0Bt	0Bt	12,000Bt	0Bt
RETURN ON INVESTMENT							
Income		22,200Bt	22,200Bt	27,200Bt	22,200Bt	22,200Bt	116,000Bt
Expenditure		-17,645Bt	-17,645Bt	-17,645Bt	-17,645Bt	-17,645Bt	-88,225Bt
Investment "Cashflow"		4,555Bt	4,555Bt	9,555Bt	4,555Bt	4,555Bt	27,775Bt
CASH FLOW FOR IRR	-12,000Bt	4,555Bt	4,555Bt	9,555Bt	4,555Bt	16,555Bt	27,775Bt
CUMULATIVE CASH FLOW	-12,000Bt	-7,445Bt	-2,890Bt	6,665Bt	11,220Bt	27,775Bt	

PROJECT IRR	45.2%

ANALYSIS OF HOUSEHOLD EARNING STRATEGIES - NORTH EAST THAILAND
(using Internal Rate of Return (IRR) analysis)

Scenario: **Three**

Description: Growing rice only for own use, no cassava, money borrowed for 5 cows under Agricultural Restructuring Proje package, pasture sown and maintained for cattle feed.

Source of Funding Capital borrowing

CASH FLOW AND INTERNAL RATE OF RETURN ANALYSIS

INVESTMENT	Current	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
							0
Initial investment	-75,500Bt						-75,500Bt
Residual value at year 5						60,000Bt	60,000Bt
Total Investment "Cashflow"	-75,500Bt	0Bt	0Bt	0Bt	0Bt	60,000Bt	-15,500Bt
RETURN ON INVESTMENT							
Income		0Bt	0Bt	6,000Bt	15,000Bt	15,000Bt	36,000Bt
Expenditure		-3,360Bt	-3,360Bt	-3,360Bt	-7,135Bt	-7,135Bt	-24,350Bt
Investment "Cashflow"		-3,360Bt	-3,360Bt	2,640Bt	7,865Bt	7,865Bt	11,650Bt
CASH FLOW FOR IRR	-75,500Bt	-3,360Bt	-3,360Bt	2,640Bt	7,865Bt	67,865Bt	-3,850Bt
CUMULATIVE CASH FLOW	-75,500Bt	-78,860Bt	-82,220Bt	-79,580Bt	-71,715Bt	-3,850Bt	

PROJECT IRR -1.0%