Département **S**ociété, **D**éveloppement, **U**rbanisation
(S. D. U.)

T R I — O R S T O M Project

AGRICULTURE DEVELOPMENT AND THE IMPACT ON LAND USE : PROGRESS REPORT ON DOI CHANG

John Mc KINNON

Documents de Travail

INSTITUT FRANÇAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION

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Département "Société, Développement, Urbanisation"

AXE 2 "REALITES ET STRATEGIES DU DEVELOPPEMENT"

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Agricultural Development and the Impact on Land Use:

Progress Report on Doi Chang

Introduction

The principal goal of this study was to evaluate the adaptive response of the people of Doi Chang, Tambon Wawi, Amphoe Mae Suai, Changwat Chiang Rai to recent development experience by carrying out a study of the evolution of land use and land tenure. A similar study was to be conducted in Pha Dua, Tambon Pha Sang, Amphoe Mae Chan, Changwat Chiang Rai and the two communities compared (Appendix I). This is the first draft of one of two progress reports. The second will be on Pha Dua. The third and final report will bring together the final results.

The main research instruments used were to include a time series analysis of aerial photography, the preparation of a land use map from SPOT imagery and fieldwork conducted through participant observation, running a land use questionnaire and a socio-economic survey.

Because of delays in taking delivery of aerial photography, a "secret" classification imposed on the earlier set of Doi Chang aerial photography (thereby made inaccessible) and at the time of writing results from the SPOT analysis were not available, the scope of the report has had to be circumscribed. In the absence of an adequate assembly of objective tools reconstruction has had to rely

more on villager testimony than either anticipated or prefered.

Nevertheless results have been obtained which enable preliminary responses to be made to questions questions posed at the begining of the research. When and by whom was the land first cleared? What farming strategies have emerged and to what extent are they sustainable? How do farmers obtain access to land? What impact has the introduction of intensive commercial cropping had on the environment? What agricultural options remain open to farmers? How has integration into the national economy affected the community? Is is possible to identify an optimum farm size?

Although it is not yet possible to provide firm answers to these questions the discussion introduces speculative observations as part of the process of working towards a better understanding of the field data and what is happening in farmers fields. An assessment of information available from other sources is provided as part of the research problem and will be more fully developed when fieldwork is completed. Chapter headings provide a guide to information organised under conventional categories.

Chapter 1 The Approach

Broadly speaking land use studies of the highlands of northern Thailand have been approached in two ways. First, and by far the most common, is the broad descriptive work followed by the Department of Land Development. An inventory of resources is prepared, mapped and analysis restricted to aerial photo interpretation, the percentage of land under this or that type of crop or vegetation and a guide given to land potential (eg Land Development, Department of 1981). To a certain extent research work undertaken by the Tribal Research Institute has matched this in scope and depth. A considerable number of socio-economic surveys have been prepared which provide valuable statistical information but do not attempt anything more than a straight forward, empirical account, a summary of what is collected. The second type, prepared by investigators representing a wide range of scientific disciplines have focused on specific areas and provided in-depth studies of single village land use systems. These range from natural science assessments of shifting cultivation including soil erosion measurements (Sanga, 1978) to anthropological investigations designed to measure the limits of swiddening (Hinton, 1975 & 1978) and the impact of commercialisation (Cooper, 1984).

The principal concern of the Royal Thai Government as stated by the Director General of the Department of Public Welfare through the Tribal Research Institute (Wanat Bhruksasri, personal communication) has been to make research

more relevant to the development task in the highlands. While work of the type identified above has added to our understanding of the processes at work the results of each discipline engaged have not been thoroughly articulated with each other. The convention of the first type largely precludes the possibility of achieving anything more than a descriptive account which, while it contributes to a growing data base does not generate information which can enhance the development of a more coherent and dynamic understanding of the current situation in the highlands. Work of the second type, by necessity restricted to the study of specific sites over a restricted period, does not, in such a dynamic milieu, lend itself to authoritative extrapolation.

This most unsatisfactory state of affairs results in considerable frustration. On one hand those inside the situation responsible for carrying out development work, both government and project managers remain critical of what surveys and social science research can contribute. On the other hand social scientists, especially those whose livelihood is earned well outside the situation have been increasingly critical of what is being done without always suggesting ways in which it could be more efficiently undertaken.

The question then becomes what can be done to bridge this impass? Unfortunately there is no easy answer. To call the problem is one thing, to provide an understanding is quite another matter altogether. If a more holistic

approach is called for, critical work need not initially be conducted at a higher theoretical or academic level but at a more honest, even naive but more imaginative level of competence. Where scientists for good professional reasons venture outside restricted areas of technical training in the attempt to arrive at a better understanding of a complex reality they must accept more responsibility to use their training creatively. To venture too far and challenge accepted paradigms well entrenched in the sociology of knowledge is to risk credibility and may even place the results of scientific work at risk but to accept the alternative and risk nothing avoids altogether the possibility that a contribution will be made to understanding. The results of work conducted within dry classification systems and arid categories goes nowhere and achieves nothing.

The Tribal Research Institute and the French Institute of Scientific Research for Development through Cooperation (TRI-ORSTOM) Project of which the work under review here is part, allowed room for a response to evolve which resulted in the following steps:

> First, to provide a review of work completed at the Tribal Research Institute;
>
> Second, foster critical work intended for publication within fields appropriate to Tribal Research Institute researchers competence;
>
> Third, enter into research work in a field identified by the Tribal Research Institute as worthy of study and to conduct this work under the

ORSTOM policy of research through cooperation, in other words in close cooperation with personnel based at the Institute.

At the end of the first stage a report was prepared for the Director General of the Department of Public Welfare in which a professional but largely undocumented assessment was made of work completed before July 1986 entitled "TRI-ORSTOM Project: Toward a Research and Development Plan (1986-87)". As part of an attempt to stimulate wider comment this was subsequently published in *Espace et Territories* (McKinnon & Vienne, 1987).

The principal observations made were that widely held, received knowledge about the highlands and highlanders which enjoys wide currency played such a dominant role in formulating research that important questions were not being addressed. To assist in policy formulation it was proposed that a more critical attitude be adopted towards accepted interpretations, concepts and empirical epistemological categories of ethnicity, tribalism, shifting cultivation, land degradation and so forth.

The second step engaged project personnel in the time consuming task of preparing a book for publication entitled ***Hill Tribes Today: problems in change*** (McKinnon & Vienne [eds] White Lotus: Bangkok [in press]). In this publication six researchers from the Tribal Research Institute (an administrator, agriculturalist, two anthropologists, a dietition, ethnologist and educationalist) and two invited Thai contributors (a journalist and a research assistant)

were asked to provide commentaries and reflections focused on their experience in highland communities and/or the manner in which they or their situation is perceived by outsiders. Six complementary contributions were also obtained from foreign researchers (three social anthropologists, a primitologist, geographer and sociologist). A set of over 100 photographs was selected for publication and provided another dimension in which direct comments could be made to challenge the current consensus.

The book was structured in such a way as to enable contributors to question the current state of knowledge on both the highlanders and the highlands and to pose a challenge for those responsible for policy formation. This report on work still underway at Doi Chang follows McKinnon's thinking as presented in ***Hill Tribes Today*** an attempt to add primary source material and new information to some of the observations presented in Chapter 12, "Structural Assimilation and the Consensus: clearing grounds on which to rearrange our thoughts".

This essay was based on the assumption that:

> *Contemporary Thai policy towards highlanders is not the product of current scientific knowledge, it is largely formed out of an older cultural and historical position informed by modern ideas about what constitutes progress, development and national territory... (which) national and foreign development agencies... serve to ensure their own survival*

This was seen to result in strategies of intervention

antithetical to the longterm goal of peacefully integrating highlanders into the state. It was further argued that although highlanders themselves are anxious to become Thai citizens

> *received knowledge.. places highlanders in a marginalised and subordinate position in relation to the mainstream of Thai society*

which makes integration difficult. A widely shared consensus, shared most notably by Bangkok officials diminishes their humanity and categorises them as second, if not third class residents judged to be incompetent or unworthy of taking part in decisions which will affect their future.

Rather than being weakened by state intervention this deeply embedded cultural position has been strengthened in structural opposition heightened by the contradiction between the highlanders willing and spontaneous response to integration through participation in the market economy, access to modern medical services and sending their children to school: off-set by the often charitable but technocratic, paternalistic and limited understanding of the situation which development personnel bring to their work. The following comment selected at random serves as illustrate the attitude

> *the traditional lifestyle of the hill tribes provides an obstacle to development... they only know how to hold out their hand to get*

> *what they want... although the government has provided many workers and provided a lot of money for a long time, and although some material gains have been made their conscience* [a sense of their full responsibility as Thai citizens] *is still not developed to a satisfactory level* (Phimon Saengsawang, 1982: 58).

Because political and sociological preoccupations make it necessary for decision makers to decide what should be done on the basis of an inadequate state-of-knowledge and because current ideology rules out the possibility of attempting to conduct direct negotiations across a considerable hierarchical, linguistic and cultural gap: misunderstandings are inevitable.

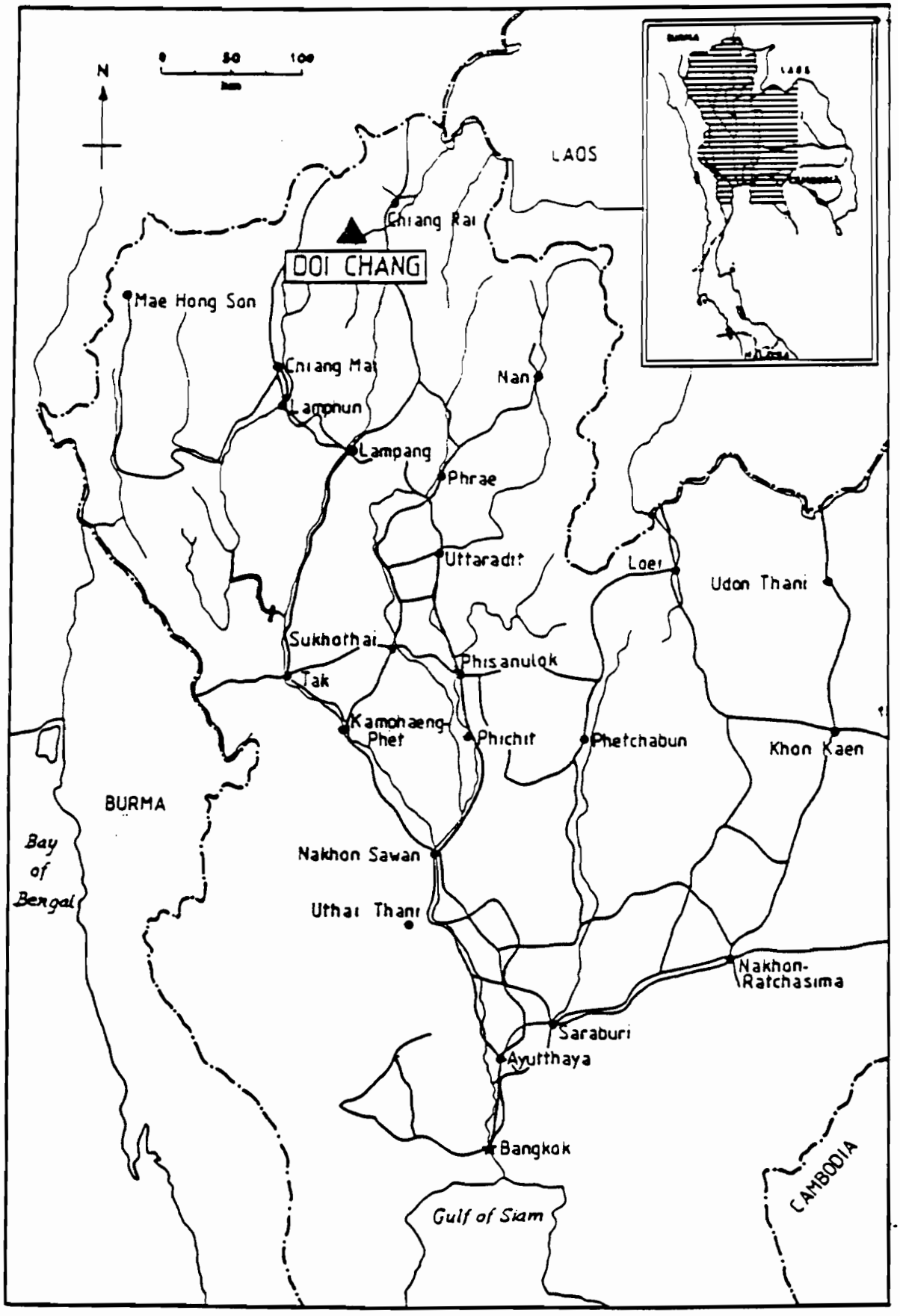
In the essay in question information was presented as part of the attempt to document the assumption that "Contemporary Thai policy towards highlanders is not the product of current scientific knowledge" but if this argument is to hold then it must also be demonstrable at the village level. This then is part of the challenge addressed by this research.

The principal aim of the research however remains the task of interpretation, making sense of the land use and land tenure system of Doi Chang to identify the internal social and economic dynamics developed in response to recent

changes: adjustments made to cope with rapid population increase occassioned by the arrival of Akha migrants from Mae Chan, the suppression of opium production, the impact of the Thai-German Development Programme a project which falls under the administrative arm of the Office of the Narcotics Control Board and how these events have affected the lives of Akha, Lisu and Yunnanese residents. In other words the objective was to mount a study of land use as a prism through which the social, cultural, economic and political factors affecting access to land based resources could be explored.

As a progress report on work still underway it is hoped that the delay in presenting final results will provide time for comments and criticism so that the usefulness of the final report can be appropriately enhanced.

FIGURE 1


N
0
50
100
LAOS
Chiang Rai
DOI CHANG
Mae Hong Son
Chiang Mai
Nan
Lamphun
Lampang
Phrae
Uttaradit
Loei
Udon Thani
Sukhothai
Phisanulok
Tak
Kamphaeng-Phet
Phichit
Phetchabun
Khon Kaen
BURMA
Bay of Bengal
Nakhon Sawan
Uthai Thani
Nakhon-Ratchasima
Saraburi
Ayutthaya
Bangkok
Gulf of Siam
CAMBODIA

Chapter 2 Profile of Doi Chang

Doi Chang is a highland town with a multi-ethnic population of over 1225 highland people enumerated in the 1986 population survey which excluded the government people who are based there. It is situated in Tambon Wawi, Amphoe Mae Suai in Changwat Chiang Rai (Fig. 1). Akha and Lisu farmers, Yunannese traders share the town with a few Thai teachers, agriculturalists and development workers. It has: a large primary school which teaches the national primary school curriculum, employs 11 teachers and caters to the needs of approximately 250 students; a Public Health Station run by the Ministry of Public Health; two video theatres; several shops; approximately 20 pick-up trucks (all owned by villagers); the Wawi Highland Agricultural Research Station run under the Department of Agriculture, Highland Agricultural Research Office; and a Welfare and Development Unit which falls under the supervision of the Department of Public Welfare, .

It cannot be called a typical highland community but this raises a another question, "Just what is a typical highland settlement?" The Tambon centre of Wawi is equally atypical. With its larger population and even greater cultural mix both towns presents a face to the world which Furnivall writing about pre-war Burma described as plural societies "with different sections of the community living side by side but separately, within the same political

unit... Each group holds to its own religion, its own culture and language, its own ideas and ways. As individuals they meet but only in the market place, in buying and selling" (Furnivall, 1948: 304). Although the specific conditions under which the contemporary social, economic and political transformation is taking place have changed a great deal it is aposite to point out that such ethnic diversity was more apparent and not so long ago in Chiang Mai itself (Vatikiotis, 1984). Clearly Doi Chang like Wawi are carriages but lately attached to a train of modernisation pulled by the powerful engine of commercialisation which was brought into being by the industrial revolution. The momentum of this transformational process may be regretted by some, its speed and destination altered by development planners, the fate of its communities promoted or imperiled by political intervention but for better or worse these towns are recapitulating the experience of Thailand itself.

It is a measure of how quickly Doi Chang has changed that many Thai on hearing the name imagine an isolated community set in the deep forest. An area from which Boon Chuey in his book ***Thirty Minorities of Chiang Rai*** (1957: 63) provided a photograph of Lisu farmers standing in a field of poppies. Until people stopped growing opium in 1986 many tourists visited in the certainty that they would see the fabled Golden Triangle in bloom. The forest has gone but this appears to be due not only to the activities of farmers clearing fields but also the activities of a logging

concession granted a few years ago by the Royal Forestry Department. The operation removed the remaining stands of commercially attractive timber.

In retrospect the choice of Doi Chang as a study village seems abitrary. The resident Loimii Akha have close contacts with Ban Mai Pattana and Ban Pha Daeng to the north, and the Ilo Akha village of Huai Khii Lek is not so far away. Many kin of the Lisu of Doi Chang live in the neighbouring village of Doi Laan and have access to fields there. The boundary drawn around the study community indicates a territorial reality which is misleading. The farmers of Doi Chang claim effective rights to land in Huai Khrai to the west, Doi Laan and Ban Mai Pattana. Their children attend schools all over the country, as far south as Changwat Ang Thong in the central region of Thailand, in Chiang Mai, the provincial city of Chiang Rai and Mae Suai and a vocational school in Lampang. One resident has a university qualification earned in China, another former resident is away for study in Australia and another is in the US. To report on this community in the traditional scholastic mode followed by anthropologists studying primitive and isolated communities would be to misrepresent the complexity of the political, social and economic milieu in which the people of Doi Chang secure a living.

Although Doi Chang is only 28 kilometers from the main highway between Chiang Rai and Chiang Mai it is still a frontier town. At the height of the rainy season the road is

closed to all but the most determined pick-up truck drivers and still presents a considerable challenge to four wheel drive vehicles.

It is not only in a physical sense that Doi Chang can be considered a frontier town. A few years ago the village headman was shot and killed. The Lewis's report "feuds between clans. In one year six people were killed... in the Doi Chang and Tak areas" (Lewis & Lewis, 1984 : 258). In November 1986 at the height of a most successful tomato season armed highway robbers relieved several farmers of their earnings as they were returning to Doi Chang. When farmers took to carrying guns to protect themselves they were frequently stopped by soldiers and "fined" for being in illegal possession of arms.

The presence of law-and-order agencies has not been able to guarantee the safety of farmers. In September 1987 five Akha returning from market with 40,100 baht in their pockets were held up at gun point. Their attempts to resist were met with gunfire. Two men were seriously injured. The group surrended their money and five wristwatches (Thai News 21 November, 1987 : 2). In Decembre 1987 a local government official attempted to extort 15,000 baht from a wealthy villager by claiming that he had found a bag of heroin in his house. The matter was resolved by the courageous intervention of a local Department of Public Welfare worker who took the matter to the District Officer.

Doi Chang like many American western frontier towns in the last century many other highland communities exists a marginal relationship with the state. The presence of officials in the role of teachers and development workers makes Indians of the highlanders for whom, in the presence of a powerful colonising group, it is irrelevant whether or not they can claim historical, indigenous status and therefore the right to occupy the land. According to the law the whole area is classified as Conservation Forest which falls under the National Forest Reserve Act (1964). This brings all the land under the administrative authority of the Royal Forestry Department.

The attempt to draw historical parallels is itself misleading because Doi Chang is firmly part of a twentieth century. The successful replacement of opium poppy briefly made it a destination for flights of helicopters bringing international dignitaries. When the Malaysian Prime Minister visited Thailand at the end of February, 1987 he visited Doi Chang in the company of Thailand's Prime Minister. This official attention has led to other interests being negociated. In close proximity to Doi Laan a relatively large tract of land has been bought by urban based speculators with good government connections.

The people of Doi Chang are caught up in a revolutionary process with which they are ill equipped to cope. Most are poor. Many are stateless refugees who lack official

documentation including house registration, ID cards and citizenship. No farmers have legal rights to the land they work yet they are caught up in a profound political, economic and social process which threatens to completely change their way of life. This is no game. It is a fight for survival in which they know there can only be winners and losers. A large part of their willingness to cooperate with development agencies is a measure of their anxiety leavened with hope in the goodwill of the government to keep the number of losers to a minimum.

Administration

The Department of Public Welfare (DPW), through the provincial Development and Welfare Centre at Mae Chan set up the first DPW Unit in neighbouring Doi Laan in 1981. Following 1983 when the Thai-German, Highland Development Programme commenced work in Tambon Wawi the Unit was moved down to Doi Chang (1985).

Since the Thai-German Highland Development Programme (TG-HDP) commenced work considerable investments have been made in the administrative infrastructure and substantial support provided to farmers to encourage them to enter into cash cropping. As an integrated project TG-HDP works under the umbrella of the Office of the Narcotics Control Board (ONCB) with line agencies in agriculture, forestry, education, health, public works and community development. Field activities designed to deliver agricultural inputs are

managed mainly through Wawi Highland Agricultural Research Station and the Department of Public Welfare.

According to project documents the principal goal of the undertaking is to increase the standard of living of the target population "while maintaining the ecological balance of the project area" (TG-HDP, Internal Paper 24: 5) and to achieve this by increasing both the supply of subsistence crops and agricultural income "based on appropriate land use" (TG-HDP, Internal Paper 24: 23).

To date investments have been provided in the form of the Public Health Station, school, the Wawi Highland Agricultural Research Station and the Development and Welfare Unit (DPW Unit) and associated equipment. Inputs in kind (fertiliser, pesticides, herbicides, plant materials and etc) have been provided to approximately 20 farmers each year in each of the following crops coffee (400 trees per farmer to plant 1 rai), tomato (for 1984 -1985 only), red kidney beans, cabbage (very few) through the DPW Unit. A seven year plan for cropping systems research conducted by the Wawi Highland Agricultural Station commenced in 1986 and under benevolent management good relationships have been established with farmers. This programme went into a training phase in 1987 and set up the first on-station trial in this same year. Plans for the following five years includes both on-station and adaptation trials in farmers fields (groups of six) hopefully culminating in larger field trials in advance of

extension in 1991 and 1992 which will involve groups of farmers consisting of 80 persons. Incentives will be provided for: "addition work... (at least for the soil and water conservation measures)", risk compensation "in case of crop failure (and) free inputs" (Schubert et al, 1986: 280-81).

Population

The earliest official population figures available were published by the Tribal Research Centre in 1972 (Directory of Tribal Villages: 1972: 78). At that Doi Chang is reported as having a Lisu population of 643 consisting of 27 exceptionally large households with an average of nearly 24 people. Such a figure hardly seems likely and places the credibility of the total number in doubt. It was not until 1986 when a national survey was carried out that a more reliable figure became available.

Table 1
Population of Doi Chang 1986

Ethnic Groups	Households (HH)	Families	Number of People	Average Size HH
Lisu	87	106	584	6.7
Akha	83	115	599	7.2
Yunnanese	10	12	78	7.8
Totals	180	233	1,225	6.8

Source: National Survey of Hill Tribe Population Doi Chang (1986).

As has already been noted, Doi Chang is an unusually large community. The recent arrival of Akha and the return

of Lisu from Tak has added to the total number of residents. To what extent this move is a function of the setting up of the TG-HDP project is difficult to determine but clearly the security and assistence provided by a largely foreign funded project has not discouraged settlement.

The size of households ranging from 7.8 (Yunnanese) to 6.7 (Lisu) reflects a composition not atypical of highland communities. It indicates that most households consist of an extended family sometimes including elderly grandparents and married children with children of their own. This is borne out with reference to household census forms and records of available labour. As the basic economic unit households must balance productive workers against consumers and when this is in a state of imbalance corrective strategies must either be negotiated through marriage alliances or with recourse to other means. The dependency ratio calculated as follows: the number aged 0-14 plus the number aged 60 and above, divided by the number aged 15-59 and multiplied by 100 provides a measure of the general loading on individual groups (Table 2, over).

Table 2
Comparative Dependency Ratios of Doi Chang Ethnic Groups

Ethnic Group	Doi Chang	Kunstadter*
Yunnanese	101.9	112.3
Lisu	78.3	77.4
Akha	78.4	85.7
Thailand 1970		100.1
Total pop.	78.3	

Source: *Kunstadter, 1983: 22; National Survey of Hill Tribe Population, Doi Chang (1986)

Just how useful it is to tabulate figures for such small populations can be questioned. It is something of a comfort that they compare so closely with figures published elasewhere (Kunstadter 1983) and that they are relatively low.

Table 3 over...../

Table 3

Lisu, Akha and Yunnanese Age-Sex Distribution

Age	Lisu				Akha				Yunanese			
	Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0 - 4	20	4.2	20	4.2	30	7.1	41	7.5	7	6.8	10	9.7
5 - 9	28	5.9	38	8.1	32	5.9	45	8.2	5	4.8	13	12.6
10 - 14	36	7.6	44	9.3	36	6.6	36	6.6	6	5.8	7	6.8
15 - 19	37	7.8	29	6.1	31	5.7	35	6.4	4	3.9	6	5.8
20 - 24	29	6.1	33	7.0	28	5.1	28	5.1	7	6.8	5	4.8
25 - 29	16	3.3	16	3.3	18	3.3	29	5.3	1	1.0	2	1.9
30 - 34	16	3.4	17	3.6	25	4.6	18	3.3	7	6.8	6	5.8
35 - 39	11	2.3	7	1.5	13	2.4	13	2.4	-	-	2	1.9
40 - 44	6	1.3	10	2.1	9	1.6	10	1.8	1	1.0	1	1.0
45 - 49	8	1.7	12	2.5	5	0.9	14	2.6	4	3.9	2	1.9
50 - 54	8	1.7	5	1.1	7	1.3	6	1.1	-	-	-	-
55 - 59	7	1.5	4	0.8	4	0.7	8	1.5	1	1.0	2	1.9
60 - 64	1	0.2	5	1.1	5	0.9	4	0.7	2	1.9	-	-
65 - 69	2	0.4	2	0.4	1	0.2	1	0.2	-	-	-	-
70 - 74	1	0.2	2	0.4	2	0.4	2	0.4	1	1.0	1	1.0
75 - 79	-	-	-	-	1	0.2	-	-	-	-	-	-
80+	1	0.2	-	-	-	-	-	-	-	-	-	-
Total	**227**		**244**		**256**		**290**		**46**		**57**	
Grand totals	**471**				**546**				**103**			

Source: National Survey of the Hill Tribe Population (1986)

Population Pyramids

On the following pages appear a consolidated age/sex population pyramid for the total population of Doi Chang (Figure 2) based on Table 3 and a set of age/sex population pyramids for each of the ethnic groups (Figure 3).

The pyramid should be read by following the outside line. Where the proportion of those in a specific ethnic group exceed that of other groups this is shown by the perimeter shading: black for Lisu, light diagonal shading for Akha and dark diagonal shading for Yunnanese. Problems in following Figure 2 should be referred to Figure 3. The differences between the various ethnic groups especially given the smaller size of the Yunnanese population, are relatively insignificant. What is surprising is the diminished lower rankings for children in the 0-4 and 5-9 cohorts, especially for the Lisu and Akha populations. This pinched base, given the number of those both fertile and married indicates that the presence of children may have been under reported. This is supported by the opinion of field workers who observed that most households included babes-in-arms. A household check needs to be made of the schedules.

This pinched base may also reflect changing attitudes to family planning. The median age of 18 for the Lisu and 19 for the Akha indicate a relatively low birth rate and low natural population increase (possibly under 2.5%). Given high infant mortality rates (20.4 /1000 newborn) due, according to Kunstadter (1983: 31) reporting on the results of his work on

FIGURE 2

AGE - SEX DISTRIBUTION OF LISU, AKHA AND YUNANESE
□ DOI CHANG □

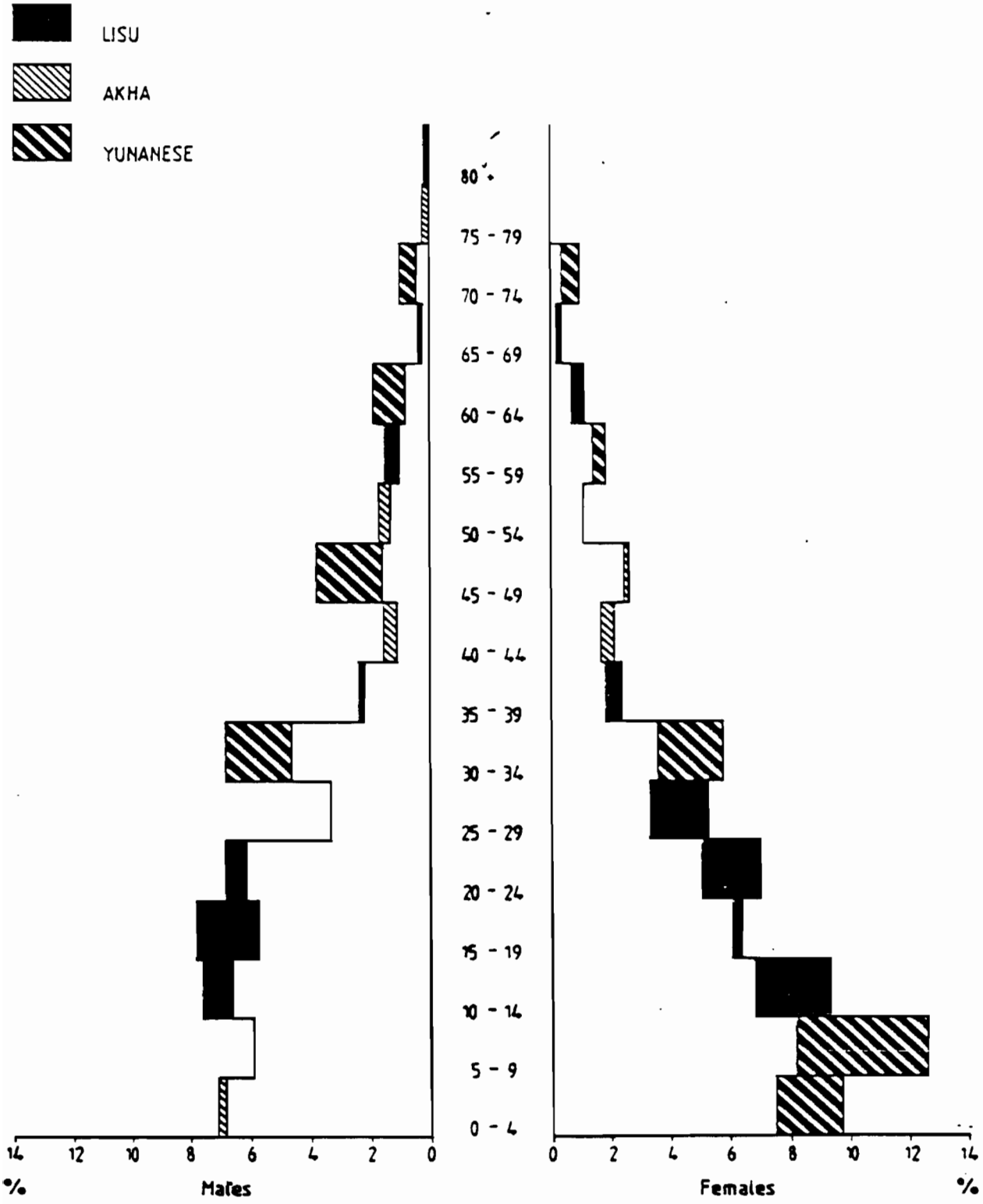
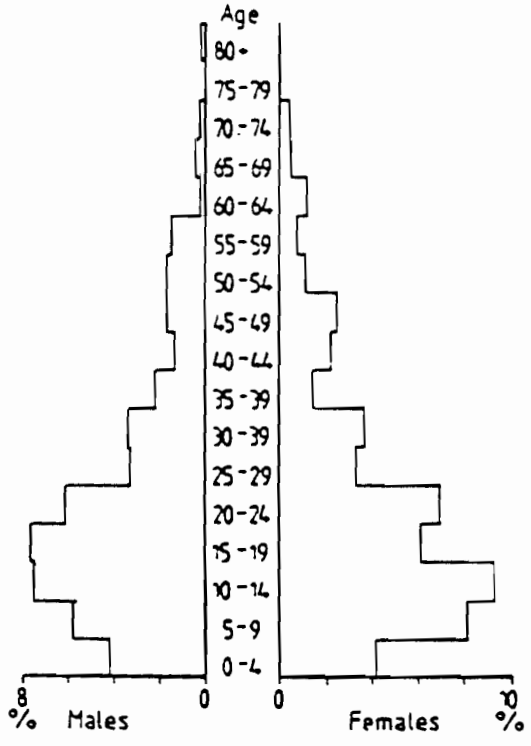


FIGURE 3

I.

-LISU-



□ DOI CHANG DEMOGRAPHIC □

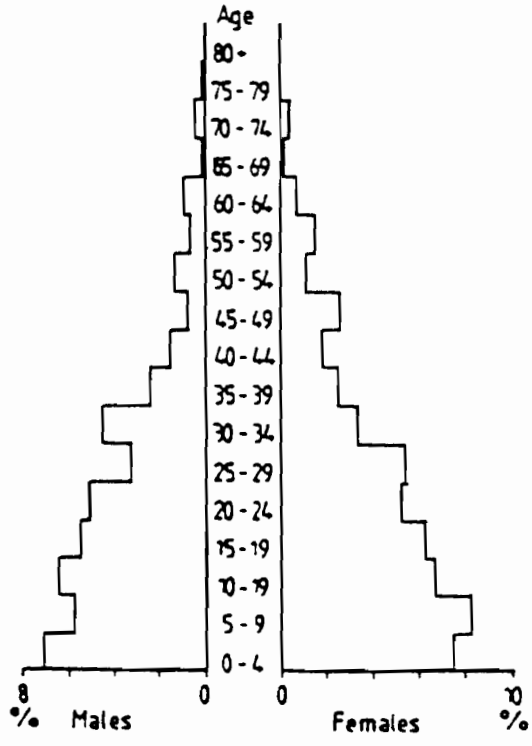
FIGURE I. AGE-SEX DISTRIBUTION OF LISU

II. AGE SEX DISTRIBUTION OF AKHA

III. AGE SEX DISTRIBUTION OF YUNANESE

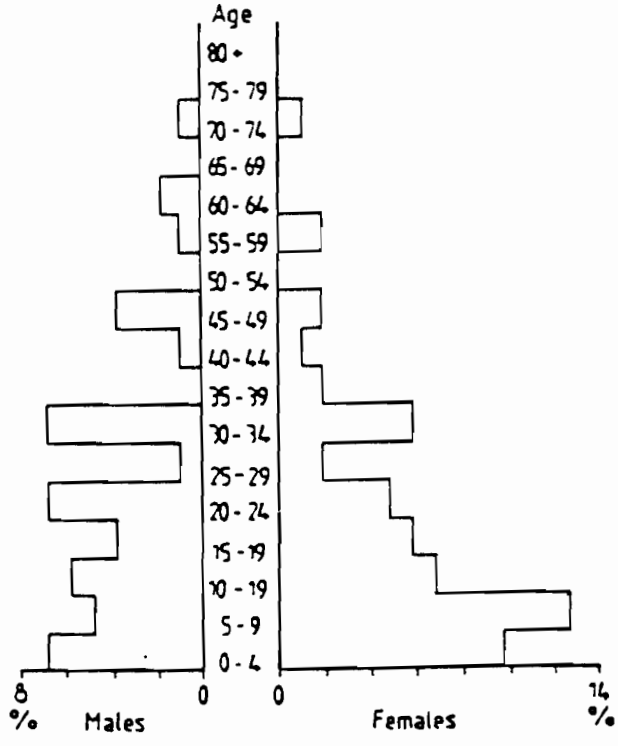
II.

-AKHA-



III.

-YUNANESE-



Karen and Lua children, to fever (40 %), enteritis, diarrhoea .pn 25 and other gastro-intestinal ailments (36%) and respiratory problems (6%), these all continue to take their toll. If in fact fewer children are being born these are not necessarily guarranteed a better chance of survival. The building of a Public Health Station by the TG-HDP has not ensured that medical services are always available.

Poor nutrition is also a factor which must be taken into account especially in the light of observations made by Ralana Maneeprasert (1989) of the Tribal Research Institute who reports that it is children and women who are most likely to suffer. Studies reviewed in her contribution to *Hill Tribes Today* report that from approximately 30 to 40 percent of highland children under the age of six suffer from Protein Energy Malnutrition (PEM). The results of a survey of 10 Doi Chang households by a nutritionist attached to a research team from the Centre for Advanced Training in Agricutural Development of the Technical University of Berlin found that the diet of 50 percent of those from whom information was collected ate under 90 percent of normal, healthy daily requirement (Schubert et al, 1986: 103), one household produced only enough rice to meet its needs for three months, three households less than six months supply and five less than nine months supply which accounts for 90 percent of the sample (Ibid: 1986: 105). Evidence from this same survey revealed that 19 percent of children examined suffered from PEM over an extended period, were chronically malnurished

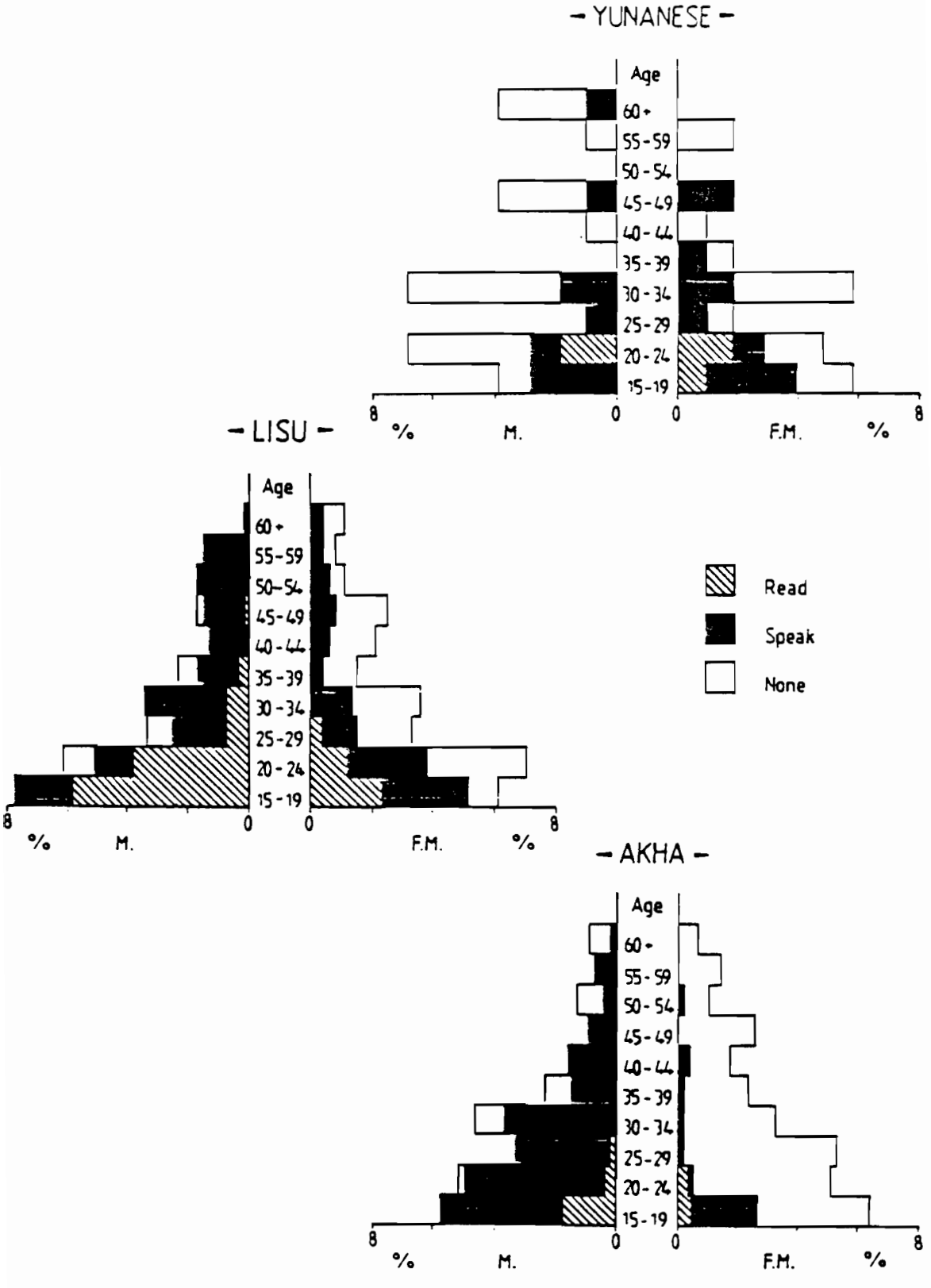
(Ibid: 116) and that "Children between 1 and 5 years seemed to be more affected by acute malnutrition than older ones" (Ibid: 1986: 115).

It appears that quite a few young people attend educational institutions outside Doi Chang. Preliminary information indicates that amongst either the better off households or those who consider it worth the risk of allowing their children to attend Christian missionary schools in urban areas or other places at further remove: there is a marked preference for outside education. The possibilities of an identity crisis associated with such seperation are not considered as costs against the gain of securing properly spoken central Thai and associated behavioural characteristics. Several householders stated that this preference was based on the belief that by sending their children away they (the children) would learn the finer points of lowland social etiquette and therefore be able to pass for Thai. This in turn is an interesting comment on highlander awareness of the discrimination to which they are habitually subject by most resident officials and in the course of visits to neighbouring towns. Be this as it may the immediate point is that the population pyramid does not indicate cohorts diminished by these absences.

Figure 4 provides an overview of Thai language skills amongst the resident population over the age of 15. It does not provide a general indication of the considerable linguistic skills of highlanders, especially males who often

FIGURE : 4

THAI LANGUAGE SKILLS OF THOSE 15 YEARS AND OVER BY ETHNIC GROUP



speak at least one language in addition to their natal tongue if not two or three. The Figures present few surprises but need to be checked.

A considerable portion of the small Chinese Yunnanese population appear to rate very low and several young adults are listed as having no Thai language skills at all. For such an active trading group this hardly seems possible. The figures need to be checked.

The Lisu and Akha pyramids follow a predictable pattern which shows a larger proportion of males in contrast to females able to both read and speak Thai. The higher standard in Thai declared by the Lisu (able to read) may be an indication of their longer access to Thai schooling. The fact that few Akha women in contrast to their men, are able to speak Thai, indicates a clear sexual division which should be explained.

A considerable amount of field data has not as yet been processed and will be presented in subsequent reports.

Chapter 3: Evolution of Land Use

The area of Doi Chang has been occupied for a considerable time. Although I am not aware of any stone artifacts having been found there are good reasons to assert on the basis of the discovery of pebble tools under a basalt flow considered to have been laid down approximately 690,000 years ago (Mae Tha district of Lampang) that the north has been occupied by man for a very long time (McDonald & McDonald, 1975-78: 1-10). According to the Payap historian Dr Ronald Renard in a recent study "There is evidence of people living in the Doi Inthanon Ranges for thousands of years" (Renard et al, 1988: 16) and it seems reasonable to extrapolate this assumption to Doi Chang. Both the flora and the fauna have most probably evolved in association with human use of the environment. The idea of an uninhabited, untouched, natural forest only recently subject to modification by man is a most unlikely myth.

It is not surprising that the ancient history of Doi Chang is difficult to reconstruct but it is somewhat frustrating to be so far unable to construct a history of the more recent past with any great precision. Lisu elders report that their forefathers migrated from Burma before the turn of the century. According to information provided to a Tribal Research Institute problem census team which carried out a survey in 1986 the Lisu first settled in Doi Chang 93

years ago which dates their arrival at 1893. The truth of this statement needs to be verified. The estimate provided by the Welfare and Development team and reproduced in a booklet for visiting dignitaries states that the Lisu arrived 65 years ago which dates their arrival at 1921. This figure is independently verified by the Lewis's with reference to an unpublished paper written by the linguist-missionary Hope who lived in the village for some time and "who established the date for the arrival of the first four Lisu families in the Doi Chang area as 1921, and 15 more families joined them the following year" (Lewis & Lewis, 1984: 242).

Migrant highlanders are well aware that when their credentials are being examined for official documentation their date of arrival is an important consideration. In the absence of carefully constructed geneologies it is not always possible to estimate this accurately. Occassional disruptions as documented below (epidemics and the break down of law-and-order) which apparently encouraged some people to move out of the area for a while also contributes to the confusion.

What appears to be most likely is a few Lisu households, as many as seven (including a *yai yai* or Shan head of household) under the leadership of a Yunnanese silver (and most likely opium) trader (La-taa-pha) moved into the area shortly after it had been abandoned by a Hmong community before 1922.

If the arrival of the Lisu can be dated to the end of the last century then two points can be made. First that the community was set up only a short time after the period when most lowland villages studied by ethnologists in northern Thailand were "first settled or resettled no earlier than the 1880s" (Wijeyewardene, 1985/86: 97). Second that it is highly likely that poppy had already been grown there for several years. Descriptions of such villages provided by an Englishman surveying the borders of Siam (1890-93) before the formation of French Indo-China gives a clear picture of a Hmong community in the vicinity of Chiang Khong (December - February, 1891).

> *When they arrive at the site for the new village, which is always near a spring, the trees are cut down, and when a sufficient space is cleared, rough hewn planks are made for the sides of the house, while smaller blocks are used for the roof as a rough shingle. Ventilation is free enough, and the smoke from the fires issues freely from the sides and roofs. Water is sometimes brought down in bamboo pipes, and the wooden tub which receives it has a close fitting cover to keep out the dust. The mill-stones are neatly formed. While one woman may be seen busily grinding Indian corn, others are preparing indigo for dyeing cloth, and in embroidering neat and elegant designs in cotton and silk.*
>
> *They are careful with their cattle and ponies, and often place them on platforms above the ground. The dogs are an excellent breed of sheep-dog; some are without tails. The village is almost always picturesquely situated, and in the month of February, when the poppies are blooming after a shower of rain, the prospect is very pleasing. The blossoms of the poopy are large and of ever shade of colour, from pure white to deep purple. The blossoms, with a white centre and petals (four) tipped with all the shades between a light pink to deep purple, are very pretty. Women may be seen proceeding from plant to plant with china cups*

> *collecting the opium that has been thickly oozing from five or six incisions in the pods. Inone direction are fields of Indian corn, in another tobacco, hemp, and vegetables (Anon, 1895: 86)*

If the Hmong following the practise of the times had abandoned the village like all those

> *who cultivate the hill-sides, occupy some months felling the trees on the slopes... extended year after year, a new lot being prepared for cultivation as the soil of one lot seems exhausted. When the felling of timber extends beyond a reasonable distance, it becomes time to move on and find another village (Anon, 1895: 89)*

then the Lisu would have moved into an area already denuded of trees. In the case of Doi Chang this is unlikely. Fragmented evidence indicates that the Hmong community was quite small. Men in their late 40s describe childhood adventures in country quite close to the village, now under cultivation, as supporting stands of trees of considerable girth supporting a high canopy. If Lisu population densities remained very low and the area was abandoned at the end of the last century it is possible that much of the forest was able to regenerate. It is a pity that access to 1954 aerial photography was blocked because this could have provided evidence independent of personal testimony on the status of the forest at an intermediate period.

The history of the village is further confused by various comings and goings. By 1923 it appears that a village of from 12 to 15 Lisu households had been

established. Some of these people moved from the neighbouring village of Huai San (four kilometers to the north-east) following a cholera epidemic which claimed the lives of two families. At this time the leader of Doi Chang was a man by the name of Aapapukaa Taami, a clan which is still represented by some nine households. In 1952, for reasons which are not clear, many of the people left for a new village which they planned to set up in Amphoe Mae Ramat, Tak province leaving Doi Chang with only seven households. Six years ago, because of problems which according to informants, threatened a break down in public order, many of these people returned to Doi Chang and some took up land in Chiang Mai province.

In 1958 a Yunnanese family, the first to settle permanently in Doi Chang, took up residence and opened a small shop. There are now ten *chin haw* households.

The Lisu community received a further wave of immigrants in 1981 when the government mounted a military operation against Khun Sa's head quarters at Hin Taek, Amphoe Mae Chan.

The Akha, principally from the Loimii group, first came to Doi Chang from Ban Pa Kluai and Huai San, Amphoe Mae Chan in 1983. Some 38 households moved in relatively quickly and were subsequently joined by kin from Huai Yuak and Hua Mae Kham. The reasons for this move are once again given as a break down in law-and-order following the routing of Khun Sa and rumours that a foreign project was also likely to be set

up also played a part. The presence of a project alone was seen to guarrantee a high level of government interest and therefore a higher degree of public safety.

The population of Doi Chang has clearly built up during the period marked by the presence of the TG-HDP project. Although some households have moved out more have moved in since the 1986 population survey.

The project however, cannot be held entirely responsible for this population boom. Profits earned from the cultivation of tomatoes also attracted settlers. Tomato production may have been introduced by TG-HDP but once it was evident that such commercial production had taken on a life of its own, assistance was withdrawn. The absence of project support in the 1986 season did little to dampen farmer enthusiasm for this crop. In the hope that the successful tomato season of 1986 would be repeated, many optimistic farmers from neighbouring districts visited before the 1987 rainy season to inquire into the prospects of renting land. Farmers in Doi Chang, aware of the hazard presented by the effect of a heavy rainy season on the road and the difficulty of transporting crops to the market in Mae Suai were prepared to consider renting out their own fields and taking up land at Doi Lan.

Impact on the Environment: the national context

The impact of settlement on the highland environment is a matter which inspires considerable controversy. A type of environmental fundamentalism enjoys an influential following in fashionable Bangkok circles which although it does not stand up well to scientific scrutiny (McKinnon, 1989) is so firmly entrenched in the public mind that it will be extremely difficult to change. Although in purely asthetic and onotological terms the radical argument, that it would be better to have at least half of Thailand once again covered with forest states an ideal to which few would take exception, the proposition is quite unrealistic. It is unlikely that the present economic boom could have been achieved in the absence of pioneer farmers all over the country who have felled the forest to bring land under productive cultivation. Development has its costs and the days when Thailand could be described as a series of scattered cities "exist(ing) around the fringes of tiger-infested jungle" (Reid, 1980: 239) have long since gone.

Be this as it may, within the current controvery the highlands of the north presents a special case. More forest survives than in other parts of the country. The minorities who have traditionally used this land have only recently been expected to conform to Thai administrative, political and cultural expectations and during this period Thailand itself has been under-going an industrial revolution which has materially left most highlanders well behind.

Unlike Thai farmers who have pioneered the forest as roads were built and the domestic and export market grew, highlander participation in the market economy was only marginal and then principally through the production of opium, a crop that was declared illegal in 1956. In the intervening years opium has become the object of an international crusade against narcotics exposing highlanders to the world as backward, non contributors to the national economy engaged in the destruction of the remaining forest. Their image has not been improved with the increased arrival over the past 30 years of refugees attempting to escape the anarchy which passes for government in neighbouring Burma and establish a place in a nation whose prosperity and overall, even-handed treatment of minorities has acted as a magnet to immigration. The presence of so many poor, minority people whose loyalty to the state is believed to remain in question poses largely uninvestigated and unverified fears about national security.

Partly because any evaluation of their presence starts from a relatively negative assessment evaluations of their impact on the environment tend to follow suit. In a recent publication prepared by the Thailand Development Research Institute the presence of highlanders is seen to be

> *...denuding important watershed areas. Forest reserves, which are protected for conservation purposes, are increasingly encroached. Soil erosion increases, as does sedimentation in rivers which originate in the highland areas, promoting downstream flooding and, by accelerating run-off, aggravating*

drought problems in the dry season (Anat et al, 1987: 80)

By extension it then becomes possible to argue that

> *If (the Royal Thai Government) wants to protect the highland watersheds, it will be forced to institute widespread resettlement of hill farmers from (the highlands), protecting the watersheds thereafter with force, if necessary* (Ibid).

In such a "scientific" climate of opinion it then becomes possible to ignore the fact, pointed out by Sanga Sabhasri that "Erosion occurs every year no matter whether the forest is disturbed or undisturbed. This is a natural phenomenon in any forest type" (Sangha, 1978: 170). The assumptions made by Anat et al about the forest influence on streamflow do not appear to be informed by recent hydrological information. The forest hydrologist Richard Lee, professor of forestry at West Virginia University tells us quite a different story.

> ***The most persistent misconceptions** are that forests increase local precipitation, reduce the impact of raindrops under the canopy, prevent disasterous floods, and conserve water for streamflow during periods of drought; in other words forest cutting would supposedly decrease gross precipitation (even to the point of turning humid forest regions into deserts!), and cause the drying up of springs and streams* (Lee, 1980: 16-17. Emphasis added)

On the specific points raised by Anat et al Lee is even more outspoken. He finds most popular opinions "exaggerated and distorted" (Ibid)

> *Many people still think that forested land, because it is forested, produces greater average streamflow; the fact is that forests*

> *use water extravagantly, and forested land almost always produces less streamflow volume than does land with other cover types*

On the specific issue "that forest cover alleviates flooding in the rainy season" (Anat et al, 1987: 93) Lee tells us that

> *The forest influence on floods was a matter of considerable controversy for many years; to foresters it was an article of faith on which they based a crusade for the setting aside of vast forest reserves, and public acceptance of their position led to far reaching legislation. Fortunately the weight of evidence could not forever be denied, and although public opinion changes slowly, it is now generally recognized by professional foresters that some of the most devastating floods on record have occurred in undisturbed forest watersheds...* (Lee, 1980: 278)

Evidence of erosion can clearly be seen in Doi Chang fields. This is readily verified with reference to the Department of Land Development survey results (various, 1981) and the technical report of the Centre for Advanced Training in Agricultural Development, Technical University of Berlin (Schubert et al, 1986: 123-26) but whether this significantly contributes to a national watershed crisis is another matter altogether. To jump from an observation of the specific to the general without establishing the links in between ignores both scientific method and caution. In fact the results of a sedimentation study conducted by the hydrologist Sheng in streams below Hmong fields in the Mae Sa valley just north of Chiang Mai found that turbidity was lower than that of the Mae Sa river.

As has been pointed out by Blaike and Brookfield

> *Land degradation should by definition be defined as a social problem. Purely environmental processes such as leaching and erosion occur with or without human interference, but for these processes to be described as 'degradation' implies social criteria which relate land to its actual or possible uses* (Blaikie & Brookfield, 1987: 1).

In the absence of erosion there simply would be no Chiang Mai Basin and no Central plains.

Although reports like that of Anat et al may exercise considerable influence with serious political consequences for farmers in the forest and the timber industry, there is insufficient scientific evidence available to support their case. This is not the real issue. The real issue is that their are farmers in the highlands and insufficient land available on which they can be successfully resettled. Erosion initially reduces the fertility of farmers fields. Conservation measures are required which do not make it neccessary to invoke a national watershed crisis. Soil erosion is first and foremost "a significant problem facing highland farmers" (Department of Agricultural Extension, Chiang Mai University, 1988: 168).

Local Impact of Settlement and Agricultural Practices

Until 1983-84 when Doi Chang became a destination for Akha settlers population densities remained relatively low. If the average composition of Lisu households surveyed in

1988 as 6.7 (rather than 25 as reported in 1972) pertained in the past then in about 1922 the population of Doi Chang was about 127. Using the area of current land under use (2,750 rai) as a base, there was approximately 21.6 rai of reasonable agricultural land available per head of population or 144 rai available to each family family.

At this time the agricultural system of the Lisu was clearly based on a rice, maize, opium cropping system described for the broad group of pioneer swiddeners (Geddes. Dessaint, Durrenberger, Walker, Keen, 1969/70). Informants report that they were able to fallow land for periods of up to 10 years until relatively recently.

Geertz has described the system as having a "generalised structure" (Geertz, 1963: 16-17) in which a wide variety of plants are cultivated. In the 1960s Walker was able to identify 59 plants cultivated by the Lahu (Walker, 1970: 333-37). In a more recent publication Chantaboon has listed an inventory of 350 species of food crops

> *of these 198 or 57 percent are staple food crops, vegetables, supplementary food crops, cereals, herbs spices, condiments etc.. Only 86 varities of medicinal plants or 25 percent of the total have been identified. The role that these plants play in maintaining an economy of semi-subsistent self reliance is clearly documented* (Chantaboon, 1989).

In the same article Chantaboon also reports the collection of 1100 varieties of highland rice (Ibid). The genetic diversity of the plant materials assembled by

highland communities over the years is indeed remarkable.

The traditional mode of production, the set of interrelated management systems run within an external framework of political, biological, technological and economic restrictions imposed by their relatively isolated situation and operated internally through access to land, labour and proximity to markets to meet the cultural and agricultural objectives of individual households and by extension the community: was and still is, extremely complex.

When there was an abundance of land the preference was to clear virgin forest, burn the biomass to release nutrients and plant crops by dibbling the fields. In terms of energy use the method was extremely efficient. Little cultivation was required, erosion from small scattered fields was rarely a major problem, few weeds invaded the fields and pests were kept to a minimum. Initial harvests were good, in the absence of raiders, principally in the form of wild animals, civilized activities could be cultivated in dance, music and the poetry of the ritual ceremonial round.

Social Reproduction

This is not to pretend that life was idyllic. Life was dangerous and short. Malaria was a constant hazard, life expectancy low, motality rates especially among infants, high. To ensure group survival and both social and cultural reproduction a high level of fertility had to be

maintained. The availability of adequate labour to maintain the system was an absolute necessity. To capture the advantage of surplus labour and the wealth which came with this, lowland aristocrats faced with the problem of plenty of land but not enough people to work it resorted to raiding and relocating communities into areas under their command. Highlanders used a more ancient cultural strategy, that of mediating both the exchange of women and the value of surplus labour with the objective of promoting reproduction within established social units such as the clan or lineage in the hope of enhancing both intra- and inter-family and lineage links.

Such a general, functional observation cannot be stretched too far. The cultural tension between pragmatic adaptive strategies and structural and therefore pyschological expectations can occassion trauma. The Tibeto-Burman people who have come to be known as Lisu and Akha adapted patrilinial social structures modified to express particular cultural values and preoccupations which cannot be clarified solely with reference to either functional or historical explanations. These people do not belong to tribes as coherent socio-political groups and the diversity of their genetic, linguistic and cultural background cautions us against making any simplistic generalisations. To do so can be quite misleading. As Conrad has recently pointed out the widely accepted "fact" of Lisu ethnic identity remains in

question (Conrad, 1989).

Still, for reasons yet to be identified, the people who call themselves Lisu and now live in Thailand place a high surplus value on women which is still expressed in the form of a high bride price. Dr Otome Hutheesing, a student of Lisu society has argued that because of this stress, when Lisu find themselves in a position when they can no longer command from a prospective son-in-law's family or pay to the family of a prospective spouse the expected bride price they suffer an acute sense of loss of repute (Hutheesing, 1987). The profound pyschological nature of the implications of this distress can lead to suicide or murder which adequately attests to the deeply structured nature of the phenomenon. Princes may bring politics and war into the world but ordinary individuals when subject to tension have as their only context of reference, an intensely personal understanding of their culture: a torment of contradictions can bring politics and war home to the family.

The history of Doi Chang has been marked by various disputes which have provided reasons for out-migration but farming activities have been maintained by a core of households for at least sixty years.

Erosion

The dark grey and yellow-brown top soils which vary from 5-10 cm to 30-40 cm show erosive signs of this long period of occupation. The relatively long slopes (20 to 45%) which

fall to the Huai Khrai river are deeply weathered and the upper slopes especially show signs of sheet and rill erosion. The parent material of schist and shale is exposed in some places and several fields have been cleared of metamorphic rocks which remain scattered in heaps among the plants. It is most likely that serious erosion is a relatively recent problem.

Farming Practices

As has already been mentioned, farmers long resident in the area talk of a period not so long ago when it was still possible to fallow fields for up to ten years. A comprehensive survey of twenty highland villages (including Thai) made by Keen in the late 1960s reports that more than half of the communities surveyed had fallowed their swidden rice fields for ten or more years before clearing them for a second time (no information is reported for the remainder) (Keen, 1969/70: 25). Yields obtained from highland in contrast to those secured by upland Thai farmers in Nan were relatively good (150 *tang* per ha. as against 80 *tang* respectively) (Ibid: 22). The area worked per worker was found by Keen and Durrenberger to be 0.27 ha. (Ibid: 26). Roughly speaking, if this figure is applied to Doi Chang in 1922, with a population of 127 of whom it can be assumed some 50% were workers a total of 17 ha or 106 rai needed to be prepared each year to provide the community with a normal proportion of their rice needs (It is not clear from Keen's

discussion whether these communities were self sufficient. Again this needs to be checked before a more elaborate reconstruction is attempted).

The elevation of Doi Chang (between 1050 and 1350 metres) may have presented farmers with particular difficulties in cultivating rice but this has not as yet been investigated. The "400 variety" a type of rice well adapted to this relatively high altitude would have grown quite well here (Chantaboon, 1989) and rice is still grown to this day.

Because the impact of recent changes on both the community and the environment can only be explored in relation to what pertained in the past, a good reconstruction of the earlier system of cultivation nees to be prepared.

Speculative Observations

What appears to have happened is that as it became difficult to practise shifting cultivation farmers turned to more intensive forms of rotational farming and kept more land under semi-permanent cultivation. Fallow periods were truncated and the demand on labour, especially for weeding increased.

Recent changes have further increased pressure on available land resources. These have had and continue to exercise a profound and rarely benign impact on both the land and the occupying societies. The arrival of the Akha apparently doubled the population (for several reasons this requires investigation). The suppression of opium and the continuing need for a cash crop to make up shortfalls in rice production

resulted in an intensifies demand for land. Farmers were motivated not only by the necessity to secure food they also wanted to acquire industrially manufactured goods, meet the expenses of sending their children to Thai schools outside the area and gain access to modern medical services. To complicate things the new crops themselves required that more land be made available. Replacement crops appear to impose much heavier demands on soil nutrients than opium and farmers maintain they have to cultivate more land to get the same returns. All of these observations require further consideration.

The impact on social life appears to have been profoundly disruptive. The leisure afforded by the yearly agricultural round under shifting cultivation has been displaced by intensified demands on labour. As it has become increasingly difficult to maintain the ritual round and the pschological support and meaning to life which this provided, cultural life has suffered. The old dangers of wild animals and malaria have been replaced by new hazards such a high incidence of sudden deaths (which appear to be connected with the misuse of chemical sprays), challenges to law-and-order and a high level of despair which expresses itself in suicide and family centred violence.

The impact of the TG-HDP is difficult to isolate from adaptive strategies spontaneously entered into by farmers using their own initiative. Whilst the presence of the project has provided services sought by the community at

large (medical, schooling and agricultural inputs and advice) increased government attention tends to set up serious contradictions between the local preference for integration against national policies of assimilation which tend to subordinate socio-economic processes to political and hierarchical preferences. Although community tolerance remains remarkably high this tends to exacerbate more deeply structured tensions which need to be evaluated.

Chapter 4
Current Land Tenure and Land Use

In the absence of supporting sociological investigations both land use and land tenure studies can be remarkably uninformative. This Chapter will present maps showing current land use and outline the general pattern of contemporary land tenure. This information is compared to a similar exercise carried out by the Department of Land Development and indicate the problems involved in coming to a good assessment of land potential. The problem is raised to point out the difficulties hidden by rapid, technical surveys and to make a case for a more sociologically informed approach.

Figure 16 attached to this progress report provides an analysis of land use pertaining in Doi Chang from 1983/84 aerial photography prepared by Chuthapon Phisitkul of the TRI-ORSTOM Project. A summary of the whole area covered by the map is provided (over) Table 4.

In 1983/84 out of the total area of just over 16,000 rai some 75 percent of the area was not under cultivation, approximately 24 percent was still in dense forest and 40 percent under a process of regeneration (open forest and low shrubs). It can be assumed that much of this 40 percent including the areas of Imperata (11%), just over 50 percent of the total area was fallowed and subject to land claims. Some 17 percent of the total land was under cultivation. The rice/maize/opium cropping configuration is shown with an

overlay of newer commercial crops such as tomatoes and coffee.

Table 4

Land Use of Doi Chang 1983-84

Land	Area (Rai)	Percent (%)
Village	170.24	1.062
Tomato Rows	95.26	0.594
Rice	727.94	4.541
Opium	15.34	0.096
Maize	1256.68	7.839
Bare Soil	657.93	4.104
Dense Forest	3894.34	24.292
Open Forest	2472.44	15.423
Shrubs	4067.66	25.373
Grass	1757.38	10.962
Incomplete information	916.04	5.714
Total	16,031.25	100

Note: Areas are worked out for the whole map.

Source: 1983/84 aerial photos and TRI-ORSTOM field surveys March - August 1988.

The immediate area under cultivation and subject to land claims in 1988 is shown in Figure 5 (over). The black shading indicates land subject to Lisu rights of usufruct: the diagonal lines Akha claims. Considering how recently the Akha arrived they have been very quick to consolidate firm acknowledgement from the Lisu of their rights to land.

As the "original" occupants the Lisu principally assert their claims with reference to rights established by a forebear who cleared the land and maintained access for long enough to pass this to the current holder. The traditional manner of acquiring such a claim is traced patrilinially through the father and the clan or lineage. Customary land tenure however is rarely so simple. In the course of field

work a simple questionnaire was used which asked farmers to identify how they had gained access to the land they were cultivating at the time. Apart from renting, purchasing and borrowing a catch-all category was used which asked if access had been gained through customary tenure. The term occassioned considerable confusion and raised questions of legitimacy which had not been anticipated. If by "customary tenure" we, the researchers, meant a strict adherence to a type of customary law then few informants were prepared to describe the way in which they had come by land as being consistent with this category. Further questions indicated that any number of familial relationships could serve to gain access to land and clearly these could be exercised at the discretion of the recognised holder rather than with reference to any hard and fast law.

This then invokes another contentious issue, the question of land ownership. No ethnic minority in Doi Chang holds any legal claim to land, in other words a claim to ownership which could be defended in a Thai court of law. This is not the question but rather the manner in which the people of Doi Chang can dispose of land at their personal disretion without reference to others. Amongst neither the Lisu nor the Akha of Doi Chang is there a belief that land should be held in trust by a lineage as a communal estate for the exclusive use of descendants. Individuals exercise rights of transfer in a manner which suits their personal preference. As a consequence it has been relatively easy for

a market in land to develop. Transactions are conducted with a freedom which is completely consistent with what happens in lowland northern Thai farming communities also most commonly without reference to national law. It is, as it were, an informal economy but not entirely unacknowledged by the state. A nominal tax on land claims is administered through the local district office. The receipt itself becomes a type of "title" which must be produced if, and when, a more secure legal claim is considered by the Royal Forestry Department.

All but a small proportion of the land claimed by the Akha has been purchased from Lisu owners. Over the past four years the price of land has increased expedientially. As the price of land has risen so have rental charges. Fewer Lisu farmers are now willing to sell for prices which are within the reach of potential Akha clients. A full documentation of this process has yet to be prepared. However it is already clear that in 1988 the high rents commanded by owners of fields suitable for growing tomatoes, the high cost of inputs and transport combined with an extremely low price (one baht/kg as against 3.5 +/kg in 1987) has resulted in serious indebtedness.

The map shown as Fig. 5 is a thoroughly field checked document. Surveys carried out by those with only a superfical knowledge of the situation, like those conducting socio-economic surveys without staying long enough to test the veracity of either their information or their questions

are likely to carry away quite misleading information. The danger is that when this is formulated into published material it takes on an authority which is difficult to correct.

When investigators believe that there is really nothing further to learn about highland minority cultures and the way in which they conduct their lives, surveys are increasingly likely to become trapped within informational categories which assume that the researchers understand the significance of their questions to those whom they are directed. A simple example of this is provided by data collected in the course of a Department of Land Development survey conducted for the TG-HDP and completed in 1984. Figure 6 shows (over), superimposed on the map of 1988 land tenure claims, a boundary around total holdings which is difficult to understand. The southern sector of land claims (towards Doi Laan village) which lie in another sub-catchment were ignored altogether. The names provided as claimants are difficult to identify (Lisu names, Thai transliterations of customary names and given Thai names) make it extremely difficult to use. The size of holdings is distorted by the draftsman's preference for straight lines and the analysis provided in Table 5 lists figures which cannot be used to measure changes between the two survey dates (1984 and 1988). Even though aerial photograph of the time clearly shows that at the time the survey was carried out tomatoes, rice opium and maize was being grown, according to the notes which accompanied the Department of Land Development land tenure map, most farmers

Figure 5

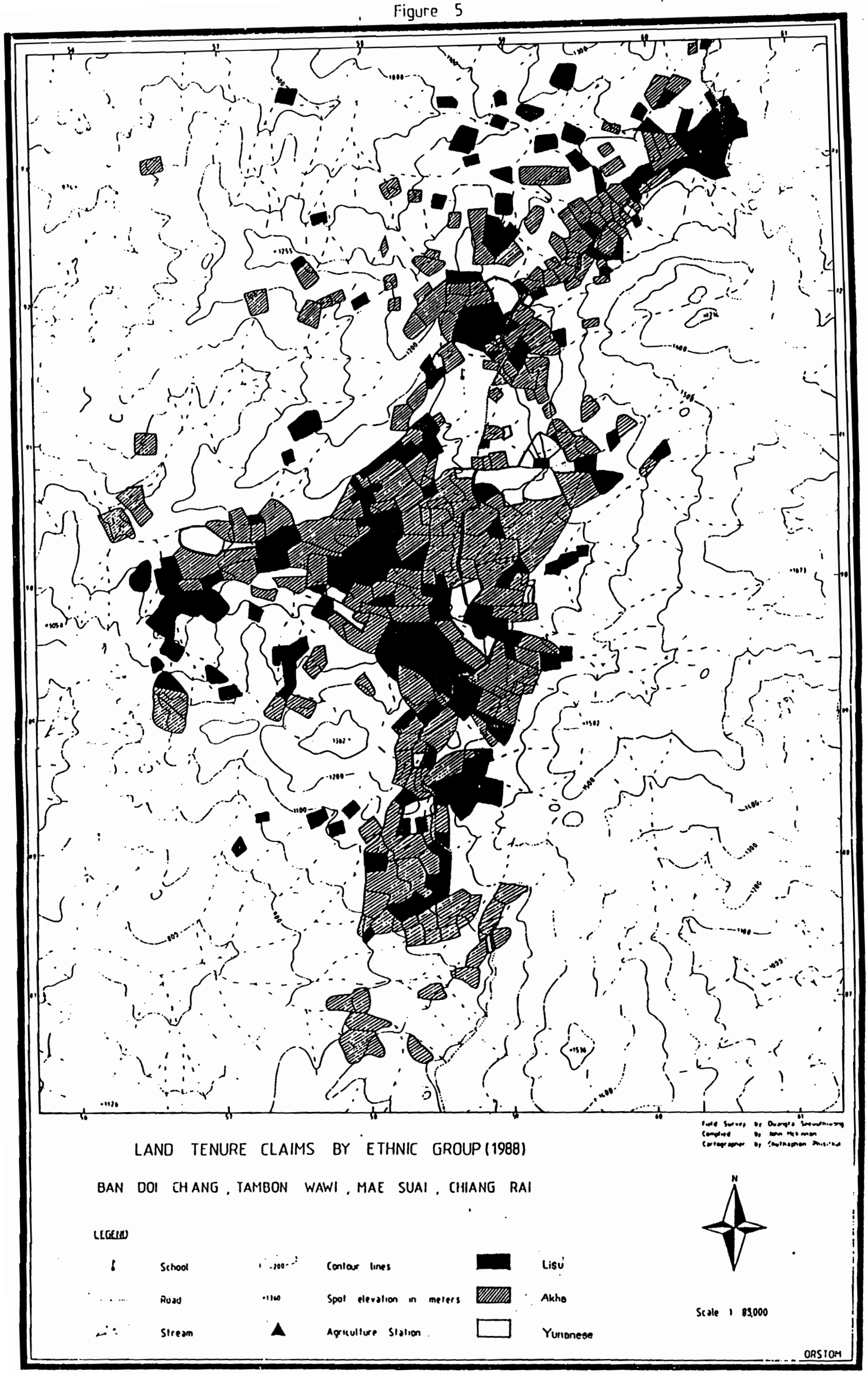
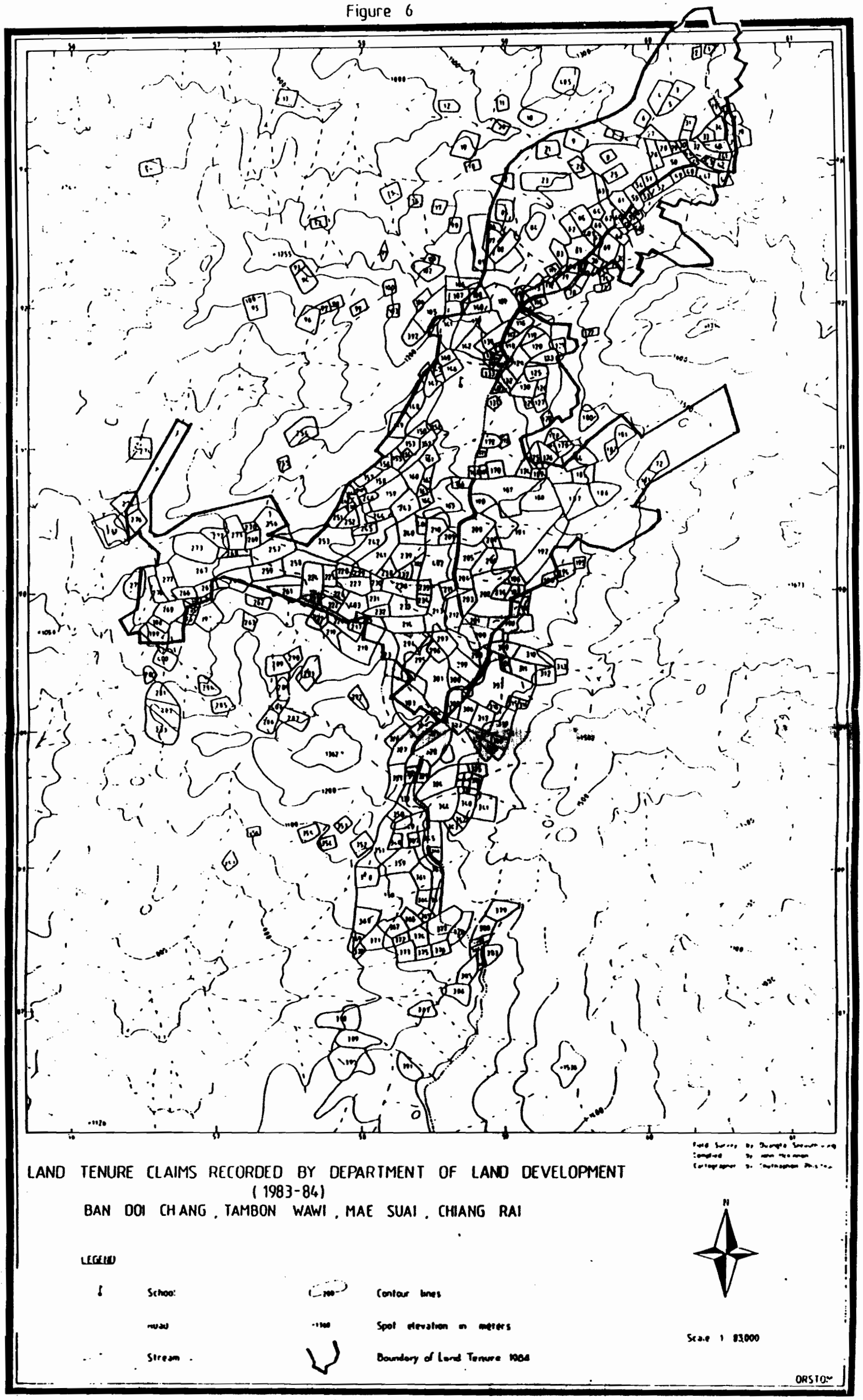

LAND TENURE CLAIMS BY ETHNIC GROUP (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Agriculture Station
Lisu
Akha
Yunnanese
N
Scale 1 : 50,000
ORSTOM

Figure 6


LAND TENURE CLAIMS RECORDED BY DEPARTMENT OF LAND DEVELOPMENT
(1983-84)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Contour lines
Spot elevation in meters
Stream
Boundary of Land Tenure 1984
N
Scale 1 :5,000
ORSTOM

were said to be growing only maize. The usefulness of the survey as a document on which the project was supposed to evaluate the farmers position and plan for their future is seriously limited and calls into question the reliability of other survey results.

These remarks should not be taken as criticism of all the work undertaken. Rather they provide a comment on the deadline the survey team had to meet (survey of the whole of Tambon Wawi in three months), the restricted technical paradigm in which they were working and the absence of appropriate expertese.

Table 5

Land Use of Land Land Tenure Area Identified in Department of Land Development Survey (1984)

Land Use	Area (rai)	Percent (%)
1. Total area Surveyed	3,755	100
2.0 Total area Under community use	3,435	91
2.1 houses	157	4
2.2 fields (maize)	3,252	86
2.3 lynchi	15	-
2.4 coffee	10	-
3.0 Total area Under government use	320	8
3.1 school	10	-
3.2 health station	2	-
3.3 unused land	4	-
3.4 forest	246	6
3.5 roads	26	-
3.6 streams	16	-

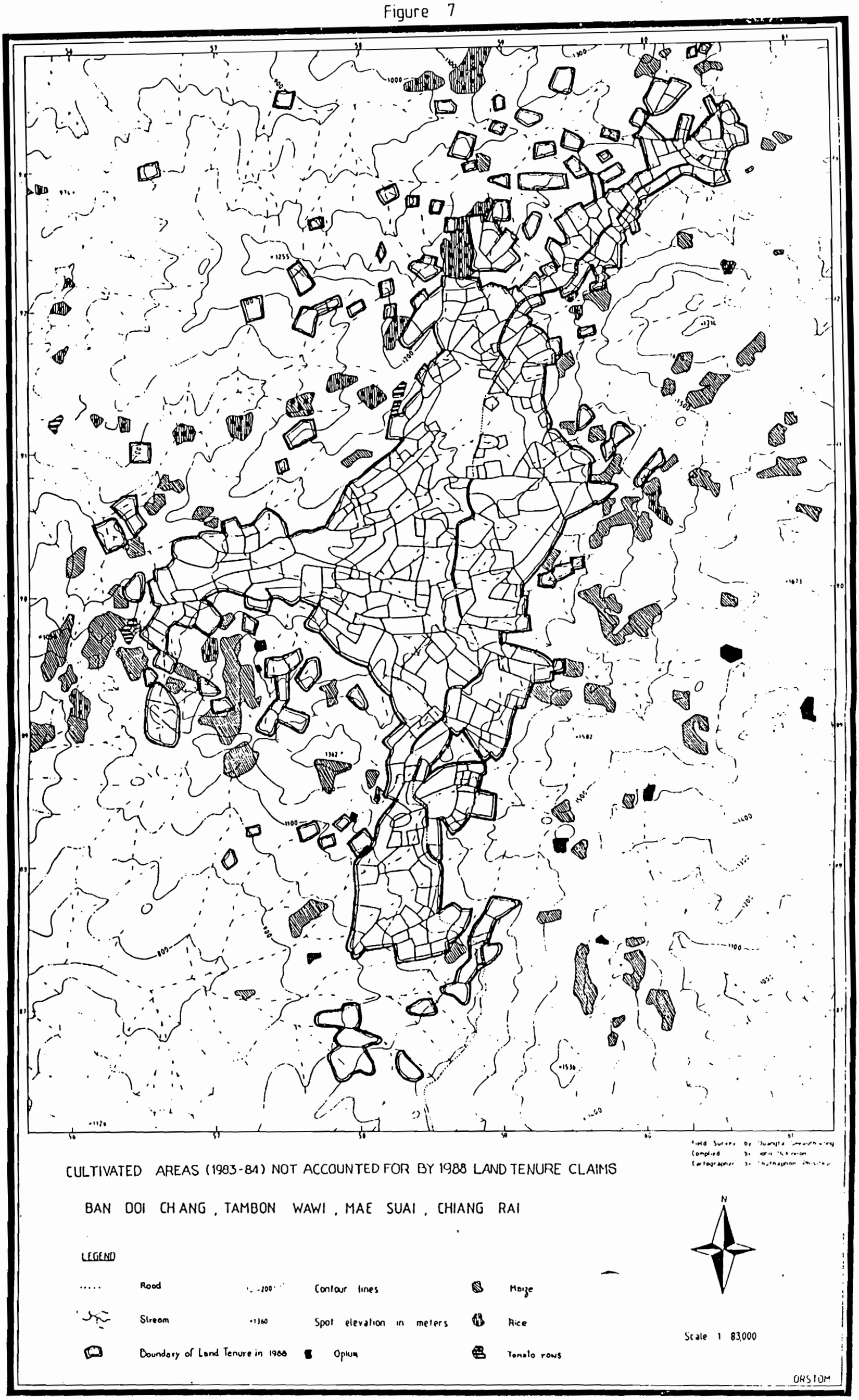
Note: Map of land use appears on Figure 6

Source: *Report on Land Survey under the Thai-German Highland Development Programme Located at Ban Huai Khrai, Ban Doi Chang in Tambon Wawi Amphoe Mae Suai Changwat Chiang Rai*, 1984: pages not numbered.

Such difficulties also occur in work conducted within a more generous timetable but then the chances of picking up the shortfalls are greatly enhanced and can become part of the exploration of the meaning of the data. For example Figure 7 (over) shows cultivated areas not accounted for by 1988 land tenure claims conducted as a part of the present study. If the concern was only to disguise the identity of those who were growing opium at this time (black shading) this would be understandable but sizable fields of rice, maize and tomatoes are also shown. There is no reason why all these areas should be disowned. Even though informants reported that now either land had to be worked or relinquished after a three year fallow, it is unlikely that claims to all this land have been allowed to lapse.

The dissonance between different sets of information then provides a basis for further questions which are extremely important if estimates are to made of optimum farm size. Local considerations must be taken into account as well as the purely technical matters considered by outsiders. Is the alignment of the two maps correct? Do the farmers of neighbouring communities use this land? (In fact land to the west is claimed by Ban Huai Khii Lek and many of the fields to the east and south are worked by neighbouring Lisu

Figure 7


CULTIVATED AREAS (1983-84) NOT ACCOUNTED FOR BY 1988 LAND TENURE CLAIMS
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
Road
Contour lines
Maize
Stream
Spot elevation in meters
Rice
Boundary of Land Tenure in 1988
Opium
Tomato rows
N
Scale 1 83,000
ORSTOM

communities). But land used in juxtaposition to current holdings clearly belongs inside the Doi Chang domain. Have informants under-declared land to avoid tax payments, is the survey methodology at fault or is this land of such low quality that it is not worth claiming? (Slopes are steep) Given the increasing price of land this hardly seems possible but then is it only land with some potential for commercial cropping that has any significance within the moneytised sector of the local economy? Distance from the road and difficult access may be important considerations. Does it lie in a no-man's land in which claims can still be exercised by clearing? If these outlying areas command a lower value then to what extent does the map indicate the presence of an indigenous land classification system?

As long as information is treated as having inherent value and does not have to fit within a preconceived paradigm it offers the possibility of discovery.

Even if their accuracy can be verified by the most rigorous methods, territorial maps such as these can also be misleading. Many Doi Chang farmers both Akha and Lisu maintain claims to land at some distance from the mapped area. Some of these outside fields lie just to the south in the vicinity of Doi Laan. Most lie within a day's walk. Others are found at a considerable distance from the village. A survey currently underway should enable the research team

to document their importance to and for a set of sample households.

Because land use research requires a lot of work of a technical and specialised nature and produces sets of maps which provide information that can mean something to people with only a rudimentary training in map reading, it is tempting to pretend that once the appropriate number of Figures has been produced the work is finished, the pound of flesh delivered. Here the work has only begun. Although at this stage of the research the next Chapter can only offer such maps as evidence of industriousness, conscientiously conducted to a competent standard, the real questions, the anthroplogical questions of problems in change has hardly been broached. It is hoped that these will form the substantial part of the final report.

Chapter 5 Cropping Patterns

An assembly of maps showing cropping associations is an essential part of land use studies. What the information conveys to those in a position to evaluate this is not at all clear. Such maps convey the presence of a choice, a choice made by a community as to how they will collectively and consciously use the land which they can effectively, if not legally, claim as part of their estate. The resulting pattern is simultaneously geographically concrete and sociologically abstract to a point which is almost devoid of meaning. The map states a reality which is so mundane that we know we can both completely believe and completely ignore it. The pattern is something which we can simultaneously accept and forget. To do so is to lose sight of the human reality which provides its context and meaning. As Baudrillard has taught us, the powers of seduction are remarkably strong. The sense that we understand and/or need not go any further is powerful. The authority of choice is more profound than we care to admit. We would prefer not to have the responsibility. The distance is made in a dignity which is fully accepted by a sociology of knowledge dominated by Cartesian thinking but the anthropological content cannot be so easily ignored.

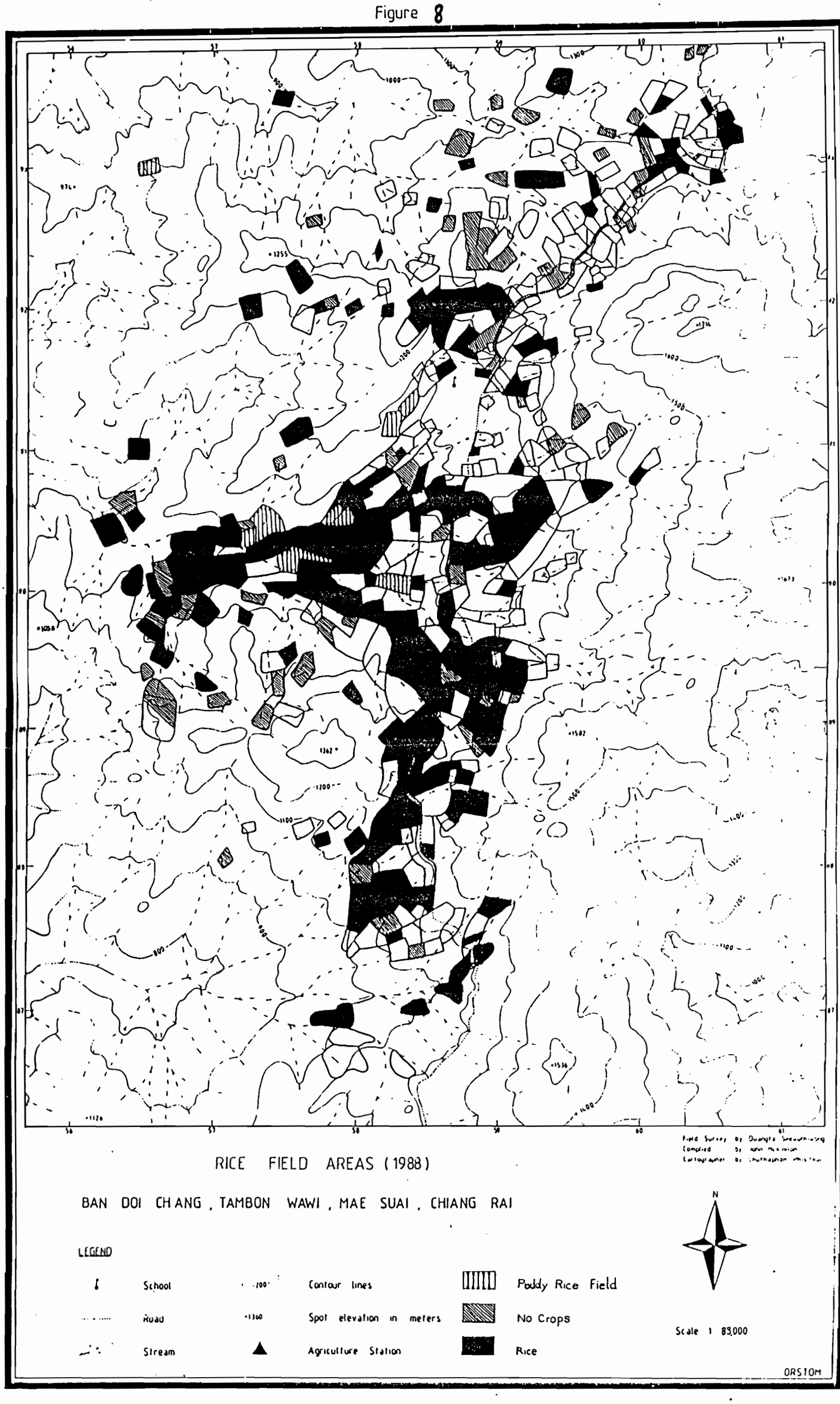
But can it? The starting point remains where the man who claimed that if he could be given a place to stand, he could move the earth. At a certain stage of argumentation

conventional categories of consistency close around us. The Cartesian structure envelopes our imaginations. We are rendered incompetent by the scientific instruments we have chosen. We are reminded of this when we arrive at the boundary of our sociologically proscribed, intellectual limitations.

So the maps. Figure 8 (over) indicates the incidence or frequency with which rice is grown on land claimed by the residents of Doi Chang to grow the crop on which they depend for their survival. Some of these plots are quite small. They appear to have been planted to reassert their believe that they can grow food for themselves, that they know that rice is the food of their ancestors. For certain ritual offerings they must present such an offering to provide evidence that they have not forgotten, that what is offered is the product of their own effort in cooperation with nature.

It is a measure of the extent to which they have bought into the lowland economy that Petra Windisch of the Centre for Advanced Training in Agricultural Training in Agricultural Development could record as a result of her nutritional survey of Tambon Wawi that

Figure 8


RICE FIELD AREAS (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Agriculture Station
Paddy Rice Field
No Crops
Rice
N
Scale 1 83,000
ORSTOM

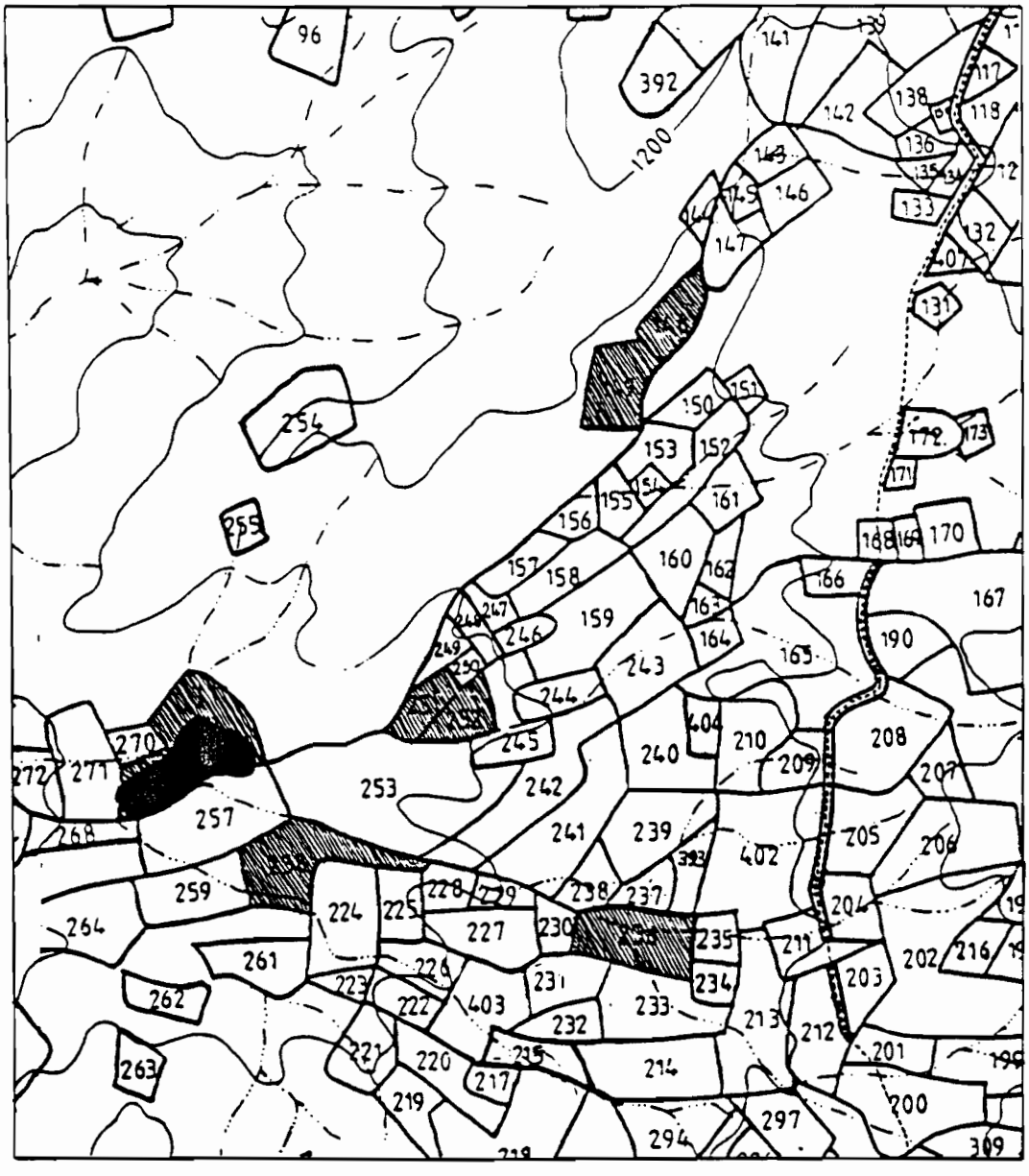
-73% of the surveyed households would buy/bought lowland rice.
-17% would buy/bought upland rice
-5% would borrow upland rice
-5% would work as hired labour for upland rice (30 baht/day)

(Schubert et al, 1986: 58).

The black shading exaggerates the amount of rice being grown but indicates the strength of a commitment to an independent cultural and material existence.

Figure 9 shows the areas identified as suitable for flooded crops such as paddi rice. Here again a discrepancy is displayed: the discrepancy between the capabilities of the farmer and the judgement of the expert. The highlighted black areas show the area identified by the Department of Land Development as suitable for flooded crops (with limitations) and the actual area under flooded cultivation. If in fact the whole area under some form of irrigation was shown it would dwarf that of areas under flooded irrigation. Water is brought onto tomato farms through a sophisticated reticulation system made possible with the use of plastic hoses. None of this is shown on the Department of Land Development maps. The refinement of supplementary irrigation is completely over-looked. Where it is possibile to flood fields and secure a significant rice harvest this does not escape the farmers attention.

FIGURE 9



AREA SUITABLE FOR IRRIGATED CROPS
IDENTIFIED BY DEPARTMENT OF LAND DEVELOPMENT
(1983-84)

LEGEND

Road

Contour lines

Stream

Spot elevation in meters

Area suitable for flooded annual crops DLD

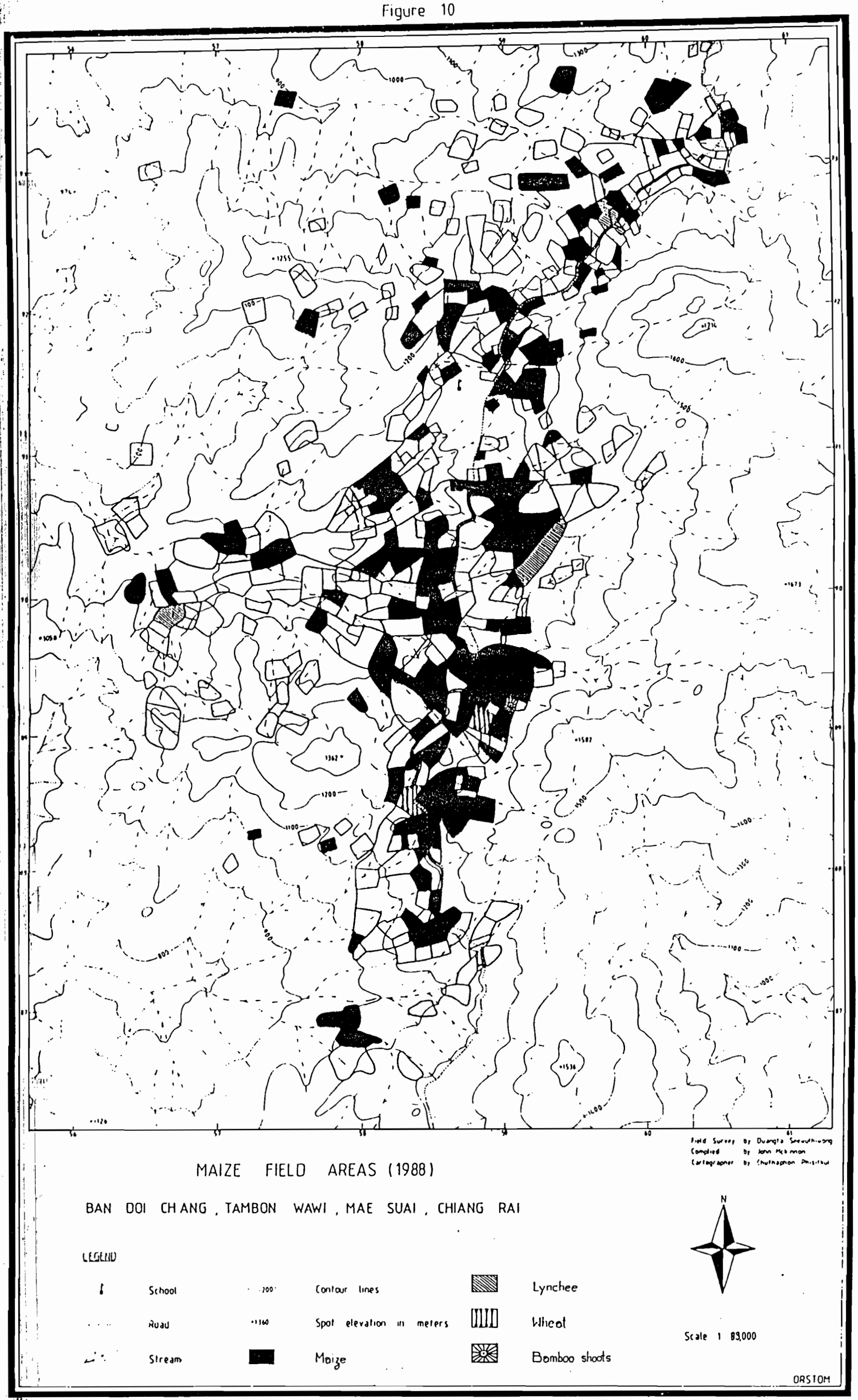
Actual area of flooded crops

N

1 : 15000

ORSTOM

Figure 10


MAIZE FIELD AREAS (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Maize
Lynchee
Wheat
Bamboo shoots
N
Scale 1 83,000
ORSTOM

The maize fields, like rice, are an expression of a commitment to an older economy (Figure 10, page 69). Most, if not all of this crop is grown for animal feed. The relatively marginal crops of wheat and lynchee are not important but represent an experimental fringe the first of which is likely to succeed and the second most certainly to fail as a commercial crop.

Figure 11 (over) highlights tomato: the miracle crop on which farmers built the decision to forego the planting of opium. In the first four years it was remarkably successful. As early as December -January 1983/84, 95 rai had been planted, most with TG-HDP support and had proved promising enough for farmers to listen to arguments that they could, without any great risk to their earning capacity, replace opium with tomatoes.

In the following seasons, even following the withdrawal of project support farmers chose to enter into tomato production in a big way. By 1987 and through to the beginning of the 1988 rainy season, despite occassional transport problems, farmers persisted, unaware of the fragility of the market and the fact that they were the captives of a few road head traders.

To an extent which still has to be fully documented the 1988 season has been a disaster. At the beginning of the 1988/89 cool season when the road was at last more easily negotiated, farmers were still paying half of the money

earned from sales to cover transport costs alone. As Bernard Vienne has pointed out

> *If economic change and even social welfare can be planned and implemented in such a way as to produce additional income, better education, sufficient health services and so forth, the subsequent ineluctable process of social transformation is, generally unpredictable* (Vienne, 1989).

A full costing of a sample of tomato growing households is still under preparation. The returns from tomato per man day of 38.1 baht when the selling price is 3.5 baht per kilogramme has never equalled that of opium (97.7 baht/man day) (Department of Agricultural Extension, CMU, 1988: 55). The current selling price of one baht, of which 50% goes to cover the cost of transport clearly indicates a serious failure.

Figure 12 (over) shows the distribution of coffee in both Akha and Lisu fields as well as the incidence of the use of grass strips.

Coffee is currently being promoted as the priority extension crop. All of the farmers whose fields are shown have received some assistance from TG-HDP through the DPW Unit and the Agricultural Station. This will also be discussed in more detail in subsequent reports. It is however interesting to note that although farmers are willing to believe in the future of the crop, the fact that the project provides an ID card which identifies the farmer as a member of the coffee growers group is greatly appreciated by cooperating farmers, especially those who lack other documentation.

Figure 11

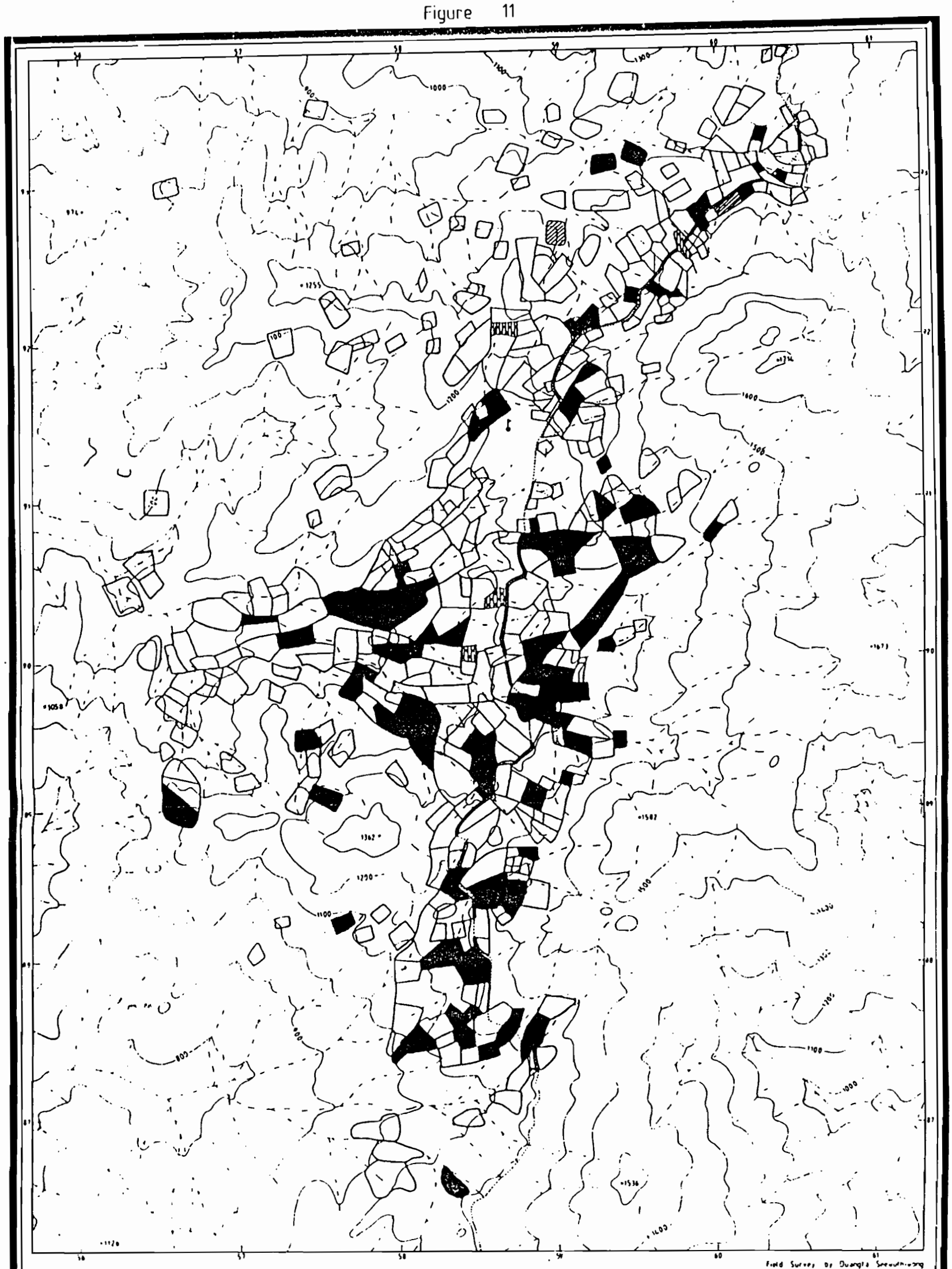
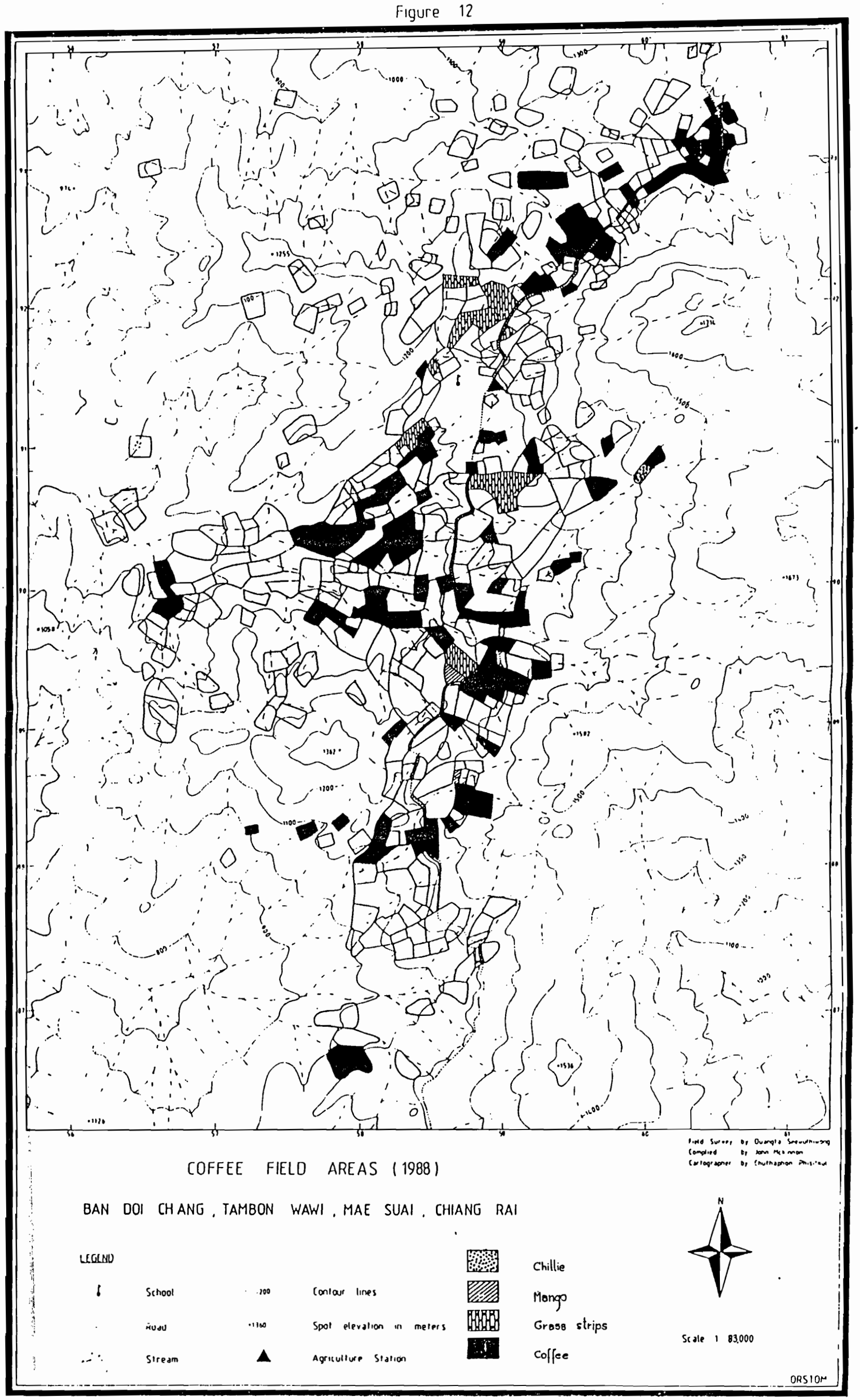

TOMATO FIELD AREAS (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Agriculture Station
Peach
Tea
Tomato
N
Scale 1 83,000
ORSTOM

Figure 12


COFFEE FIELD AREAS (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Agriculture Station
Chillie
Mango
Grass strips
Coffee
N
Scale 1 83,000
ORSTOM

Grass strips recently introduced as part of a method to introduce conservation farming have been formed and planted by representatives drawn from the whole community. As part of the promotion effort most of these have been established in close proximity to the village where they are clearly visible. Some farmers with holdings well off the road and away from appreciative project eyes, have also taken the trouble to plant grass strips but why this is undertaken is not yet clear. Is it part of an attempt to legitimise land claims, secure project subsidies or implement measures which the farmers recognise as being worthwhile?

Figure 13 & 14 (over) highlights the relatively few fields in which the remaining cash crops are grown. On the former both caggage and red kidney bean are shown. On the latter ginger.

Unlike tomato which requires an advanced level of crop management, cabbage is considered to be less demanding. Unfortunately it is also subject to erratic price fluctuations and in 1987 many farmers were reduced to accepting a price of only one baht per kilogramme compared with a wholesale selling price in Bangkok or Chiang Mai of four baht. As cabbage can be grown in places much closer to urban selling points and these markets are periodically over-supplied, the risk factor is high.

Red kidney bean does not enjoy a good domestic market in Thailand and its success was initially established by crop replacement projects who encouraged exporters to sell in Hong

Figure 13

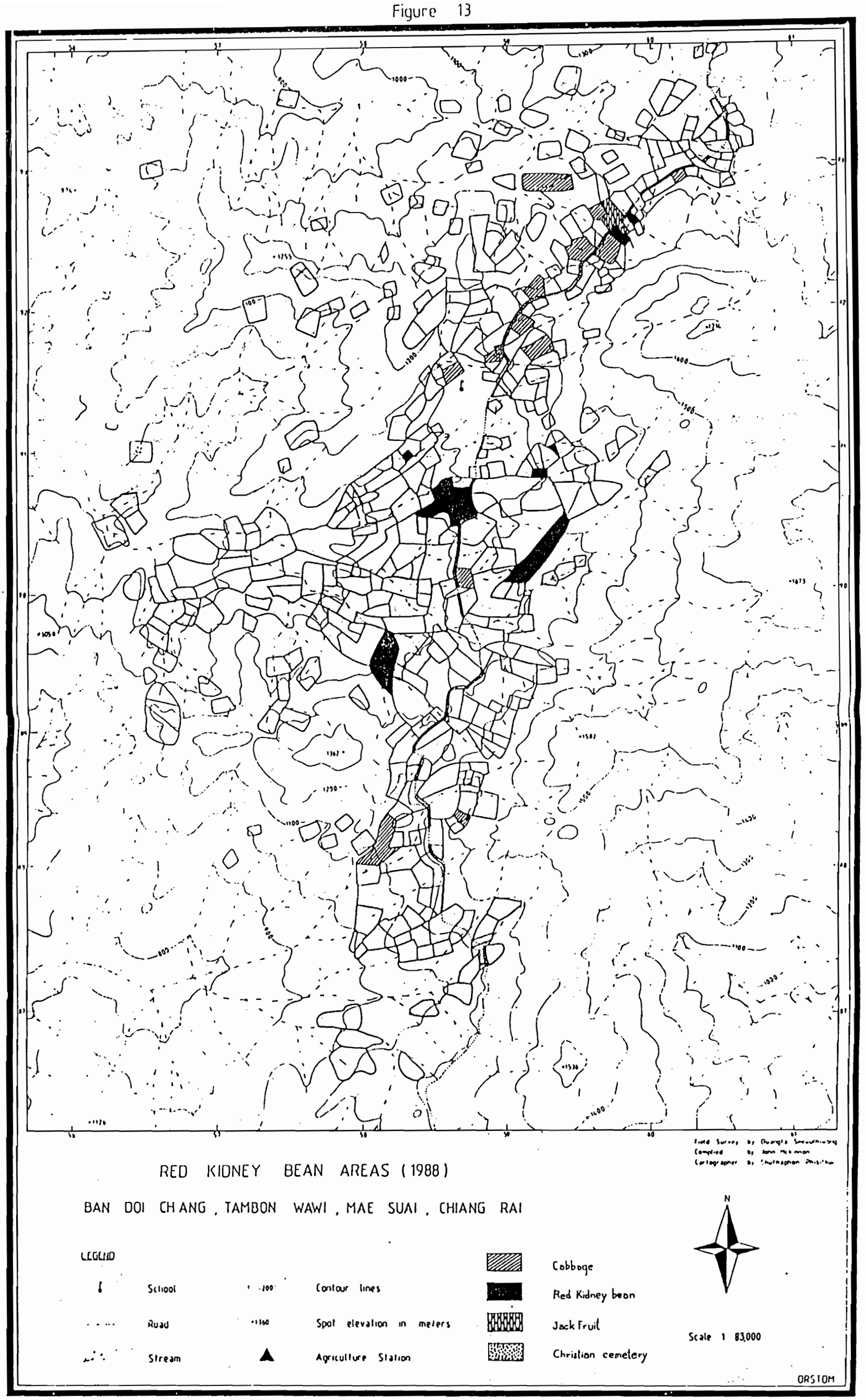
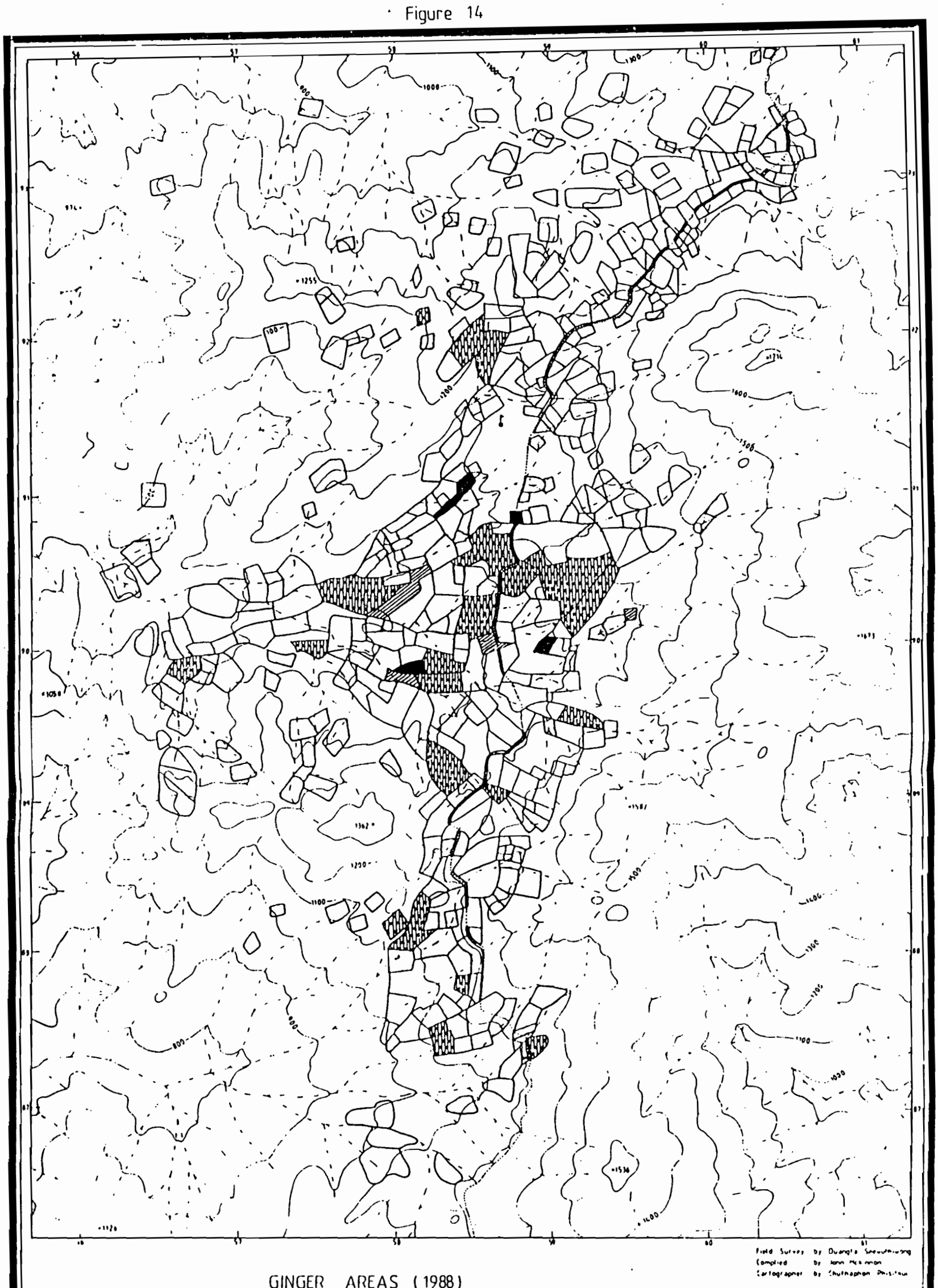

RED KIDNEY BEAN AREAS (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Agriculture Station
Cabbage
Red Kidney bean
Jack Fruit
Christian cemetery
N
Scale 1 83,000
ORSTOM

Figure 14


GINGER AREAS (1988)
BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI
LEGEND
School
Road
Stream
Contour lines
Spot elevation in meters
Agriculture Station
Ginger
Apple
Fish Pond
N
Scale 1 83,000
ORSTOM

Kong and Singapore. Once harvested the beans do not perish easily. However, while they are growing they are susceptible to pests and diseases, a fact which has tended to discourage adoption even in the presence of project support. Farmers admit to joining red kidney bean growing groups to secure the fertilizer and chemical hand-outs which come with membership.

There is a good domestic market for ginger which can be widely grown throughout Thailand. Mainly because of this the price fluctuates from year to year and Doi Chang farmers who in the past have occassionally cultivated large fields are reluctant to do so again. Most of the fields shown on the map are relatively small.

The maps provide an overview of farming patterns which require further documentation and investigation. However what can be ventured about the changes which have taken place since the days in which opium was grown, provides few reasons for optimism. The cropping assembly of opium/rice/maize allowed a more leisurely approach to farming activities, a wider range of domestic food plants were grown, the impact on the environment was much less distructive. As a part of this system opium did not have to be grown on large tracts of land. It could be grown successfully in the absence of chemicals on the same plot over successive years. The promotion of intensive commercial cropping introduces a heavier farmer work load and a greater demand on the land, seriously diminishes self sufficiency and greatly increases

the vulnerability of the highlander household economy to fluctuating market prices. Serious indebtedness, declining productivity of the land and a profound erosion of community morale appears to be the result.

Chapter 6 Future Work

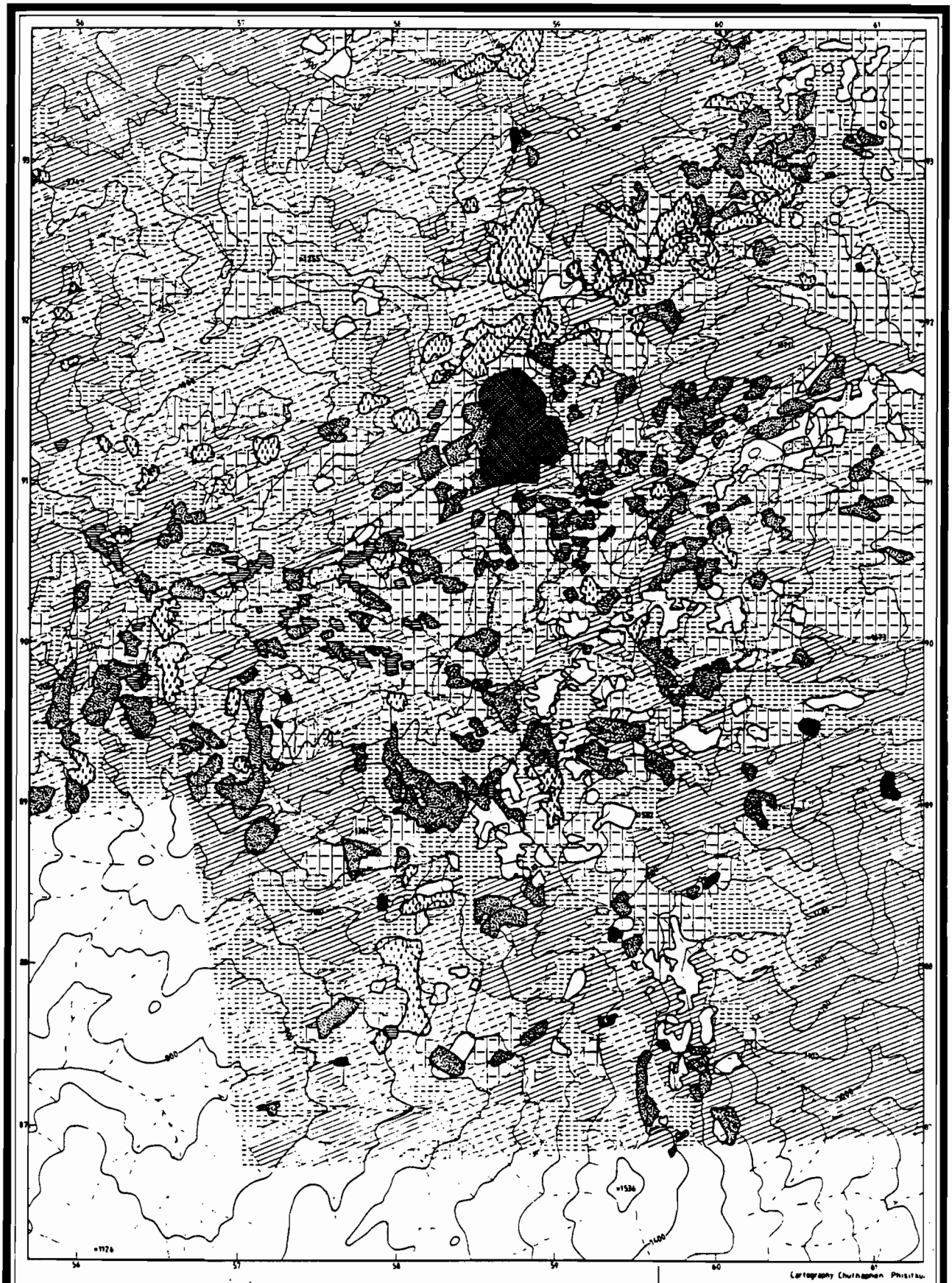
Work under way is focused on two aspects of land use and land tenure: individual households, their land holdings and the joint enterprises into which they enter; and single plots of land for which are identified those who have access and under what terms. The household centred approach conducted within the matrix of the family provides an interior perspective; the selection of specific fields provides an arbitrary counterpoint, an approach from the outside which contributes to the development of an understanding of the sociological and economic facts summarised by the maps. When research is conducted within either of these mediums without reference to each other either the microcosm of individual households tends to dominate findings or the superficial picture of the mapped macrocosm seems to dismiss the need for further questions. To achieve a good level of understanding of farmer access to, and the use made of land based resources requires that an attempt be made at an integrated interpretation

This work is not yet completed. Maps of the village and kin associations have still to be checked and this work is properly that of an anthropologist. A socio-economic survey of a complete inventory of sample household fields, land tenure and crop yields has had to be delayed to allow time for the harvest to be assessed. The descriptive record needs to be checked as work proceeds so that the difficulties outlined above in previous chapters (between different sets

of information) can be clarified before the results of aerial photo analysis can be used with confidence.

This work will be completed over the next six months.

Initial explorations of this material have revealed an extremely complex set of inter-household cooperation prevail which do not easily lend themselves to a conventional either anthropological or land use studies approach. The ethnic composition of Doi Chang, complicated by political allegiances, economic hardship and project intervention has a story to tell which if carried to a successful conclusion could contribute a great deal to our understanding of the current situation in the highlands. Such work cannot be conducted in the manner followed by technical consultants. It is a new understanding of the situation which is needed not the imposition of a conventional interpretation which will only take us back to where we started.



Cartography Chulalongkorn Physiology

LAND USE 1983-84

BAN DOI CHANG , TAMBON WAWI , MAE SUAI , CHIANG RAI

LEGEND

- Spot elevation in meters
- Contour Lines
- Stream
- Road
- Village
- Tomato Rows
- Rice
- Maize
- Opium
- Bare Soil
- Dense Forest
- Open Forest
- Shrub
- Grass land

N

0 1km

ORSTOM

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APPENDIX

TRI-ORSTOM INTERNAL PLANNING PAPER [RESEARCH] NUMBER 9

Agricultural Development and the Impact on Land Use: a comparative study of Pha Dua and Doi Chang

This TRI-ORSTOM project which will be conducted during 1988 is principally designed to trace the evolution of land use and land tenure in each of these villages as part of a broader land use research programme being undertaken by the Tribal Research Institute. This will be done by preparing maps from available aerial photography, analysing a SPOT image taken in January, 1988 and carrying out extensive interviews with villagers.

The team is as follows.

Chantaboon Sutthi	TRI agriculturalist	full time
Manus Maneeprasert	TRI geographer	part time
Somkiat Chamlong	TRI social scientist	full time
Yves Conrad	ORSTOM fellowship anthropologist	part time
John McKinnon	ORSTOM geographer	full time
Duangta Seewuthiwong	research assistant	full time
Chuthaphon Phisitkul	cartographer	full time

Main Objective

The main objective of the study is to evaluate the adaptive response of each of these communities to recent development experiences to find out whether there are any practical lessons to be learned.

Villages

Pha Dua is a permanent settlement which over a period of more than 40 years has negotiated a secure position for itself with local Department of Public Welfare officials. It is relatively homogeneous, its inhabitants appear to have retained an average of approximately 50 rai of farm land per household and maintains a strong village social structure. They also appear to have successfully managed the transition from a mountain forest to a lowland farm society.

The more isolated, mainly Lisu village of **Doi Chang** has, over the past few years, received considerable assistance from the Thai-German Programme. Changes have occured more rapidly than in Pha Dua and development initiatives appear to have been taken out of the hands of local residents. Opportunities created by the introduction of commercial tomato and cabbage production have attracted Akha settlers anxious to improve their standard of living and this in turn has led to rapid changes in land tenure.

Questions

A series of questions will be posed as part of the analysis of land use data. When and by whom was the land first cleared? What strategies have evolved which may be utilized for long term development? How is a balance retained between the number of people wanting to farm and the availability of agricultural land? What impact is the introduction of intensive commercial farming likely to have on the environment? What options remain open to each community of farmers? Is the setting up of small farms restricted to less than twenty rai feasible? What is an optimum farm size necessary to enable farmers to work this land in perpetuity?

Dependence

One of the most challenging issues concerns the extent to which development is built on local initiatives and outside support. The nature of dependency whether direct and subject to the vagarities of project decisions or structured into the market economy will identify the degree of vulnerability to change on which current developments have been built. Each of the villages under study here provides an adaptative model which promises to help elucidate this question. Pha Dua has with the help of, and in negotiation with, government officials worked out its own position. Doi Chang appears to have been pushed into making changes which may be difficult to sustain.

Optimum farm size

There appears to be a reasonable a priori argument to support the proposition that stated government preference for smaller farms (20 rai) and the apparent support given to this policy by projects may be deeply faulted on both economic and ecological grounds. The commercial farms of Doi Chiang are reasonably small and intensive use has initially provided high returns. Heavy tilling of gardens on steep slopes may well lead to serious erosion and short lived productivity. Over use of insecticide may encourage buyers to move their operation elsewhere and result in a loss of market. Smaller farms and a high dependence on commercial cropping may led to eventual failure.

There appear to be two possible answers to this potential problem.

1) Smaller farms protected by conservation farming techniques may avoid rapid erosion. However, this appears to be but a short term answer, smaller farming units may deny their "owners" the long term economic flexibility so necessary to adjust to a highly dynamic marketing situation.

2) Allow farmers to retain a larger holding so that they are able to use low intensity cultivation systems, grow a higher proportion of their own food needs and pursue farming activities which do not pose the same

high ecological or marketing risks.

Pha Dua and Doi Chang provide examples of the two principal extremes of adaptation. An historical evaluation over as long a term as possible may enable a documented and well informed opinion to be advanced.

Sub-project

A biography will be prepared for a leading elder of Pha Dua, Mr Lao Lue. The immediate objective of this is to assist in the preparation of a proper chronological calender on the basis of which it will be possible to reconstruct past land use. The undertaking will also provide a good opportunity to construct an insider's view of the way in which negotiations with the Royal Thai Government were carried out. Because of its inherent interest this sub-project may lead to the publication of the first extended biography of a national highlander.