2. THE STATUS OF SOCIAL DEVELOPMENT IN THE RURAL UCR

2.1 Physical Quality of Life

2.1.1 Roads

Information on road communication from village to amphoe seat is provided in Table 2.1. The data cover 4 situations : (1) there is no road; (2) There is a road that is trafficable all year round; (3) there is a road but it is not always trafficable during the wet season; (4) road communication with the amphoe is not possible during the wet season.

There are few differences between the changwats in the proportion of villages enjoying year round road communication with the amphoe. . It ranges from 61 to 71%. The differences appear in extreme cases. Singburi and Ayutthaya have the worst record for lacking road links and as the proportion of existing roads that cannot be used in the wet season is also high, the overall situation in deemed to be poor. On the other hand, the good showing of Chainat and Saraburi for the high proportion of villages having road links with their amphoe is qualified negatively by the low quality of these roads which cannot be used during the wet season. One needs to be reminded that in many of these locations roads are not the only option for travel in and out of villages as boat transportation over a wide network of rivers and canals is readily available.

2.1.2 Settlements

Physical quality of life can be measured by certain amenities enjoyed by village households. Table 2.2 provides data on 4 simple indicators : good structural condition of the dwelling, toilets in the house, adequate supply of clean drinking water, availability of electricity.

The measuring rod is the proportion of villages in which 90% or more of the households enjoy these amenities. There are marked differences between the changwats for some of these indicators. The quality of housing is much poorer in Chainat, Lopburi and Saraburi than in the other 3 changwats. The score for toilets is much lower in Ayutthaya, Lopburi, Saraburi. Availability of an adequate supply of clean drinking water is a grave problem in all changwats but a bit less so in Saraburi. Villagers in all changwats are well provided with electricity.

2.1.3 Amphoe level comments

Looking at amphoe level scores for all five indicators used to measure physical quality of life, one finds that in all changwats, some of their amphoes score more poorly than the others for several indicators. The following are the main poor performers:

Chainat:	Hankha, Watsing
Singburi:	Inburi, Khaibangrachan
Angthong:	Chaiyo
Ayutthaya:	Nakhonluang, Latbualuang
Lopburi:	Khokcharoen, Lamsonthi
Saraburi:	Muaklek, Kaengkhoi, Muang

Anticipating topics treated below, although there are exceptions, there is a general trend for other negative features to be present in these amphoes, such as lower level of elementary school attendance, higher levels of illiteracy in the adult population, higher levels of dependence on informal sector sources of agricultural credit charging usurious rates of interest.

2.2. Social Infrastructures

2.2.1 Village and tambon level public services

Table 2.3 provides data on the institutions and organizations providing various village and tambon level public services in the UCR villages. Although there are differences between the changwats as to the extent to which each service is provided to their villages, orders of magnitude between each type of service are more or less the same.

The government sponsorship of various activities is fairly evident : Ministry of Health, Ministry of Education, Ministry of Agriculture and Cooperatives, and Department of Community Development. Many activities are projects they have been promoting for a number of years. Not many but some activities are surely or probably villagers' initiatives: village temples, the initial move to establish a school, meeting halls, perhaps reading rooms and libraries. Of recent years, government funds (Rural Employment Creation Program) have been available through Tambon Councils for such purposes.

Some services are weakly provided, probably because they do not respond to a need in this environment. Thus rice banks and cattle/buffalo banks are intended to be a source of savings and loans for the villagers but the credit needs of the villagers far exceed the capacity of such schemes to provide. A more promissing scheme is the Dept. of Community Development's Savings for Production Groups and their cooperative stores which are fairly well developed in Singburi and Lopburi. Generally speaking, one finds few village level stores, markets and service installations in the UCR, as villages in this area are not isolated subsistence level communities. Rather, the villages are integrated in a differentiated sub-regional grid including towns in which these "town" services are better provided and that is why the villagers go for them. Another reason is that town traders come into the villages in their ubiquitons pick-up trucks to sell their goods and services and to buy village produce.

Basic services are those best provided for at the village level. These relate to religion, health care and elementary education. In interpreting the data, one must be aware that village units in this context are administrative units, not functional village communities in the sociological sense. Depending on their size, the latter might include two or more administrative units. The fact that not all administrative villages have elementary schools does not imply that the functional village community does not have access to a school.

2.2.2 Education at the village level

Elementary education with school available at least in the tambon area is well provided for in all changwats of the UCR and these schools are well attended. More than 90% of the children of primary school age are in fact in school in more than 96% of the villages of all changwats, except Lopburi where the rate is 90%. The provision of a secondary school within the area of the tambon is much less and there are marked differences between changwats. The percentage of villages having access to such schools goes from 14% in Ayutthaya to 34% in Singburi. Lowest percentages are indicated in Ayutthaya and Saraburi.

Generally speaking, village based services directed to the pre-school children and to the out-of-school adults are weak in all changwats. One should mention educational/training services are provided routinely by government officers of the four key Ministries of Agriculture, Education, Health and Interior out of amphoe and changwat offices. The rate of literacy in the UCR is high. The percentage of villages in which more than 90% of the adults aged 14-50 are literate goes from 86% in Lopburi to 100% in Angthong. It is 90% in Saraburi, 96% in Chainat and Ayutthaya, and 97% in Singburi.

2.2.3 Health care

All changwats of the UCR are well provided with either health stations or hospitals accessible to villagers within their tambon. The proportion of villages so provided goes from 94 to 96%. Travel time to reach them is usually under half an hour or an hour at most. When road conditions are bad or in the few cases where such institutions are not set up in the tambon, it can be much longer--up to 2 hours or more. Primary health care services in the form of village based medicine funds and supplies or health communicators and volunteers are much more spotty. They are fairly well provided for in Chainat, Singburi and Angthong; much less so in the other three changwats. Generally speaking however, even when only slightly ill, villagers prefer to seek treatment in health stations or hospitals.

2.3 Agricultural Groups

Overall information on membership in agricultural groups in the UCR is provided in Tables 2.4 and 2.5 which complement one another.

2.3.1 Agricultural cooperatives

These include cooperatives of all kinds such as sugarcane growers cooperatives, dairy farmer cooperatives, hog raiser cooperatives, etc. There is much diversity among changwats in the extent of participation in agricultural cooperative groups. Overall mean membership per village is 11.9 but the range goes from 9.5 in Saraburi, the lowest, to 23.6 in Chainat, the highest. These figures are not very meaningful because of the very high range of variation in mean membership per village from amphoe to amphoe in each changwat. High and low participation is best estimated at the amphoe level. This information is supplies in Table 2.5.

2.3.2 Occupational groups

There are farmers groups of all kinds that are promoted by the various government agencies engaged in agricultural extension and rural development in general. These include farmers associations, rice growers associations, irrigation water users associations, housewife associations, youth associations, etc. There is a higher level of participation in these groups than in the cooperative groups, probably because the former make fewer demands on their members. In many cases, it seems membership is more nominal than real, i.e., farmers giving their names to the promoting government officials more to satisfy their request than out of real interest. For inter-changwat comparisons, the same remarks apply as were made for the cooperatives, although variations are less extreme. Details are presented in Tables 2.4 and 2.5.

2.4 Agricultural Credit Sources

Information on agricultural credit sources in the UCR is provided in Table 2.6. The Savings for Production Groups are promoted and sponsored by the Community Development Deparment. Although it is not the most important source of credit, it is certainly the most interesting. The amount of funds

available for loans is predicated on the amount of interest earning funds deposited by members in the group's Krung Thai Bank savings account. The effective interest paid on loans is the difference between the posted rate for loans and the interest earned by the savings deposit (say 12% minus 6%), much lower therefore than regular rates. The scheme also insures that members do not borrow beyond their means. Participation in this scheme is fairly high in all changwats except Lopburi and Saraburi.

The main source of agricultural credit for all changwats is the BAAC and *Agricultural Credit Cooperatives, both of which provide credit only for* agricultural production related expenditures and not for other household expenses such as food (a major item in household accounts), house construction, medical expenses, education, wedding and funeral ceremonies, etc. The Cooperatives are sponsored and managed by officers of the Agricultural Cooperatives Division (Cooperative Promotion Department, MOAC). Much of the credit they extend is in kind (chemical fertilizer, etc.) rather than in cash.

A particular area of concern is the extent of dependence on informal sector sources of credit such as merchants which habitually charge usurious rates of interest: 5% a month or more. It is particularly high in Chainat, Lopburi and Saraburi. Overall avarages are not very meaningful as they hide the extent of the problem at the local level. The following is a list of the amphoes of the UCR with notably higher than average dependence on the informal sector for credit:

(1) Chainat: *Sankhaburi(61.4), Sanphaya(52.5), Hankha(49.0)*
(2) Singburi: Bangrachan(48.7), Phromburi(37.9)
(3) Angthong: Phothong(43.8), Sawaengha(40.7)
(4) Ayutthaya: Latbualuang(74.1), Phachi(63.2)
(5) Lopburi: Thaluang(97.6), Chaibadan(93.5), Khokcharoen(88.4), Lamsonthi(84.6), Khoksamrong(78.4), Phathananikhom(66.7), Sabot(62.5)
(6) Saraburi: Muaklek(93.2), Nongdon(67.9), Phraphutthabat(50)

It is not without significance that almost 80% of these amphoes are located in upland cropping areas. Because upland farmers do not produce the rice they eat they have to buy it. This increases their household expenses considerably.

Their main sources of credit do not extend loans for this so they borrow from the merchants. Many farmers in Lopburi and Saraburi do not have secure rights to their land in the form of title deed, Nor Sor 3 or Nor Sor 3 Kor. It cannot therefore be presented as collateral for a loan so they cannot obtain loans from formal sector credit institutions. So they borrow from the merchants.

There is evidence to show that the rate of indebtedness of farmers is very high and many get caught in a losing game. They are heavily in debt with the BAAC for example, but they urgently need cash to put in a crop. So they borrow money from the merchants to repay the loan in order to qualify for a new loan from the BAAC. When the latter becomes due, they have to borrow from the merchants again to repay it. BAAC loans get used to repay the merchants and loans from merchants get used to repay the BAAC, and on and on. It is no wonder that so many farmers simply sell their land or cede it to their creditors in default of debt repayment to escape the hopeless pursuit, even if it means joining the ranks of the casual labourers.

Table 2.1 Road Communication from Village to Amphoe Seat in the UCR by % of Villages

Road link from village to amphoe	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1. Inexistent	2.2	11.8	4.1	10.7	0.5	2
2. All season	67	69	71	61	69	64
3. Irregularly trafficable wet season	16	8	18	23	24	19
4. Not traficable in wet season	17	22	12	16	6	17

Source: NRC-2-C, 1988.

Table 2.2 Household Amenities Enjoyed by 90% or more of the Households in the UCR by % of Villages

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1. Houses in good structural condition	67	95	96	83	66	67
2. Houses with toilets	90	80	95	43	33	31
3. Adequate supply of clean drinking water	43	16	34	20	45	70
4. Electricity	90	99	99	98	89	96

Source: NRD-2-C, 1988.

Table 2.3 Village and Tambon Level Public Services Provided in the UCR by Changwat and % of their Villages

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
Village level						
1. temple	56	49	39	38	56	51
2. rice bank	14	3	1	5	6	5
3. agric. produce receiving center	7	1	1	1	2	1
4. cattle/buffalos bank	6	0.3	0.2	0.2	1	1
5. veterinary center	5	13	5	2	9	2
6. medicine fund and supply	86	74	73	49	46	43
7. health communicators/ volunteers	82	73	72	48	43	40
8. child care center	9	6	5	3	4	3
9. kindergarten	17	19	15	10	8	10
10. primary school	52	42	31	31	50	38
11. secondary school	4	7	3	3	3	3
12. adult educ. center	2	2	1	1	1	2
13. meeting hall	32	23	29	24	20	10
14. reading room	37	38	41	24	27	18
15. library	36	31	25	25	19	27
16. vocational training center	0	2	2	1	1	1
17. coop. store	4	6	16	3	6	7
Tambon level						
1. health station or hospital	94	96	96	96	95	96
2. primary school	96	95	97	97	99	96
3. secondary school	32	34	24	14	20	17
4. tambon office	79	81	83	97	97	72
5. savings for production group coop. store	18	42	13	12	27	15
6. police station	37	20	19	10	21	14

Source : NRD-2-C, 1988.

Table 2.4 Membership in Agricultural Groups in the UCR

	Agricultural Cooperatives			Occupational Groups		
	Total members	Changwat mean per village	Amphoe mean per village range	Total members	Changwat mean per village	Amphoe mean per village range
1. Chainat	9,788	23.6	8.0-51.4	13,460	32.4	22.8-46.2
2. Singburi	4,583	15.9	11.6-39.5	7,163	24.9	15.9-33.2
3. Angthong	5,490	14.0	12.1-39.5	7,163	24.9	15.9-33.2
4. Ayutthaya	7,999	6.6	1.5-14.7	13,766	11.3	5.2-18.4
5. Lopburi	14,998	15.0	6.6-68.6	19,665	19.6	10.2-28.0
6. Saraburi	7,656	9.5	2.7-37.4	14,885	18.0	7.7-41.3
		UCR mean			UCR mean	
UCR	50,514	11.9		81,087	19.1	

Source: NRD-2-C, 1988.

Table 2.5 Membership in Agricultural Groups in the UCR by Amphoes with the Highest and Lowest Mean Membership per Village

	Agricultural Cooperatives				Occupational Groups			
	Highest		Lowest		Highest		Lowest	
1. Chainat	Manorom	(51.4)	Hankha	(8.0)	Muang	(46.2)	Sankhaburi	(22.8)
	Muang	(40.9)	Watsing	(10.7)	Watsing	(36.9)	Samphaya	(25.9)
	Sanphaya	(35.9)	Sankhaburi	(21.4)	Hankha	(33.8)	Manorom	(26.8)
2. Singburi	Thachang	(39.5)	Inburi	(11.6)	Thachang	(33.2)	Khaibangrachan	(15.9)
	Khaibangr.	(21.1)	Bangrachan	(11.9)	Phromburi	(32.2)	Muang	(19.6)
	Phromburi	(20.9)	Muang	(15.0)	Inburi	(28.6)	Bangrachan	(26.4)
3. Angthong	Muang	(20.5)	Pamok	(12.1)	Pamok	(57.9)	Muang	(20.6)
	Samko	(16.1)	Wisetchaichan	(12.5)	Samko	(53.6)	Chaiyo	(22.2)
	Sawaengha	(13.9)	Phothong	(12.8)	Wisetchaichan	(28.9)	Phothong	(24.7)
4. Ayutthaya	Latbualuang	(14.7)	Bangban	(1.5)	Bangsaai	(18.4)	Uthai	(5.2)
	Nakhonluang	(12.5)	Phachi	(2.9)	Maharat	(16.8)	Bangban	(7.1)
	Bangsaai	(11.2)	Muang	(4.1)	Sena	(16.5)	Bangpain	(7.2)
5. Lopburi	Thaluang	(68.6)	Khokcharoen	(6.6)	Chaibadan	(28.0)	Thaluang	(10.2)
	Phatthana.	(22.1)	Muang	(7.3)	Khoksamrung	(26.0)	Banmi	(14.1)
	Thawung	(16.6)	Lamsonthi	(9.2)	Lamsonthi	(25.8)	Phatthanan	(14.1)
6. Saraburi	Nongdon	(37.4)	Nongkhae	(2.7)	Wihandaeng	(35.0)	Banmo	(7.7)
	Wihandaeng	(30.7)	Nongsaeng	(3.0)	Muaklek	(27.4)	Nongkhae	(9.4)
	Muaklek	(23.8)	Phraphut	(3.2)	Kaengkhoi	(27.0)	Saohai	(10.4)

Source: NRD-2-C, 1988.

Table 2.6 Agricultural Credit Sources in the UCR by % of Villages

	Saving for Production Group	Agric. Credit Coop.	BAAC	Commercial Bond	Merchants	Other
1 Chainat	18.3	79	93.7	61.4	48.2	21.4
2. Singburi	21.5	90.3	95.1	74.3	30.9	14.6
3. Angthong	31.0	70.1	91.0	41.1	26.9	28.3
4. Ayutthaya	22.0	59.3	88.8	13.3	21.5	13.2
5. Lopburi	11.9	60.0	82.3	41.8	57.2	22.2
6. Saraburi	10.3	53.9	88.2	20.8	39.2	18.5

Source: NRD-2-C, 1988.

3. EMPLOYMENT PATTERN IN THE RURAL UCR

3.1 Operators/non-operators of agricultural land

A primary distinction in rural employment is between those who do and do not operate agricultural land. Those who do operate agricultural land, whether it be owned, leased, or be made available for use by whatever arrangement, are indeed cultivator-farmers. Those who do not operate agricultural land, even though they might own some, are not. Some without land, however, might perhaps engage in livestock raising and grazing cattle, for example, on public land.

Data on the operation of agricultural land in the UCR are given in Table 3.1 and in Figures 3.1-3.6. The highest incidence of landlessness as defined is in Ayutthaya : 50.6% of all households, but it is also higher than 50% in some amphoes in Angthong, Lopburi and Saraburi. Chainat is the most thoroughly agricultural changwat in the UCR.

3.2. Land issues effecting operators of agricultural land

3.2.1 Tenurial status

From the point of view of their land tenurial status, households who operate agricultural land are distributed into three categories: (1) full owners and (2) part owners and part renters and (3) renters only. Information on these categories of farmers is provided in Table 3.2 and in Figures 3.1 - 3.6.

For the UCR as a whole, the distribution of full owners, part owners and renters only, is 48.1%, 30.5% and 21.3% respectively. The category of full owners is the largest of the three except in Ayutthaya and their proportion is highest in Chainat. Changwats with the highest proportion of renters only are Ayutthaya and Saraburi. Both exhibit considerable intra-changwat

variation, some of their amphoes having noticeably higher rates of renters than the average. Both Angthong and Ayutthaya have considerably higher than average proportions of part owners and part renters. Many farmers are in this category by choice to consolidate their holding. A farmer for example owns three plots of land somewhat distant from one another. If possible, he will rent out the two plots farthest away from his house and rent in an equivallent area of land adjoining his main plot close to his house.

The category of owners is loosely defined in this section. As explained below, not all "owners" have equal rights to the land they operate. The rights claimed by some is not recognized by law although they might beheve in practice as if they were legal owners.

The owners of rented agricultural land are usually relatives, fellow villagers, or outsiders (Table 3.3). In all changwats except Chainat, most of the owners are in fact outsiders, the highest proportions being in Ayutthaya, Lopburi, and Saraburi.

3.2.2 Rights to the land : types of land documents

Secure full ownership to the land is provided only by three types of documents issued by the Department of Lands: the title deed or chanot, the Nor Sor 3, and the Nor Sor 3 Kor. Two other types of documents are also issued by the Dept. of Lands, the baichong and the Sor Kor 1, but they confer only temporary rights to the land pending implementation of conditions to be granted permanent rights. As can be seen from Table 3.4, for all villages in Singburi, Angthong, and Ayutthaya, and for virtually all villages in Chainat, ownership rights to the land are established by documents ensuring that they are legally secure and permanent.

The land holding situation is complicated by the existence of reserved forest land in Chainat (125.17 km^2), Lopburi (2,013.4 km^2-32.5% of the total area), and Saraburi (738.12 km^2), as of 1984. Amphoes most affected in Chainat are Watsing (6 villages) and Hankha (9 villages). In Lopburi they are Chaibadan (49 villages), Thaluang (39 villages), Lamsonthi (34 villages), Khokcharoen (21 villages), Sabot (16 villages), Phatthananikhom (15 villages), Khoksamrong (5 villages), and Banmi (1 village). Amphoes most affected in Saraburi are Muaklek (50 villages), Kaengkhoi (15 villages), Muang and

Nongkhae (7 villages each), Wihandaeng (2 villages), Phraputthabat and Nongsaeng (1 village each).

Reserved forest land is public land and as such not under the jurisdiction of the Dept. of Lands, which is the only government agency authorized to issue ownership documents. Initially at least, all forest land was under the jurisdiction of the Royal Forest Dept. and operators of agricultural land in this area were technically illegal encroachers subject to eviction, a measure that is politically unenforceable. In the last two decades, efforts have been made to leagalize the de facto situation by issuing documents providing usufruct (not ownership) rights to the land. These are the Sor Tor Kor issued by the MOAC through the RFD, and the Sor Por Kor 4-10 issued through the Agricultural Land Reform Office (ALRO). Some encroachers of reserved forest land without such documents pay land taxes and use the receipts as a basis to establish their right to the land but this has no standing before the law.

As can be seen from Table 3.4, in 25% of the villages in Lopburi and in 14% of the villages in Saraburi the farmers do not have secure ownership rights. Amphoe Muaklek in Saraburi is a special case in this roster. According to the NRD-2-C 1988 data, 16 of its villages hold STK documents and 39, "other" documents, now almost certainly ALRO documents issued to 6 of 9 tambons in 1989 -- all usufructuary, not ownership documents.

3.2.3 Size of agricultural land holding

According to the Center for Agricultural Statistics (Agricultural Statistics of Thailand, Crop Year 1987-1988 Bangkok 1988), average farm sizes in the six changwats of the UCR are as follows:

(1) Chainat 26.3 rai
(2) Singburi 19.5 rai
(3) Angthong 20.9 rai
(4) Ayutthaya 32.5 rai
(5) Lopburi 39.6 rai
(6) Saraburi 36.6 rai

This source provides no information however on the variation and range of farm size by amphoe and changwat which would permit the identification of

problem areas for individual farming households. There is information for rice areas which gives indications of the range of farm size of rice farmers which should be fairly accurate for farmers in the area identified as "paddy only area" (Figure 1.7). Table 3.5 provides information on the area planted in rice by rice farmers in the UCR by changwat and size groups. A breakdown at the amphoe level is given in bar chart form in Figures 3.7 - 3.12. One may categorize the rice farmers on the basis of the size of their paddy holding as follows:

(1) marginal (<11 rai)
(2) small (11-20 rai)
(3) medium (21-50 rai)
(4) large (>50 rai)

The rationale is that if rice growing is a sole occupation, holdings smaller than 11 rai are not economically viable and holdings of 11-20 rai only barely so. The distribution of farmers of these categories is shown in Table 3.6.

Looking at the overall figures, one is struck by the large proportion (31-43.8%) of marginal farmers in all changwats except Ayutthaya and Saraburi, both of which appear to have a more balanced distribution and a higher proportion of medium and large farmers. It is impossible to conclude from these data that these marginal farmers are necessarily poor. Most presumably have other occupations such as growing other crops, raising livestock or engaging in non-agricultural enterprise.

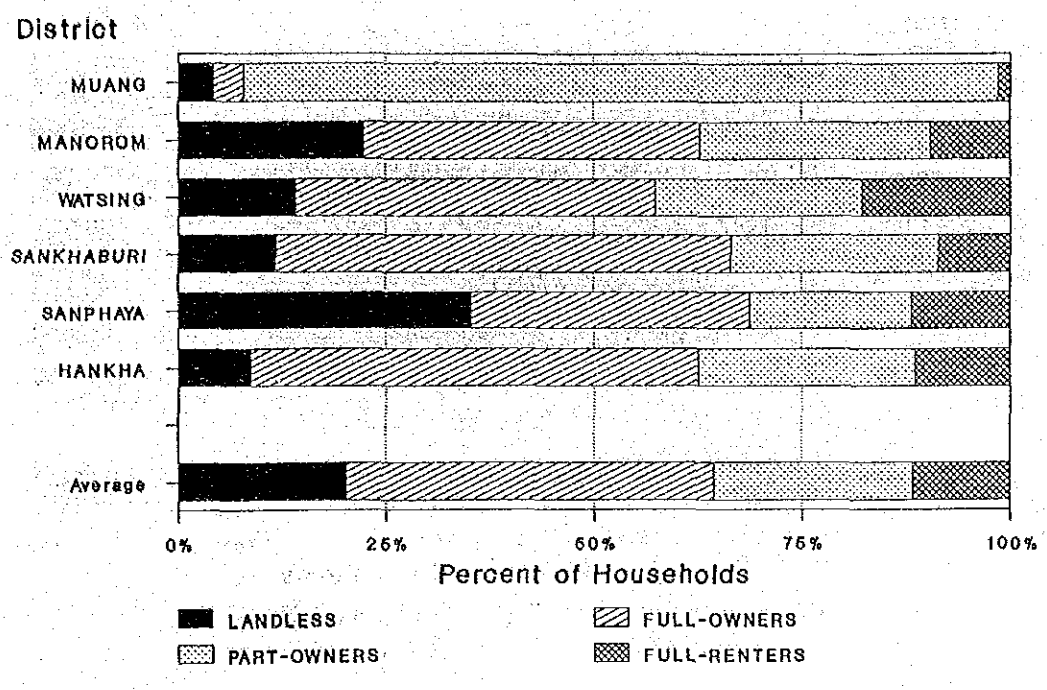
To complement these data, information is provided on the size of land plots planted in upland crops (Tables 3.13 and 3.15) and in orchards (Table 3.16). Unfortunately there is no way of knowing to what extent these crops are combined with paddy growing in the total holding of the farmers, although one would expect that the larger plots are operated by upland crop farmers and not by paddy farmers. One is struck by the relatively large number of huge holdings, 100-200 rai or more, planted in these crops which leads one to conclude that notable farmers are poor. It raises a number of questions to which we have no answer at this time. Are these huge holdings owners-operated or are the owners big investors who are town or city based who hire local people to operate their plantations? Many are located in amphoes with large tracts of reserved forest land under RFD or ALRO jurisdiction under Sor

Tor Kor or Sor Por Kor 4-10 programs which limit exploitation under usufruct and rental rights to 50 rai. How many are operating illegally and under which arrangement?

Table 3.1 Operators/Non-Operators (Landed/Landless) of Agricultural Land in the UCR by % Households

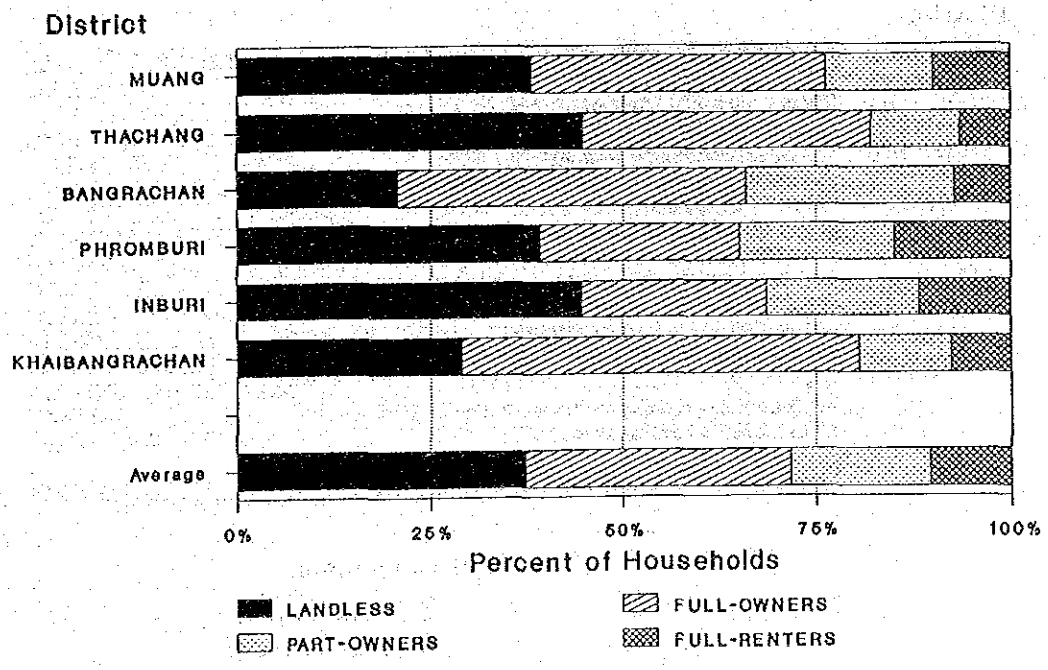
	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
No. Households	52,795	26,976	36,511	72,175	94,404	57,927
Landed HH	42,102	16,866	21,966	35,654	66,615	35,183
% by changwat	79.7	62.5	60.2	49.4	70.6	60.7
Range of % by amphoe	64.2-91.3	55.2-70.4	49.9-76.4	21.5-80.3	41.6-90.6	46.3-82.2
Landless HH	10,692	10,110	14,545	36,521	27,789	22,745
% by changwat	20.3	37.5	39.8 50.6	29.4	39.3	
Range of % by amphoe	8.7-35.8	20.8-44.7	23.6-53.5	19.7-78.5	9.4-58.4	17.2-53.7

Source: NRD-2-C, 1988.



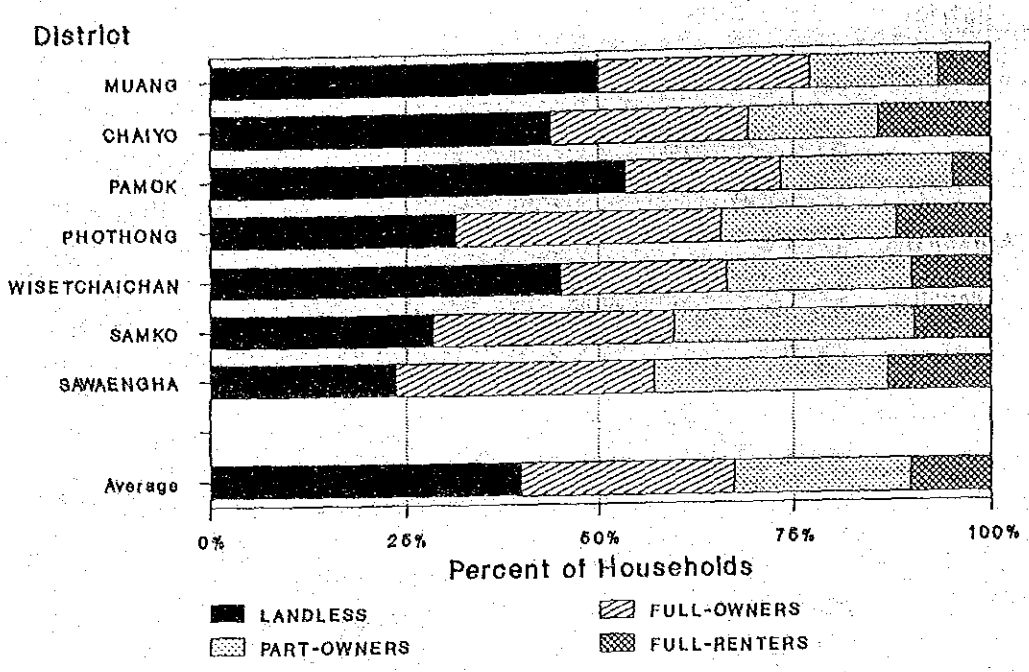
Source: NRD-2-C

Figure 3.1 LAND HOLDING IN CHAINAT In 1988



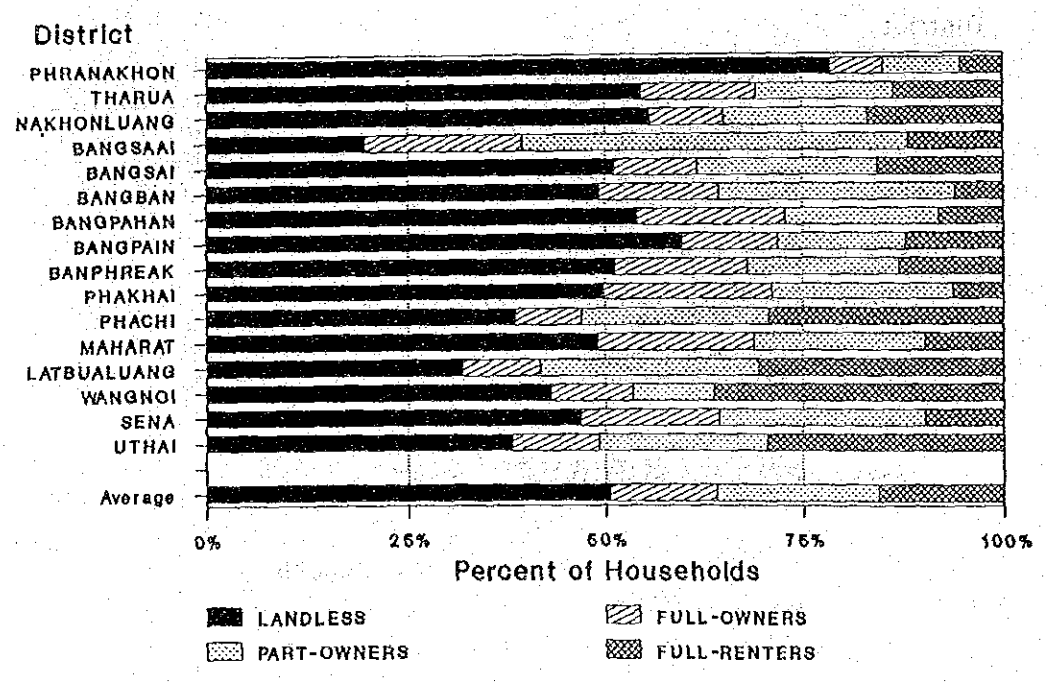
Source: NRD-2-C

Figure 3.2 LAND HOLDING IN SINGBURI In 1988



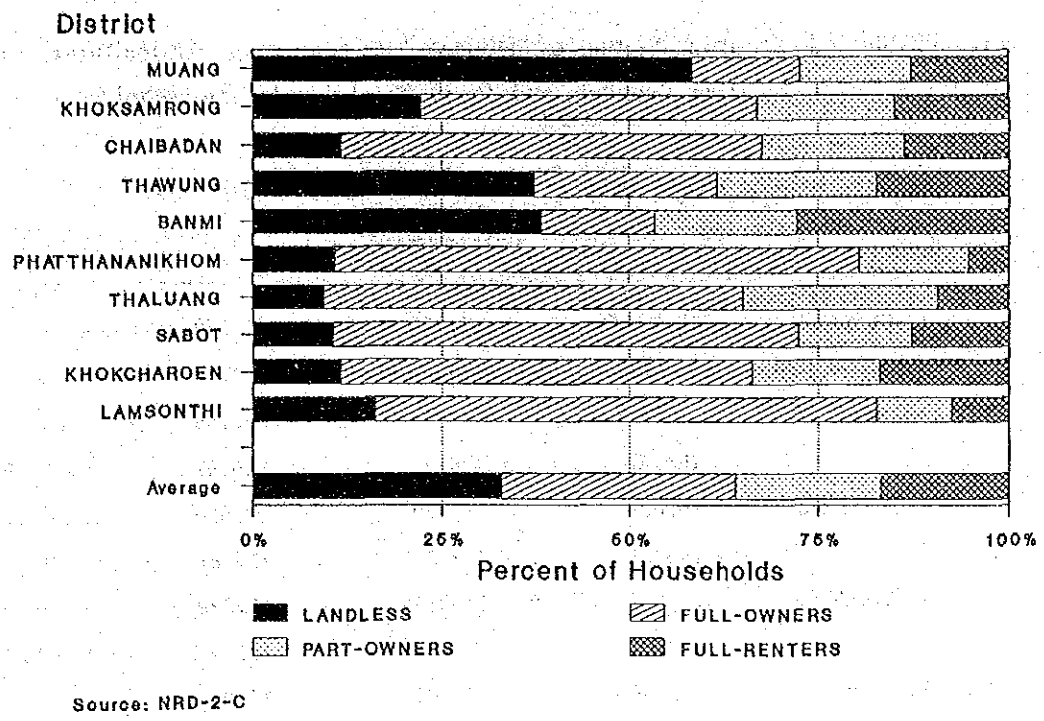
Source: NRD-2-C

Figure 3.3 LAND HOLDING IN ANGTHONG in 1988



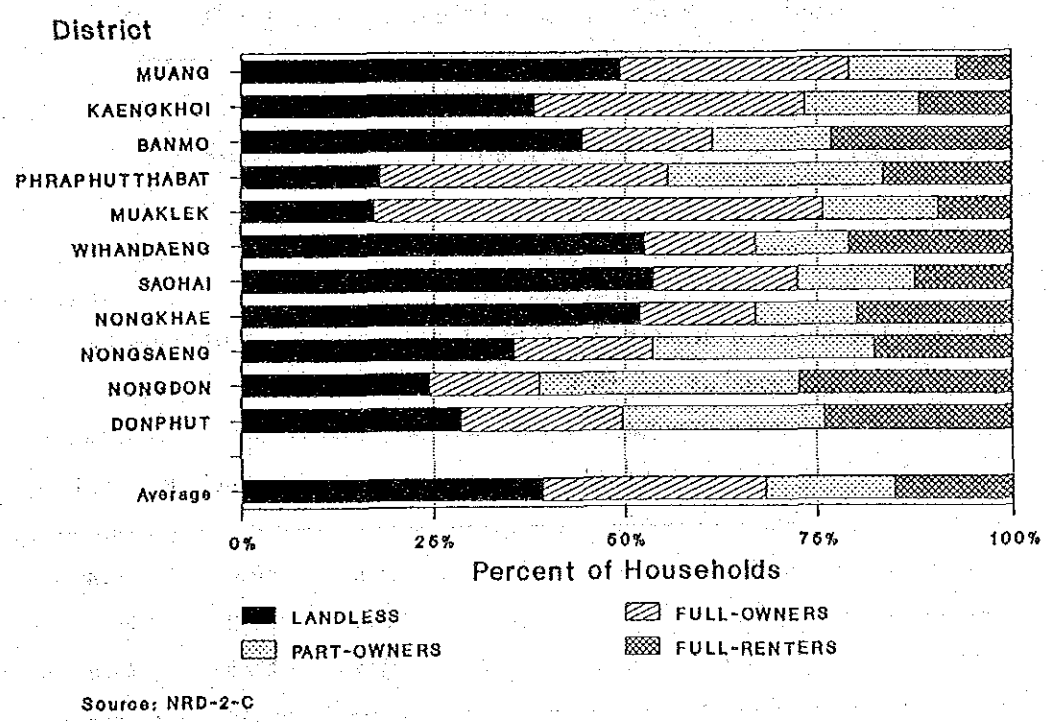
Source: NRD-2-C

Figure 3.4 LAND HOLDING IN AYUTTHAYA in 1988



Source: NRD-2-C

Figure 3.5 LAND HOLDING IN LOPBURI In 1988



Source: NRD-2-C

Figure 3.6 LAND HOLDING IN SARABURI In 1988

Table 3.2 Tenurial Status of Households Operating Agricultural Land by Number and % of Total Landed Households

	Full owners	Part owners part renters	Renters only
1. Chainai	23,227	12,734	6,149
	(55.2)	(30.2)	(14.6)
2. Singburi	9,235	4,846	2,785
	(54.8)	(28.7)	(16.5)
3. Angthong	10,034	8,238	3,695
	(45.7)	(37.5%)	(16.8)
4. Ayutthaya	9,617	14,814	11,240
	(27.0)	(41.5)	(31.5)
5. Lopburi	36,230	16,339	14,046
	(54.5)	(24.5)	(21.1)
6. Saraburi	16,803	9,714	8,666
	(46.8)	(27.6)	(24.6)
UCR	105,146	66,685	46,581
	(48.1)	(30.5)	(21.3)

Source: NRC-2-C, 1988.

Table 3.3 Owners of Rented Agricultural Land by % of Villages in Changwats of the UCR

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
Relatives	23.1	18.1	18.9	13.6	10.0	14.4
Neighbors	38.6	35.1	36.3	19.3	33.2	21.7
Outsiders	33.7	43.1	40.7	56.4	51.5	48.8

Source: NRD-2-C, 1988.

Table 3.4 Types of Land Document Held by Operators of Agricultural Land in the UCR, by Changwat and % of Villages

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1. Title beed (Chanot)	46.3	86.5	89.0	100.0	39.4	62.6
2. NS3, NS3K	50.1	10.1	11.0	100.0	39.4	62.6
3. Baichong, SK1	0.5	-	-	-	8.1	0.3
4. STK	1.0	-	-	-	4.3	2.3
5. Other	-	-	-	-	6.8	4.6
6. No document	1.2	-	-	-	4.4	0.5

Source: NRD-2-C, 1988.

Table 3.5 Distribution of UCR Rice Farmers by Categories of Marginal, Small, Medium, and Large Farmers in % of Total Rice Farmers--Based on Table 3.7

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi	UCR
Marginal farmers (< 11 rai)	31.0	35.9	43.8	19.7	30.8	18.6	28.6
Small farmers (11-20 rai)	31.7	29.8	32.4	26.0	32.9	26.7	30.1
Medium farmers (21.50 rai)	30.3	28.3	23.5	40.6	27.8	42.7	32.4
Large farmers (> 50 rai)	7.0	6.0	3.9	13.7	8.5	12.0	8.9

Source: NRD-2.C, 1988.

3.3 Rural Employment in the UCR

3.3.1 Rural employment and manpower absorption

This section provides an overview of the various types of economic activities engaged in by the rural work force of the UCR. Of the 13 activities reviewed here, it comes as no surprise that rice production is the one that absorbs the most manpower : 172,758 households. In the listing that follows, each is ranked according to the number of households engaging in it and given a rating which is a percentage of the number engaged in rice production. It is a rough listing with no assumptions being made as to the extent to which each activity is or is not engaged in as a sole or full-time occupation by the households involved. The data are derived from Tables 3.6, 3.7 and 3.8.

(1) rice growing (100)
(2) off-farm work (57)
(3) fast maturing upland crops (35)
(4) cattle raising (20)
(5) poultry raising (16)
(6) cottage industry (13)
(7) pig raising (10)
(8) fishery (8)
(9) slow maturing upland crops (7)
(10) vegetable growing (5.7)
(11) orchards (5.5)
(12) buffalo raising (3)
(13) tree crops (2)

Case studies providing more specific household level, details of six farming household types are given in the next chapter. These are based on field interviews and include paddy farmers, upland crop farmers, sugarcane farmers, cattle farmers, pig farmers, and orchard farmers.

Table 3.6 Crop Production in the UCR by Number and % of Households Involved, Changwat and Changwat Overall Rank Order

	paddy		main fast maturing upland crop		main slow maturing upland crop		orchards		vegetables		tree crops	
	rank	HH	rank	HH	rank	HH	rank	HH	rank	HH	rank	HH
1. Chainat	2	38,480	3	4,207	2	3,708	4	1,600	5	844	6	180
		(22.3)		(6.9)		(29.2)		(16.7)		(8.6)		(4.9)
2. Singburi	6	15,945		1,215		718		1,568	6	215	3	827
		(9.2)		(2.0)		(5.7)		(16.4)		(2.2)		(22.5)
3. Angthong	5	20,678	5	1,802	5	447	1	1,819	2	1,740	4	483
		(12.0)		(3.0)		(3.5)		(19.0)		(17.7)		(13.1)
4. Ayutthaya	3	34,967	4	2,081	6	336		1,178	4	1,181	5	408
		(20.2)		(3.4)		(0.3)		(12.3)		(12.0)		(11.1)
5. Lopburi	1	40,940	1	37,724	1	4,869	3	1,637	3	1,692	1	932
		(23.7)		(61.8)		(38.4)		(17.1)		(17.2)		(25.3)
6. Saraburi	4	21,748	2	13,998	3	2,913	2	17,691		4,170	2	852
		(12.6)		(22.9)		(23.0)		(18.5)		(42.3)		(23.1)
UCR		172,758		61,027		12,688		9,571		9,842		3,682

Source: NRD-2-C, 1988.

Table 3.7 Livestock and Fishery Production in the UCR by Number and % of Households Involved, Changwat and Changwat Overall Rank Order

	Cattle		Buffalo		Pigs		Poultry		Fishing		Aquaculture	
	rank	HH	rank	HH	rank	HH	rank	HH	rank	HH	rank	HH
1. Chainat	5	4,305	2	1,445	3	3,344	3	5,068	5	890	2	876
		(12.6)		(25.0)		(18.5)		(17.9)		(8.3)		(25.1)
2. Singburi	6	3,868	6	207	4	2,405	1	7,424	1	3,351	4	460
		(11.3)		(3.6)		(13.3)		(26.2)		(31.2)		(13.2)
3. Angthong	3	5,274	5	455	1	5,225	4	4,141	3	1,645	3	628
		(15.4)		(7.9)		(28.9)		(14.6)		(15.3)		(18.0)
4. Ayutthaya	4	5,147	4	1,015	5	1,416	6	2,492	2	2,658	1	999
		(15.1)		(17.5)		(7.8)		(8.8)		(24.8)		(28.6)
5. Lopburi	1	9,118	3	1,186	2	4,905	2	5,727	6	864	5	318
		(26.7)		(20.5)		(27.1)		(20.2)		(7.9)		(9.1)
6. Saraburi	2	6,443	1	1,476	6	811	5	3,491	4	1,349	6	215
		(18.9)		(25.5)		(4.5)		(12.3)		(12.6)		(6.1)
UCR		34,155		5,784		18,106		28,343		10,739		3,496
		(100.0)		(100.0)		(100.0)		(100.0)		(100.0)		(100.0)

Source: NRD-2-C, 1988.

Table 3.8 Off-Farm/Non-Farm Work in the UCR by Number and % of Households Involved, and Changwat Overall Rank Order

	work outside of home tambon		main cottage industry	
	rank	HH	rank	HH
1. Chainat	5	13,441	3	3,113
		(13.7)		(13.7)
2. Singburi	6	7,241	5	2,423
		(7.4)		(10.6)
3. Angthong	2	19,223	4	2,663
		(19.6)		(11.7)
4. Ayutthaya	1	25,338	1	9,471
		(25.8)		(41.5)
5. Lopburi	3	17,513	2	3,119
		(17.8)		(12.7)
6. Saraburi	4	15,329	6	2,007
		(15.6)		(8.8)
UCR		98,085		22,796
		(100.0)		(100.0)

Source: NRD-2-C, 1988.

3.3.2 Crop production[1)]

1) Rice production

As mentioned, rice production is the economic activity that absorbs the largest number of workers in the rural UCR. The relative importance of rice production as an occupation is further illustracted by the consideration of the proportion of rice growing households in relation to landed households operating agricultural land and in relation to total households (Table 3.9). More than 90% of the farmer-cultivator households of the UCR grow paddy except in Lopburi and Saraburi where the proportion is 62%. Even in these two major upland crop producing changwats, more than half of the farmers produce paddy. Considering now the total household population of the UCR, we find that paddy production is the occupation engaged in by 50.7% of the households on average. The proportion is lower than that in Saraburi, Lopburi, and Ayutthaya; and it is higher in the other three changwats. We repeat here the caveat these figures are not limited to paddy producers as a sole occupation. Many if not most also engage in other economic activity. Changwats with the largest number of paddy farmers are Lopburi, Chainat and Ayutthaya in that order. Two thirds of the paddy farmers of the UCR are in these three changwats. In the distribution of holdings planted in rice ranging in size from less than 1 rai to more than 50 rai, the median range of holdings sizes is 11-20 rai (small farmer size) in Chainat, Singburi, Angthong and Lopburi and 21-50 rai (medium farmer size) in Ayutthaya and Saraburi. The implication is that there is a larger proportion of marginal farmers in the first group of changwats, and a larger proportion of large farmers in the second group. (Tables 3.6, 3.10. Figures 3.7 to 3.12).

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1) In the analysis of economic enterprise in the rural UCR that follows, much use in made of the median as a descriptive statistics measure. Simply stated, the median is "the value of a variable which exceeds half of the observations and is exceeded by half." Thus, in a ranked listing of subjects (persons, groups, villages, etc.) in relation to a variable characteristic (e.g., size of plot cultivated, crop yield, number of livestock raised, etc.), the median value is the achievement realized by the subject at the mid-point of the listing in relation to the variable. The median measure is preferred to the mean for purposes of social development planning because it is a better indicator of the distribution of the variable characteristic in the population, thus better reflecting the true condition of individuals in the population. Mean values can be misleading in this respect because they can be distorted by a small number of high achieving subjects in a population with generally lower levels of achievement or vice versa.

UCR paddy farmers grow one or two crops of rice a year. Those who grow three crops a year are rare exceptions. The most common practice in Ayutthaya, Lopburi, Saraburi (72-85% of the farmers) is to grow only one crop a year. In Angthong, Singburi, and to a lesser extent in Chainat, the practice is to grow two crops a year, but not every year. The deciding factors are the availability of irrigation water (which is not supplied every where every year by the Royal Irrigation Department) and rice market prices. Two crops are grown regularly every year by 19.5% of the Ayutthaya farmers, 12% of the Chainat farmers, and 9% of the Saraburi farmers because of exceptionally favorable conditions prevailing in some of their amphoes, mainly Muang and Hankha in Chainat; Latbualuang, Sena and Bangsai in Ayutthaya; and Nongkhae in Saraburi. These also produce higher than average crop yields.

Although there is a fair number of villages in the UCR with rice production yields of up to 800 kg. a rai, median yields by changwat are in the 400-500 kg./rai range in Chainat and Singburi but only 300-400 kg./rai in the other four changwats (Table 3.11). This is very low by international average.

An example of what can be achieved under good conditions in this area is provided by farmers in a land reform project area in Amphoe Latbualuang in Ayutthaya. Project activities included land consolidation, soil improvement to achieve optimum profiles for rice production, and provision of farm level irrigation and drainage ditches as well as roads. Farmers in this area can grow three crops a year. The first grown from January to April has a yield of 700-800 kg./rai. The second grown from June to September has a yield of 900-1,000 kg./rai. The third grown from October to January has a yield of 400-600 kg./rai. Not many farmers grow this third crop, however, because the yield is relatively low and there is much loss of paddy by rats which invade the fields at this time. However impressive, this project has limited possibilities as a development model. Because of high development costs it cannot be replicated on a large scale. The project site which was acquired by ALRO is currently (January 1990) occupied by about 2,000 farmers with holdings ranging from 5 to 8 rai. Farmers have the option of either renting the land or entering into a rent-purchase agreement

with ALRO. The latter is an expensive proposition. For the rent-purchase of six rai of land, a farmer must commit himself to paying 1,700 Baht/month for 15 years.

Table 3.9 Proportion of Rice Growing Households in Relation to Total Households, and to Total Landed (Farmer-Cultivator) Households in the UCR by Changwat

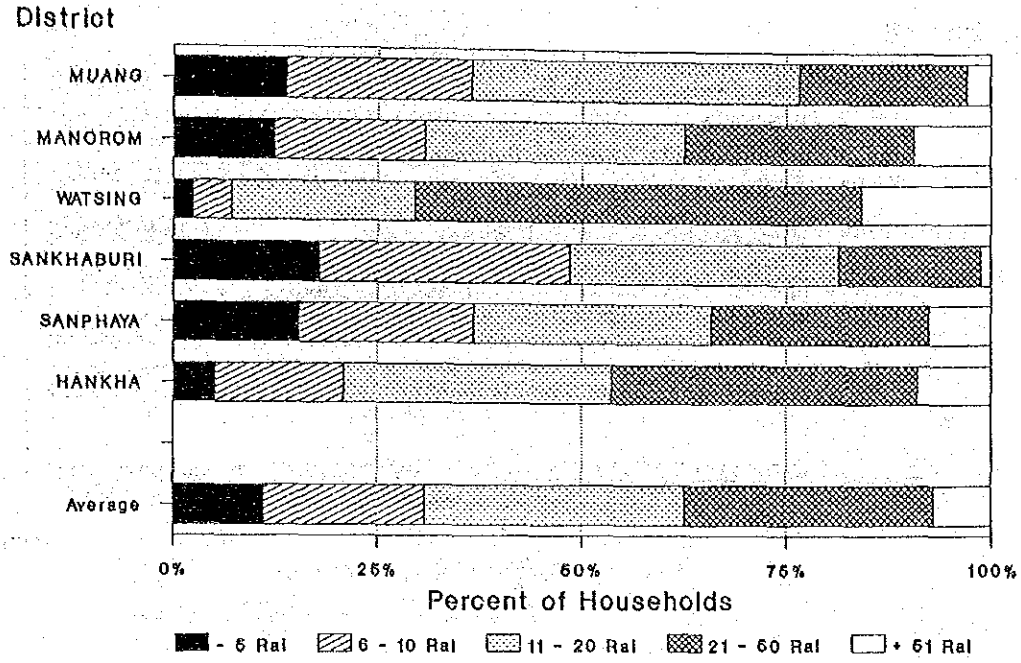
	Rice growing households	Total households (% of paddy growers)	Total landed households (% of paddy growers)
1. Chainat	38,480	52,795(72.9)	42,103(91.4)
2. Singburi	15,945	26,976(59.1)	18,866(94.5)
3. Angthong	20,678	36,511(56.6)	21,966(94.1)
4. Ayutthaya	34,967	72,175(48.4)	35,654(98.1)
5. Lopburi	40,940	94,404(43.4)	66,615(61.5)
6. Saraburi	21,758	59,990(37.5)	35,183(61.8)
UCR	172,758	340,851(50.7)	218,387(79.1)

Source: NRD-2-C, 1988.

Table 3.10 Area (rai) Planted in Rice by Rice Farmers in the UCR by Changwats, Numbers and % of Farmers

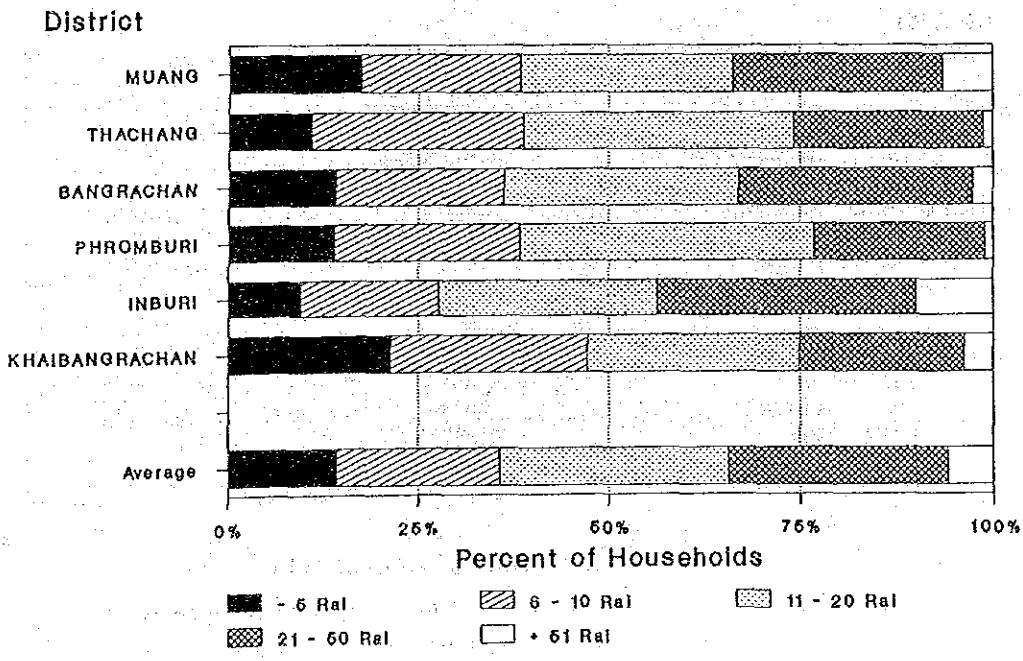
rai	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi	UCR
<1	342	211	132	80	533	169	1,467
	(0.9)	(1.3)	(0.6)	(0.2)	(1.3)	(0.8)	(0.8)
1-5	3,926	2,051	3,053	2,182	4,260	1,160	16,632
	(10.2)	(12.9)	(14.8)	(6.3)	(10.4)	(5.3)	(9.6)
6-10	7,634	3,453	5,119	4,612	7,826	2,726	31,370
	(19.9)	(21.7)	(28.4)	(13.2)	(19.1)	(12.5)	(18.2)
11-20	12,209	4,750	6,695	9,094	13,454	5,804	52,006
	(31.7)	(29.8)	(32.4)	(26.0)	(32.9)	(26.7)	(30.1)
21-50	11,659	4,522	4,852	14,199	11,398	9,274	55,904
	(30.3)	(28.3)	(2.35)	(40.6)	(27.8)	(42.7)	(32.4)
>50	2,709	958	827	4,797	3,469	2,615	15,375
	(7.0)	(6.0)	(3.9)	(13.7)	(8.5)	(12.0)	(8.9)
Total	38,480	15,945	20,678	34,967	40,940	21,748	172,758
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	(22.3)	(9.2)	(12.0)	(20.2)	(23.7)	(12.6)	(100.0)
Median size (rai) of plots	11-20	11-20	11-20	21-50	11-20	21-50	11-20

Source: NRD-2-C, 1988.



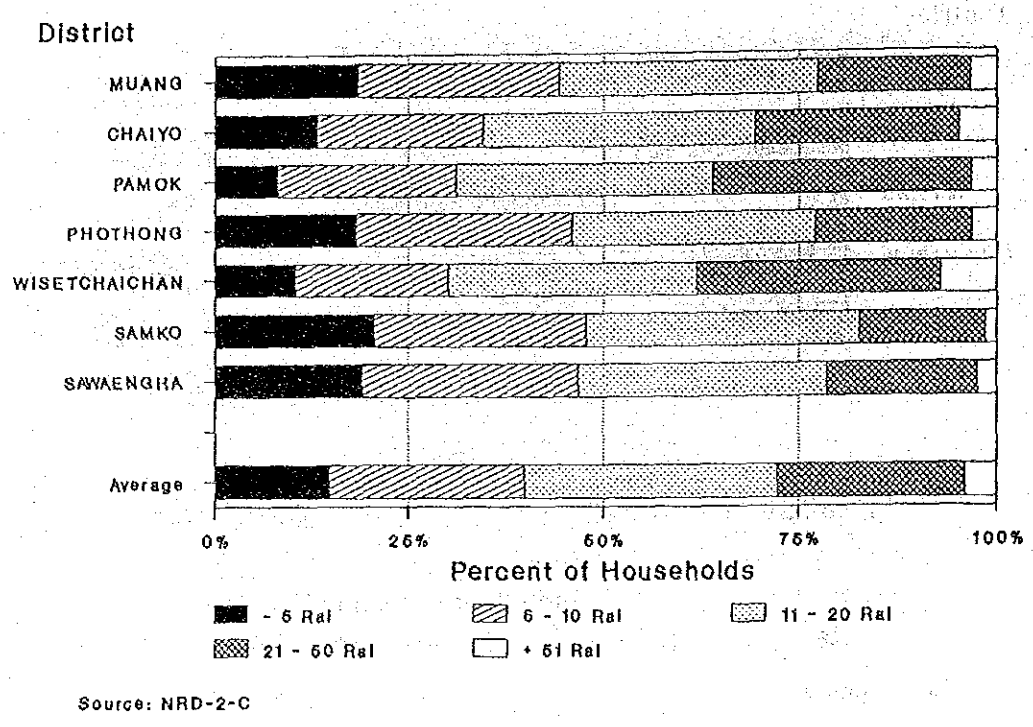
Source: NRD-2-C

Figure 3.7 RICE AREA PLANTED IN CHAINAT In 1988



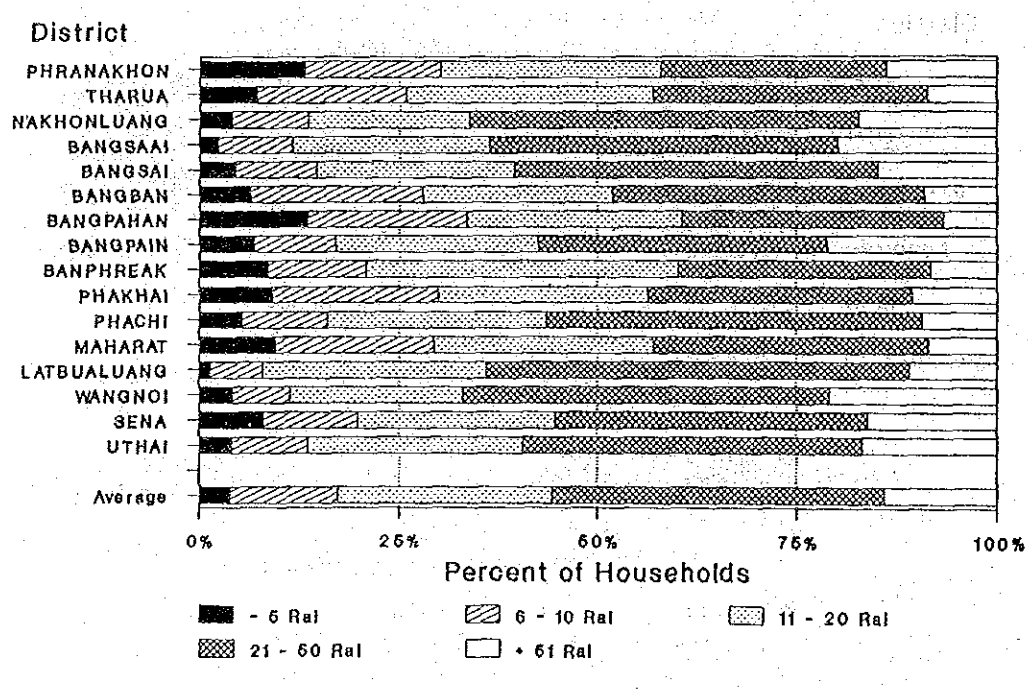
Source: NRD-2-C

Figure 3.8 RICE AREA PLANTED IN SINGBURI In 1988



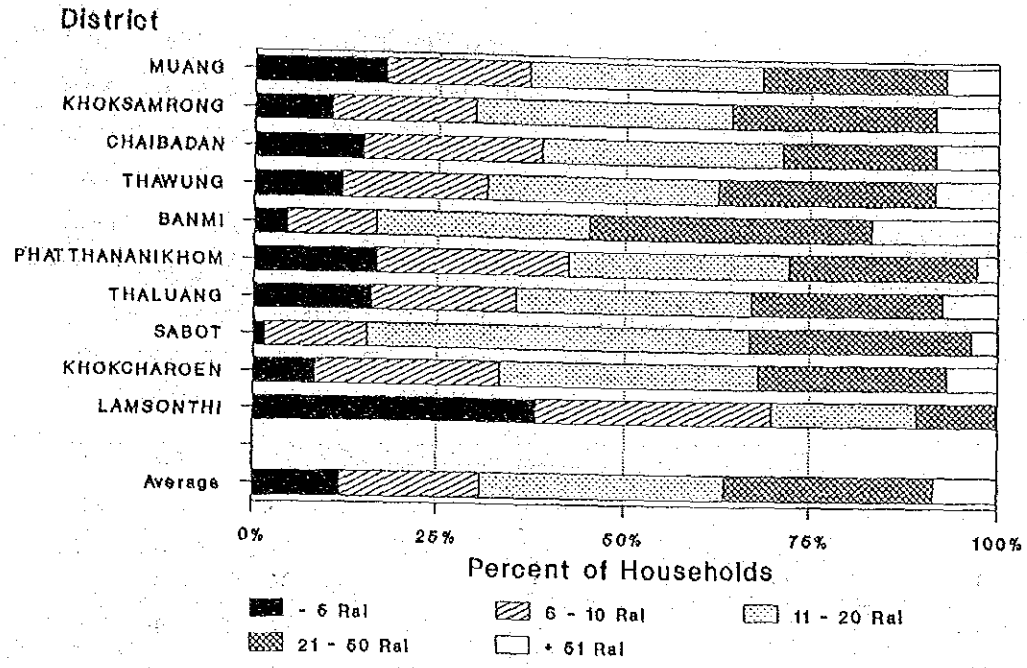
Source: NRD-2-C

Figure 3.9 RICE AREA PLANTED IN ANGTHONG In 1988



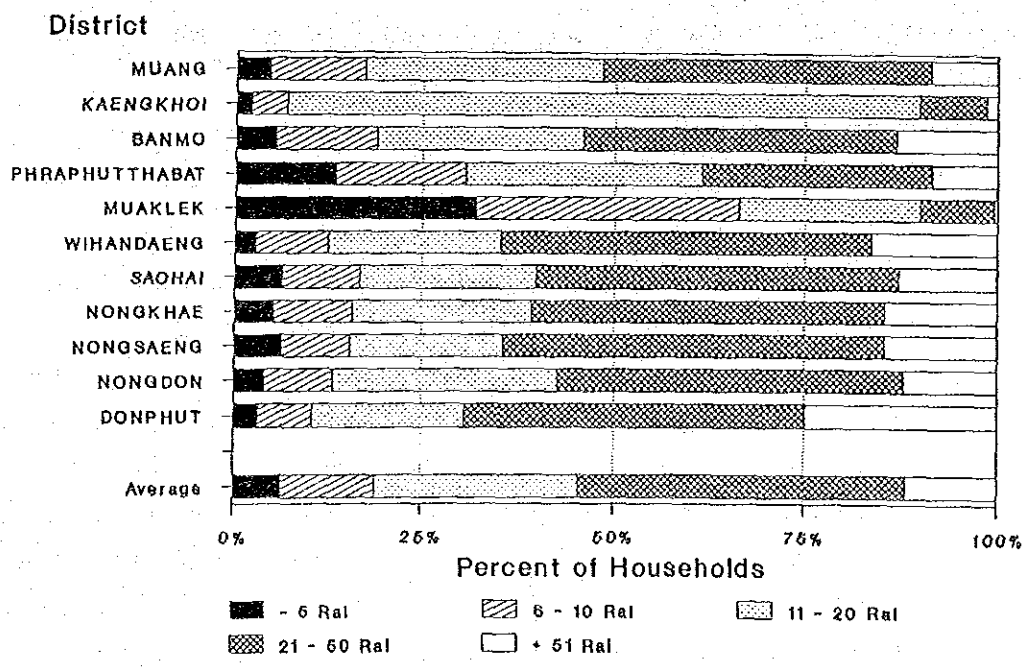
Source: NRD-2-C

Figure 3.10 RICE AREA PLANTED IN AYUTTHAYA In 1988



Source: NRD-2-C

Figure 3.11 RICE AREA PLANTED IN LOPBURI in 1988



Source: NRD-2-C

Figure 3.12 RICE AREA PLANTED IN SARABURI in 1988

Table 3.11 Rice Production Yields (kg./rai) in the UCR by Changwat, Yield Size Group, and Number of Villages Achieving

rai	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
<200	41	5	9	58	40	33
201-300	81	9	69	289	187	114
301-400	37	90	221	520	434	393
401-500	67	72	43	195	182	195
501-600	81	39	50	65	24	16
601-700	81	43	30	53	3	1
701-800	26	30	12	19	3	-
801-900	1	-	-	-	1	-
Total villages producing	415	288	434	1,199	874	752
Median yields per village	401-500	401-500	301-400	301-400	301-400	301-400

Source: NRD-2-C, 1988.

2) Fast maturing upland crop production[1)]

Fast maturing upland crops are those that can be grown to maturity in less than four months. Those that take longer than four months to produce are slow maturing upland crops. There are farming households producing fast matuing upland crops in all changwats of the UCR and the largest numbers by far are in Lopburi and Saraburi, followed by Chainat (Table 3.6). There are more farmers with larger plantations in these changwats. The median size of plantations in Lopburi and Saraburi is larger than 100 rai. In Chainat, it is 90-100 rai. In Singburi and Angthong, median sizes are much smaller, most farmers to cultivating much smaller plots. Ayutthaya is rather unique in that although the median size of plots is only in the 20-30 rai range there are big farmers in 38 villages cultivating plots that are bigger than 90 rai (Table 3.13). Most are in Tharua, Nakhonluang, Bangban and Bangphreak.

There are several fast maturing crops produced in the UCR. Ranked according to the number of villages known to produce them, the most important of these are (1) maize, (2) ground nut, (3) mung bean, (4) sorghum, and (5) soybean. Most of the maize is grown in Lopburi and Saraburi, but also fairly substantially in Chainat and Ayutthaya.

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1) There are gaps in the NRD Committee 1988 village survey data on the following enterprises : fast and slow maturing upland crop production, orchards and tree crop production, and cottage industry. The problem is that in several instances, the space provided in the village questionnaire for the answer to specific questions was left blank. There are several possible explantions : the respondent was careless, ignorant of the answer, or unwilling to answer. Another possibility suggested by internal evidence is that the question was irrelevent in the context of that village. For example, in this village, no fast maturing upland crops are grown so there is nothing to answer as to which crops are grown, the number of houscholds involved, or the size of the plots on which the crops are grown. The space is therefore left blank and the implicit answer to the question is "nil". The analyses that follow are based on available data, leaving open the question of there being more in the villages on these enterprises than what was reported. Where relevant, the size of the incomplete village samples is indicated in the tables in percentages of the total number of villages (Tables 3.12, 3.13, 3.14, 3.15, 3.16 and 3.22).

Virtually all sorghum is grown in Lopburi. Ground nut is grown mainly in Chainat and Singburi. All other crops are fairly evenly distributed throughout all changwats. Ayutthaya has the most villages growing mungbean.

With few exceptions (e.g. Muaklek in Saraburi), there is only one plantation a year for any one of these crops. They are planted mostly in the wet season in Chainat, Lopburi, and Saraburi; and in the dry season in Singburi, Angthong and Ayutthaya.

3) Slow maturing upland crop production

The number of farming households involved in slow maturing upland crop production is smaller than those producing fast maturing crops. The largest numbers are in Lopburi, Chainat and Saraburi. They are much fewer in the other three changwats (Table 3.6). There is a high proportion of farmers growing crops on large plots in Chainat, Singburi and Lopburi. The median size in Chainat is 140-160 rai, in Singburi 120-140 rai, and in Lopburi 140-160 rai (Table 3.15).

Ranked by the number of villages known to produce them, the main slow maturing upland crops grown in the UCR are (1) sugar cane, (2) cassava, and (3) cotton. The main sugar cane producers are Singburi, Angthong, Lopburi and Saraburi. Cassava is grown only in Chainat, Lopburi and Saraburi. Lopburi produces most of the cotton but some is also grown in Saraburi.

4) Fruit tree production

The number of orchard growers is fairly evenly distributed among the six changwats from 1,178 in Ayutthaya to 1,819 in Angthong. The median size of orchards is 20-30 rai in Lopburi and 40-50 rai in Saraburi. In the four other changwats it is smaller : 1-10 rai in Angthong and 10-20 rai in Chainat, Singburi and Ayutthaya -- which indicates that the proportion of smaller orchards is rather high. This notwithstanding, Ayutthaya once again manifests uniqueness: in 37 of its villages, orchards are larger than 90 rai. In one village in Wangnoi they are in the 800-900 rai range (Tables 3.15 and 3.16).

5) Vegetable production

The largest numbers of vegetable farming families are in Saraburi (4,170) followed by Angthong and Lopburi (Table 3.6). In all changwats, the median size of vegetable gardens are in the 1-10 rai range. In 25 villages however there are gardens that are larger than 90 rai: 3 in Angthong, 13 in Ayutthaya, 5 in Lopburi, and 4 in Saraburi.

6) Tree crop production

There are relatively few known tree crop farming households in the UCR. The largest numbers are in Lopburi (932) followed by Saraburi and Singburi (Table 3.6). The median size of tree crop plantations is 1-10 *rai Singburi and 10-20 rai in all other changwats.* Plantations larger than 90 rai are found in 44 villages : one each in Chainat and Singburi, and 14 each in Ayutthaya, Lopburi and Saraburi.

7) Cropping intensity and constraints

a. Dry season cropping

This is practiced by some villages in all changwats but the percentage of their villages doing so is not high. It ranges from 21% in Chainat and Ayutthaya to 33% in Angthong. It is, 32% in Singburi, 28% in Lopburi, and 31% in Saraburi. By changwat averages, the proportion of villages in which more than 50% of their households engage in this practice is very low -- less than 10%. *Some amphoes have better records.* The source of water used by most villages for dry season cropping is surface water which indicates that at present, the practice is linked to access to rivers, streams, and canals. There is only limited use of groundwater and of residual rain water collected in reservoirs. The latter practice is a somewhat more developped in Lopburi. There is obviously much scope for the development of small scale water resources if dry season cropping is to be expanded.

b. Proportion of village agricultural land operated

The situation is as follows in percentages of villages:

	100%	75%	50%	25% or less
1. Chainat	64.6	31.6	2.4	1.4
2. Singburi	89.6	10.4	-	-
3. Angthon	86.4	11.7	0.7	0.9
4. Ayutthaya	79.0	15.4	2.0	3.9
5. Lopburi	54.1	41.7	2.9	1.3
6. Saraburi	66.9	24.6	2.1	3.9

In none of the six changwats is all agricultural land operated in all villages but the changwats with the highest proportion of villages achieving this are Singburi, Angthong and Ayutthaya in that order. At the other end of the scale, changwats with the worst records leaving 50% or more of their land idle are Saraburi, Ayutthaya, Lopburi and Chainat, in that order. The main reasons cited in all changwats for leaving land idle are:

1st, lack of water. It is the main reason in Chainat, Singburi, Lopburi and Saraburi and ranked 2nd in Ayutthaya and 3rd in Angthon.

2nd, crop production not cost effective. It is the main reason in Angthong and Ayutthaya and ranked 2nd in Chainat, and 3rd in Lopburi and Saraburi.

3rd, poor soil. This is ranked 2nd in Angthong, Lopburi and Saraburi and 3rd in Singburi and Ayutthaya.

Flooding was ranked 2nd in Singburi and was seen as important but given a lower ranking in Chainat, Ayutthaya and Saraburi.

Labour shortage was ranked 4th in Saraburi and given lower ratings elsewere.

Lack of knowledge. Few village respondents attributed much significance to this factor.

Soil problems reported in the UCR:

1. Depleted soil: all changwats.
2. Eroded soil: Singburi, Angthong, Ayutthaya, Saraburi
3. Stony soil: Chainat, Lopburi, Saraburi
4. Acid soil: Chainat, Ayutthaya, Saraburi
5. Saline soil: Angthong
6. Shallow soil, hard soil: Saraburi

c. Crop rotation

It is practiced in virtually all villages in Chainat, Angthong and Lopburi. More than half of the village households are involved in the practice in 70% or more of their villages. In Singburi, crop rotation is practiced in some 87% of its villages. In about one half of these there is involvement of more than 50% of the village households. The percent of villages practicing crop rotation is rather lower in Saraburi and Ayutthaya, 74% and 70% respectively. There is involvement of more than 50% of the village households in about one half of these villages in both changwats.

Table 3.12 Fast Maturing Upland Crops Grown in the UCR by Changwat, Order of Priority, and Number of Villages in which Grown

	Chainat		Singburi		Angthong		Ayutthaya		Lopburi		Saraburi	
	1	2	1	2	1	2	1	2	1	2	1	2
Size of village sample: % of total	40.2	19.0	58.3	47.9	25.7	4.6	37.2	26.3	66.6	59.5	97.3	46.3
1. maize	46	3	-	-	2	2	20	8	459	31	264	8
2. sorghum	-	9	-	-	-	-	-	-	16	306	-	37
3. seasame seed	-	-	-	2	-	1	8	3	8	2	12	3
4. mung bean	15	4	51	1	83	2	116	2	32	82	11	37
5. ground nut	14	8	17	1	-	-	1	-	2	6	9	20
6. soybean	5	4	14	3	5	2	1	-	21	28	5	40
7. yam bean	-	-	-	-	-	-	-	-	-	-	1	7
8. tobacco	-	-	-	-	-	-	-	-	1	3	-	-
9. hay	-	-	2	-	-	1	-	-	2	4	17	
10. other	2	1	3	1	8	4	8	10	3	2	18	14

Source: NRD-2-C, 1988.

Table 3.13 Area (rai) of Individual Holdings Planted in Most Popular Fast Maturing Upland Crops by Villages Growing[1)]

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
size of sample	54.5%	41.3%	32.0%	22.3%	53%	39.1%
1-10	12	7	52	53	7	33
11-20	11	9	12	21	6	36
21-30	7	12	4	23	6	29
31-40	4	5	3	15	5	19
41-50	7	36	12	22	10	16
51-60	2	6	2	9	1	6
61-70	-	4	2	1	1	1
71-80	1	1	2	8	2	9
81-90	1	-	2	1	-	1
91-100	18	5	9	22	24	30
> 100	31	3	-	16	488	141
Total villages growing	94	88	48	191	550	321
Median area of plantations (rai)	91-100	41-50	41-50	21-30	>100	>100

Source: NRC-2-C, 1988.

Note: 1) The tabulation is based on answers to question 12.1 of the village questionnaire : "What is the size of land plot most households used?"

Table 3.14 Slow Maturing Upland Crops Grown in the UCR by Changwat, Order of Priority, and Number of Villages in which Grown

	Chainat		Singburi		Angthong		Ayutthaya		Lopburi		Saraburi	
	1	2	1	2	1	2	1	2	1	2	1	2
Size of village sample: % of of total	37.1	11.6	53.1	-	13.3	-	26.3	-	36.1	21.6	94.8	32.8
1. jute	-	-	-	-	-	-	-	-	4	1	-	-
2. cotton	-	-	-	-	-	-	-	-	104	20	25	6
3. cassava	60	4	-	-	-	-	-	-	52	24	65	3
4. castor bean	-	-	1	-	-	-	-	-	1	-	3	2
5. sugar cane	5	7	61	-	37	-	6	-	51	11	33	6
6. other	1	-	-	-	-	-	-	-	5	1	25	1

Source: NRD-2-C, 1988.

Table 3.15 Area (rai) of Individual Holdings Planted in Most Popular Slow Maturing Upland Crops by Number of Villages Growing[1)]

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
Size of sample	52.3%	22.2%	16.6%	8.9%	32.3%	23.3%
1-20	8	2	22	3	11	36
21-40	4	3	-	1	16	39
41-60	6	4	4	4	49	27
61-80	2	6	2	1	15	3
81-100	12	10	5	1	33	13
101-120	1	5	1	-	3	1
121-140	-	3	-	-	-	-
141-160	9	12	1	-	15	5
161-280	-	2	-	-	1	-
181-200	13	9	1	-	15	5
>201	10	8	2	1	66	25
Total villages growing	65	64	38	11	209	154
Median area of plantations	141-160	121-140	1-20	41-60	141-60	41-60

Source: NRD-2-C, 1988.

Note: 1) The tobulation is based on answers to question 12.2 of the village questionnaire: "What is the size of land plot most households used?"

Table 3.16 Area (rai) of Individual Holdings Planted in Fruit Trees (Orchards) by Number of Villages Growing[1)]

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
Size of sample	88.2%	99.7%	57.2%	70.7%	79.9%	69.6%
1-10	30	39	108	83	37	61
11-20	35	32	25	40	26	32
21-30	15	15	1	19	17	10
31-40	2	6	9	11	5	8
41-50	13	8	14	21	22	26
51-60	2	4	4	12	3	1
61-70	1	1	-	1	1	3
71-80	-	1	1	1	3	1
81-90	-	1	-	1	-	1
91-100	4	3	2	8	16	12
>100	5	2	2	29	20	30
Total villages growing	107	112	183	226	150	110
Median area of plantations	11-20	11-20	1-10	11-20	21-30	41-50

Source: NRD-2-C, 1988.

Note: 1) The tabulation is based on answers to question 13 of the village questionnarie: "Land used for most households (growing orchards)".

3.3.3 Livestock raising and fishery

1) Cattle raising

Of all livestock production enterprises in the UCR, cattle raising employs the most farming households: 34,155 for the whole area. The largest number of cattle raising households is in Lopburi (9,118), followed by Saraburi and Angthong. Changwats with the highest median rating of size of village cattle population are Lopburi (>100 heads) and Chainat (90-100 heads). Changwats with the highest number of villages with a cattle population of over 100 heads are Lopburi (361 villages), Chainat (175 villages), Saraburi (160), and even little Angthong (101 village). Both beef and dairy cattle are raised. The proportion of cattle farmers raising government recommended breeds is markedly higher in Angthong (84%) and Chainait (75%) than in other changwats where it is 50% or less. (Tables 3.7 and 3.17).

2) Buffalo raising

The extent to which farm mechanization is displacing this faithful farmer's traditional assistant is reflected by the relatively small number of households raising water buffaloes. The largest numbers are in Saraburi (1,476), followed by Chainat and Lopburi. It is only in these changwats that more than a few villages are found with large buffalo populations. In Singburi, Angthong and Ayutthaya, the median size of village buffalo population is in the 1-10 heads range. The percentage of farmers raising government recommended breeds is 33% or lower (Tables 3.7 and 3.18).

3) Pig raising

This enterprise ranks third among the livestock production enterprises by the number of farming households engaged in it (18,106). The largest numbers are in Angthong (5,225), followed by Lopburi and Chainat. The median size of village pig population is highest in Lopburi. It is noteworthy that in 4 of the 6 changwats there are 50 villages or more with pig populations of more than 100 heads. The percentage of pig raisers raising government recommended breeds is highest in Angthong (94%), Chainat (89%), and Singburi (60%). It is lower in Saraburi (45%), Lopburi (30%) and Ayutthaya (29%) (Tables 3.7 and 3.19).

4) Poultry raising

This enterprise employs the second largest numbers of farming households among the livestock production enterprises (28,343). The largest numbers are in Singburi (7,424), followed by Lopburi and Chainat in that order. All changwats have a substantial number of villages--from 142 to 348--with a poultry population of more than 1,000 birds. Changwat median ranges of village poultry population go from 400-500 birds in Ayutthaya to 900-1,000 in Saraburi (Tables 3.7 and 3.20).

5) Fishing

A substantial number of UCR households engage in fishing as an economic activity (10.739). The largest numbers are in Singburi (3,351), followed by Ayutthaya, Angthong, and Saraburi, in that order (Table 3.7).

6) Aquaculture

Of the 3,496 UCR households engaging aquaculture, the largest numbers are in Ayutthaya (999), followed by Chainat and Angthong in that order (Table 3.7).

Table 3.17 Size of Village Cattle Population in the UCR by Changwat, Cattle Population Size Group, and Number of Villages Achieving

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1-10	39	44	54	69	28	71
11-20	47	35	58	49	55	64
21-30	37	26	49	27	40	33
31-40	24	21	19	14	37	16
41-50	24	14	19	12	29	20
51-60	9	6	21	8	20	6
61-70	12	9	14	4	12	5
71-80	11	5	8	3	10	3
81-90	8	6	9	3	6	-
91-100	7	5	9	5	11	7
>100	50	50	89	27	81	30
Total villages raising	268	191	349	221	329	277
Median number of head/village	31-40	21-30	31-40	11-20	41-50	21-30

Source: NRD-2-C, 1988.

Table 3.18 Size of Village Buffalo Population in the UCR by Changwat, Buffalo Population Size Group, and Number of Villages Achieving

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1-100	10	3	8	45	11	14
101-200	10	17	22	56	21	15
201-300	24	17	22	36	13	12
301-400	15	18	19	18	11	9
401-500	10	19	14	32	24	6
501-600	7	15	4	11	11	4
601-700	8	6	5	2	8	9
701-800	8	9	10	9	10	6
801-900	3	7	2	5	2	1
901-1,000	7	10	8	16	11	10
>1,000	40	65	78	118	66	71
Total villages raising	142	186	189	348	188	157
Mean number of	501-600	601-700	701-800	401-500	601-700	901-1,000

Source: NRD-2-C, 1988.

Table 3.19 Size of Village Pig Population in the UCR by Changwat, Pig Population Size Group, and Number of Villages Achieving

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1-10	19	20	32	224	14	90
11-20	29	18	42	197	37	116
21-30	22	38	46	106	41	77
31-40	21	27	40	71	36	54
41-50	22	21	48	62	42	46
51-60	15	19	28	32	30	23
61-70	12	19	25	24	23	20
71-80	17	15	21	20	29	20
81-90	13	16	14	8	15	13
91-100	17	12	11	11	27	24
>100	175	73	101	47	27	24
Total villages raising	362	278	409	802	655	643
Median number of head/village	91-100	61-70	41-50	11-20	>100	31-40

Source: NRD-2-C, 1988.

Table 3.20 Size of Village Poultry (Chickens and/or Ducks) Population in the UCR by Changwat, Poultry Population Size Group, and Number of Villages Achieving

	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1-10	48	50	84	214	42	116
11-20	31	18	23	64	38	34
21-30	10	7	12	19	21	26
31-40	10	1	5	19	13	15
41-50	11	-	5	8	11	6
51-60	4	1	4	4	6	9
61-70	-	-	1	1	4	2
71-80	3	-	-	1	1	2
81-90	5	1	-	2	2	4
91-100	3	-	-	1	2	1
>100	47	1	-	2	17	19
Total villages raising	172	79	134	335	157	234
Median number of head/village	21-30	1-10	1-10	1-10	11-20	11-20

Source: NRD-2-C, 1988.

3.3.4 Non-farm/off-farm work

1) Cottage industry

Cottage or village industry is not the only non-agricultural economic activity pursued at the village level. There are administrators such as village and tambon headmen, school teachers, health workers and midwives, traders and brokers in agricultural produce, small shopkeepers and restaurateurs, transport service operators, people providing services of various kinds such as carpenters, mechanics, hairdressers and dressmakers. However, of all these enterprises, cottage industry is providing employment to the largest number. At least 22,796 households are known to be involved in this industry and it ranks sixth as a source of employment among the 16 enterprises reviewed in this study. Changwats with the largest number of households involved in cottage industry are Ayutthaya, Lopburi and Chainat in that order.

Types of cottage industries practiced in the UCR are listed in Table 3.21. There are 12 and include both artistic and utilitarian products. Ranked according to the number of villages involved in their production, the six most important products are:

1. basketry (546)
2. embroidery (193)
3. brick making (184)
4. gem finishing (116)
5. cloth weaving (90)
6. laterite blocks (66)

There is a tendency of amphoe level specialization in the selection of the industry engaged in, many villages being involved in the same practice. The following are more obvious examples:

- Weaving: Banmi (Lopburi)
- Basketry: Inburi (Singburi), Phothong and Sawaengha (Angthong), Bangpahan (Ayutthaya), Muang (Lopburi).
- Knife making: Nakhonluang (Ayutthaya).
- Brick making: Bangban, Bangpahan (Ayutthaya).

- Gem finishing: Banmi, Khoksamrong (Lopburi).
- Embroidery: Wangnoi (Ayutthaya).

Not many of these crafts offer high potential for income generation, particularly for the more time consuming and labour intensive ones such as weaving, basketry and embroidery. Income would be under 20 baht a day. They appear to be mostly leisure time activities for otherwise unoccupied villagers.

Gem cutting and polishing began to be practiced in rural Thailand not many years ago and initially generated excellent income because there was high demand. As word of this spread, the number of these small enterprises expanded exponentially and there is overproduction. Now the producers are having difficulties in marketing their product and are getting low prices forit.

The Ayutthaya Aranyik knife making industry is often cited as a promising example. It is an old established craft practiced for many generations in amphoe Nakhonluang. Currently, 4 villages engage seriously in the industry. Out of 3,000 households, 2,000 make knives. It is a sole occupation for about 200 households. A cooperative was set up with a board and a manager to market the product. It currently has 150 members. There are internal problems because of personality conflicts between the chairman of the board and the manager, and the members are unhappy because they feel the manager is not aggressive enough in seeking new market outlets. At present the cooperative can purchase only about 30% of the members' production because its quality is not up to standard. Craftsmen resist the idea of undergoing training to improve the quality of their product: they are unwilling to take time off for this and feel they are quite competent as it is. Production costs keep going up all the time because of higher prices of raw materials. Current average income is about 40 baht a day per worker--about 1,200 baht a month, which is very low. This industry is currently ailing but it it perhaps not beyond redemption if enlightened and comprehensive enterprise development support is provided, not merely technical training.

Capitalizing on the current construction boom and the big demand for construction materials, many rural people are earning good income by making bricks and laterite building blocks. Village brick making is not new in Thailand but not at this scale. Technology has also improved as they use clay moulding presses to produce bricks of more exacting standards. Some enterprises are larger and launched by village entrepreneurs who hire workers other than family members to produce the bricks. Bricks are often sold cooperatively but the producers are reluctant to set up formal registered cooperatives fearing they will have to pay taxes and share their profits somehow.

Table 3.21 Cottage Industries Practiced in the UCR by Changwat, Order of Priority, and Number of Villages Involved[1)]

	Chainat		Singburi		Angthong		Ayutthaya		Lopburi		Saraburi	
Order of priority:												
Size of village sample:	1	2	1	2	1	2	1	2	1	2	1	2
% of total	33.0	14.0	68.8	48.6	39.8	4.4	54.4	25.0	36.5	19.2	93.9	64.1
1. cloth weaving	13	-	1	-	2	2	4	5	39	14	10	-
2. basketry, peasant hats, etc.	36	4	76	4	121	2	144	37	71	3	48	-
3. fiber weaving, mat making	11	2	-	5	2	-	4	-	15	2	2	-
4. food processing	-	1	2	-	3	1	7	2	3	2	2	-
5. metal working: knives, tools, etc.	3	-	-	1	2	-	18	1	4	2	-	-
6. brick making, pottery	-	-	12	1	16	3	117	19	5	10	1	-
7. gem finishing	-	-	7	2	-	3	20	6	75	2	-	-
8. carving	-	-	-	-	-	-	9	7	-	-	-	-
9. embroidery, needle work	1	-	-	4	1	-	139	10	1	-	36	1
10. furniture making from bamboo, rattan, etc.	-	-	2	1	-	-	3	2	1	-	2	-
11. cement products	-	-	3	-	-	-	4	2	4	-	2	-
12. laterite building block	4	-	7	-	10	7	22	5	-	4	7	-
13. other	-	-	-	-	-	-	-	-	-	-	1	-

Source: NRD-2-C, 1988.
Note: 1) The tabulation is based on answers to question 2.1.1 of the village questionnaire: "Type of cottage industry most households in the village engaged in (prioritized by the popularity)".

2) Work outside of the home tambon

In the discussion of the employment pattern of the rural work force of the UCR, a primary distinction was introduced at the beginning of the present chapter between households who operate agricultural land and households who do not. The former are farmer-cultivators and the latter are not. It was noted that the proportion of the latter was high: 35.9% overall and ranging at the changwat level from 20.3% in Chainat to 50.6% in Ayutthaya (Table 3.1). If all these people were not farmers, what then was their occupation? The answer is that they worked at many occupations, most of them outside of their home village area.

Overall information on off-farm work outside of the home tambon is provided in Table 3.22 and in Figures 3.13-3.18. The overall proportion of households so employed is 28.8% and ranges at the changwat level from 18.6% in Lopburi to 52.6% in Angthong. One finds an imperfect but significant correlation between landlessness as defined and outworking. This is more apparent at the amphoe than the changwat level. Generally speaking, the higher the rate of landlessness, the higher the rate of work away from the home tambon. This can be verified visually by comparing the bar charts on land holding (Figures 3.1-3.6) and the bar charts on work outside the tambon area (Figures 3.13-3.18)

Some of the findings of the NRD Committee village survey on this question are very thought provoking.

First of all, the high percentage of households with members are working outside of the home tambon. As mentioned, it ranges from 18.6% of the total number in Lopburi to 52.6% in Angthong. In all changwats there is considerable variation of these rates at the amphoe level, all changwats having amphoe outworker rates that are much higher than the changwat rate. For example, the outworker percentage in Sawaengha (Angthong) is 70.9%; in Banmo (Saraburi) it is 54.2%; in Wangnoi (Ayutthaya) it is 52.3%. It is interesting to note that Angthong, the changwat with the second smallest population (after Singburi) also has the second largest number of outworkers in the UCR (after Ayutthaya).

The type of work taken up by the largest number of outworkers is either factory work or that of tradesmen such as carpenters, brick layers, plumbers, electricians, etc. Although this information is not supplied by the source, one would guess that many of these work in construction or public works such as road construction. The level of skill, mostly picked up on the job, would not be high. Agricultural labour ranks a rather distant third after the two mentioned as a choice of employment, which is quite a reversal from the not too distant past.

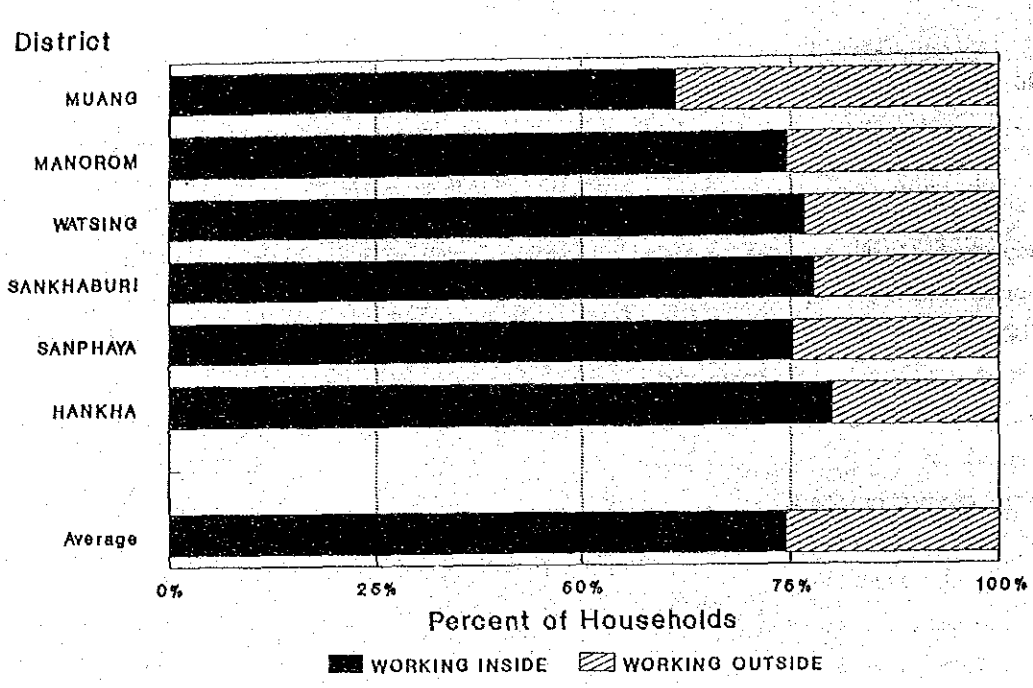
Except for Saraburi, the place of work of the highest proportion of outworkers is Bangkok, ranging from 40.2% in Angthong to 61.4% in Chainat. In Saraburi the trend is for more workers to work in the same amphoe or changwat, presumably in the several factories there. From conversations with villagers, it appears that the trend to seek employment in Bangkok is being reversed as more employment opportunities closer to home are creted by the setting up of large factories in Ayutthaya, Saraburi and Lopburi.

As for work time, the data suggest the appearance of a trend away from traditional seasonal migration to work between periods of peak demand for family labour on the farm. More outworkers have full time jobs or jobs of a duration longer than 3 months. There are no significant differences between the sexes in the participation in this job market.

Table 3.22 Off-farm Work Outside of the Home Tambon in the UCR

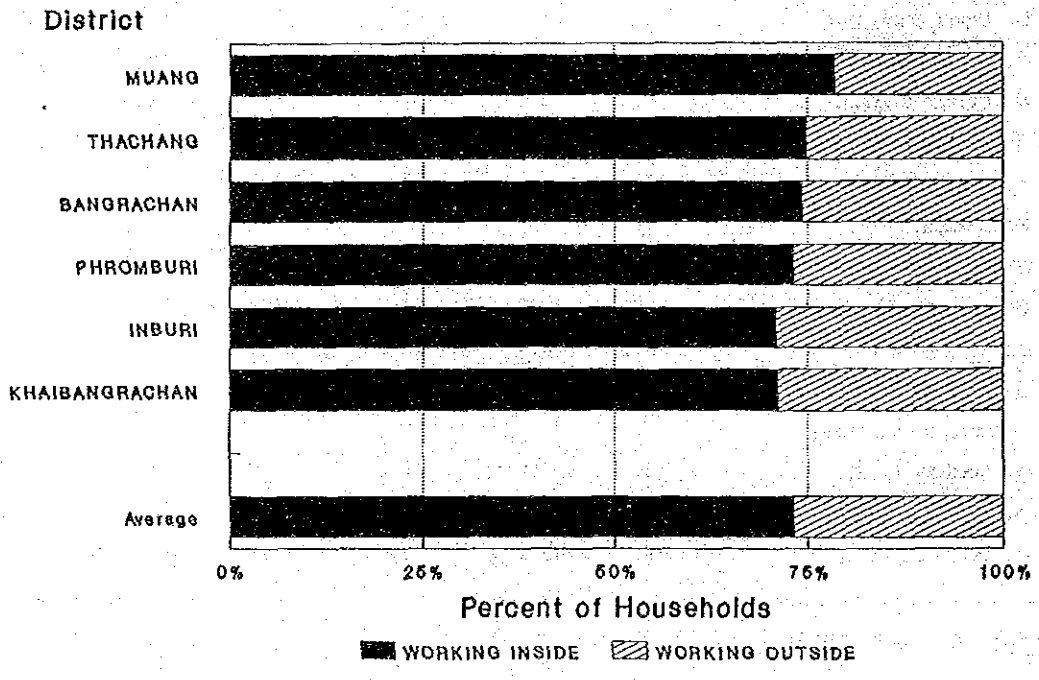
	Chainat	Singburi	Angthong	Ayutthaya	Lopburi	Saraburi
1. Households with members working outside tambon	13,441	7,241	19,223	25,338	17,513	15,329
-UCR rank	5	6	2	1	3	4
-% of changwat total HH	25.5	26.8	52.6	35.1	18.6	26.4
-% range of amphoe total HH	19.9-38.7	21.5-29.2	34.9-70.9	8.6-52.3	6.0-30.0	12.8-54.2
2. Work characteristics by village (% of total changwat villages)						
2.1 Predominant type of job:						
a. factory work	24.8	16.7	37.2	49.7	35.3	58.7
b. agriculture	11.8	15.9	17.0	7.4	15.7	12.6
c. services	1.4	1.0	2.1	3.0	1.9	1.2
d. trades (masons, etc.)	49.2	50.3	28.3	25.8	25.8	15.8
e. other	6.5	14.6	14.3	11.5	10.6	5.1
2.2 Place of work						
a. same amphoe	6.5	9.4	8.5	10.2	7.9	21.7
b. same changwat	6.5	18.1	12.6	13.5	15.1	30.4
c. same region	12.0	19.4	35.9	27.9	14.4	12.6
d. other region	1.7	1.4	0.9	1.3	2.4	2.4
e. Bangkok	61.4	49.3	40.2	44.3	48.2	25.7
f. abroad	5.5	1.4	0.7	0.2	1.3	0.7
2.3 Work time						
a. daily	9.9	21.5	24.6	31.3	16.3	46.1
b. seasonal	21.7	25.0	20.7	13.3	19.1	8.1
c. < 3 months	8.9	6.9	14.0	18.8	6.9	9.7
d. > 3 months	53.5	45.1	39.4	33.9	46.8	29.6
2.4 Gender of workers						
a. mostly male	43.6	34.0	27.6	29.8	25.2	36.0
b. mostly female	13.7	19.4	20.7	27.1	16.2	26.1
c. both equally	36.1	45.1	49.7	40.2	47.4	30.4

Source: NRD-2-C, 1988.



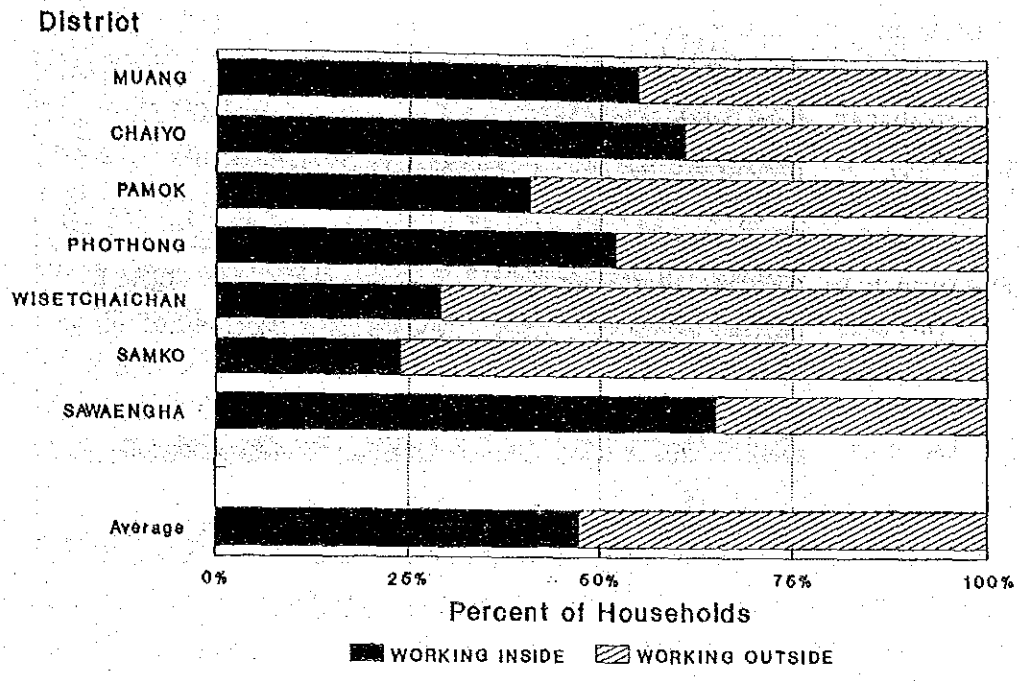
Source: NRD-2-C

Figure 3.13 WORKING OUTSIDE TAMBON AREA IN CHAINAT in 1988



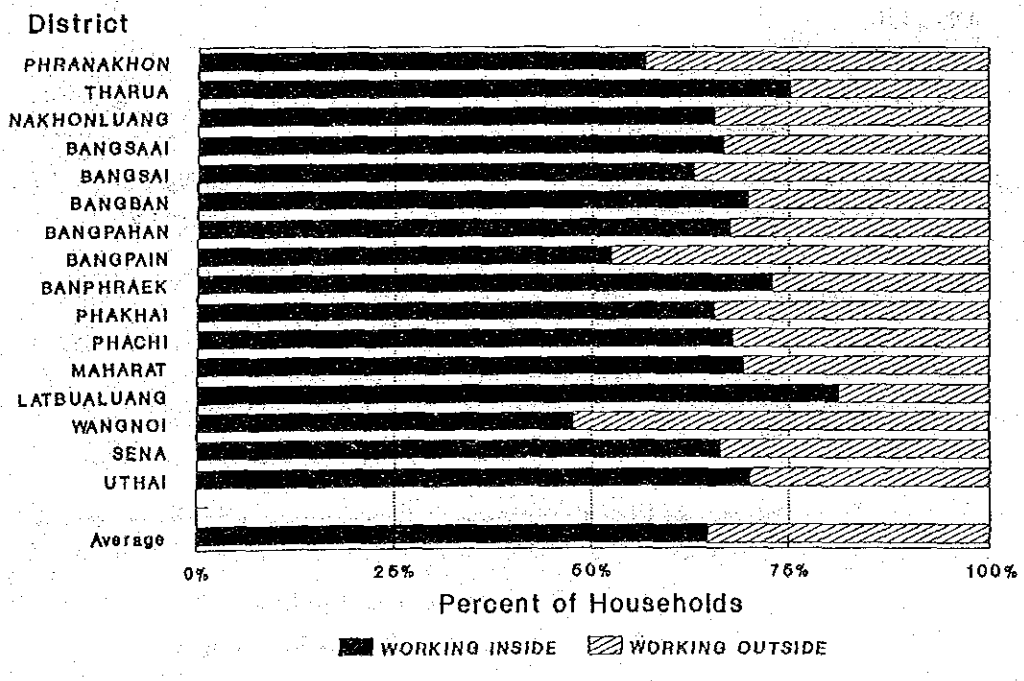
Source: NRD-2-C

Figure 3.14 WORKING OUTSIDE TAMBON AREA IN SINGBURI in 1988



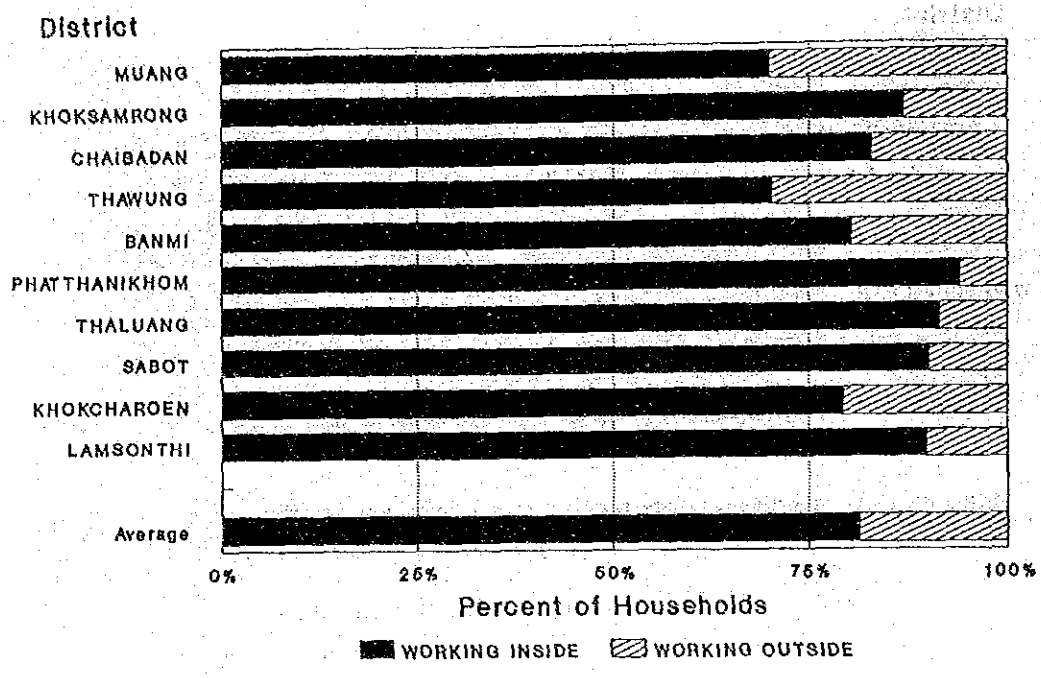
Source: NRD-2-C

Figure 3.15 WORKING OUTSIDE TAMBON AREA IN ANGTHONG In 1988



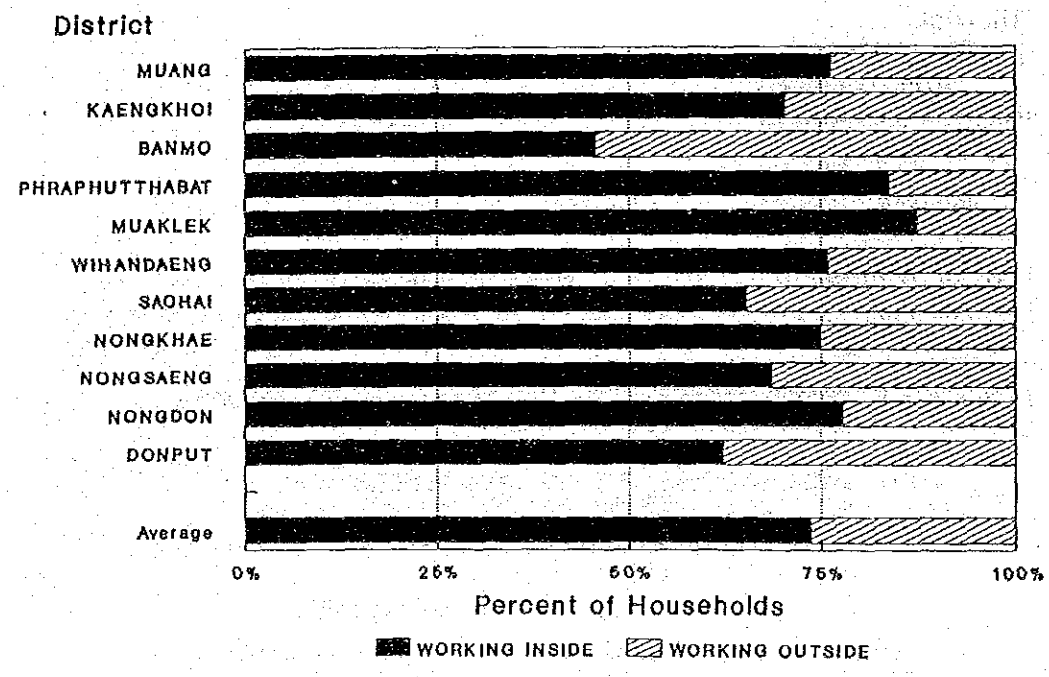
Source: NRD-2-C

Figure 3.16 WORKING OUTSIDE TAMBON AREA IN AYUTTHAYA In 1988



Source: NRD-2-C

Figure 3.17 WORKING OUTSIDE TAMBON AREA IN LOPBURI In 1988



Source: NRD-2-C

Figure 3.18 WORKING OUTSIDE TAMBON AREA IN SARABURI In 1988

4. FARMING HOUSEHOLD TYPES: CASE STUDIES OF PADDY FARMERS, SUGARCANE FARMERS,UPLAND CROP FARMERS, ORCHARD FARMERS, CALLTE FARMERS, AND HOG FARMERS

The primary data was obtained through face to face interviews with 148 respondents together with 16 village headman or master informants interview. Farmers were classified in various types, eg. paddy farmers in Ayutthaya, upland crop farmers in Lopburi, cattle farmers in Saraburi, sugarcane farmers in Singburi, hog farmers in Chainat, and orchard farmers in Angthong.

4.1 Household composition

The selected farm household head were mostly represented by male heads of household. By definition, the respondent has to be adult and economically active or gainfully self-employed household member, who was recognized as head of household. Culturally, this role has usually been ascribed to the male parent, although women have widely been responsible for financial matters in the Thai farmer society.

We counted 701 persons in our 148 sample household. 523 persons or 74.6 per cent are in labour force (persons from 11 to 60) and 25.4 per cent are not in labour force and are cared by others (children between 1-10 years of age, or persons above 11 years old but are in school, or disabled, or too old to work) (Table 4.1).

Table 4.1 Population by Labour Force Status by Type of Farmers

	Total population	No. of households	Average No. of members per household	Labour force	Non-labour force
Paddy farmers farmers	111	24	4.6	84	27
Upland crop farmers	103	24	4.2	74	29
Cattle farmers	145	25	5.8	109	36
Sugarcane farmers	122	25	4.8	96	26
Hog farmers	118	25	4.7	97	21
Orchard	102	25	4.0	63	39
Total	701	148	4.7	523	178

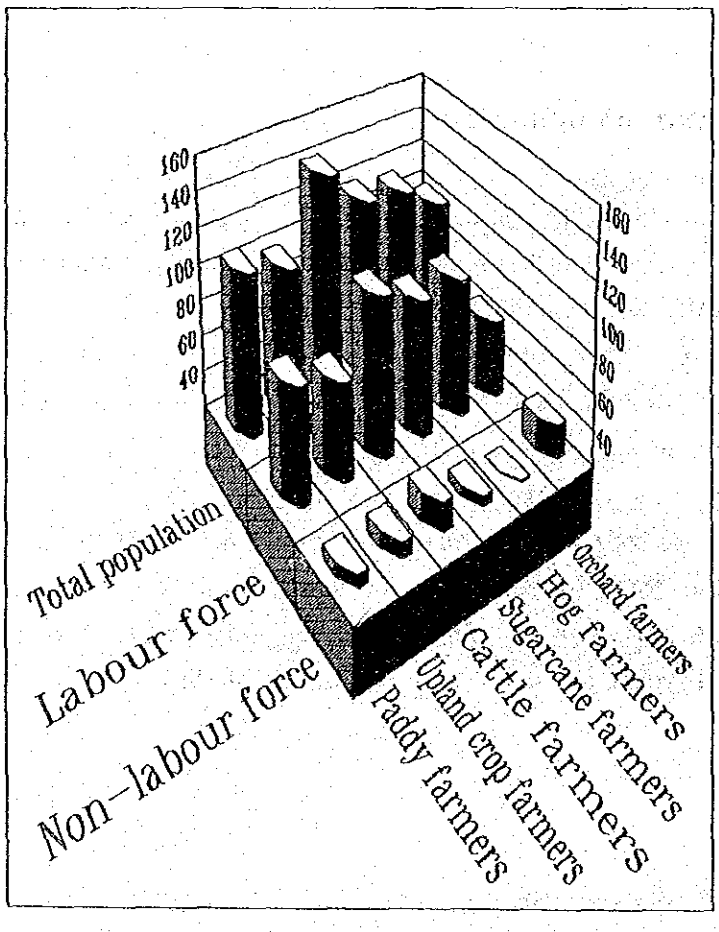


Figure 4.1 Population by Labour Force Status

An interesting point to note about the population is the average number of members per household. It appears that those figures is 4.7 member per household which is considerably declined in the past decade. From the village headman interviews, we found that most of the heads of the household are already engaged in birth control. The data showed that largest family sized were 5.8 for cattle farmers.

4.2 Level of education

Table 4.3 shows the level of education of household members in various types of farmers. As commonly notable in rural areas of Thailand, the majority of sample household members has attained the elementary level of formal educa tion or compulsory schooling after completion of the fourth grade. A minority of sample household members only did not have any formal education, which does, however, not necessarily imply they were illiterate. Of all the household members, 496 (76.0%) completed elementary education, whereas 22 (3.4%) has never received any formal education.

Table 4.2 indicated age distribution for household member. Noteworthy are the facts that the proportions of children below 11 years of age and youth in the 11 to 20 years of age brackets are large indeed. The large proportion of young household members, coming of age in the immediate future, highlights a subsequently emerging problem.

4.3 Employment status

Table 4.4 shows status of labor force in their main occupation. In general most people either work for themselves or work for their families (80.6 percent) which reflect that family labour still play an important role in the Thai farmer society. The percentage of people work as employee in either a government or a private firm is low. According to the village headman interview, other job opportunities such as home industry (e.g. brick making, gem refining, basket weaving, and food processing) still have problems about marketing, unsteady income, and relatively low income compared to non-agricultural employment.

Table 4.2 Age Distribution of Household Member

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
1-5	4	8	12	9	4	11	48 6.8%
6-10	8	6	14	7	7	7	51 7.3%
11-15	11	8	18	11	9	3	60 8.5%
16-20	16	7	27	10	17	4	81 11.6%
21-30	17	22	25	24	27	17	132 18.8%
31-40	8	16	12	18	14	9	77 11.6%
41-50	18	11	15	16	12	8	80 11.4%
51-60	14	10	12	17	18	22	93 13.3%
61 and over	15	15	10	10	10	19	79 11.3%
Total	111	103	145	122	118	102	701 100.0%

Table 4.3 Level of Education of Household Members 6 Years of Age and Older

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never attened a school	8	5	3	1	3	2	22 3.4%
primary school	81	78	111	83	90	53	496 76.0%
secondary school	17	9	13	19	14	14	86 13.2%
technical school	1	1	5	8	4	7	26 4.0%
university	0	2	1	2	3	15	23 3.5%
Total	107	95	133	113	114	91	635 100.0%

Table 4.4 Main Occupation of Household Member

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
Agricultrual self-employed	47	72	72	69	68	44	372 80.6%
Private business	2	0	2	0	5	0	9 2.0%
Home industry	5	0	0	1	0	0	6 1.3%
Agricultural worker	0	2	1	1	0	0	4 0.9%
Non-agricultural worker	9	2	16	6	9	2	44 9.5%
Government service	0	0	3	5	2	13	23 5.0%
General workers	0	1	1	1	0	0	3 0.7%
Total	63	77	95	83	84	59	461

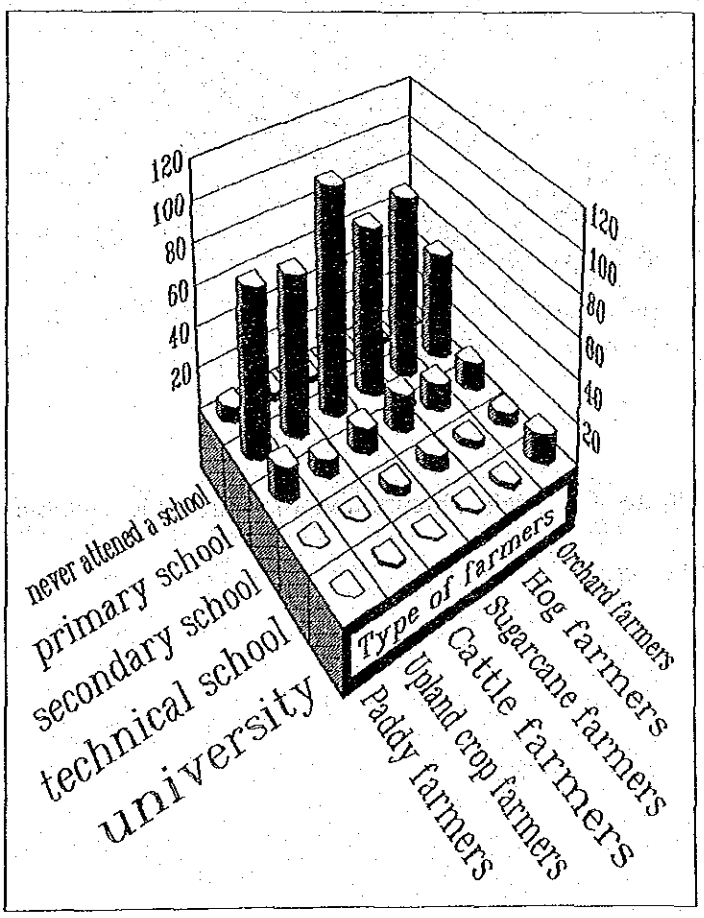


Figure 4.2 Education Distribution of Household Member

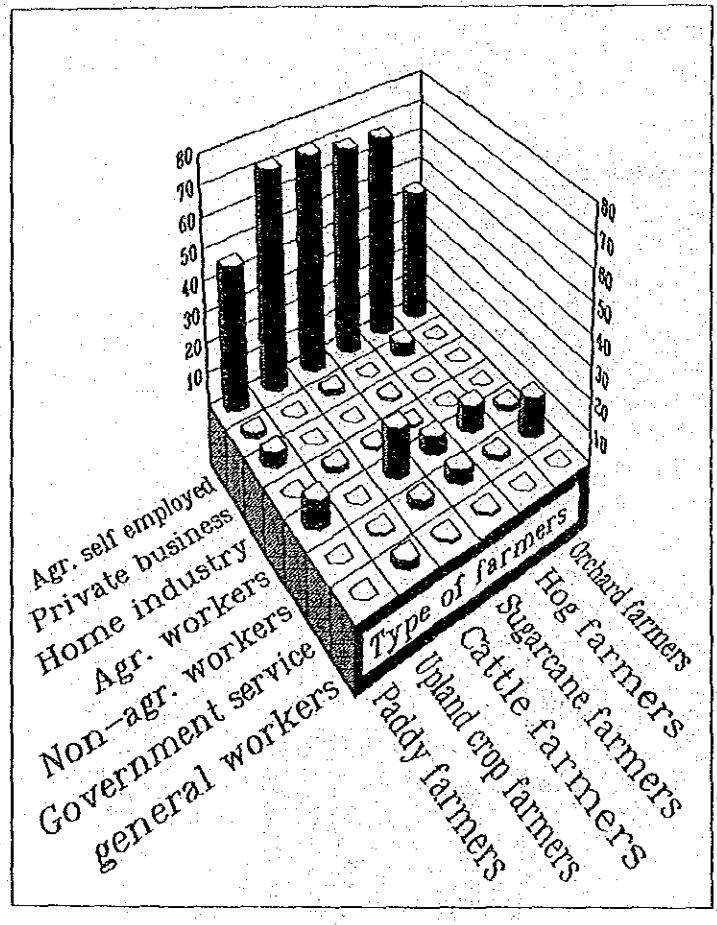


Figure 4.3 Main Occupation of Household Members

4.4 Migration

There has been seasonal migration from the UCR for many years. A major cause for this movement is, according to the interview, seeking for better wages. The trend in migration patterns over the past 5 years indicates those who migrate are mostly younger individuals who do not want to work in agriculture.

Table 4.5 indicates that Bangkok has been the center of migration activity. The impact of those migration is a lack of available labour in the village, which makes it difficult to form any groups or association.

One of the rural development programs, which directly serves in attracting and retaining people in the rural area, is the government-sponsored land settlement program. In fact, the government-sponsored land settlement program have been operated in Thailand for the past three decades. In general, these projects have been proved successful. However, to support the present migration policies, this program needs improvement and expansion.

4.5 Land holding

Land holding here indicates the capacity of a houschold to make use of an amount of land during a required period of time. The status in relation to the land may be full owner, part owner of more than50%, part owner of less than 50%, and full renter.

The average size of holdings of the houscholds is different between types of farmers. In case of a full renter, the upland crop farmers represent the largest size of full renters (39.5 rai), whereas paddy farmers hold the largest size for full renters (8.63 rai).

Table 4.5 Seasonal Migration by Household

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
moved to other village	0	2	0	0	0	0	2 5.0%
moved to same changwat	0	4	1	0	0	0	5 12.5%
moved to other changwat	0	4	0	6	4	1	15 37.5%
moved to Bangkok	6	1	3	2	5	1	18 45.0%
Total	6	11	4	8	9	2	40

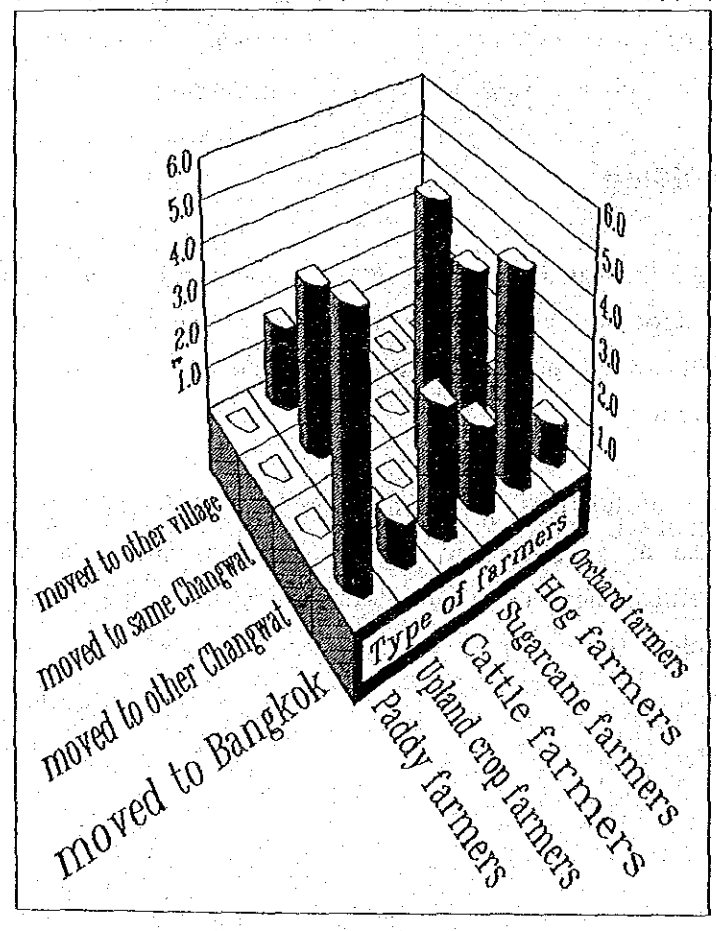


Figure 4.4 Seasonal Migration

Table 4.6 Average Size of Land Holding by Type of Farmers

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers
Full owner	8.42	39.5	5.40	16.16	3.96	22.4
Part owner>50%	6.38	19.63	0.96	3.84	1.92	2.92
Part owner<50%	4.33	13.21	5.60	9.92	0.92	2.56
Full renter	8.63	0.67	0.84	2.84	0.44	1.60

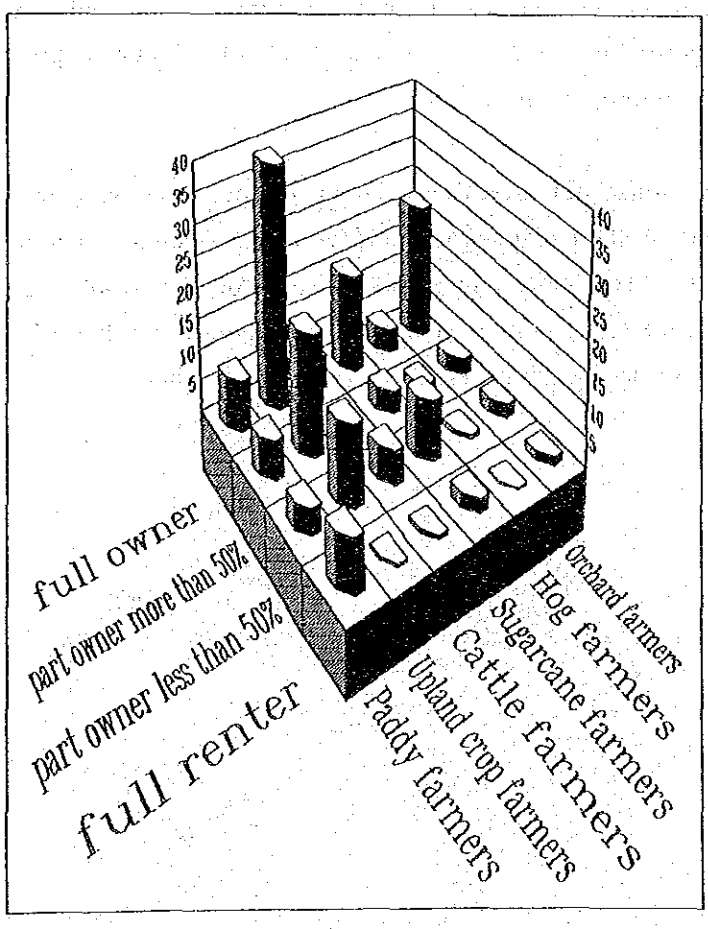


Figure 4.5 Type of Land Holding

4.6 Income and expenditure

Income is derived from the various rural enterprises which can be grouped into farm and non-farm income. Table 4.7 and Table 4.8 show average farm and non- farm income by type of farmers. One might observe that the sugarcane farmers gain the highest farm income, nevertheless, their average farm expenditure was also the highest one, especially for the fertilizer and hiring labour items (see Table 4.9).

Orchard farmers and cattle farmers rank the first and the second highest non-farm income. This is because most of these farmers have the second permanent job such as teachers, employer, etc., which is different from other type of farmers who have to concentrate more on their farm.

Table 4.10 indicates average non-farm expenditure, where all the type of farmers have surprisingly almost the same pattern of consumption. Food item shows the outstanding highest part.

The account of household overall financial balance was summarized in Table 4.11. According to these data, 35.8 percent of the sampled household had a negative balance. The mean financial balance for the whole sample was 34,866 baht. Sugarcane farmers perform the highest surplus of 70,674 baht while hog farmers is the only type of negative balance.

Table 4.7 Average Farm Income Per Year 1989

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers
Crops, Livestock	46,387.4	81,558.0	84,395.4	170,141.0	19,502.0	32,412.2
Land rent-out	391.7	0	0	77.0	0	4,580.0
Farm worker	404.2	45.9	3,060.0	3,472.6	19,054.0	4,108.0
Fisheries	0	0	0	0	220.0	760.0
Seedling	0	891.7	8.0	12,730.0	1,618.0	2,810.0
Other	250.0	1,250.0	0	9,382.0	1,402.0	8.0
Total	50,958.6	83,745.6	87,463.4	195,802.6	41,796.0	44,678.0

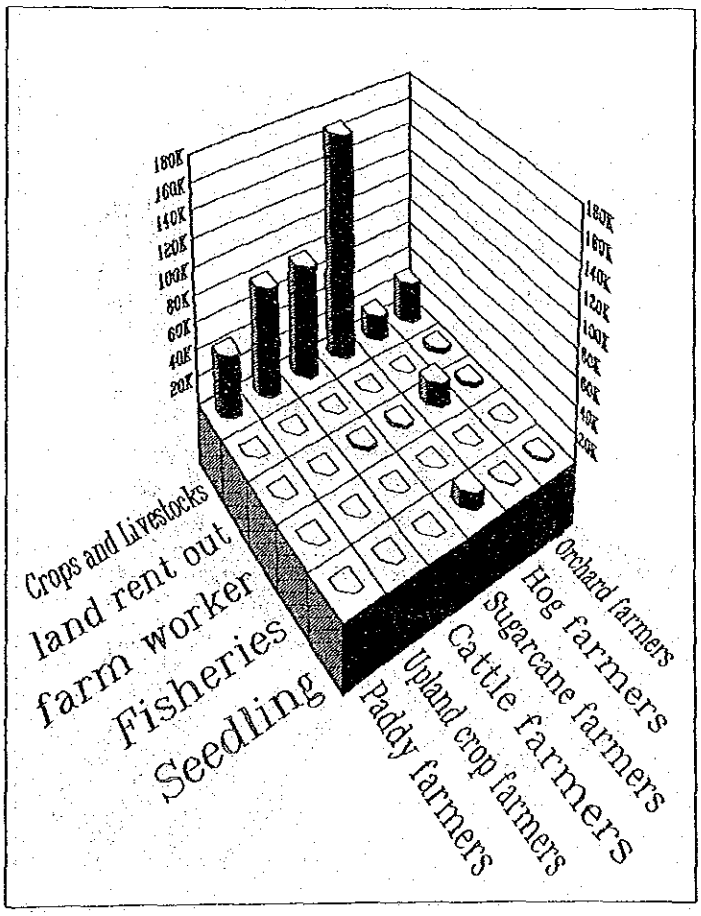


Figure 4.6 Average Farm Income Per Year 1989

Table 4.8 Average Non-Farm Income

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers
Housing rent-out	0	3,400.0	0	0	0	0
casual workers	1,903.3	345.8	132.0	986.0	5,182.0	136.8
Trading	4,775.0	2,250.0	5,840.0	2,400.0	5,192.0	7,457.0
Home industry	6,025.0	0	0	1,440.0	25.6	768.0
Occasional income	0	2,200.0	4,000.0	2,928.0	0	9,849.6
Salaries	2,036.7	1,050.0	18,035.2	3,672.0	4,176.0	23,808.0
Other	17,100.0	650.0	1,423.2	14,640.0	9,148.0	4,524.0
Total	31,840.0	9,895.8	29,430.4	26,066.0	23,723.6	46,543.4

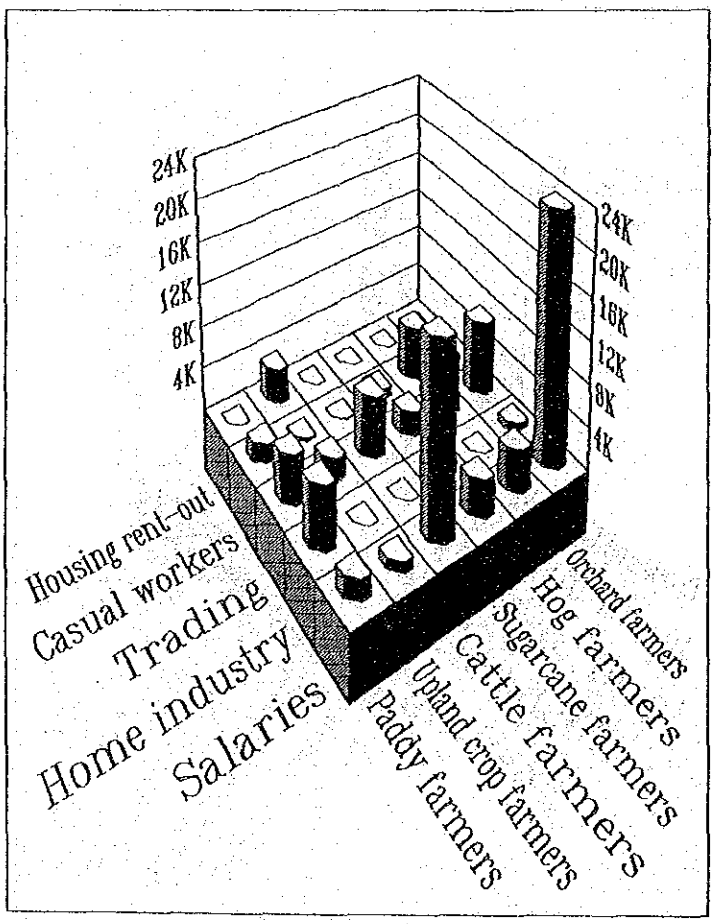


Figure 4.7 Average Non-farm Income

Table 4.9 Average Farm Expenditure

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
Fertilizer	3,416.5	3,736.4	1,248.6	16,582.8	1,643.9	4,298.0	
Pesticide	1,619.7	4,354.4	140.0	3,615.3	319.2	1,021.0	
Fuel	447.7	2,412.2	176.0	558.8	86.6	2,162.0	
Animal food and Medicine	60.0	170.8	22,588.6	78.0	18,752.3	3,360.0	
Land rental	2,481.3	1,920.8	256.0	7,038.0	349.6	160.0	
Hired workers	4,710.0	7,340.0	2,967.6	45,164.8	2,424.4	3,048.0	
Total	12,735.2	19,934.6	27,376.8	73,037.7	23,576.0	14,049.0	

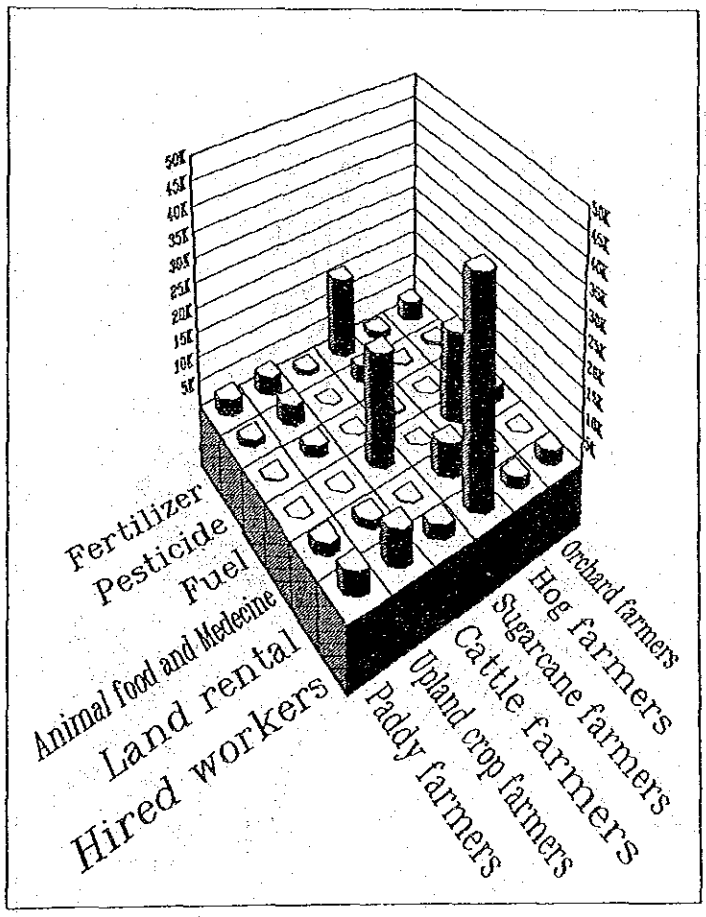


Figure 4.8 Average Farm Expenditure

Table 4.10 Average Essential Non-Farm Expenditure

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
Rice	5,505.6	4,868.1	4,376.0	5,652.4	2,909.6	4,754.0	
Food	14,297.3	13,442.3	13,679.4	14,740.0	11,356.8	13,032.0	
Clothes	2,500.0	2,025.0	1,798.8	3,260.0	1,412.0	2,300.0	
Health Care	2,110.4	2,408.3	1,318.0	1,816.0	4,960.0	1,663.2	
Education	3,157.9	2,204.6	1,854.5	5,256.0	2,394.0	496.8	
Donation	2,570.8	2,291.7	1,892.0	4,564.0	2,296.0	4,352.0	
Other	1,680.5	1,310.3	2,630.0	2,658.8	1,944.8	2,354.5	
Total	31,822.5	28,550.3	27,548.7	37,947.2	27,273.2	28,952.5	

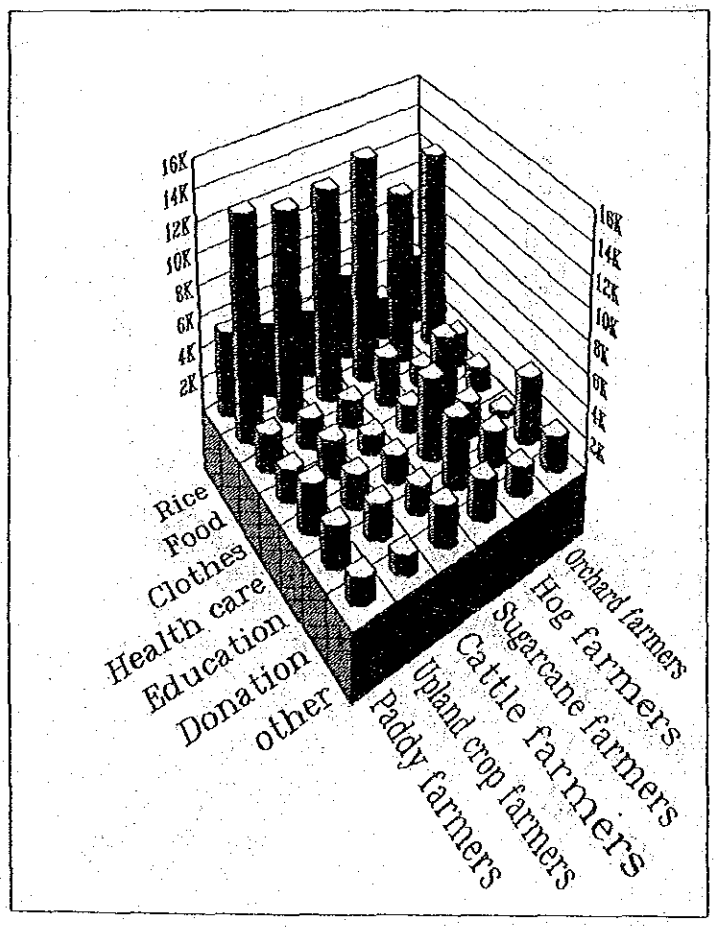


Figure 4.9 Average Essential Non-farm Expenditure

Table 4.11 Household Financial Balance by Type of Farmers

	Paddy farmers	Upland farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
more than (60,000)	0	0	0	2	4	0	6
(60,000)-(40,001)	1	0	1	0	3	2	4.1% 7
(40,000)-(20,001)	4	0	1	2	4	2	4.7% 13
(20,000)-(1)	2	8	3	2	6	6	8.8% 27
0-20,000	8	6	4	2	2	5	18.2% 27
20,001-40,000	3	1	3	2	3	2	18.2% 14
40,001-60,000	2	3	3	3	2	0	9.5% 13
60,001-80,000	0	2	2	3	0	3	8.8% 10
80,001-100,000	0	0	1	1	0	2	6.8% 4
100,001-120,000	1	1	4	0	0	1	2.7% 7
120,001-140,000	2	1	0	3	0	2	4.7% 8
more than 140,001	1	2	3	5	1	0	5.4% 12
Total	24	24	25	25	25	25	8.1% 148
average	29196	39152	53332	70674	-10153	26941	100.0% 34866

If negative balance is interpreted as debts, (an assumption that is not warranted in all cases since deficits could be covered by household savings), one could venture the following classification of the sampled farmers by financial position:

Indebted farmers	(20,000+)	17.6%
Break-even farmers	(20,001)-20,000	36.4%
Middle income farmers	20,001-60,000	25.1%
Upper income farmers	60,001+	20.9%

4.7 Farmers' perception of their future in the UCR

4.7.1 Education attainment of children in the future

Table 4.12 and Figure 4.10 indicate farmers attitude about education attainment of children in the future, i.e., if possible to what extent they wish their children receive formal education. The answers is surprisingly unique in all type of farmer, i.e., most of the farmers want their children receive the highest education, a university.

Consequently, as shown in Table 4.13 and Figure 4.11, most of the farmers want their children engage in government service. This attitude reflect Thai traditional value that government service still is the most popular occupation in the rural society. It can be explained by the fact government services such as policemen, teachers etc. give more security for their life, i.e., life-time employment.

4.7.2 Farmers' attitude toward environment in the future

Table 4.14 and Figure 4.12 show farmers attitude toward environment of the UCR in the future. Most of the answers concern about various pollutions e.g. pollution due to chemical effect, pollution due to factory etc. Farmers who respond such answer are the farmer who actually had a bad experience in such pollution. Cattle farmers in Saraburi who were disturbed by dust from a cement factory and paddy farmers in Ayutthaya who were disturbed by water pollution from a sportshoes factory.

4.7.3 Farmers' attitude toward need for the village

Table 4.15 and Figure 4.13 indicate the most important need for their village. The answers are unexpectedly unique among all type of farmers, where 79 percent of the sample household said that infrastructure such as standard road and water work are the most important. These answer might reflect insufficient distribution of basic physical infrastructure in the UCR village.

Table 4.12 Education Attainment of Children in the Future

	Paddy farmer	Upland crop farmer	Cattle farmer	Sugarcane farmer	Hog farmer	Orchard farmer	Total
primary level 6	3	3	2	2	2	0	12 10.2%
secondary level 3	3	2	1	1	2	1	10 8.5%
secondary level 6	2	2	1	1	2	0	8 6.8%
technical college	2	1	3	1	3	2	12 10.2%
university	14	13	12	12	7	13	71 60.2%
other	1	0	0	2	1	1	5 4.1%
Total	25 21.2%	21 17.8%	19 16.1%	19 16.1%	17 14.4%	17 14.4%	118 100.0%

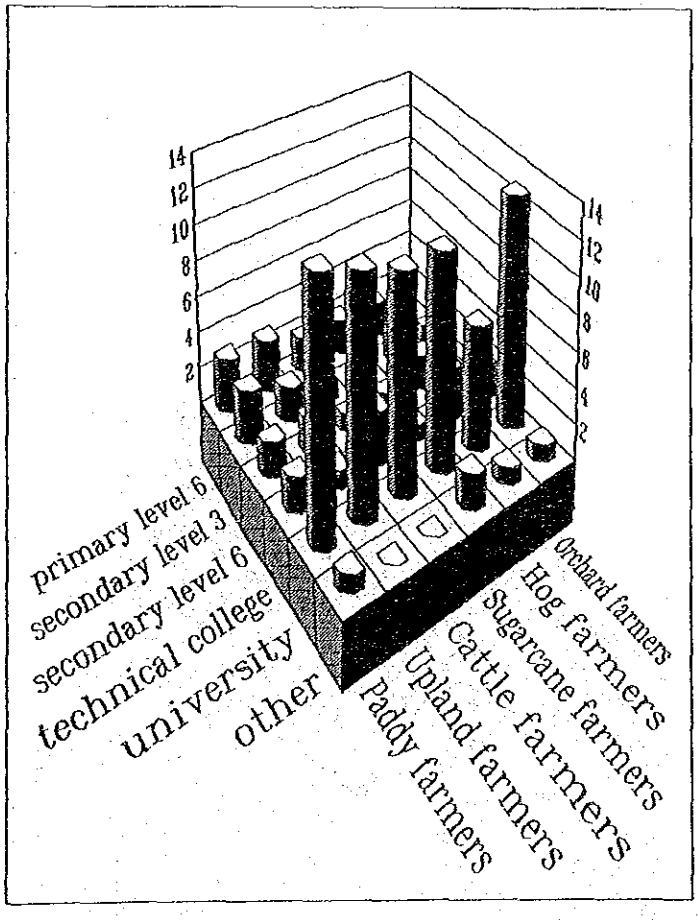


Figure 4.10 Education Attainment of Children in the Future

Table 4.13 Occupation of Children in the Future

	Paddy farmer	Upland crop farmer	Cattle farmer	Sugarcane farmer	Hog farmer	Orchard farmer	Total
general employer	3	0	1	0	0	0	4 3.6%
agricultural worker	1	3	1	1	1	0	7 6.3%
factory worker	4	0	2	1	1	1	9 8.1%
service	0	1	0	0	0	0	1 0.9%
bank employer	0	1	1	1	0	1	4 3.6%
government service	14	15	12	13	12	10	76 68.5%
other	2	0	1	2	2	3	10 9.0%
Total	24 21.6%	20 18.0%	18 16.2%	18 16.2%	16 14.4%	15 13.6%	111 100.0%

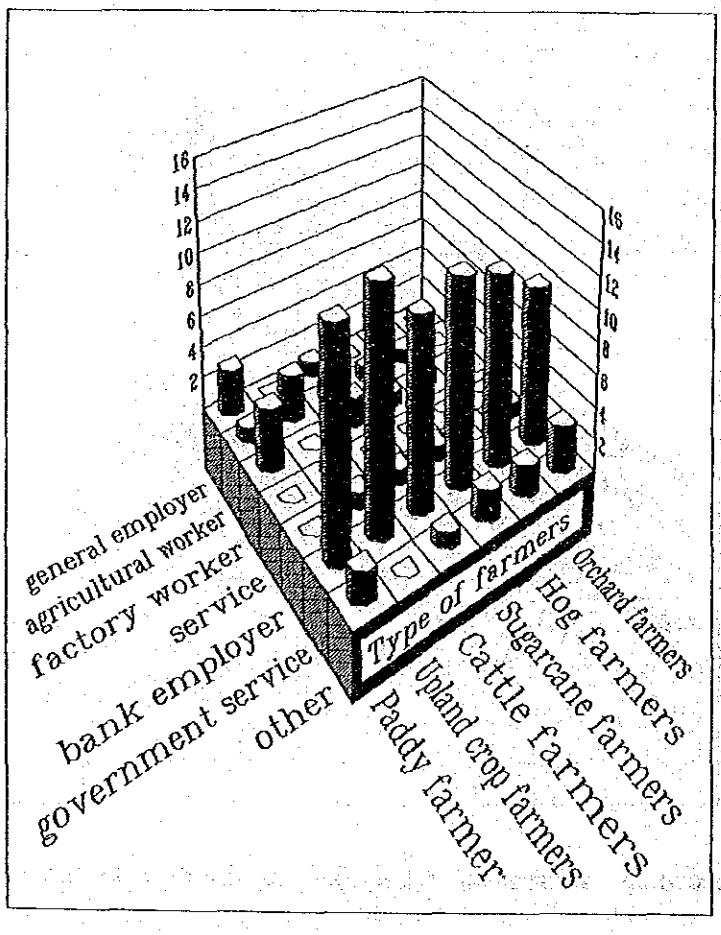


Figure 4.11 Occupation of Children in the Future

Table 4.14 Environment in the Future

	Paddy farmer	Upland crop farmer	Cattle farmer	Sugarcane farmer	Hog farmer	Orchard farmer	Total
no comment	0	4	4	6	10	3	27 18.2%
no change	0	10	5	7	1	3	26 17.5%
pollution due to chemical effect	1	2	0	1	0	4	8 5.4%
pollution due to factory	16	3	12	2	1	7	41 27.7%
pollution due to other	6	0	3	1	0	2	12 8.1%
more industrial development	1	2	0	6	11	6	26 17.6%
better agricultural condition	0	3	1	1	1	0	6 4.1%
more seasonal migration	0	0	0	1	0	0	1 0.7%
real wage will decline	0	0	0	0	1	0	1 0.7%
Total	24%	24%	25%	25%	25%	25%	148%

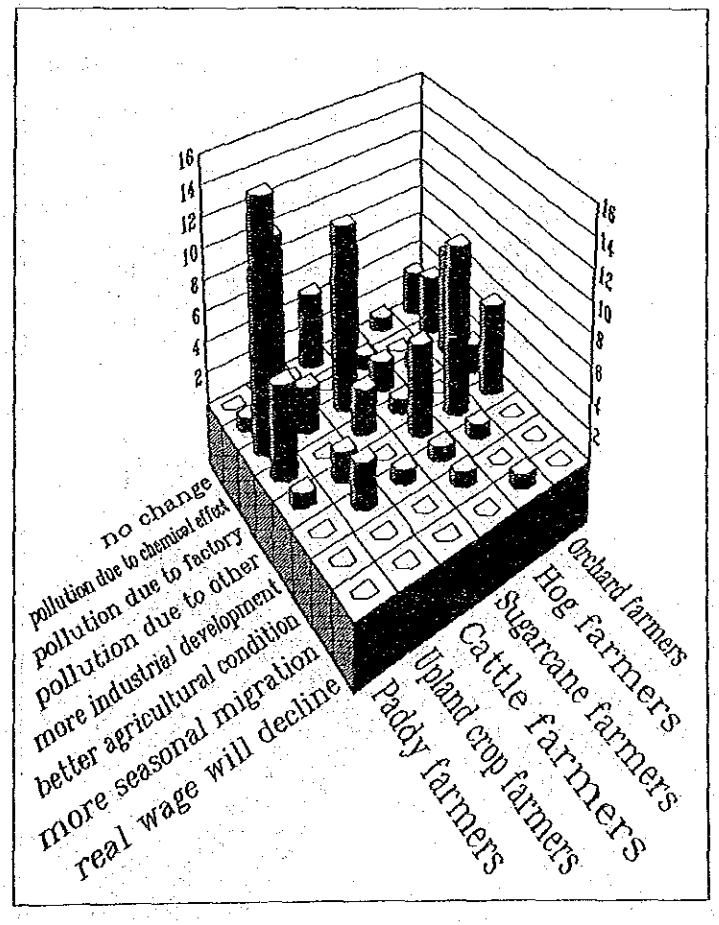


Figure 4.12 Environment in the Future

Table 4.15 The Most Important Need for Your Village

	Paddy farmer	Upland crop farmer	Cattle farmer	Sugarcane farmer	Hog farmer	Orchard farmer	Total
infrastructure	18	14	17	11	6	18	84 56.8%
public health	1	1	0	2	6	1	11 7.3%
custom and moral	1	0	0	0	1	0	2 1.4%
promotion of occupation	0	1	1	2	0	0	4 2.7%
more school, temple	0	2	1	0	0	0	3 2.0%
saving cooperative	0	0	2	0	0	0	2 1.4%
no comment	4	6	4	10	12	6	42 28.4%
Total	24 16.2%	24 16.2%	25 16.9%	25 16.9%	25 16.9%	25 16.9%	148 100.0%

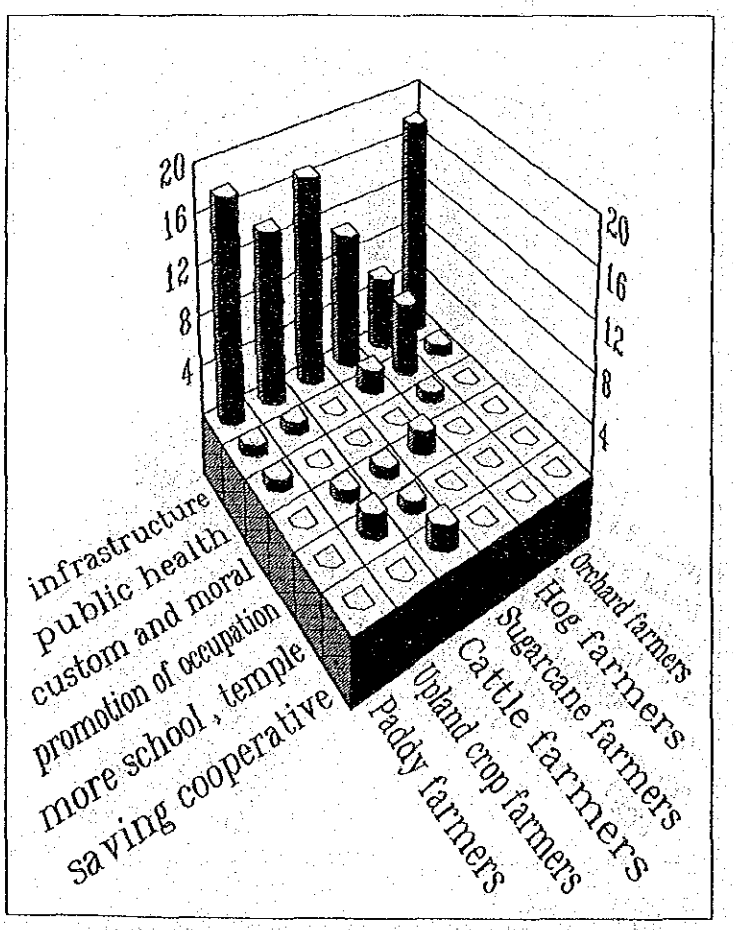


Figure 4.13 The Most Important Need for Villages

4.8 Farm innovation and crop diversification

The following Tables introduces modernity of the sampled rural farmer, e.g. knowledge of progressive practices or technology of production, etc. The negative indicators account for the answer ranking from never heard, have heard but no knowledge, and have heard but no interest. The positive indicators involve the productive answer, e.g. can implement if input available, interested in practice in the future, and practicing now.

It should be noted that the negative indicators imply that farmer are facing a barrier to access those innovation but it does not necessary imply that farmers ignore to improve their occupation.

Figures in the table are calculated by weighting the different score as follows

negative indicators

never heard	=	-3
have heard but no knowledge	=	-2
have heard but no interested	=	-1

positive indicators

can implement if input available	=	+1
interested in practice in the future	=	+2
practicing now	=	+3

Farm innovation	Paddy farmer	Upland crop farmer	Cattle farmer	Sugarcane farmer	Hog farmer	Orchard farmer
multiple cropping	-20	26	-32	-12	7	34
new crops	-12	-1	-8	-6	-8	27
improved seed	24	30	14	31	26	19
Fruit tree graft	-1	-14	-2	-5	-9	30
improved livestock	-11	12	57	-10	38	-14
new type of livestock	-46	-27	-22	-19	-26	-35
new strain of fish	-26	-23	-19	-27	-24	-30
farm mechanization	24	24	-9	13	-3	5
farm level irrigation	-2	7	16	53	29	50
organic farming	-6	28	45	11	6	61
soil improvement	4	19	-9	-9	16	25
second paddy	34	-13	3	55	35	39
scientific livestock	-33	4	45	-24	25	-24
multiple cropping	-18	47	-9	-5	-3	23
inter cropping	-20	-5	-19	-15	-12	28
farm post production	-6	8	-14	6	1	3
Sc. livestock raising	-14	-5	54	-6	3	-23
Sc. aquaculture	-28	-24	0	-28	-4	-27
contract farming	-30	-20	0	9	-12	-37
cottage industry	-27	-13	-15	-11	3	1
agro-industry	-35	-37	-23	-30	-18	-10
dairying	-35	-24	43	-28	-18	-35
local trading	13	0	6	-4	13	-1
sericulture	-36	-9	-15	-28	-26	-40
apiculture	-39	-24	-26	-30	-26	-39
Total	-346	-34	61	-119	13	30

Table 4.16 Diversification of Crops

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	5	3	1	0	0	0	9 6.1%
have heard but no knowledge	4	5	4	0	1	3	17 11.6%
can implement if input available	5	4	5	2	4	0	20 13.6%
interest in practice in the future	2	3	5	4	3	6	23 15.6%
practicing now	5	1	1	1	0	10	18 12.2%
have heard but not interest	2	8	9	18	17	6	60 40.8%
Total	23 15.7%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

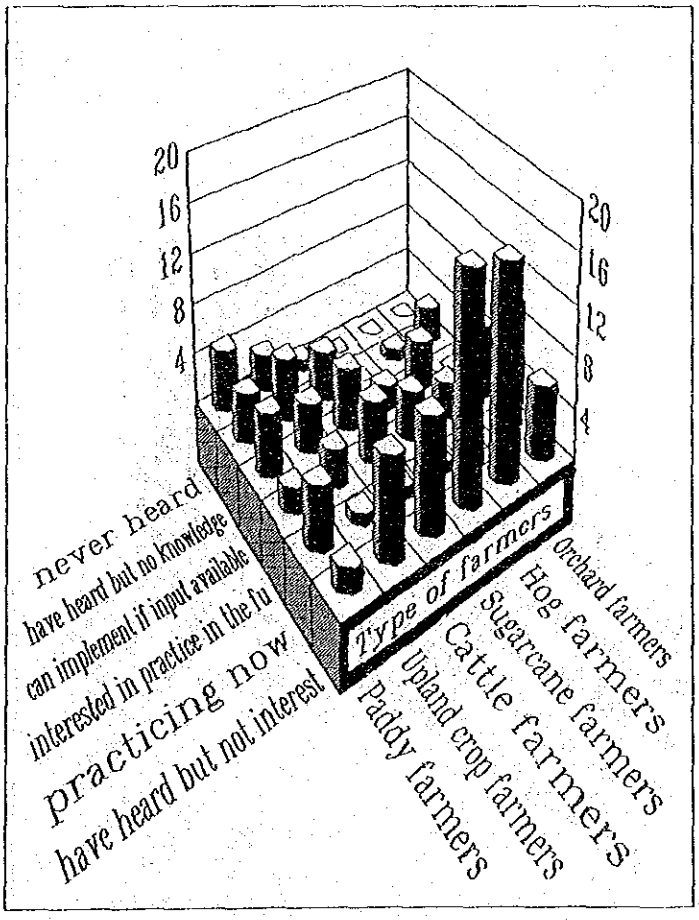


Figure 4.14 Diversification of Crops

Table 4.17 Introduction of New Profitable Crop

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	2	2	1	0	0	0	5 3.4%
have heard but no knowledge	4	2	3	2	1	1	13 8.8%
can implement if input available	1	4	2	1	4	2	14 9.5%
interest in practice in the future	3	4	8	4	4	7	30 20.4%
practicing now	11	10	4	11	8	5	49 33.3%
have heard but not interest	2	2	7	7	8	10	36 24.6%
Total	23 15.7%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

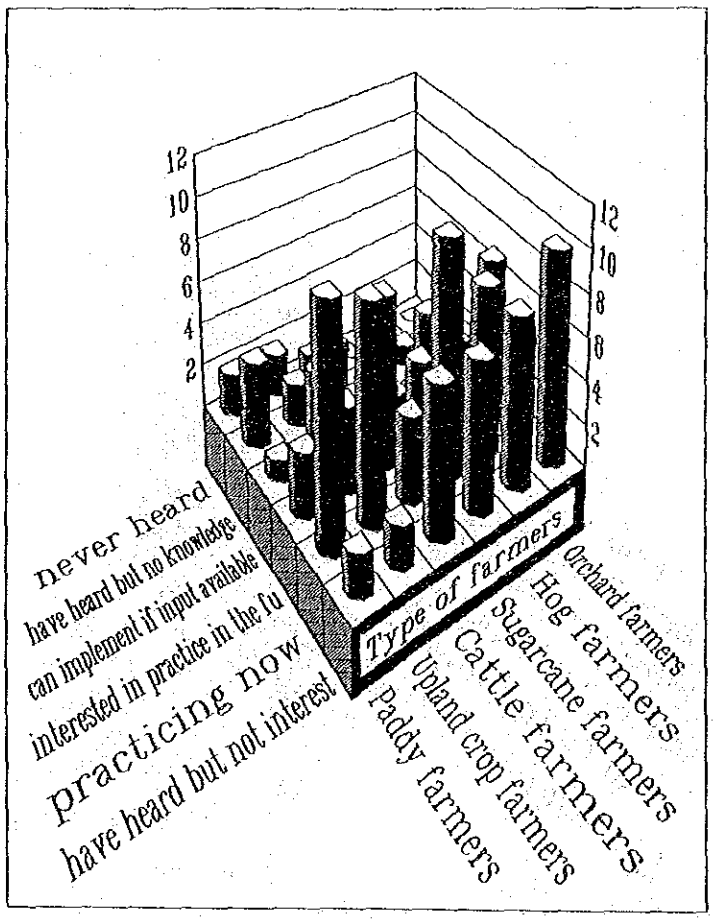


Figure 4.15 Introduction of New Profitable Crop

Table 4.18 Improved Seed

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	1	3	4	2	0	1	11 7.5%
have heard but no knowledge	8	3	2	0	0	0	13 8.8%
can implement if input available	3	5	4	3	1	3	19 12.9%
interest in practice in the future	5	2	5	3	5	0	20 13.6%
practicing now	0	4	1	2	0	12	19 12.9%
have heard but not interest	6	7	9	15	19	9	65 44.2%
Total	23 15.7%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

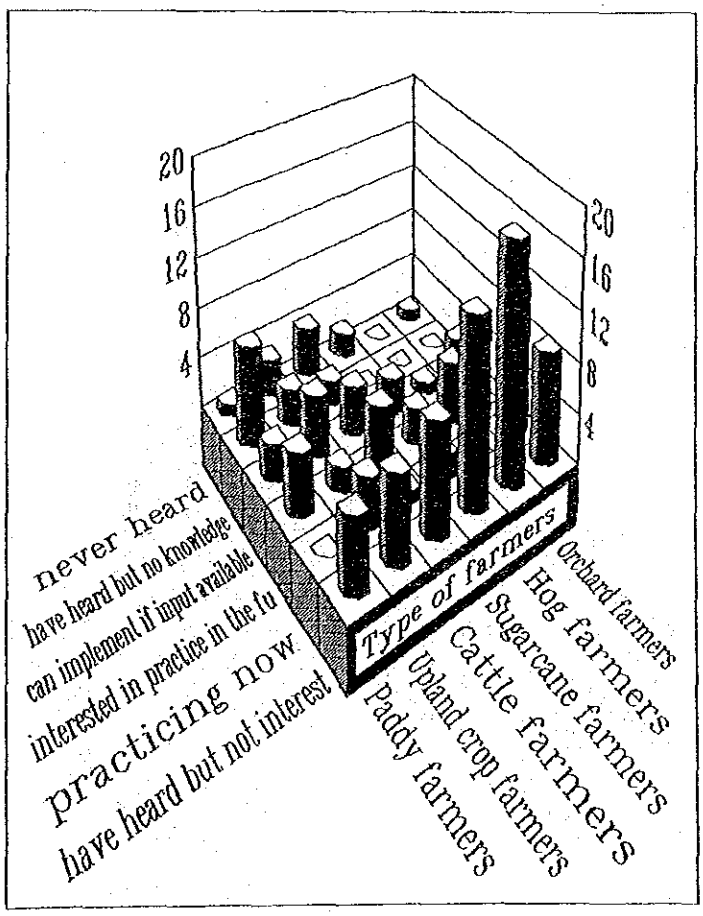


Figure 4.16 Improved Seed

Table 4.19 Improved Fruit Tree Grafts

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	2	2	7	2	0	2	15 10.1%
have heard but no knowledge	9	3	4	2	0	0	18 12.1%
can implement if input available	2	3	2	4	5	4	20 13.5%
interested in practice in the future	2	1	1	1	2	5	14 9.5%
practicing now	0	12	1	2	4	10	29 19.6%
have heard but not interest	6	3	10	14	14	4	51 34.5%
Total	24 16.2%	24 16.2%	25 16.9%	25 16.9%	25 16.9%	25 16.9%	148 100.0%

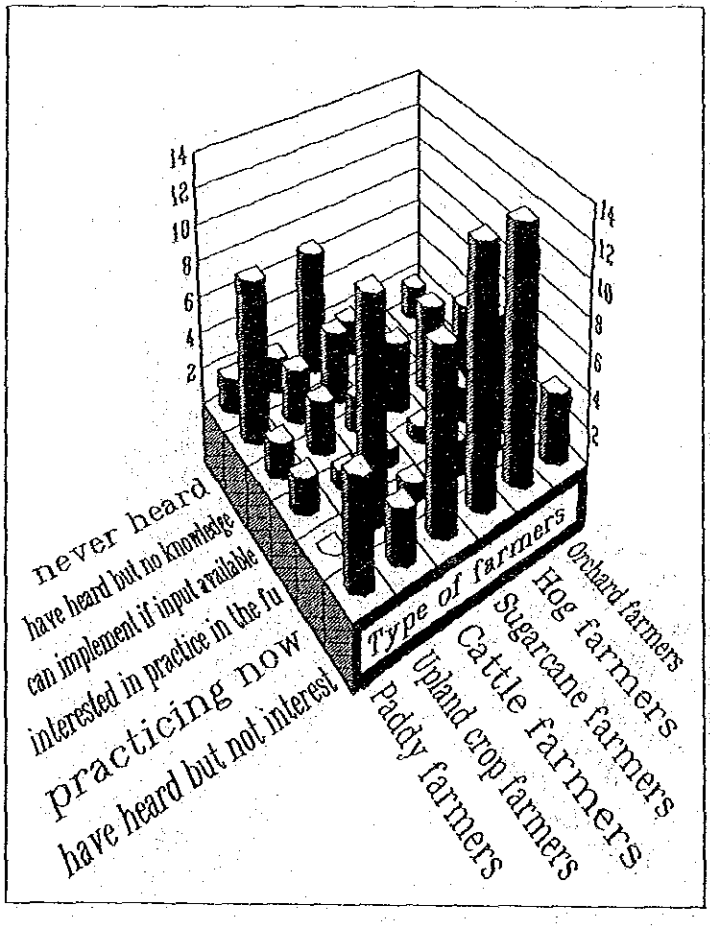


Figure 4.17 Improved Fruit Tree Grafts

Table 4.20 Improved Strains of Livestock

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	3	3	0	0	0	1	7 4.7%
have heard but no knowledge	8	4	0	3	1	6	22 14.9%
can implement if input available	3	2	3	5	3	4	20 13.5%
interest in practice in the future	3	6	4	0	2	1	16 10.8%
practicing now	3	6	16	2	13	2	42 28.4%
have heard but not interest	4	3	2	15	6	11	41 27.7%
Total	24 16.2%	24 16.2%	25 16.9%	25 16.9%	25 16.9%	25 16.9%	148 100.0%

Table 4.21 New Type of Livestock

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	10	4	3	2	0	3	22 15.0%
have heard but no knowledge	5	6	2	0	5	9	27 18.4%
can implement if input available	1	4	4	3	2	1	15 10.2%
interest in practice in the future	0	1	1	0	0	1	3 2.0%
practicing now	0	0	0	1	0	0	1 0.7%
have heard but not interest	7	9	15	19	18	11	79 53.7%
Total	23 15.7%	24 16.2%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	148 100.0%

Table 4.22 New Type of Strains of Fish

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	9	4	4	2	2	2	23 15.6%
have heard but no knowledge	4	5	2	3	2	9	25 17.0%
can implement if input available	2	5	5	1	2	2	17 11.6%
interest in practice in the future	5	0	2	1	1	0	9 6.1%
practicing now	0	1	0	0	0	1	2 1.4%
have heard but not interest	3	9	12	18	18	11	71 48.3%
Total	23 15.7%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

Table 4.23 Improved Farm Mechanization

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	0	1	1	0	0	0	2 1.4%
have heard but no knowledge	4	3	5	0	1	2	15 10.3%
can implement if input available	3	2	4	9	9	1	28 19.3%
interest in practice in the future	3	8	5	0	0	2	18 12.5%
practicing now	9	6	0	5	1	6	27 18.6%
have heard but not interest	4	3	10	11	13	14	55 37.9%
Total	23 15.9%	23 15.9%	25 17.2%	25 17.2%	24 16.6%	25 17.2%	145 100.0%

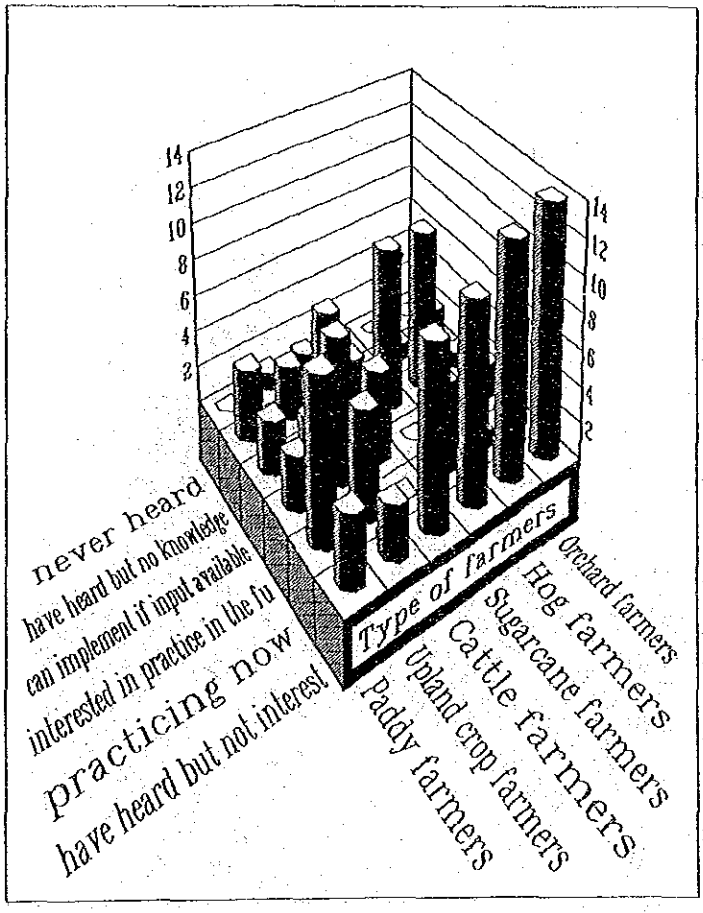


Figure 4.18 Improved Farm Mechanization

Table 4.24 Improved Farm Level Irrigation and Drainage

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	3	3	0	0	0	0	6 4.1%
have heard but no knowledge	6	3	0	0	0	0	9 6.2%
can implement if input available	3	5	5	5	3	0	21 14.5%
interest in practice in the future	5	2	2	0	1	1	11 6.2%
practicing now	3	6	6	17	11	18	61 42.1%
have heard but not interest	3	5	11	3	9	6	37 25.5%
Total	23 15.9%	24 16.6%	24 16.6%	25 17.2%	24 16.6%	25 17.2%	145 100.0%

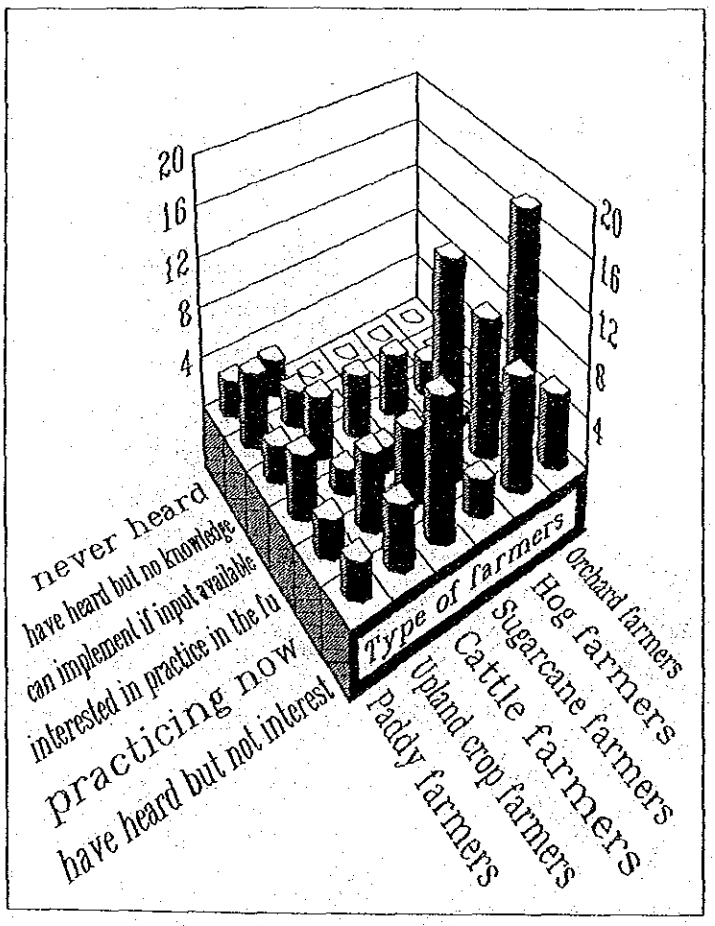


Figure 4.19 Improved Farm Level Irrigation and Drainage

Table 4.25 Organic Farming Using Compost, Manure

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	1	1	0	0	0	0	2
							1.4%
have heard but no knowledge	7	4	0	1	0	0	12
							8.3%
can implement if input available	2	0	3	2	4	0	11
							7.6%
interest in practice in the future	2	6	0	3	3	2	16
							11.0%
practicing now	4	10	16	6	3	20	59
							40.7%
have heard but not interest	7	3	6	13	13	3	45
							31.0%
Total	23	24	25	25	23	25	145
	15.9%	16.6%	17.2%	17.2%	15.9%	17.2%	100.0%

Table 4.26 Improved Soil Quality and Rotation Crop

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	1	0	2	2	0	0	5 3.4%
have heard but no knowledge	4	4	2	2	0	1	13 9.0%
can implement if input available	7	4	4	4	1	5	25 17.2%
interest in practice in the future	5	1	3	3	5	7	24 16.6%
practicing now	1	9	1	1	6	5	23
have heard but not interest	5	6	12	12	13	7	55 37.9%
Total	23 15.9%	24 16.6%	24 16.6%	24 16.6%	25 17.2%	25 17.2%	145 100.0%

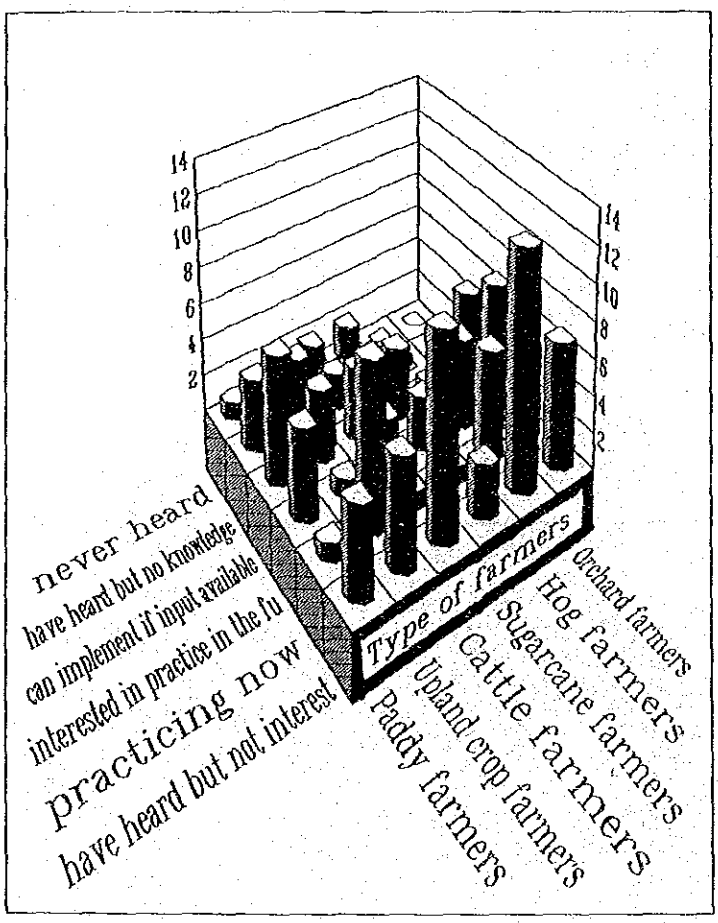


Figure 4.20 Improved Soil Quality and Rotation Crop

Table 4.27 Practice Second or Third Crop of Paddy

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	0	2	1	0	0	0	3 2.1%
have heard but no knowledge	3	5	2	0	0	0	10 6.8%
can implement if input available	3	7	7	0	1	2	20 13.7%
interest in practice in the future	3	2	6	0	2	0	13
practicing now	11	0	0	20	13	15	59 40.0%
have heard but not interest	2	8	9	5	9	8	41 28.1%
Total	22 15.1%	24 16.4%	25 17.1%	25 17.1%	25 17.1%	25 17.1%	146 100.0%

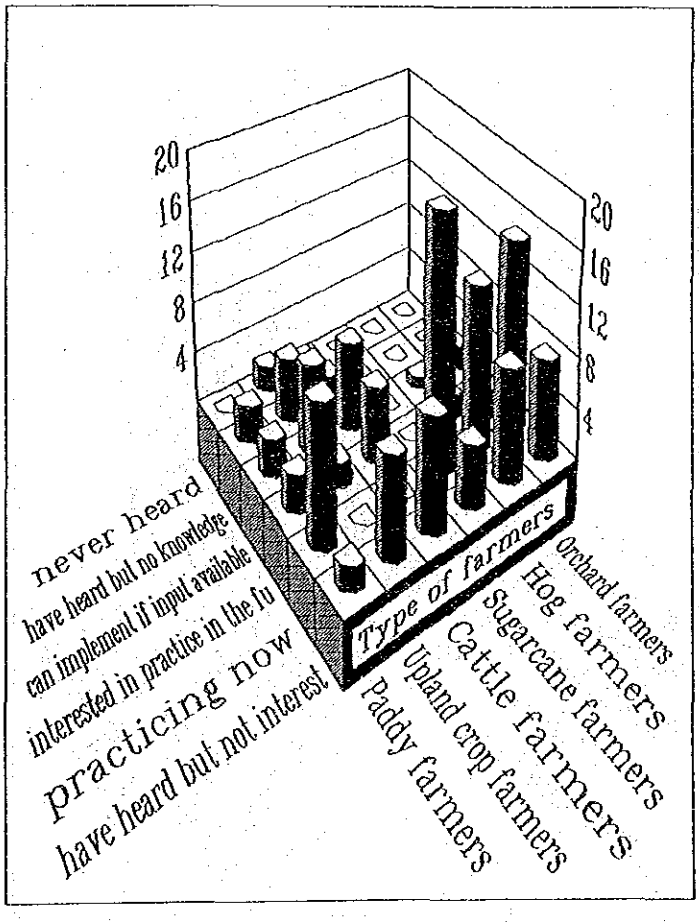


Figure 4.21 Practice Second or Third Crop of Paddy

Table 4.28 Scientific Raising of Livestock e.g. Artificial Insemination

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	5	0	0	3	0	1	9 6.2%
have heard but no knowledge	6	6	0	3	0	6	21 14.4%
can implement if input available	1	3	5	3	3	3	18 12.3%
interest in practice in the future	1	4	0	0	4	1	10 6.8%
practicing now	0	4	15	1	8	0	28 19.2%
have heard but not interest	9	7	5	15	10	14	60 41.1%
Total	22 15.1%	24 16.4%	25 17.1%	25 17.1%	25 17.1%	25 17.1%	146 100.0%

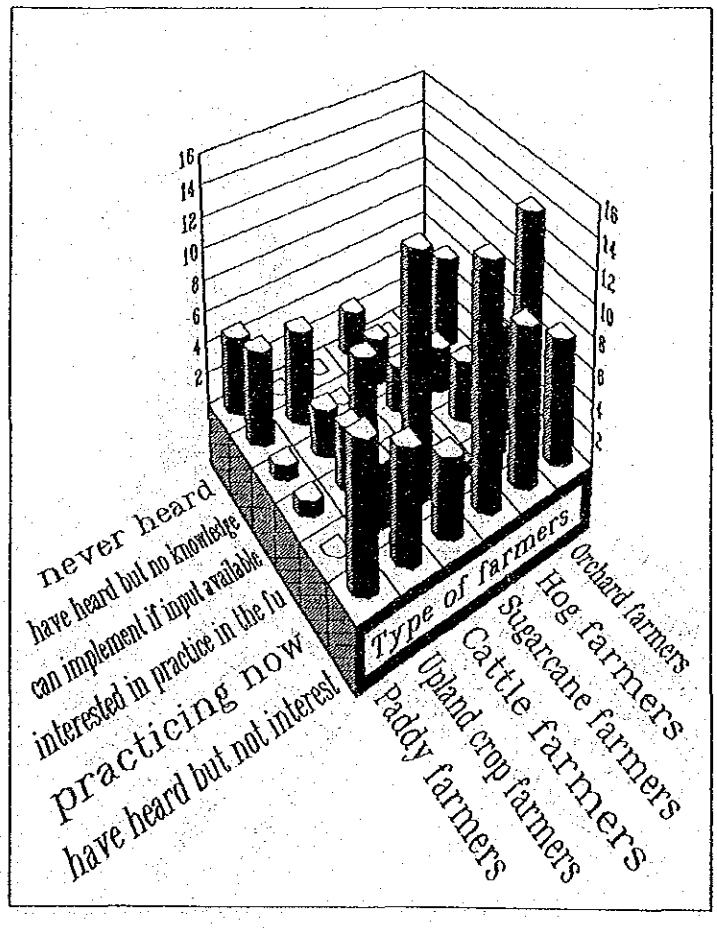


Figure 4.22 Scientific Raising of Livestock e.g. Artificial Insemination

Table 4.29 Multiple Cropping of Short Term Upland Crop on Same Land

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	4	1	2	0	0	0	7 4.8%
have heard but no knowledge	5	0	1	1	0	1	8 5.5%
can implement if input available	2	0	4	2	4	2	14 9.6%
interest in practice in the future	3	3	3	3	2	3	17 11.6%
practicing now	1	16	1	2	2	9	31 21.2%
have heard but not interest	7	4	14	17	17	10	69 47.3%
Total	22 15.1%	24 16.4%	25 17.1%	25 17.1%	25 17.1%	25 17.1%	146 100.0%

Table 4.30 Intercropping of Different Crop on Same Land

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	4	1	3	2	0	1	11 7.5%
have heard but no knowledge	7	3	2	0	0	0	12 8.2%
can implement if input available	1	3	7	4	5	0	20 13.6%
interest in practice in the future	4	2	0	2	1	5	14 9.5%
practicing now	1	3	0	0	0	10	14 9.5%
have heard but not interest	6	12	13	17	19	9	76 51.7%
Total	23 15.6%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

Table 4.31 Improved On-Farm Production to Enhance Quality of Crops

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	3	2	1	0	0	1	7 4.8%
have heard but no knowledge	4	4	3	1	0	2	14 9.7%
can implement if input available	0	4	2	6	5	0	17 11.7%
interest in practice in the future	7	4	4	0	4	8	27 18.6%
practicing now	1	5	0	5	1	2	14 9.7%
have heard but not interest	6	5	15	13	15	12	66 45.5%
Total	21 14.5%	24 16.6%	25 17.2%	25 17.2%	25 17.2%	25 17.2%	145 100.0%

Table 4.32 Special Production of Broiler, Layers e.g. Chicken in Cases

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	4	1	0	0	1	1	7 4.8%
have heard but no knowledge	5	6	0	0	0	9	20 13.6%
can implement if input available	2	3	2	2	3	2	14 9.5%
interest in practice in the future	5	7	1	5	4	0	22 15.0%
practicing now	1	0	18	0	3	2	24 16.3%
have heard but not interest	7	7	4	18	14	10	60 40.8%
Total	24 16.3%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	24 16.3%	147 100.0%

Table 4.33 Scientific Aquaculture to Raise Fin, Shell Fish

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	5	4	2	0	0	2	13 9.1%
have heard but no knowledge	7	7	1	5	4	7	28 19.6%
can implement if input available	3	2	3	1	4	3	16 11.2%
interest in practice in the future	2	2	4	0	2	0	10 7%
practicing now	0	1	3	0	2	0	6 4.2%
have heard but not interest	6	7	12	19	16	10	70 50.0%
Total	23 16.1%	23 16.1%	25 17.5%	25 17.5%	25 17.5%	22 17.5%	143 100.0%

Table 4.34 Improve Other Farm Innovations

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	1	1	0	0	0	0	2 18.2%
interest in practice in the future	1	0	0	0	0	0	1 9.1%
practicing now	8	0	0	0	0	0	8 72.7%
Total	10 90.9%	1 9.1%	0 0%	0 0%	0 0%	0 0%	11 100.0%

Table 4.35 Contractual Agreement with Agribusiness Firm to Produce Various Commodities

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	6	8	2	2	1	2	21 14.4%
have heard but no knowledge	5	0	1	0	0	11	17 11.6%
can implement if input available	2	0	2	1	0	0	5 3.4%
interest in practice in the future	2	1	6	0	5	1	15 10.3%
practicing now	0	4	2	9	0	0	15 10.3%
have heard but not interest	8	10	12	13	19	11	73 50.0%
Total	23 15.8%	23 15.8%	25 17.1%	25 17.1%	25 17.1%	25 17.1%	146 100.0%

Table 4.36 Practice Non-Farm Related Activity e.g. Home Industry

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	4	0	3	0	0	1	8 5.4%
have heard but no knowledge	8	6	2	2	0	2	20 13.6%
can implement if input available	1	1	6	6	5	1	20 13.6%
interest in practice in the future	2	5	2	0	2	4	15 10.2%
practicing now	1	0	0	1	3	4	9 6.1%
have heard but not interest	7	12	12	16	15	13	75 51.0%
Total	23 15.6%	23 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

Table 4.37 Practice Agro-Industry e.g. Food Processing

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	4	5	2	2	0	0	13 8.8%
have heard but no knowledge	9	7	4	3	1	5	29 19.7%
can implement if input available	1	2	3	1	4	6	17 11.6%
interest in practice in the future	1	0	0	0	0	0	1 0.7%
practicing now	0	0	1	0	0	2	3 2.0%
have heard but not interest	8	10	15	19	20	12	84 57.1%
Total	23 15.6%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

Table 4.38 Diary Farming

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	5	2	0	4	0	1	12 8.2%
have heard but no knowledge	8	7	0	3	1	10	29 19.7%
can implement if input available	0	4	7	2	4	1	18 12.2%
interest in practice in the future	2	1	2	0	0	0	5 3.4%
practicing now	0	0	12	1	0	0	13 8.8%
have heard but not interest	8	10	4	15	20	13	70 47.6%
Total	23 15.6%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

Table 4.39 Local Level Trading

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	3	0	2	0	0	1	6 4.1%
have heard but no knowledge	2	2	0	0	0	1	5 3.4%
can implement if input available	6	8	3	3	3	4	27 18.4%
interest in practice in the future	4	2	7	5	4	1	23 15.6%
practicing now	5	1	2	0	5	4	17 11.6%
have heard but not interest	3	11	11	17	13	14	69 46.9%
Total	23 15.6%	24 16.3%	25 17.0%	25 17.0%	25 17.0%	25 17.0%	147 100.0%

Table 4.40 Sericulture

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	6	1	2	0	2	2	13 8.8%
have heard but no knowledge	5	5	4	5	1	11	31 20.9%
can implement if input available	1	3	3	1	2	0	10 6.8%
interest in practice in the future	1	4	4	0	0	0	9 6.1%
practicing now	0	1	0	0	0	0	1 0.7%
have heard but not interest	11	10	12	19	20	12	84 56.8%
Total	24 16.2%	24 16.2%	25 16.9%	25 16.9%	25 16.9%	25 16.9%	148 100.0%

Table 4.41 Apiculture

	Paddy farmers	Upland crop farmers	Cattle farmers	Sugarcane farmers	Hog farmers	Orchard farmers	Total
never heard	6	4	3	2	2	2	19
							12.9%
have heard but no knowledge	7	6	3	3	1	10	30
							20.4%
can implement if input available	0	4	1	1	2	0	8
							5.4%
interest in practice in the future	1	2	2	0	0	0	5
							3.4%
have heard but not interest	9	8	16	19	20	13	85
							57.8%
Total	23	24	25	25	25	25	147
	15.6%	16.3%	17.0%	17.0%	17.0%	17.0%	100.0%