4.2 VILLAGE LEVEL DESCRIPTION

4.2.1 GENERAL

The Reservoir Area is comprised of 17 villages. 13 villages are located in Upper Reservoir, whereas 4 villages in the lower Reservoir. Ten (10) out of 17 villages are located on the Left Bank of the Nam Ngiep River along the old Highway 4 running parallel to the Nam Ngiep River, while 7 villages, four (4) them in the Lower Reservoir Area, are on the Nam Ngiep's Right Bank. There are a total of 853 households and the population 5,204 habitants in the Reservoir Area. The average number of persons per family is 6.1, compared with 6.5 for Xaysomboon as a whole and 5.9 for the Lao PDR.[47] The male population is less than female and consists of 49% of the whole population, compared with roughly 50% for Xaysomboom and 49% for the Lao PDR.[48]

As mentioned above under ethnic descriptions, the administrative villages in the Reservoir Area, as generally in the Xaysomboon Special Zone, tend to be multi-ethnic and clustered along the main roads. This is largely for security reasons but is also a result of GOL's rural development policy and its concomitant resettlement of highland communities to river valleys or plains areas near lines of communication. The individual ethnic communities tend to be located, however, in hamlets within the administrative village boundaries, so that social structure and housing types described below remain for the most part along ethnic lines. Table 3.2 indicates the ethnic distribution in the Reservoir Area villages.

Table 4.2 Ethnic Distribution in Reservoir Area Villages

VILLAGE NAME	LAO LOUM	LAO THEUNG	LAO SOUNG	LAO LOUM + LAO THEUNG	LAO LOUM + LAO SOUNG
UPPER RESERVOIR					
Phonehom		*			
Namlong				*	
Xiengkhong				*	
Nakang				*	
Nahong				*	
Viengthong				*	
Naxay				*	
Naxong				*	
Phonyeng					*
Dong	*				
Hatsamkhone	*				
Phiangta				*	
Pou					*
Subtotal :	2	1	0	8	2
LOWER RESERVOIR					
Houaypamon			*		
Nam Youk			*		
Sopphouh					*
Sop Youk					*
Subtotal :	0	0	2	0	2
TOTAL	2	1	2	8	4

[47] Ovesen, 1995, Tables 14 & 16, pp. 20, 22. According to the Lao Census a household is one or more persons living in a part or whole of a dwelling who together arrange for food and other life necessities, and share a common registration book. English. 1998. p. 17

[48] Ovesen, 1995, Table 12, p. 18.

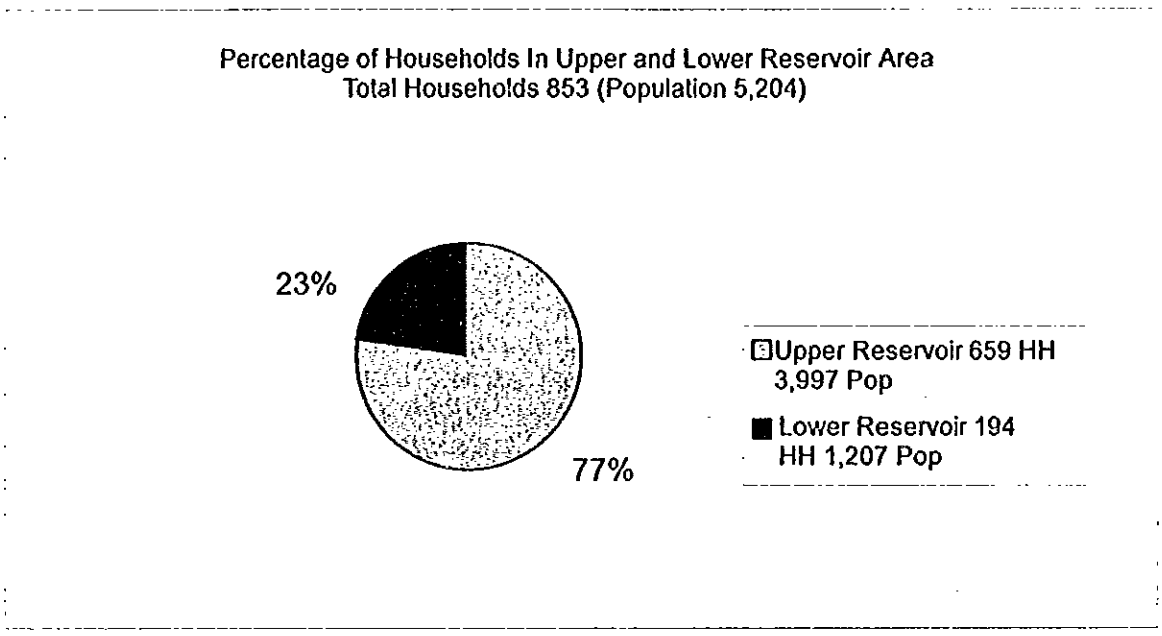

Figure 4.7 Distribution of Households in Upper and Lower Reservoir

The average size of a village is about 50 households, compared with around 60 households per village for Xaysomboon and 70 for the Lao PDR.[49] Only 8 villages out of 17 villages are of larger size, mainly due to larger pieces of small-scale irrigated paddy land as well as oldest settlement villages in the area.

Some 60% of the surveyed population reported their occupation as farmers, the great majority of these being lowland rice farmers. Most of the rest were students, and there were some 19 teachers, 3 health practitioners, 4 traders, 16 reporting 'other.'

As part of Xaysomboon Special Zone, the Reservoir Area is administered by the Kethsum Pathana (KP) using the armed police of the Ministry of Interior to provide security for the area. The KP also has a development role and has sponsored irrigation projects, schools, and local health centers in the area.

4.2.2 AGE OF VILLAGES AND SURVEYED HOUSEHOLDS

The six villages of Ban Xiangkhong, Naxang, Nahong, Dong, Pou, Namyouk have all been established over fifteen years ago, with Xiangkhong said to be about one 100 years old and Naxang, Dong and Pou over twenty years old. Ban Phiangta and Sopyouk are said to be older than 10 years, and the rest of the villages, Ban Phonehom, Viengthong, Naxay, Phonyeng, Hatsamkhone, Houaypamon, Sopphouh have all been established for less than 10 years, with Nakang and Sopphouh only around three years.

One assumes that especially the Upper Reservoir Area population was decimated

[49] Ovesen, 1995, Table 16, p. 22. The Zonal and National figures include urban establishments and not only villages.

during the Indo China War due to intense bombing along old Highway 4, a strategic route that would have allowed the Pathet Lao access to the Mekong plains. As a result of this bombing, Thathom District, for its population, is today one of the most highly contaminated by UXO in the Lao PDR.

Table 4.3 Village Age

VILLAGE	VILLAGE AGE
UPPER RESERVOIR	
Phonehom	7
Namlong	-
Xiangkhong	30 +
Nakang	3
Nahong	15 +
Viengthong	5
Naxay	7
Naxong	30 +
Phonyeng	8
Dong	30 +
Hatsamkhone	5
Phiangta	10 +
Pou	20 +
LOWER RESERVOIR	
Houaypamon	3
Sopphouh	5
Namyouk	15 +
Sopyouk	10 +

The relatively young age of the villages also reflects that the Taviang area (Upper Reservoir) is a rural development FARD (Focus Area for Rural Development). Many of the Lower Reservoir village households were also established under a UNDP development project that like the rural development policy for the country as whole assisted in reestablishing highland villages to river valleys and along roads to make them more accessible to social infrastructure and efforts to extend irrigated rice land.

According to the socioeconomic survey, most households, some 53%, in the Reservoir Area are less than five years old. For the Upper Reservoir this figure is nearly 60% and for the Lower Reservoir almost 40%.

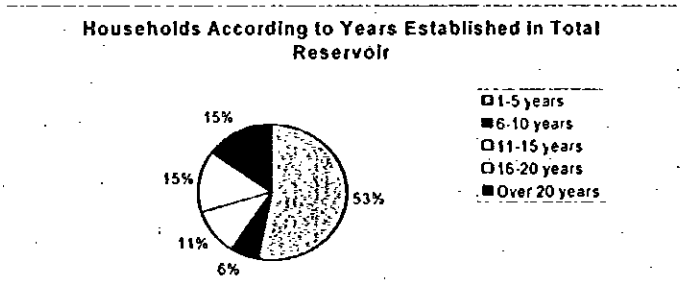

Figure 4.8 Households According to Years Established in Reservoir

Similarly, some 42% of households reported that they had been officially resettled in the Reservoir Area, some 43% in the Upper Reservoir and 41% in the Lower Reservoir.

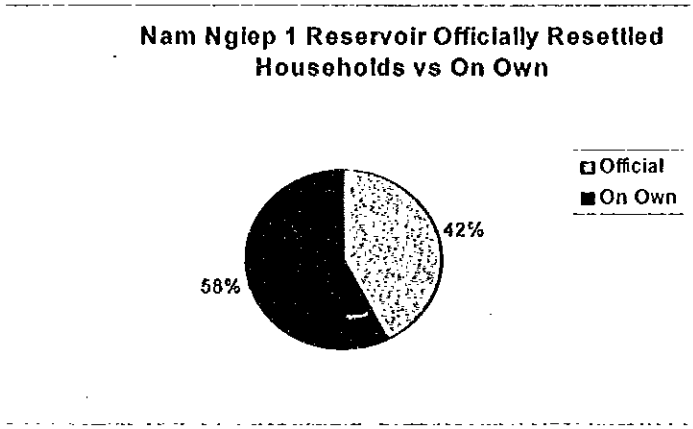

Figure 4.9 Officially Resettled Households Vs Came on Own

4.2.3 IN-MIGRATION & RESETTLEMENT PREFERENCE

All 179 households answered the question where they had come from, and only 79 respondents answered the hypothetical question on the socioeconomic survey, if you had to resettle where would you choose.

4.2.3.1 WHERE HOUSEHOLDS CAME FROM PRIOR TO BEING IN THE RESERVOIR AREA

The Reservoir Area households surveyed have come from 23 different districts in the 7 Northern Provinces of Xieng Khouang, Xaysomboon, Houaphanh, Bolikhamsay, Vientiane, Luang Namtha, and Luang Prahbangh. Most village households in the Upper Reservoir surveyed came from Kham District, Xieng Khouang Province (37 households). Xieng Khouang Province is the origin of most Upper Reservoir households, some 67 or about 38% of all households surveyed in the Reservoir Area and about 50% of all the Upper Reservoir Households. The numbers for Lao Loum and Lao Theung from Xieng Khouang Province are similar, 54 Lao Loum and 43 Lao Theung, with no Lao Soung households surveyed coming from Xieng Khouang. After Kham District, Khoun District is the originating district for surveyed households coming from Xieng Khouang (12 households), about 9% of all the Upper Reservoir Households.

Thathom District itself, which is the district where the Upper Reservoir is located, accounts for the second largest number of households after Kham District, some 36 of the surveyed households. So about 27% of all the Upper Reservoir households originate in the same District where they live now. Some 20 households originating in Thathom District itself are Lao Loum, 10 Lao Theung and 6 Lao Soung (the only Lao Soung surveyed in the Upper Reservoir). Xaysomboon, which includes Thathom District, accounts for the largest number of households surveyed, some 43 households, 24% of all households surveyed in the Survey Area and about 32% of all the Upper

Reservoir households surveyed. Houphanh Province accounts for most of the rest, some 14 households, or 8% of the total surveyed and just over 10% of the Upper Reservoir Households.

In contrast to the Upper Reservoir, most of the Lower Reservoir households surveyed, virtually all Lao Soung, came from Hom District of Xaysomboon, the district in which they now live. These are some 35 households, about 20% of all the Reservoir Area households but nearly 80% of the households in the Lower Reservoir. Whether or not these Lao Soung households originated from Hom District or it was the last of many moves is a question unanswered, however. A survey of the Nam Ngum Watershed found a very high rate of in-migration there similar to the pattern in the Reservoir Area, with about a third of households not born in the district they were in at the time of enumeration. Some 66% all households sampled reported moving at least once, some as many as four times, since 1972, with majority moving during the 1980s and 1990s.[50]

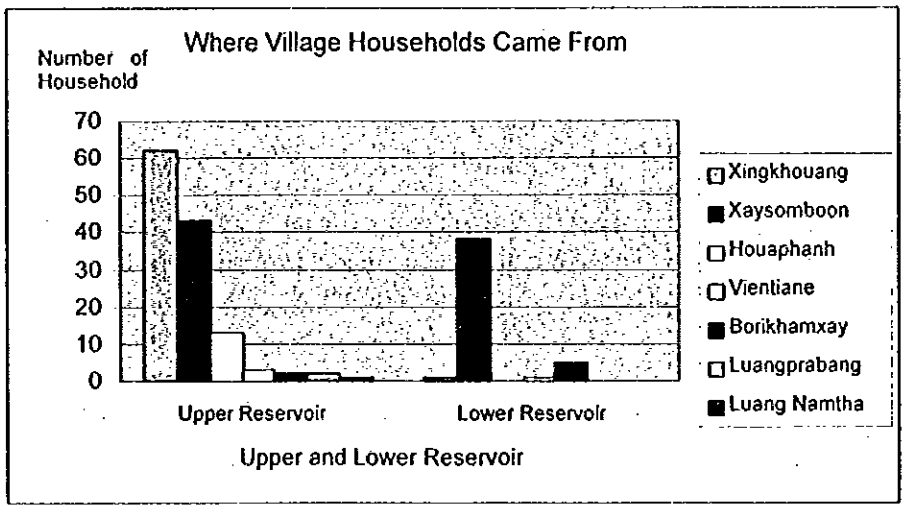

Figure 4.10 Where Village Households Have Come From

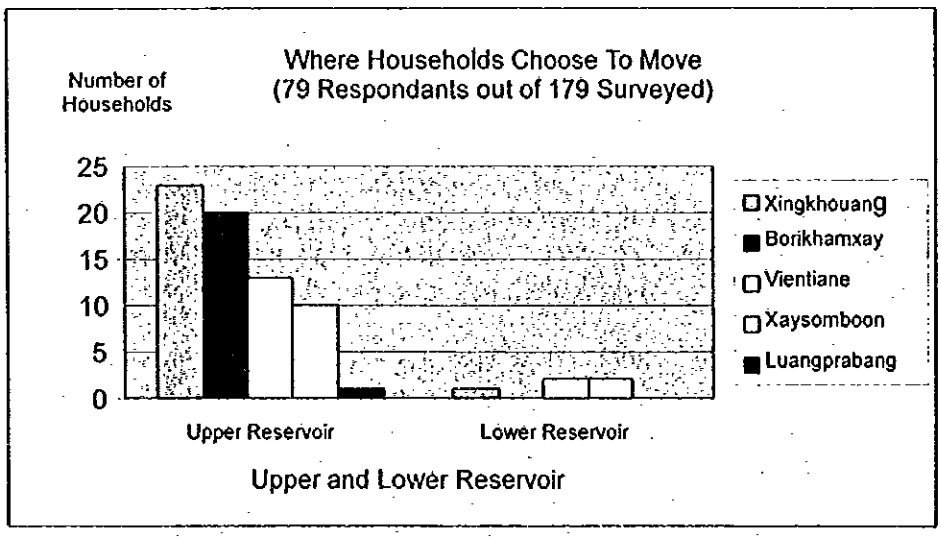

Figure 4.11 Where Households Choose to Move

[50] English 1998, p. vii.

Table 4.4 Provinces and Districts of Origin for Reservoir Area Villages

	Xieng Khouang					Xaysomboon					Houaphanh					Bolikha-mxay			Vientiane			**	
DISTRICTS / VILLAGES	Kham	Khoun	Pek	Nonghet	Phaxay	Thatom	Hom	Xaysomboon	Lanxang	Phun	Xiengkhor	Xamtay	Huameuang	Samneua	Viengxay	Paksan	Bolikhan	Khamkeuth	Hinhurp	Feuang	Xanakharm	Luangnamtha	Xiengngeun
UPPER RESERVOIR																							
PHONEHOM																							
Theung	9			4																			
NAMLONG																							
Loum			1															1				1	1
Theung			1																				
XIENKHONG																							
Loum	2	2			1	2														1			
NAKANG																							
Loum												1											
Theung						3						1											
NAHONG																							
Loum	3														1								
Theung		2			2	3				3				1									
VIENGTHONG																							
Loum																							
Theung	8					1																	
NAXAY																							
Theung		1			1	3																	
NAXONG																							
Loum	2	1	1		1	3						4							2				
Theung			1																				
PHONYENG																							
Loum	1		1	1		2																	
Soung			1			6																	
DONG																							
Loum	4	1	1			8						1	1										
HATSAMKHONE																							
Loum	6																						
PHIANGTA																							
Loum	2	1				4					1												
Theung			1																				
PEU																							
Loum		2				1	3				2						1						
Theung		2						1															
Lao Loum	20	7	4	1	2	20	3				3	6	1		1		1	1	2	1		1	1
Lao Theung	17	5	4	4	3	10		1		3		1		1									
Lao Soung						6																	
TOTAL:	37	12	8	5	5	36	3	1		3	3	7	1	1	1		1	1	2	1		1	1
LOWER RESERVOIR																							
HOUAYPAMON																							
Soung							1		1								2						
NAMYOUK																							
Soung							16	1									2				1		
SOPPHOUH																							
Soung							5	1															
SOPYOUK																							
Soung		1					13									1							
TOTAL		1					35	2	1							1	4				1		

**Luangnamtha and Luangprabang Provinces

4.2.3.2 WHERE HOUSEHOLDS WOULD MOVE

While only 79 households responded to the hypothetical question about where they would like to be move if resettlement became a reality (which site workshops have emphasized is not likely to happen for 10 years, if it happens at all), their choices are a bit surprising considering where the households originated. In the Upper Reservoir, most of those responding said they would prefer Xieng Khouang Province, which would be expected. However almost as many mentioned Bolikhamsay Province, most of these Pakxan District. Very few households originate from this Province, but this answer may be reflective of the economic growth potential perceived by villagers there, given the existence of superior communications and social infrastructure. Vientiane came in next and Xaysomboon fourth as destination preferences.

In the Lower Reservoir, too, as many households indicated that they would prefer to move to Vientiane Province as indicated Xaysomboon, although about 80% of households had come from Xaysomboon prior to their arrival in the Lower Reservoir villages.

4.3 SOCIAL STRUCTURE

4.3.1 OFFICIAL VILLAGE ORGANIZATION

The Reservoir Area villages exist within a political framework of provinces, *kwaeng*, and districts *muang*, each with different spheres of responsibility. The *tasseng*, subdistrict, is a group of villages of not more than 10, each with own village leaders, village councils and village assemblies. Trankell, in her study of the social impacts of Highway 13 from Vientiane through the NNHP downstream area in Pakxan District reported that in Vientiane Province the *tasseng* were being abolished.[51] However, Taviang Sub-District seems to be a political grouping that survives at this level.

Since the time of French colonialism, all ethnic groups have been subject to the same kind of official village organization that has long characterized the Lao Loum.[52] A village in the Lao PDR, under law, is a community comprising at least 20 households or more or 100 people.[53] Each village has a leader responsible for executing decisions taken at higher levels, assisted by one or two deputies and a secretary. This organization is termed the 'Village Authority Committee' in the STS Consultants socioeconomic survey of the Reservoir Area. The Village chief or headman represents the village to the above organizations.

This headman is responsible to the district authorities for the general administration of the village. The village headman is appointed by the vote of each head of the households. There is no fixed term of office, a headman functions as long as the inhabitants of the village are satisfied with his way of handling village affairs, or as long

[51] Trankell. 1999. p. 89. Decree on Organization and Administration of Villages, GOL 1993.
[52] Ovesen, 1996.
[53] Goudineau 1997. p. 149

as he himself wants to go on being headman.[54]

Villages are further organized into groups, called *khlum baan*, or *noay*, mainly for purpose of community labor, most often 10-20 households. These are usually recognized as physically delimited villages quarters, consisting of one or more 'hamlets,' and were commonly marked as such by villagers when they presented the village in sketch mapping.[55] The *noay* are not to be confused with working cadres as these recognized from other socialist regimes, since they have a longer history, extending into pre-colonial times. In Thailand, for instance, they sometimes have an additional purpose of providing food for the monks in the local temple. Each group, as described by Trankell, has its own leader who is responsible for organizing the group to carry out different work tasks, such as road repair and road maintenance. For purpose of maintenance, village roads and access roads are divided into sections, and each *noay* is responsible for its section, the size of which is determined according to its number of able-bodied men.

The general political structure of the administrative village, headed up by the 'Village Authority Committee,' is reproduced in other bodies that have been formed for the further construction and development of the nation. These are the Lao Women's Union (LWU), the Old People's Union and the Youth Union, which are also described in the STS Consultants socioeconomic survey. These groups are responsible for putting issues of public interest before the village assembly. They are hierarchical in structure, constituting the village sociopolitical organization, and are an effective means to reach all levels, mostly communicating proposals and messages downwards than upward. The structure of these organizations maintains an image of consensus. [56] The Village Head or Chief heads the Village Council, or Assembly, with its other members including the deputy village leaders, group leaders and representatives of the local Women's Union, Old People's Union, and Youth Union.

Apart from the above 'official' administrative positions, the village elders have a good deal of influence. The members of the council are recruited on the basis of mature age, a record of being a successful farmer, and a proven ability of successfully dealing with the authorities and other outsiders, occasionally by having occupied a public position. Frequently they form a semi-official group which is responsible, together with the headman, for the maintenance of orderly relations in the village, and for making sure, among the Hmong for instance, that the swiddens are allowed sufficient fallow periods.[57] Among the Lao Loum, the role of the council is, among other things, to arbitrate in conflicts over inheritance of land, and members of the council typically serve as go-betweens for marriages and assist at funerals.

Since the villages in the Reservoir Area, as generally in the Xaysomboon Special Zone, tend to be multi-ethnic and clustered along main roads such as the old Highway 4 passing through the Taviang Sub District -- largely for security reasons but is also a result of GOL's rural development policy and its concomitant resettlement of highland communities to river valleys or plains areas near lines of communication – the ethnic-based social structure described below tends to be within hamlets within the 'official'

[54] Ovesen, 1996.
[55] Trankell. 1999. p. 89. Ovesen, 1996.
[56] Trankell. 1999. p. 90.
[57] Ovesen, 1996.

villages of the Upper Reservoir.

B. Pou, for instance, originally was a Lao Loum village. A Lao Soung hamlet called B. Naphanh settled within B. Pou's administrative boundaries fairly recently. Therefore, B. Naphanh is a hamlet of B. Pou, although its social structure and housing are noticeably Lao Soung (Hmong) and not Lao Loum. This tends to be the pattern for many 'official' villages in the Upper Reservoir, although in the Lower Reservoir Area, villages are entirely Lao Soung.

4.3.2 ETHNIC BASED SOCIAL STRUCTURE

4.3.2.1 LAO LOUM

The Lao Loum social structure has been described in a number of village studies monographs, although that of the *Phuan* or *Meuy*, the two sub-groups of this official classification most likely found within the Reservoir Area, have not been to the same degree. The following nevertheless, from observations in the Reservoir Area, probably holds true for these groups as well.

Among the Lao Loum, kinship is cognatic, i.e. relations are traced through both parents. The implication of this is that the group of kinsmen that a person belongs to is not necessarily given, but that kin group are formed according to a number of practical concerns. Among these concerns, access to economic resources, primarily land, has a high priority. Rural Lao Loum communities are examples of what has been called a 'house-based society', which means that the household and/or the village rather than any descent group is the focal social unit. In other words, practical kinship is a function of spatial proximity and territorial community rather than lineal descent.

The village plays a very important role in Lao Loum society. In contrast to the Hmong, where the individual household and the descent group were the socially most important entities, among the Lao Loum there is a marked sense of village solidarity. Thus, in case migration becomes necessary, the decision to migrate is taken on village level, and the whole village moves as on body. The unity of the village is symbolized by the *cai ban*, the 'heart of the village', a small pole which is erected and inaugurated by the elders or by a monk when settlement is completed. Village solidarity is also strengthened and/or maintained by marriages that create ties of alliance between the families. Though there is no rule prescribing village endogamy (i.e. marrying within the village), or dissuade marrying out, there is a general preference-among responsible adults, if nor necessarily among the young-for marrying within the village.[58]

4.3.2.2 LAO THEUNG

Aside from the section on the Austro-Asiatic Family in Chazée's recent work and a book published by the Institute for Cultural Research which is little informed by

[58] Ovesen, 1996.

ethnographic methodology, there appears to be virtually no literature on the Khamu of Laos.[59] Chazée describes their villages as being administratively managed according to the official system, with a village chief, a committee and mass organizations and a traditional council of elders playing an important social and cultural role. This organization is supplemented by working groups of approximately 10 households for cooperation in highland paddy, reorganized on an annual basis and governed by informal rules.[60]

As described by Chazée, the Khamu have weak indigenous social and political groupings and easily adapt to new socio-political organizations, or the agricultural and production systems of more efficient or better organized neighboring communities. "They sometimes adapt too easily, by abandoning their traditional landmarks and taboos, which constituted the traditional safety net. When this acculturation is not counterbalanced by new behaviors and attitudes adapted to their society, the too rapid acculturation, and poorly understood new references have negative consequences. The Khamu communities then have much difficulty finding a new balance."[61]

4.3.2.3 LAO SOUNG (HMONG)

While, the Hmong are subject to the same official village organization, their informal social organization appears to be different than that of the other groups in the Reservoir Area. Among the Hmong the household has a pronounced socio-economic autonomy, so that the concept of the village has traditionally a different meaning and much less importance for the Hmong than it has for the Lao Loum. The Hmong have not traditionally felt attached to any particular village as a spatial or social unit-in the same way as the Lao Loum. To the Hmong, the primary foci of social identification are the household, the group of close relatives (*kwv tij*), and the clan, irrespective of any temporary or even permanent settlement. Their social identity is thus fixed through the concepts of patrilineal descent groups ('lineages' and clans), the actual units of which are dispersed. This ideology of social organization, based on descent rather than on locality, is also the reason why Hmong villages do not have Hmong names, but are referred to by the Lao name that the district authorities or the local Lao population have decided upon.[62]

4.4 RELIGION

According to the STS Consultants socioeconomic survey, the communities downstream of the proposed NNHP Dam are 85% Buddhist, followed by 12% Christian and about 3% professing Animism. The latter religion has a much greater percentage of adherents in the Reservoir Area upstream of the Dam, accounting for some 65% of the Reservoir Area population. Some 56% of the Upper Reservoir population are

[59] Simana, Suksavang 1997. Kmhmu' Livelihood: Farming the Forest. Vientiane: Institute for Cultural Research, Ministry of Information and Culture. Translator, Elisabeth Preisig. Largely historical myths and village livelihood and cultural practices told in the first person by a Khamu Ou. Useful as a 'photograph' of Khamu life.
[60] Chaise 1999, p. 67.
[61] Chazeé 1999, p. 71.
[62] Ovesen 1996.

Animists and 100% of the Hmong in the Lower Reservoir. Buddhism is only 44% of the Upper Reservoir population and only 35% of the Reservoir Area population.

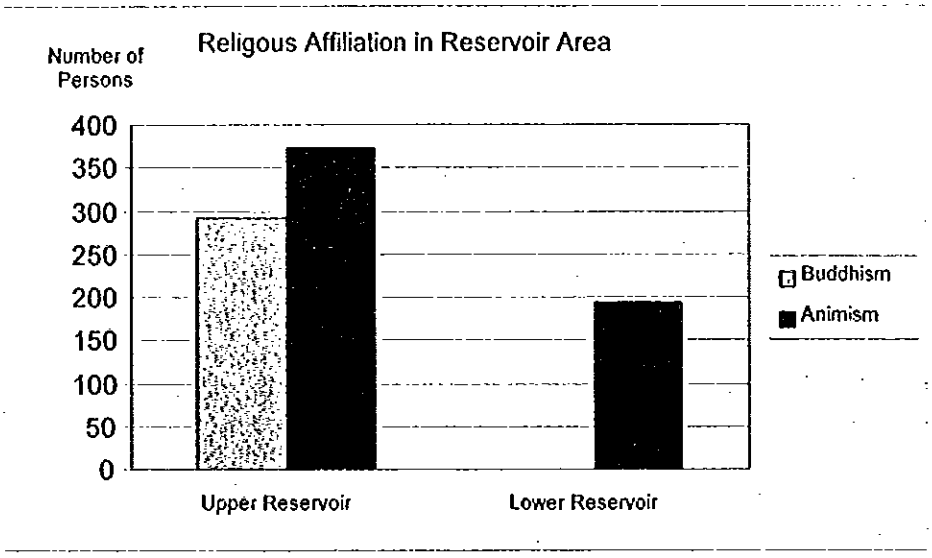

Figure 4.12 Religious Affiliation of Surveyed Households

4.4.1 LOU LOUM

Most Lao groups are formally Theravada (Hinayana) Buddhists, and this branch of Buddhism is traditionally also the official religion of the country, even though freedom of religion was decreed by law in 1994. In the rural areas, the practical religion consists of a localized amalgamation of theological Buddhism and indigenous spirit cults, so also can be surmised in the Reservoir Area. While the worship of the spirits is mainly a domestic affair-apart from the eventual annual offerings or sacrifice to the village spirit-the public religious activities are centered on the temple.

Buddhism is lived by the monks in a monastic manner while believers practice through prayers, veneration and offerings procuring merits. Candles, joss sticks, products of the banana tree, rice, domestic animals, prepared meals, parasols, banners, and music are the commonest offerings. The religious center, the temple, or *wat*, also plays an important role in the Lao village.[63] The most significant way in which Lao women perform their duties towards the society is by being active in the life of the temple. By bringing food to the monks and by organizing a number of annual temple ceremonies and festivals, they create merits for themselves and the community, which will pay off in future incarnations.[64]

Lao Buddhism, like in neighboring countries, is accompanied with beliefs in spirits, the *Phi*. These beliefs are still very vivid and spirits are often held responsible for diseases and problems. People then do not hesitate to go ask for forgiveness in the temple. A

[63] Chazeé 1999, p. 28-29.
[64] Ovesen 1996.

small wooden house shaped alter, *San Papoum* is often erected for the Phi within or outside the house, where daily offerings and feasts are given during religious festivals.[65]

While the above is generally true for Lao Loum groups, it is noteworthy that there are no *wats* in the Reservoir Area. This may be a reflection of the newness of the villages as well as the possible existence of the *Meuy*, who have been observed to be not so strongly influenced by Buddhist ideology as other Lao groups.[66] Chazée notes that numerous Taï minorities are not Buddhists and continue to refer to spirits and to the cult of ancestors in an elaborate manner.[67]

The *Boon* festivities are numerous through the year, including water and harvest festivities, the New Year *Pi May*, rites linked to *Pa Beuk* fishing and non-Buddhist festivities like *Baci*, and those for weddings, births and death. The *Baci* is one of the symbols of the Lao cultural identity. Sutras are recited on this occasion in which 32 guardian spirits known as *khwăn* are bound to the guest of honor by white strings tied around the wrists.[68]

4.4.2 LAO THEUNG (KHAMU)

Animism mixed sometimes with shamanism characterizes the religion of the Austro-Asiatic family, of which the Khamu are the most numerous, in general. Differing from the animism of the Hmong, theirs is not as strongly linked to the cult of the ancestors and the lineage. Therefore, there is no longer any strong link of continuity in the knowledge of the family or ethnic history, ascendance or descendants. There is no great ceremonial obligation and conservation of inheritance anymore. There still exists a spirit of ancestors, sometimes a spirit of the father and mother, but their role is much more passive than among the Hmong and other Miao-Yao and Tibeto-Burman families.[69]

The difference is linked to the Austroasiatics having emblematic lineages or kinship, generally linked to an animal or a plant, while the Hmong for instance lineage or kinship is based on a genealogical reference.[70]

While not having a strong kinship or lineage regime like the Hmong, among the Khamu Ou the lineage name is transmitted from father to son and the woman takes the husband's lineage name at marriage. The name is linked to an animal, usually a wild animal, or to a plant. Individuals linked to an animal or a plant representing the lineage may not eat it. Also the same house is not shared between two persons of different linkages.[71]

Spirits or genies are very active in daily life and responsible for each disease, accident,

[65] Chazeé 1999, p. 29.
[66] Trankell 1999, p. 67
[67] Chazeé 1999, p. 29.
[68] Chazeé 1999, p. 29. Cummings 1998, pp. 56-64.
[69] Chazeé 1999, p. 56-58.
[70] Chazeé 1999, p. 56-58.
[71] Chazeé 1999, p. 56.

bad omen, natural calamity, suffering or bad harvest. The wrath of the spirits of mountain water, forest, thunder, big woods and sky, outside the village, are generally the most feared. The latter are dissuaded from entering the village by building village gates where sacrifices are organized and where bamboo *taleo* and other frightening wooden objects are erected. Traditionally among the Khamu Ou buffalo are sacrificed for the spirits, and the heads preserved in their houses, though this is rare now and usually a pig is sacrificed instead.[72] This hierarchy of spirits the Khamu call *hrooi*, the most important ones being associated with the guardianship of the house and village. The ceremonies which involve the *hrooi* have been closed to non-Khamu observers, and very little is known about them.[73]

The belief in spirits has diminished through acculturation, assimilation, political campaigns and adoption of the Lao model. Several villages do not remember anymore the names of the spirits and related legends, and only important spirits like the family and house spirits are still respected. A minority of Khamu has even adopted Buddhism.[74]

4.4.3 LAO SOUNG (HMONG)

Like in most other 'tribal' societies, the indigenous religion of the Hmong is intimately connected to the structure and organization of the society and the dominant mode of subsistence. Buddhism, the official religion of the country, is quite alien to the Hmong way of thinking. Christianity has proved to have greater appeal, not least in its messianic aspects, but about 80% of the Hmong in Laos still subscribe to the indigenous, 'animist' religion.[75]

The Hmong cosmos is inhabited by a large number of different spirits (*dab*). The most important categories of spirits are the household spirits, the spirits of medicine, the spirits of medicine, the spirits of nature, and the shamanic spirits. The household spirits include a number of highly specialized spirits, residing in and guarding the pillars, the main house-post, the loft, the cooking hearth, the ritual hearth, the bedroom, and the front door. These spirits are worshiped by members of the household according to the customs of the clan. The most important spirit of the house is that which ensures the wealth of the household and protects its members, and whose alter, *dab xwm kab*, is placed on the wall opposite the main door. The altar consists of a rectangular sheet of paper painted with 'gold'. At New Year a chicken or (preferably) a large pig is sacrificed to this spirit, and blood and hair (or feathers) is daubed on the altar.[76]

The spirits of nature live in wild and uncultivated spots. They are not inherently malevolent, but they are likely to attack if disturbed, and they are constantly on the lookout for wandering human souls to capture. Every human being possesses a number of 'souls' (*plig*). Some of these souls are not overly faithful to the body of the person but like to stray in search to the playful company of spirits or other souls. They

[72] Chazeé 1999, p. 57.
[73] Cummings 1998, p. 64.
[74] Chazeé 1999, p. 57
[75] Ovesen 1996.
[76] Ovesen 1996.

may wander during sleep, and sometimes they get lost, with the result that the person gets sick. The ritual *hu plig* (calling the souls) is performed to bring back wandering souls. It is often performed for a sick person, and it is always performed for a newborn baby on the third day after birth, which is the first time the body and souls are brought securely together, thus transforming the newborn into a proper human being. It is also always performed for a new bride on the third day after marriage, because of the necessity of securing the fragile souls of the new bride and connecting them with the spirits of her husband's clan and household.[77]

In cased of more severe illness, the services of a shaman (*txiv neeb*) may have to be called upon. A person (mostly a man but sometimes a woman) becomes a shaman at the bidding of the shamanic spirits. Their wish is usually conveyed to the shaman-to-be by means of an illness with fever and hallucinations, and when the person recovers he has the gift of getting into a trance with the ability to cure other people with the help of these spirits. The general idea of the shamanistic performance is that the shaman in a state of trance, together with his auxiliary spirit, embarks on a journey to the spirits that are the cause of the illness. The shaman negotiates the cure by persuading or bargaining with the spirits to either release the soul of the sick person or to prolong his license for life.[78]

4.5 EDUCATION

All of the villages, with the exception of B. Naxay, have a primary school. The children of B. Naxay go to school in B. Dong, which is a distance of four (4) km or about one hour walking distance. B. Sopyouk and B. Namyouk in the Lower Reservoir have the best primary school education facilities in the Reservoir Area, provided through Japanese aid and is assisted by the UNDCP Phalavek Alternative Development Project. They are the only primary schools in the Reservoir Area that meet the standards of the Ministry of Education. The ratio of teachers to students is in the Reservoir area is 1:25.[79]

B. Dong has the only secondary school in the Reservoir Area. With 6 grade levels, it is about 3 years old, has almost a hundred students and 6 teachers. Unfortunately, the Taviang Secondary School has no dormitories and the closest other secondary schools are in the respective district headquarters of Xaysomboon, Thathom and Hom Districts.

Some of the 1,221 persons in 179 households surveyed, 22% reported having some formal education, 17% a primary level education, 4 percent secondary, and only 1 percent high school. About 67% of these were male and 33% female. Of the almost 80% without formal education, about half reported being literate without benefit of

[77] Ovesen 1996.
[78] Ovesen 1996.
[79] "Laos' public school system is organized around five years at the *pathom* (primary) level beginning at age six, followed by three years of *mathayom* (middle) and three years of *udom* (high) school. In reality less than three years of formal education is the national norm, and most teachers themselves have spent less than five years in school. Seventy percent of all Lao citizens enroll in primary school at some point in their youth, but the dropout rate is 60%. These statistics don't take into account the education provided by the country's Buddhist wats; in rural localities, monastic schooling is the only formal education available, most commonly for boys only." Cummings 1998. P. 50.

formal education. This achievement of literacy through non-formal means may possibly be through Buddhist and army institutions or through irregular primary school attendance, similar to what has been reported in a village study in Nepal.[80] Somewhat more women (230) than men (206) however reported literacy without a formal education, leading to other speculations since monasteries and the military are in the Lao PDR the preserve of men.

Of the overall Reservoir Area population for which information was obtained, one person reported having attending university, 35 high school, 237 secondary school, 912 having completed primary school and some 1,477 some sporadic attendance at primary school.

Table 4.5 Education Level of Reservoir Area Population

EDUCATION LEVEL	MALE	FEMALE	NUMBER OF PERSONS	PERCENT
NO FORMAL SCHOOLING				
Illiterate	216	296	512	42
Literate Without Formal Schooling	206	230	436	36
Subtotal No Formal Schooling :	422	526	948	78
FORMAL SCHOOLING				
Primary	136	77	213	17
Secondary	36	11	47	4
High School	13	0	13	1
Subtotal Formal Schooling :	185	88	273	22
TOTAL	607	614	1,221	100

Note will need to be taken in devising a public consultation program that includes the Hmong in the Reservoir Area of ethnographic observations of Hmong communities elsewhere in the Lao PDR that:

- The Hmong generally speak the Hmong language among themselves, although most middle-aged and younger men and many younger women are bilingual in Lao[81] and

- Many Hmong use, besides the Sanskrit-based Lao script taught in the schools, also a special romanized phonetic alphabet not taught in the schools. "While the ability to read and write Lao in the Lao script is a necessity for any kind of education in the country, many Hmong take a more positive interest, or even delight in being able to communicate in writing their own language. Most people find the Romanized Phonetic Alphabet for the Hmong language much easier to use than the Lao script."[82]

Related to this, the following table shows a higher percentage of illiterates among the households surveyed in the Hmong majority Lower Reservoir than for the mixed-ethnic but largely Lao Loum Upper Reservoir, although interestingly enough the percentage of the surveyed population among the Hmong who had attended secondary school is higher.

[80] Ragsdale, Tod. 1975 "*Patterns of Education and Literacy in a Village Panchayat of Central Nepal*," Contributions to Nepalese Studies, Special Coronation, Issue, vol. 2, no. 1, February.
[81] Ovesen 1993.
[82] Ovesen 1995. p. 47.

Table 4.6 Education Level of Reservoir Area Population by Village (179 Surveyed Households)

	ILLITERATE		LITERATE		PRIMARY SCAHOOL		FISRT SECONDARY SCHOOL		SECONDARY SCHOOL			
UPPER RESERVOIR	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Phonehom	29	34%	39	46%	17	20%	0	0%	1	0%	85	100%
Namiong	14	40%	17	49%	3	9%	1	3%	0	0%	35	100%
Xiengkhong	15	24%	30	48%	16	26%	1	2%	0	0%	62	100%
Nakang	12	52%	7	30%	4	17%	0	0%	0	0%	23	100%
Nahong	35	38%	30	33%	20	22%	5	5%	0	2%	92	100%
Viengthong	30	42%	31	44%	10	14%	0	0%	0	0%	71	100%
Naxay	10	44%	9	39%	3	13%	1	4%	1	0%	23	100%
Naxong	32	32%	27	27%	33	33%	9	9%	2	0%	101	100%
Phonyeng	23	38%	16	26%	15	25%	6	10%	0	2%	61	100%
Dong	44	39%	42	37%	25	22%	3	3%	1	0%	114	100%
Hatsamkhone	12	31%	12	31%	7	18%	7	18%	1	3%	39	100%
Phiangta	31	40%	33	43%	10	13%	2	3%	0	1%	77	100%
Pou	24	32%	32	43%	15	20%	3	4%	0	1%	75	100%
Subtotal :	*311*	*36%*	*325*	*38%*	*178*	*21%*	*38*	*4%*	*6*	*1%*	*858*	*100%*
LOWER RESERVOIR												
Houaypamon	17	50%	14	41%	2	6%	1	3%	6	0%	34	100%
Nam Youk	94	53%	50	28%	24	14%	3	2%	0	3%	177	100%
Sopphouh	15	60%	6	24%	2	8%	2	8%	1	0%	25	100%
Sop Youk	74	59%	41	33%	7	6%	3	2%	13	1%	126	100%
Subtotal	*200*	*55%*	*111*	*31%*	*35*	*10%*	*9*	*3%*	*20*	*6%*	*362*	*100%*
TOTAL	**511**	**42%**	**436**	**36%**	**213**	**18%**	**47**	**4%**	**0**	**1%**	**1220**	**100%**

4.6 PUBLIC HEALTH

Diseases in the Reservoir Area, diarrhea, dysentery, cholera, cough, flu, fever and tuberculosis, are those one expects in a rural area with little in the way of sanitation facilities (latrines) or water treatment, for instance boiling water. Water from the Nam Ngiep River and its tributaries is used for domestic and agricultural purposes, whereas water from wells is used primarily for drinking. There are a total of 5 wells in the area. However, these are only found in B. Nahom and B. Phiangta. Spring water is used in B. Phonehom and B. Phonyeng and is connected to pipe system to 28 households mainly in B. Phonehom. At the time of the STS survey, some 18 persons were recorded to have died from diarrhea and 22 patients are under medical care for this condition.

Malaria is the most prevalent of the diseases indicated by the STS consultants socioeconomic survey. One 112 cases were recorded to have died in 1998 from malaria. B. Phonehom was the most affected, with 46, or 41% of these.

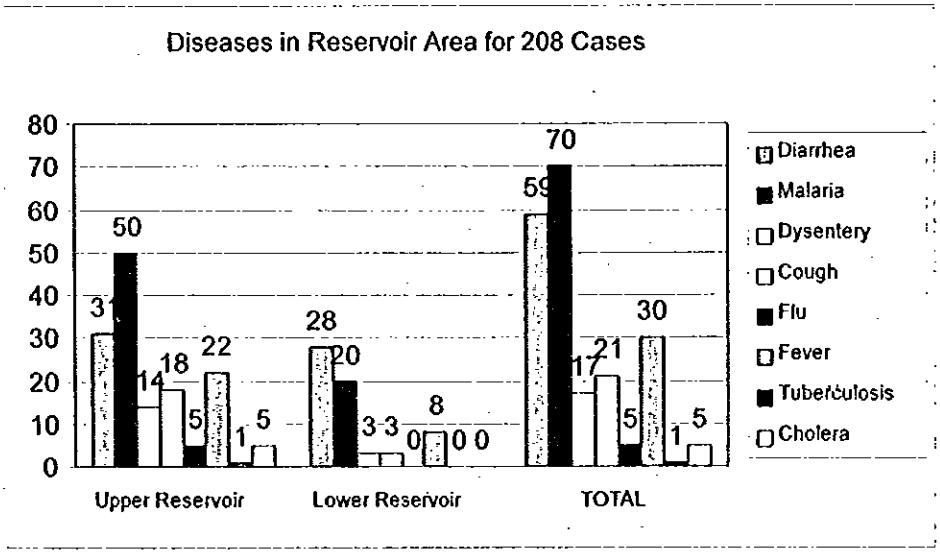

Figure 4.13 Diseases in Reservoir Area

There is only 1 hospital in B. Phonyeng, the "Taviang Hospital" with 1 doctor and 6 staff. The Taviang Hospital is one hundred and 128 m^2 and has 3 rooms and 10 beds. The hospital is in good condition and made of concrete. B. Viengthong and B. Phiangta have dispensaries of about the same size and condition, each one about 48 m^2, with 4 rooms. In each dispensary there are 2 Doctor Assistants and 6 staff. While perhaps not adequate, the health facilities are nevertheless, relative to other areas in the country, fairly good in the Upper Reservoir. In the Lower Reservoir, however, there appears to be no clinic. There are also about 20 traditional practitioners who can also provide basic aid when needed.

Health is a particularly important issue with regards to resettlement in the Lao PDR. The UNDP review of resettlement experience in the country noted that official assistance during household relocations was often viewed as "a method of making the removal more effective rather than of supporting the families during their time of upheaval."[83]

This was particularly true for health assistance, which appeared to be very limited when it existed at all, usually in the form of merely distributing some medicine. While this reflected the lack of facilities in isolated districts, the consequences were seen as having an especially serious human cost, i.e. deaths during the treks of several days accompanying some relocations and epidemics breaking out immediately afterwards of dysentery, malaria, and measles, among other diseases. This 'great fragility' of health within many villages during the first few years of relocation tended to last for at least the first three years after relocation. This was particularly true in villages that had moved straight from the mountains down to the plains. The change in altitude, the sudden switch of environment, and sometimes the difference in water quality, all put the displaced people in a new pathological situation to which they had to adapt.

The villagers were particularly vulnerable because they were weakened by the displacement itself, which was then followed by the efforts at reestablishment, village construction, preparing fields and so forth. Also their diet was often disturbed. They were faced with a rice shortage over the initial years until consistent rice production could be implemented, and it was more difficult than before to find supplementary food from forest produce. They were unfamiliar with the natural resources surrounding their new area, which were in any case often less abundant than in the mountain regions they had left behind. This fragility was reflected in a death rate, which was particularly high in the first years. Some villages had literally been decimated, with up to 30% dying, most usually from malaria.

The survey found too that a long-term symptom in the displaced villages from the highlands was an infant mortality rate that everywhere seemed higher than the national average. While possibly not worse than the previous situation in the remote areas, the situation nevertheless was well below that of surrounding, mostly Lao Loum, villages in the plains or valleys where relocation was directed; and the casualty rate was such that it required a number of years to regain a certain demographic balance.

4.7 INFRASTRUCTURE

4.7.1 HOUSING

Information on the types of houses of the Lao Loum, Lao Theung and Lou Soung exists in the current ethnographic literature, most of which is from sociocultural studies associated with hydropower plants in the Lao PDR. These descriptions are a useful start for describing the houses in the NNHP Reservoir Area, since the houses appear

[83] Goudineau 1997. p. 25.

to conform to these descriptions. The sociocultural study planned for the next phase of the feasibility work will confirm these descriptions.

Generally speaking, the villages in the table below are administrative villages, which in the Xaysomboon Special Zone tend to be multi-ethnic and clustered along the main roads. This is largely for security reasons but is also a result of GOL's rural development policy and its concomitant resettlement of highland communities to river valleys or plains areas near lines of communication. The individual ethnic communities tend to be located, however, in hamlets within the administrative village boundaries, so that housing types remain for the most part along ethnic lines.

4.7.1.1 LAO LOUM HOUSES

The houses of the Lao Loum are built on poles, varying in height from one and a half meters to three depending on how severe the flooding is in the area. This however is not only as a precaution against flooding but also because the space under the house has its special usage. A rice pounder and a weaving stool often occupy the space under a house, and it is further used for storing firewood as well as for keeping pigs and buffaloes. Next to the house is the rice barn, similarly built on poles and normally locked. Building materials for the house reflect the wealth and ambitions of its owner or builder. The floor is made of planks, as are the walls of the larger or wealthier houses, while for the majority the walls are made out of bamboo mats. Roofs are sometimes thatched with woven batches of leaves only, but more usually they are 'tiled' with slates of flattened bamboo.[84]

Access to the house is gained by mounting a ladder, which leads up to the roofed veranda, which normally runs the whole length of the house. This is where visitors are generally entertained and from where conversations may be held with neighbors or passing people. From the veranda two doors give access to the walled living area where meals are eaten and where the cooking fire is placed. Along the back wall of the living area are the walled-off sleeping quarters, which are private to the family members. Beyond the cooking fire a door leads out to a smaller veranda which is the washing and dishwashing place.[85] Kitchen gardens are boat-like structures raised on slits coming to the level of the veranda. Filled with soil and onions, coriander and mint constantly watered when people wash hands or clean pots and pans.

The rice barns and large gardens with banana, pineapple, fruit trees and some vegetables are located just outside the residential area. Villagers explain that the rice barns are a distance from the house in case there was a fire so that even if their house burnt down, they would have enough rice to eat. It may also be fear of flooding since the rice barns are often located on slightly higher ground as well. Vegetable gardens are located at the water's edge and on the sandy bank so as to make use of the ground water. Paths and steps are cut into the steep sandy banks due to constant use and lead to the water's edge where boats are tied up and where bathing and washing clothes takes place.[86]

[84] Ovesen 1996.
[85] Ovesen 1996.
[86] Sparkes 1995.

All gardens are fenced in to protect them from roving chickens, pigs and cattle. Small coops, built of bamboo, are scattered about the village and chickens, ducks, geese and turkeys are rounded up at night and locked in. Buffalo and cattle are often kept underneath the house. Otherwise, cattle and buffalo roam freely along the river, grazing in the shallows and undergrowth. Pigs fend for themselves.[87]

The plan of the house and its orientation if space reflect important social and cosmological values. Houses are oriented in relation to the flow of the river, and the general and absolute rule is the upstream is superior to downstream. Thus the shrine of the house spirit (*phi heuan*) is placed in the upstream corner of the living area. Men are sitting and/or eating further upstream than women and children, and the cooking fire is downstream from the eating places. The kitchen and washing veranda is furthest downstream. In the sleeping quarters the elder generation sleeps upstream and the younger downstream.[88] Village sites may be chosen through an elaborate rice ritual described in Chazée. Lao Loum villages will generally not be fenced, though Tribal Taï villages may be.[89]

There are generally two types of houses. The first is made up of sturdy wooden constructions with several rooms partitioned as sleeping quarters and having wooden tile roofs and a large veranda. The second type is of more temporary dwellings of bamboo matting and straw roofs.[90] The former type may last up to thirty years and often consist of households with several generations and up to 15 inhabitants. The latter are typical of young married couples who are in the process of establishing themselves, having just moved out of the man's parents' house after a period of post-marital residence. It may take 10 to 15 years before sufficient funds and timber are accumulated so that a sturdier house may be constructed.[91]

Usually more than half of the houses in a village are of the sturdier type. Building a house is a communal affair and all able men help to raise the structure. A bamboo house can be built in one day but gathering materials and constructing frames can take weeks depending on the amount of spare time available to the family. Wooden houses are a life's work and many take 20 years to complete.[92]

4.7.1.2 LAO THEUNG (KHAMU OU) HOUSES

The quality and size of the Khamu house depends on the wealth of the family. A well to do family with sufficient labor builds a house similar to that of the Lao Loum, with wooden piles, floor and frame and a roof in wood tiles or corrugated iron. The public living room is accessible through an entry stair. A private bedroom is separated from the public living room by a simple cotton fabric or by a bamboo wall. The kitchen and fireplace is separated from the living room. Firewood, tools, basketwork, rice pounder, tiles and construction wood are placed between the piles of the house, while the rafters provide a storage area for baskets of dried food, seed rice and valuables. The animal

[87] Sparkes 1995.
[88] Ovesen 1996. Sparkes 1995.
[89] Chazeé 1999, pp. 32-35.
[90] Sparkes 1995.
[91] Ovesen 1996. Sparkes 1995.
[92] Ovesen 1996. Sparkes 1995.

pens may be erected under, or beside the house. The draft buffalo are sometimes kept under the house during the land preparation period, between May and July.[93]

Families having only enough for regular food sufficiency content themselves with a bamboo walled house and a roof of thatch or bamboo tiles. Wood is only used for the piles, the crossbeams and main floor and wood frames. A single living room does not possess any separation for the bedrooms. The sleeping mats are rolled up in the daytime. The kitchen is usually separated from the living room, although at times it is in one of the corners. In that case, the fireplace is situated in the living room, with a bamboo shelf over the fire to dry the food.[94]

Between the piles, the firewood, tools, hand operated paddy pounder, poultry nests and different traps are kept. In case of illness, epidemics or important ceremonies in the house, entry is forbidden by a *taleo,* a wooden totem.[95]

For poor families, small bamboo houses are built on small and poorly worked piles. For disadvantaged families, widows without grown children, divorced opium addicts, elders without family support and orphans, there are huts standing on the ground. The floor and walls are made of bamboo and the roof of thatch. There is generally a single room and the fireplace is situated in the middle, a little to the back. The number of traps, nets, strangling snares for rodents, frog baskets and crustacean nets hanging at the entry of the house are indicators of these families' standard of living.[96]

Khamu villages may be of a large size, up to 150 families. The presence of a stream, and sizeable good quality land for cultivation of glutinous rice are the main criteria for choice of a site. Prior to 1975, a traditional ceremony was performed, to gain the good disposition of the district, country and forest spirits of the place. The objective of this ritual was to alter the non-organized animal and vegetable kingdoms protected by the wild spirits into an organized human territory protected by familiar spirits.[97]

Houses are arranged along the central and secondary roadways of the village, without specific orientation. However, Lao Loum practices have often influenced the arrangement of houses. A bamboo compound generally fences traditional villages, with pigs, buffalo and cows outside. Rice granaries are also grouped outside the fence.[98]

4.7.1.3 LAO SOUNG (HMONG) HOUSES

The composition of Hmong villages is somewhat different from the Lao Loum. In the latter the single household is economically independent except in times of crises or large expenses such as wedding feasts. The Hmong often combine households and join compounds together in clusters. Hmong houses often consist of several families such as the parents, two married sons and their children together with four or five

[93] Chazeé 1999, p. 65.
[94] Chazeé 1999, p. 65.
[95] Chazeé 1999, p. 65.
[96] Chazeé 1999, p. 65.
[97] Chazeé 1999, p. 65.
[98] Chazeé 1999, p. 65.

children yet to be wed. Houses are built on the ground reflecting the Hmong's origins in the mountains of central China where flooding was not a problem. Fences surround all houses in order to keep animals out. Thus it is especially important that Hmong houses be located at a safe distance from riverbanks.[99]

The construction of a new house, including collecting and preparing all structural materials, requires the work of three or four grown men for 12-14 days. Preparation of the split bamboo walls is the most time consuming task. When a household moves, as many of the parts of the old house are taken along as the distance of the moving and conditions of transportation will allow. The value of a house is difficult to reckon in terms of money, since houses are not normally a commodity among the Hmong, and since the structural materials are collected in the forest rather than being bought. In terms of the labor required for the construction, Ovesen in 1993-4 tentatively set the average price for a house at 50,000 kip, corresponding to 1,000 Kip per day per person.[100]

Most houses in a Hmong community would be traditional, although a few wealthy households, especially village chiefs, may build in the modern Lao Loum style, i.e., on stilts with timber and corrugated iron roof. These houses consist of a spacious open veranda area, which serves as the 'living room' and where guests are entertained, and two or three secluded bedrooms. Next to the 'modern' living quarters is the cooking hut, built on the ground and with traditional Hmong building materials.[101]

4.7.1.4 NUMBER OF HOUSEHOLDS CLASSIFIED BY TYPE OF ROOFING IN THE RESERVOIR AREA

Table 4.7 identifies the major types of housing in the Reservoir Area as identified by the STS consultant's survey, with some attempt to quantify the costs of the different categories found. The table represents the impacts of inundation from a 360m dam. A lower dam at 318-320m would have the impacts as shown in Table 4.8 The estimated costs of housing lost at the two dam alternatives at 360m and at 318-230m is approximately US$1,000,000 for the former and for the latter less than US$400,000. In both design alternatives, the least expensive house arbitrarily valued here at $500 constitutes around 80% of the total houses in the Reservoir Area, whereas the most expensive house, at about US$6,500, is about 7%.[102]

[99] Ovesen 1996, Sparkes 1995.
[100] Ovesen 1995, p. 42
[101] Ovesen 1995, p. 42
[102] Ovesen in 1993-4 tentatively set the average price for a well built Lao Soung house at 50,000 kip, corresponding to 1,000 Kip per day per person. At exchange rates prevailing then, this would probably be less than $100. Ovesen 1995, p. 42

Table 4.7 Number of Households Classified by Type of Roofing in Reservoir Area at FSL.360m

NUMBER OF HOUSEHOLDS CLASSIFIED BY TYPE OF ROOFING IN THE RESERVOIR AREA										
VILLAGE NAME	TILE $6,500		CORRUGATED SHEET $5,500		WOODEN 3,500		BAMBOO/THATCH $500		TOTAL	
UPPER RESERVOIR										
Phonehom	0	$0.00	1	$5,500	2	$7,000	64	$32,000	67	$44,500
Namlong	0	$0.00	0	$0.00	0	$0.00	17	$8,500	17	$8,500
Xiengkhong	2	$13,000	4	$22,000	33	$115,500	0	$0.00	39	$150,500
Nakang	0	$0.00	0	$0.00	0	$0.00	25	$12,500	25	$12,500
Nahong	0	$0.00	5	$27,500	3	$10,500	67	$33,500	75	$71,500
Viengthong	0	$0.00	1	$5,500	0	$0.00	45	$22,500	46	$28,000
Naxay	0	$0.00	2	$11,000	2	$7,000	18	$9,000	22	$27,000
Naxong	0	$0.00	5	$27,500	7	$24,500	69	$34,500	81	$86,500
Phonyeng	0	$0.00	2	$11,000	0	$0.00	61	$30,500	63	$41,500
Dong	0	$0.00	18	$99,000	11	$38,500	53	$26,500	82	$164,000
Hatsamkhone	0	$0.00	0	$0.00	0	$0.00	27	$13,500	27	$13,500
Phiangta	0	$0.00	4	$22,000	0	$0.00	45	$22,500	49	$44,500
Pou	0	$0.00	10	$55,000	19	$66,500	37	$18,500	66	$140,000
Subtotal:	**2**	**$13,000**	**52**	**$286,000**	**77**	**$269,500**	**528**	**$264,000**	**659**	**$832,500**
LOWER RESERVOIR										
Houaypamon	0	$0.00	0	$0.00	0	$0.00	18	$9,000	18	$9,000
Namyouk	4	$26,000	4	$22,000	3	$10,500	74	$37,000	85	$95,500
Sopphouh	0	$0.00	0	$0.00	0	$0.00	23	$11,500	23	$11,500
Sopyouk	4	$26,000	5	$27,500	11	$38,500	48	$24,000	68	$116,000
Subtotal:	**8**	**$52,000**	**9**	**$49,500**	**14**	**$49,000**	**163**	**$81,500**	**194**	**$232,000**
TOTAL	**10**	**$65,000**	**61**	**$335,500**	**91**	**$318,500**	**691**	**$345,500**	**853**	**$1,064,500**

Table 4.8 Number of Households Classified by Type of Roofing in Reservoir Area at FSL.318-320m Dam

NUMBER OF HOUSEHOLDS CLASSIFIED BY TYPE OF ROOFING IN THE RESERVOIR AREA AT 318-320M										
VILLAGE NAME	TILE $6,500		CORRUGATED SHEET $5,500		WOODEN 3,500		BAMBOO/THATCH $500		TOTAL	
UPPER RESERVOIR										
Pou	0	$0.00	10	$55,000	19	$66,500	37	$18,500	66	$140,000
LOWER RESERVOIR										
Houaypamon	0	$0.00	0	$0.00	0	$0.00	18	$9,000	18	$9,000
Namyouk	4	$26,000	4	$22,000	3	$10,500	74	$37,000	85	$95,500
Sopphouh	0	$0.00	0	$0.00	0	$0.00	23	$11,500	23	$11,500
Sopyouk	4	$26,000	5	$27,500	11	$38,500	48	$24,000	68	$116,000
Subtotal:	8	$52,000	9	$49,500	14	$49,000	163	$81,500	194	$232,000
TOTAL	8	$52,000	19	$104,500	33	$115,500	200	$100,000	260	$372,000

4.7.2 SOCIAL INFRASTRUCTURE

Table 4.9 summarizes under the above section on Inundation Impacts summarizes the impacts reservoir inundation would have on social infrastructure in the Reservoir Area, including square meter of floor space and estimated cost of the main facilities.

4.7.2.1 ADMINISTRATIVE BUILDINGS

The Kethsum Pathana (KP) using the armed police of the Ministry of Interior provides security and takes a hand at providing development for Taviang Sub-District, within the Xaysomboon Special Zone. It is housed in an administration building in B. Dong, opposite the area's market square of some twenty or so shops, which is in the administrative boundaries of the neighboring village to the north, B. Phonyeng. The administration is housed in a two story wooden and concrete building that serves also as a kind of barracks for the armed police force. The building is about 300m^2 in area, has a corrugated tile roof and is valued by the STS Consultant's survey at around $30,000.

4.7.2.2 SCHOOLS

There are sixteen primary schools in the Reservoir Area. Most are of fairly primitive construction, so that all together 14 of them having about 1,352m^2 combined floor space are valued at around $33,800 by the STS Consultant's survey. On the other hand the two schools donated by the Japanese government in the Lower Reservoir, having a combined 588m^2 floor space are valued at around $125,800. The Taviang Secondary School in B. Dong has about 224m^2 floor space and is valued at around $27,600.

4.7.2.3 MEDICAL FACILITIES

The Taviang Hospital in B. Dong is built at the same standard as the Taviang Sub-District Administrative Building, which is to say of cement and wood with corrugated tile roofing with about 128m^2 floor space. The two clinic-dispensaries at B. Viengthong and B. Phiangta together have about 48m^2 floor space each. All together they cost according to the STS Consultant's survey estimates about $20,600. The Lower Reservoir Area appears to have no medical facilities.

4.7.2.4 MARKETS

According to the STS Consultant's survey, only B. Phonyeng in the Upper Reservoir Area has a permanent market, with 23 shops carrying sundry items such as cigarettes, sweets, soft drinks, batteries, razor blades, towels, tee-shirts, caps, soap, and tinned food. The shops have on average about 130m^2 floor space and together are valued at

around $136,500, not including their merchandize.

This market has a morning bazaar 4 days a week, during which surrounding villagers bring their small surpluses for sale. At this time, many villages take their produce just to the main road to sell to passengers in the occasional passing vehicle.

The Lower Reservoir villages frequent the Hom District market, which is closer than the B. Phonyeng market but is not located in the Reservoir Area, some 30-50km away via a seasonal road where there is no bus service.

4.7.2.5 TRANSPORTATION

The Upper Reservoir villages in Taviang Sub-District are about 60km by road to the Xaysomboon provincial headquarters at Ban Huaxang (Cheung Cha) and about 150km to Phonsavan, the Xiengkhouang provincial headquarters along the old Highway 4. These roads presently are in bad condition and require four wheel drive vehicles during the dry season and are generally impassable during the wet season. There is no bridge across the Nam Ngiep River, and transport through Xaysomboon and Xienghouang headquarters is further hampered by serious security problems. To Muang Hom district headquarters at B. Thathom, the distance is about 30km. In the wet season, access is very difficult, so that even with a four-wheel drive vehicle it is almost impossible to get through.

In the Lower Reservoir, outside access is somewhat better. To get to the Hom District Headquarters at B. Hom from B. Namyouk and B. Sopyouk the road is relatively better, and four wheel drive vehicles can travel all year long.

By seven to nine years, when the NNHP resettlement might be expected to take place, National Route 4 should have been upgraded and made part of National Road 1, with some 30km of 7m wide bituminous highway with 1m shoulders within the planned Upper Reservoir Area. National Road 1 will be a part of the 1,062 'backbone' highway from Yot Ou at the China border to the Cambodian border. The road to the Xaysomboon provincial headquarters should have been upgraded as part of the planned national 'Transverse Roads' network, as National Road No. 5, a 110 km highway from Houaymo at the junction with National Road 13 to the Vietnamese border.[103] These developments are highly likely, as upgrading the national highway system is receiving the greatest amount of foreign aid, and the ADB is already involved in the upgrade of National Route 4, with AusAid providing assistance in putting bridges into place.

Other Roads at the Provincial and District level are likely also to be in place in the Lower Reservoir. Transportation office maps indicate a North to South Road through B. Nakong to the junction with National Road No. 5, with about 40 km inside the proposed reservoir from B. Sopyouk northward. Taviang Sub-District authorities as in the planning stage have also mentioned this road. A transverse Road 94, from Muang Hom to the junction with National Road No. 1, with 20km inside the proposed Reservoir

[103] Lao PDR. Ministry of Communication Transport Post and Construction. *Decision on Numbering and Referencing System of the Road Network and the Numbering of National Roads.* No. 1311. June 2, 1997.

Area also appears to be in the planning stage. [104]

There is currently no public transportation in the Reservoir Area, so most villagers move around by bicycle or foot, along the Nam Ngiep River by boat, or by catching rides in trucks or other vehicles passing through. There are a total of 229 boats in the Reservoir Area, including 18 motorized boats. There are 77 bicycles, three trucks (in the Upper Reservoir) and 6 small rice field tractors, which can also serve as transportation vehicles.

STS Consultant's socioeconomic report did not mention any bridges in the Reservoir Area, although a bridge has been sited from the helicopter reconnaissance of the Reservoir Area in Nam Youk. More information will need to be collected concerning this and any other bridges that may be in the area.

Table 4.9 Transportation Vehicles in Reservoir Area

VILLAGE NAME	BOATS (W/O MOTOR)	MOTOR BOAT	TRACTORS	TRUCKS	BICYCLE
UPPER RESERVOIR					
Phonehom	0	0	0	0	0
NamLong	0	0	0	0	0
Xiengkhong	40	0	0	0	0
Nakang	0	0	0	0	0
Nahong	1	0	0	0	10
Viengthong	8	0	0	0	0
Naxay	16	0	0	0	0
Naxong	30	0	0	2	15
Phonyeng	30	0	0	0	0
Dong	8	3	4	1	17
Hatsamkhone	13	3	0	0	0
Phiangta	0	0	0	0	15
Pou	12	6	1	0	0
Upper Reservoir Subtotal :	*158*	*12*	*5*	*3*	*57*
LOWER RESERVOIR					
Houaypamon	8	5	0	0	2
Namyouk	0	0	0	0	0
Sopphouh	5	1	0	0	0
Sopyouk	40	0	1	0	18
Lower Reservoir Subtotal:	*53*	*6*	*1*	*0*	*20*
TOTAL	211	18	6	3	77

4.7.2.6 RURAL ELECTRIFICATION AND TRANSMISSION LINES

According to the STS Consultant's socioeconomic survey, there are currently some 49 private generators in the Upper Reservoir Area with an average capacity of 400W. These are small units situated in the Nam Ngiep River itself, with long shafts and propellers powering them through the river current. Lines are run to individual houses supported by bamboo poles. Only B. Phonyeng has a small 10kW public generator.

[104] ADB TA 2889-LAO, Rural Access Roads Project.

Table 4.10 Generators in Reservoir Area

VILLAGE	PRIVATE GENERATORS	PUBLIC GENERATORS
UPPER RESERVOIR		
Phonehom	2	0
Xiengkhong	3	0
Nakang	0	0
Namlong	0	0
Naxay	0	0
Nahong	3	0
Viengthong	3	0
Phonyeng	10	1
Naxong	12	0
Dong	10	0
Hatsamkhone	0	0
Phiangta	6	0
Pou	0	0
Subtotal :	49	1
LOWER RESERVOIR		
Houaypamon	0	0
Nam Youk	2	0
Sopphouh	0	0
Sop Youk	2	0
Subtotal :	4	0
TOTAL	53	1

By 2001, the Upper Reservoir Area will be accessed by an ADB financed 115kV Transmission Line[105] 158km from the Nam Leuk Hydropower Station that through the Taviang Sub District to Phonsavan in Xieng Khouang Province. There is no corresponding rural electrification planned for the Lower Reservoir villages.

Use of electricity at present in the Reservoir Area is understandably little. The STS Consultant's survey would indicate that electricity is primarily used for lighting. There are also a couple of TV and video combinations and a very large number of radios (115), though these are likely to be battery run.

Table 4.11 Electricity Using Assets in Reservoir Area

VILLAGE NAME	LIGHT BULB	T V/VIDEO	RADIO
UPPER RESERVOIR			
Phonehom	2	0	6
Namlong	0	0	2
Xiengkhong	6	1	14
Nakang	0	0	0
Nahong	0	0	13
Viengthong	6	0	7
Naxay	2	0	1
Naxong	13	0	11
Phonyeng	4	0	5
Dong	4	0	12
Hatsakhone	1	0	6
Phiangta	2	0	6
Pou	0	0	11
Subtotal :	40	1	94
LOWER RESERVOIR			
Houaypamon	0	0	1
Nam Youk	3	0	13
Sopphouh	0	0	2
Sop Youk	1	1	5
Subtotal :	4	1	21
Total	44	2	115

[105] Power Transmission and Distribution Project (Loan No. 1558-LAO (SF). The line will cost $50,000 per kilometer, and approximately 60 km of rural electrification lines will be within the reservoir area servicing the Upper Reservoir villages.

4.7.2.7 IRRIGATION

STS Consultants have provided some on the design of the irrigation systems in the Reservoir Area as well as data from the village level survey on existing hectarage actually under irrigation, in both wet and dry seasons. There appear to be 5 officially sponsored irrigation schemes in the Reservoir Area, 4 of them in the proposed Upper Reservoir. Their design totals some 206ha in the wet season and 27ha in the dry season in the Upper Reservoir, and another 120 and 4ha respectively in the Lower Reservoir. Their actual hectarage appears to be about 107ha, just about half of their purported design capability in the Upper Reservoir. In the Lower Reservoir, the actual wet season hectarage appears to be about 17% of the design. In both Upper and Lower Reservoir Areas, the design and actual dry season hectarage is about the same.

In addition to the 4 officially sponsored irrigation schemes in the Upper Reservoir (in B. Nahong, Naxong, Dong, and Phiangta), there are 3 other villages reported as having irrigation in B. Phonehom, Xiengkhong, and Nakang, so that there are 7 villages with irrigation in the Upper Reservoir and one in the Lower Reservoir for a total of 8 villages out of the total of 17 villages. 4 more villages in the Upper Reservoir are due for completion of official irrigation schemes, B. Naxay, Phonyeng in 1999 and B. Hatsamkhone and Pou in 2000. They will add, at an estimated cost of 204 million kip, a total, according to their design, of 75.4ha of wet season and 36.4ha of dry season irrigation.

Nearly 12ha of government sponsored paddy land development (1996) are at B. Phiangta on the Nam Ngiep's Left Bank, with a one kilometer canal bringing water from the Nam Toun tributary. B. Naxong on the Nam Ngiep's Left Bank has a design capability of nearly 40ha of irrigation from the Nam Xong tributary, though actual figures indicate only about half of this.

Most of the existing and planned irrigation development appears to be on the Nam Ngiep's Right Bank. Although B. Dong itself is on the Left Bank, it has about 75 of a nearly 160-hectare irrigation development on the Nam Pang tributary, only about 45ha of which appears to be in actual use during the wet season.[106]

B. Nahong and Phonehom are along a road leading diagonally away from the Nam Ngiep's Right Bank. B. Nahong has about 82ha of the Nam Pang irrigation scheme, which was built in 1992, though only about 32ha appear to be actually irrigated during the wet season.

[106] Some 130 ha in the wet season and 20 ha in the dry season.

Table 4.12 IRRIGATION ASSETS IN RESERVOIR AREA

	DESIGN			ACTUAL		PLANNED			
	Irrigation Wet Season	Irrigation Dry Season	Tributary Source	Irrigation Wet Season	Irrigation Dry Season	Plan to Build Year	Irrigation Wet Season	Irrigation Dry Season	Cost in Millions Kip
UPPER RESERVOIR									
Phonehom	0.0	0.0		2.2	2.2		0.0	0.0	0.0
Namlong	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Xiengkhong	0.0	0.0		16.7	6.1		0.0	0.0	0.0
Nakang	0.0	0.0		5.0	5.0		0.0	0.0	0.0
Nahong	81.9	18.4	Nam Pang	31.9	18.3		0.0	0.0	0.0
Viengthong	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Naxay	0.0	0.0		0.0	0.0	1999	10.4	6.4	48
Naxong	38.4	7.0	Nam Xong	18.0	7.0		0.0	0.0	0.0
Phonyeng	0.0	0.0		0.0	0.0	1999	30	18	60
Dong	75.0	2.0	Nam Pang	45.0	5.0		0.0	0.0	0.0
Hatsamkhone	0.0	0.0		0.0	0.0	2000	15	0.0	48
Phiangta	11.6	0.0	Nam Toun	11.6	0.0		0.0	0.0	0.0
Pou	0.0	0.0		0.0	0.0	2000	20	12	48
Subtotal:	206.9	27.4		130.4	43.6		75.4	36.4	204
LOWER RESERVOIR									
Houaypamon	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Nam Youk	120	4	Huay Thon	20.0	4.0		0.0	0.0	0.0
Sopphouh	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Sop Youk	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Subtotal:	120.0	4.0		20.0	4.0		0.0	0.0	0.0
TOTAL	326.9	27.8		150.4	47.6		75.4	36.4	204

4.7.2.8 OTHER

Other productive assets in the Reservoir Area include 22 small diesel rice mills and 46 household foot rice mills, as well as 204 plows and 208 harrows. Although STS Consultants haven't mentioned it in their socioeconomic report, there is a commercial sawmill in B. Sop Youk observed during village-level public consultations there, about which more information will need to be collected.

Table 4.13 Select Productive Assets in Reservoir Area

	Rice mill	Foot mill	Plough	Harrow
UPPER RESERVOIR				
Phonehom	0	5	4	5
Namlong	0	1	0	0
Xiengkhong	2	2	18	22
Nakang	0	1	0	0
Nahong	4	2	25	15
Viengthong	3	5	4	4
Naxay	1	0	3	3
Naxong	2	5	27	26
Phonyeng	1	2	5	5
Dong	1	4	31	34
Hatsamkhone	1	3	4	4
Phiangta	0	5	21	24
Pou	1	6	27	28
Subtotal:	16	41	169	170
LOWER RESERVOIR				
Houaypamon	0	0	0	0
Nam Youk	4	1	19	18
Sopphouh	0	2	3	3
Sop Youk	2	2	13	17
Subtotal:	6	5	35	38
Total	22	46	204	208

4.8 LIVELIHOOD ACTIVITIES – AGRICULTURE, LIVESTOCK, FISHERIES, FOREST

In the Lao PDR as a whole, 85% of the population are subsistence farmers who grow rice as their staple crop.[107] In a recent survey of the Nam Ngum watershed, 98% of the population reported dependence on rice cultivation for their subsistence. Some 63% reported their main occupation as irrigated rice farming, 23 % combined lowland with upland rice cultivation, and 11% reported their main occupation as shifting upland rice exclusively. The survey reported that "Access to irrigated paddy land is perhaps the principal land use concern of all farmers in the watershed"[108]

Other surveys have reported a similar emphasis, both economically and culturally, on rice cultivation. Since maize and cassava are also usually available and will be consumed if procuring additional rice is not possible, the issue is not purely one of a lack of food, but: "Since rice synonymous with food (*khao* means both food and rice) all other resources are utilized in order to acquire enough before anything else is purchased. There is no substitute for rice. It is absolutely essential to understand this point if development in the region is to benefit the villagers directly."[109] Another study finds that ".... Wealth is to have paddy enough to be respected and to be able to feed a family" while another that:[110]

Cultivation of fields, upland swiddens (hai) or permanent fields on plain (na) synonymous with rice cultivation. Apart from little cotton here and there, unthinkable that fields should be used for any other crop than rice. Rice invariably of glutinous ("sticky") kind, of which large number of local varieties grown. Main distinction between short upland rice and sub-varieties chosen for varying growth cycle and hardiness under different conditions. It is generally recognized that paddy rice is 'better' for food (whiter, tastier, and stickier), while upland rice makes better wine (lao hai).

In this respect, the Lao Soung (Hmong) in the Reservoir Area are similar to their Lao Loum neighbors in resource use culture and subsistence economy. The population in the Reservoir Area in general subsists basically on lowland rice as a staple crop supplemented by swidden cultivation of upland rice, with forest products as a very important asset, both for nutritional and housing materials. Animal husbandry (buffalo, cattle, and pigs) as well as fishing and gardening are similar among all of the Reservoir Area groups. Little is known about opium poppy cultivation, though it is expected to be of an extremely modest scale for domestic use. The reported occupational status of the surveyed households in the Reservoir Area

[107] Trankell 1999, p. 45. Trankell notes for communities near to National Highway 13 in the downstream area from the NNHP Dam, however: ".... there is at the same time a growing awareness that maybe this is not enough. Among the better-off villagers themselves, there is a clear awareness of the importance of investment in other things than land and cattle. They realize that grazing for cattle will not be available much longer because of the capacity of the new technology to clear land formerly used for grazing, and they are consequently looking around for better investment of their surplus. Vehicles, such as trucks, passenger pick ups, rice mills, and threshing machines are among the favored objects." Ovesen 1995.

[108] English 1998, p. vii. Trankell 1999, p. 29 notes the "strong cultural preference for wet-rice cultivation" in the rural areas she studied.

[109] Sparkes, S. 1995. *Socio-Economic And Cultural Survey Of Selected Villages In The Nam Theun And Nam Hinboun Catchments.* Vientiane, Norplan Mimeo. 28 p.

[110] Ovesen 1993, p. 17.

indicates the dependency on subsistence rice cultivation, with virtually all those 15 years and above not attending school reporting rice farming as their main occupation:

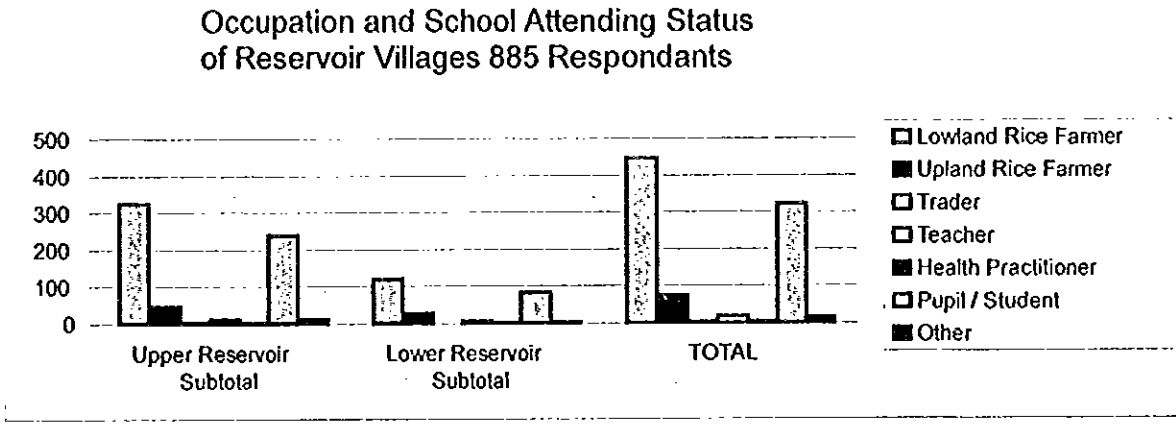

Figure 4.14 Occupation & School Attending Status of Reservoir Area Villages, of 885 Respondents

A relatively small percentage of the Reservoir Area land is cultivated with cassava, chilly, peanut, maize and sugar cane. Apart from rice cultivation, which is done in all the 17 villages, the STS Consultants reported that sugar cane, cassava and chilly seem to be expanding in "a relatively large number" of villages. Forest products comprise cardamom, rattan and bamboo shoots, out of which the collection of cardamom seems to be mostly practiced by Lao Soung and Lao Theung. STS Consultants observed that there appears to be "no market limitation for this type of product."

All the villages have vegetable gardens, except Ban Viengthong, and pasture exists in only 3 upland Hmong villages of the Lower Reservoir Area. Some 60% of forest in the Reservoir Area is village-managed, with only 2% of the total being conservation forest. Almost all the respondents are owners of the land under cultivation, with very few cases of land rental.

The following figure indicates the land use pattern in the Reservoir Area.

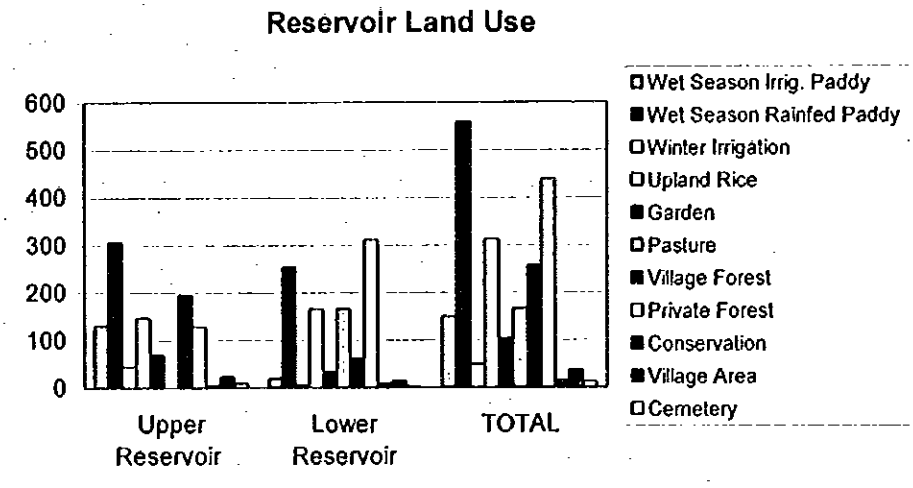

Figure 4.15 Reservoir Area Land Use

4.8.1 AGRICULTURE

Among the nearly 60% of the working-age (15 years and above) population that report rice cultivation as their main occupation, 86% report lowland rice as their main occupation and another 20% as their secondary occupation. As seen in the table below, some 80% of those reporting rice cultivation as their secondary occupation were primarily swidden upland cultivators, being generally the same households that report lowland rice cultivation as their main occupation.

In noting a strong cultural preference for wet-rice cultivation among lowlanders (here including the Reservoir Area villages, since they are along the Nam Ngiep River valley) in Laos, one anthropologist has theorized the integration of *hai*, or swidden, rice cultivation is a way of rationalizing labor throughout the year:[111]

> It should be noted that the (ethnic) Lao have traditionally restricted wet-rice cultivation to the flat plains along the river banks and, unlike for example the Tai Khao and the Tai Lue, they have never develcped wet-rice irrigation systems. Instead of expanding wet-rice cultivation in the hinterlands by means of terracing and sophisticated irrigation techniques, the Lao have resorted to rain-fed agriculture in areas that are not naturally flooded. The extensive practice of swidden cultivation among the lowland farmers thus makes it clear that the problems of swiddening are by no means restricted to the various highland populations, but is a much more widespread phenomenon.
>
> It is usually believed that pressure on existing paddy land is the main reason behind lowland swidden cultivation. But other circumstances also need to be taken into consideration, such as farmers' allocation of available labor. The traditional technique and use of draft animals for plowing puts a limit as to how much a household is able to cultivate in terms of *rais* and hectares of paddy fields during the rainy season. By combining different growth cycles of na and hai, farmers are able to extend their labor in rice cultivation for the production of a second rice crop from *hai*-cultivation and other upland fields used in shifting cultivation.[112]
>
> The lower productivity in *hai*-cultivation is generally recognized, and apart from being supported by available statistics, it is often stated by rice farmers as the main reason for their preference for *na* cultivation. The lower productivity seems to refer mainly to yield per land unit and yield in terms of labor input, while yield in terms of seed ratio makes the lower productivity acceptable and even attractive to farmers, provided surplus labor is available. Earlier reports state that as much as 30% of the total staple rice produced in Bolikhamsay Province is harvested from *hai*-cultivation, which is a clear indication of the importance of *hai*-cultivation in terms of farmers' food security.

[111] Trankell 1999, p. 29. Ovesen 1993 makes a similar observation, seeing lack of development of irrigation as an outcome of the historical lack of security for rural populations in Laos.
[112] Ovesen 1993.

Table 4.14 Main and Secondary Occupations of Lowland (*Na*) and Upland (*Hai*) Rice Cultivators in Reservoir

	MAIN OCCUPATION					SECONDARY OCCUPATION				
	LOWLAND RICE		UPLAND RICE		TOTAL	LOWLAND RICE		UPLAND RICE		TOTAL
	Persons	Percent	Persons	Percent	Persons	Persons	Percent	Persons	Percent	Persons
UPPER RESERVOIR										
Phonehom	33	85%	6	15%	39	7	39%	11	61%	18
Xiengkhong	30	100%	0	0%	30	7	70%	3	30%	10
Nakang	10	83%	2	17%	12	0	0%	14	100%	14
Namlong	0	0%	11	100%	11	1	13%	7	87%	8
Naxay	8	67%	4	33%	12	3	12%	22	88%	25
Nahong	38	93%	3	7%	41	2	14%	12	86%	14
Viengthong	22	76%	7	24%	29	1	50%	1	50%	2
Phonyeng	18	90%	2	10%	20	8	44%	10	56%	18
Naxong	31	94%	2	6%	33	2	20%	8	80%	10
Dong	57	100%	0	0%	57	0	0%	30	100%	30
Hatsakhone	15	88%	2	12%	17	3	50%	3	50%	6
Phiangta	35	100%	0	0%	35	1	4%	24	96%	25
Pou	29	76%	9	24%	38	2	13%	13	87%	15
Subtotal:	326	87%	48	13%	374	37	19%	158	81%	195
LOWER RESERVOIR										
Houaypamon	7	44%	9	56%	16	0	0%	7	100%	7
Nam Youk	66	89%	8	11%	74	11	38%	18	62%	29
Sopphouh	7	70%	3	30%	10	1	100%	0	0%	1
Sop Youk	40	85%	7	15%	47	1	5%	21	95%	22
Subtotal:	120	82%	27	18%	147	13	22%	46	78%	59
TOTAL	**446**	**86%**	**75**	**14%**	**521**	**50**	**20%**	**204**	**80%**	**254**

Table 4.15 Land Holdings (Ha) in Reservoir Area, By Ethnicity, Yrs of HH, Settlement, Total & Per Household

	Households	Ethnicity HH			% HHs Yrs Established					Settled		AGRICULTURAL LAND HOLDING											
		Lao Loum	Lao Thoung	Lao Soung	0-5 yrs %	6-10yrs %	11-15yrs %	16-20yrs %	20yrs +	Official	Non-Official	Irrigation Wet Season	Irrigation Wet Season *Per HH*	Rainfed Wet Season	Rainfed Wet Season *Per HH*	Total Wet Season Lowland Rice	Total Wet Season Lowland Rice *Per HH*	Upland Rice Area	Upland Rice Area *Per HH*	Total Land Holdings*	Total Land Holdings *Per HH*	Irrigation Dry Season	Irrigation Dry Season *Per HH*
UPPER RESERVOIR																							
Phonehom	67	0	67	0	77	8	8	0	8	69	31	2.2	0.03	27.6	0.41	29.8	0.44	15.0	0.22	44.8	0.67	2.2	0.03
Namlong	17	13	4	0	80	0	0	0	20	100	0	0.0	0.00	5.0	0.29	5.0	0.29	16.0	0.94	21.0	1.23	0.0	0.00
Xiengkhong	39	34	5	0	13	0	25	37	25	13	87	16.7	0.43	10.0	0.26	26.7	0.68	8.5	0.22	35.2	0.90	6.1	0.16
Nakang	25	10	15	0	80	0	20	0	0	0	100	5.0	0.20	7.0	0.28	12.0	0.48	22.0	0.88	34.0	1.36	5.0	0.20
Nahong	75	15	60	0	47	7	13	27	7	47	53	31.9	0.43	50.0	0.67	81.9	1.09	19.3	0.25	101.2	1.35	18.3	0.24
Viengthong	46	45	1	0	90	10	0	0	0	60	40	0.0	0.00	25.0	0.54	25.0	0.54	18.0	0.39	43.0	0.93	0.0	0.00
Naxay	22	1	21	0	80	0	20	0	0	20	80	0.0	0.00	23.3	1.06	23.3	1.06	9.7	0.44	33.0	1.50	0.0	0.00
Naxong	81	68	13	0	44	13	6	6	31	25	75	18.0	0.22	20.4	0.25	38.4	0.47	7.0	0.09	45.4	0.56	7.0	0.09
Phonyeng	63	32	0	31	83	8	8	0	0	58	42	0.0	0.00	10.9	0.17	10.9	0.17	0.0	0.00	10.9	0.17	0.0	0.00
Dong	82	82	0	0	38	0	19	25	19	25	75	45.0	0.55	40.0	0.49	85.0	1.04	4.0	0.05	89.0	1.08	5.0	0.06
Hatsamkhone	27	27	0	0	100	0	0	0	0	100	0	0.0	0.00	14.1	0.52	14.1	0.52	6.0	0.22	20.1	0.74	0.0	0.00
Phiangta	49	47	2	0	60	10	0	10	20	40	60	11.6	0.24	27.3	0.56	38.9	0.79	6.9	0.14	45.8	0.93	0.0	0.00
Pou	66	52	0	14	33	0	8	17	42	25	75	0.0	0.00	44.0	0.67	44.0	0.67	13.5	0.20	57.5	0.87	0.0	0.00
Subtotal:	659	426	188	45	59	5	10	11	15	43	57	130.4	0.20	304.6	0.46	435.0	0.66	145.9	0.22	580.9	0.88	43.6	0.07
LOWER RESERVOIR																							
Houaypamon	18	0	0	18	100	0	0	0	0	50	50	0.0	0.00	18.0	1.00	18.0	1.00	17.0	0.94	35.0	1.94	0.0	0.00
Nam Youk	86	0	0	86	25	10	20	40	5	25	75	20.0	0.23	100.0	1.16	120.0	1.40	14.7	0.17	134.7	1.57	0.0	0.00
Sopphouh	23	0	0	23	50	17	0	17	17	33	67	0.0	0.00	16.1	0.70	16.1	0.70	8.7	0.38	24.8	1.07	0.0	0.00
Sop Youk	67	1		66	31	6	19	13	31	63	38	0.0	0.00	120.0	1.79	120.0	1.79	125.0	1.87	245	3.66	4.0	0.06
Subtotal:	194	1	0	193	40	9	15	24	15	41	59	20.0	0.10	254.1	1.31	274.1	1.41	165.4	0.85	439.5	2.27	4.0	0.02
TOTAL	853	427	188	238	53	6	11	15	15			150.4	0.18	558.7	0.66	709.1	0.83	312.15	0.37	1,020.4	1.20	47.6	0.06

*Wet Season Lowland Rice (Irrigated and Rainfed) and Upland Rice

Lowland (*na*) rice in the Reservoir Area households is just under 710ha, out of which about 150ha is irrigated in the wet season and just under 50ha irrigated in the dry season. Upland rice (*hai*) is just less than 31ha. Total agricultural landholdings during the wet season in the Reservoir Area are approximately 1,020 ha.

The average landholding for families in the Reservoir Area, is 0.18ha per household for irrigated lowland rice and 0.65ha for rainfed lowland rice, which combined is 0.83ha of *na* per household during the wet season. During the dry season, there is 0.06 ha of irrigated lowland rice per household in the Reservoir Area. Upland rice is 0.37ha per household, and all together, wet season agricultural holdings are 1.20 ha per household.

Some 8 villages out of 17 have irrigation, seven of these in the Upper Reservoir Area, about half the villages. STS Consultants reports that, with an average of 3 months rice shortage, villagers practice slash and burn (*hai*) cultivation in the uplands to make up the difference. Upland rice is equivalent to about 30% of the total rice area in the Reservoir Area. Another strategy in rural Laos to making up rice shortages is to sell livestock and forest products or to seek employment outside of agriculture.[113]

Four more villages in the Upper Reservoir are due for completion of official irrigation schemes, B. Naxay, Phonyeng in 1999 and B. Hatsamkhone and Pou in 2000. They will add, at an estimated cost of 204 million kip, a total, according to their design, of 75.4 hectares of wet season and 36.4 hectares of dry season irrigation.

In other areas of rural Laos, households are reported to have between 0.5 and 2ha of paddy, including rainfed and (if existing) of irrigated lands.[114] In the Reservoir Area, the smallest average household holdings are 0.17 at Lao Loum and Lao Soung settlement of B. Phonyeng, where most (83%) of households surveyed are less than 5 years old, and about 60% were 'officially' resettled. However, a new irrigation scheme is due to be completed in B. Phonyeng in 1999 adding 30ha of irrigated *na* lands.

The largest holdings for total lowland paddy cultivation are in B. Sop Youk and B. Nam Youk in the Lower Reservoir Area, at 1.79 and 1.40ha respectively. Only B. Nam Youk in the Lower Reservoir Area, however, reports irrigated *na* holdings, some 0.23ha per household, which is not out of line with holdings in the Upper Reservoir. B. Phonehom appears to have the smallest per household holdings of irrigated land, at only 0.03ha per household. There do not appear to be any plans, as there are at B. Phonyeng, to expand this.

In the Upper Reservoir B. Nahong, Naxay, and Dong have the largest overall lowland rice holdings, at 1.09, 1.06 and 1.04ha per household respectively. B. Dong has the largest holdings of irrigated rice, at 0.55ha per household, followed by Xienghong and Nahong at 43ha per household each. B. Dong and B. Nahong appear to be the best

[113] Ovesen 1995, p. 67. Sparkes 1995: "Most harvests fall short of needs and the difference is made up selling livestock, forest products, working for cash. Since rice synonymous with food (*khao* means both food and rice) all other resources are utilized in order to acquire enough before anything else is purchased. There is no substitute for rice. It is absolutely essential to understand this point if development in the region is to benefit the villagers directly." Ovesen 1993 notes that in years where rice damage is severe, such as in flood years, villagers buy rice with money made by selling fish or livestock.

endowed villages, from the standpoint of overall as well as irrigated lowland riceholdings, in the Reservoir Area.

The largely Lao Loum Upper Reservoir villages have about twice the per household hectarage of irrigated lowland rice as the Lao Soung Lower Reservoir villages, 0.20ha per household compared to 0.10ha. On the other hand, there is a greater reliance on upland rice in the Lower Reservoir villages. Upper Reservoir holdings are 0.22ha per household, whereas the Lower Reservoir has 0.85ha.

Ovesen's warning that people tend to report officially cultivation of a smaller area than they actually have at their disposal should be kept in mind. This is so because taxes are levied according to area reported under cultivation – and villagers in any case may not have the means to make very precise land measurement. Areas under *hai* cultivation are demonstrably under-reported, since the authorities frown upon swiddening.[115]

From the Table 4.15 above, there appears to be a general pattern for irrigated rice to be in villages having more established households (more than 15 years) and for the villages with a high percentage of households having only been established 0-5 years to have no irrigated rice as yet. Official versus unofficial settlement does not appear to be a factor, though this requires examination at the village level to determine. Another pattern observed in the field and elsewhere in the Lao PDR is for highland ethnic hamlets within these villages, such as the Lao Soung community within B. Pou, an older better established Lao Loum 'administrative village,' to as yet not have irrigated lands. These very general patterns will need, however, to be confirmed in a sociocultural survey of the Reservoir Area villages that examines the individual histories and socioeconomic patterns of the villages.

Although Thathom District as a whole has been described as a rice deficit area,[116] STS Consultants found that some 107 households indicated that there is a rice surplus every year and another 29 households, for a total of 136 out of 179 households surveyed, have surplus in some years.

Only 42 households in the Reservoir Area have a rice deficit, which varies from 1 to 7 months. This compares with the findings for the Nam Ngum watershed region, which found that four out of every ten households had rice deficits of 4 or more months, usually made up with supplementary maize and cassava and purchasing rice with household earned income, from livestock, forestry and work outside agriculture.[117]

Rice sales accounted for 24% of household income overall in the Reservoir Area but food expenditures almost matched this at 20%. Income earnings from livestock were 40.5% of total income, the highest of any category, followed by sales of fish, at 30.0%. Comparison with income and expenditures for the Central Xaysomboon Special Zone shows a similar ratio between selling rice and buying food and also illustrates the

[114] Sparkes 1995.
[115] Ovesen 1993, p. 13.
[116] Handicap International. 1997c. *Province and District Report – Saysomboune Special Zone: National Survey on the Socio-Economic Impact of UXO in Lao PDR.* Report prepared for the Lao National UXO Programme (UXO Lao), Ministry of Labour and Social Welfare. Vientiane: UXO LAO.
[117] English 1998.

importance of livestock to the household income.

Table 4.16 Comparison of Average Household Income and Expenditure in Reservoir Area

INCOME SOURCE	AVERAGE INCOME (KIP)	% ALL INCOME
Rice	320,554	24.0%
Cereals	26,133	2.0%
Vegetables	6,010	0.5%
Fruit	28,779	2.0%
Forestry Products	14,380	1.0%
Livestock	553,299	40.5%
Fishing	413,000	30.0%
TOTAL INCOME	1,362,155	100.0%
EXPENDITURES		
Food	162,428	20.0%
Education	110,732	14.0%
Transport	42,413	5.0%
Farm Inputs	30,119	4.0%
Medical expenses	151,490	19.0%
Hire of Labor	71,018	9.0%
Fuel	67,549	8.0%
Travel	79,175	10.0%
Ceremonies	92,803	12.0%
TOTAL EXPENDITURES	808,175	100.0%

Table 4.17 Comparison of Average HH Income and Expenditure in Xaysomboon

INCOME SOURCE	AVERAGE INCOME	% ALL INCOME
Rice	192,696	20.0%
Swidden Crops	48,063	5.0%
Fruit/Other Trees	15,706	2.0%
Vegetables	26,938	3.0%
Livestock	222,656	23.0%
Timber	50,625	5.0%
NTFPs	39,688	4.0%
Fishing	74,063	8.0%
Hunting	58,938	6.0%
Employment	249,188	25.0%
TOTAL	978,831	100.0%
EXPENDITURES		
Food	129,688	36.0%
Clothes	52,500	14.0%
HH Necessities	28,688	8.0%
Medicine	36,250	10.0%
Schooling	24,063	7.0%
Social Obligations	16,063	4.0%
Ag inputs/Labor	54,938	15.0%
Gasoline/Kerosene	12,838	4.0%
Other	8,125	2.0%
TOTAL	363,150	100.0%
Credit Taken	130,500	
Savings	189,813	
BALANCE	674,994	

The STS Consultants yields reported for the Reservoir Area of 3.6t /ha for lowland paddy and 2.2t/ha for upland rice appear to be high compared with other rural areas in the Lao PDR. This compares, for instance, with a national average yield of paddy land 2.5t/ha (non-irrigated paddy) and for swidden fields of 1.37t/ha.[118] A recent Nam Ngum watershed survey found paddy yields ranging from 1.7t/ha to 2.42t/ha, with a mean yield of 2.3t/ha5 and upland rice from 0.56t/ha to 1.45, with a mean of 0.83t/ha.[119]

[118] Ovesen 1995, pp. 56-57.
[119] BCEOM 1999, p. iii.

On the other hand, Trankell's survey of yields along Highway 13, downstream from the proposed NNHP Dam found similar yields for best quality lands close to rivers and even for good quality upland fields.[120] Relatively high yields in the Reservoir Area may be credible, given that almost all the villages have fields along the Nam Ngiep River banks.

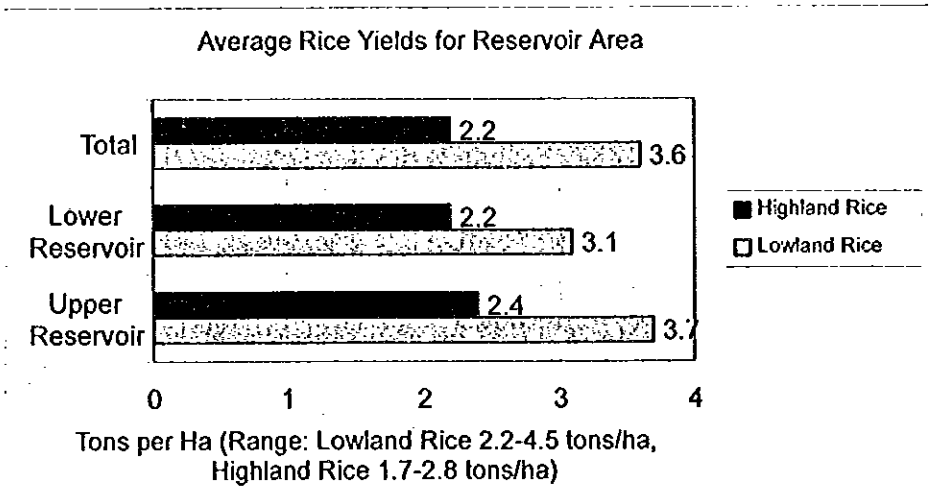

Figure 4.16 Reported Rice Surplus and Deficits in Reservoir Area, 179 HHs.

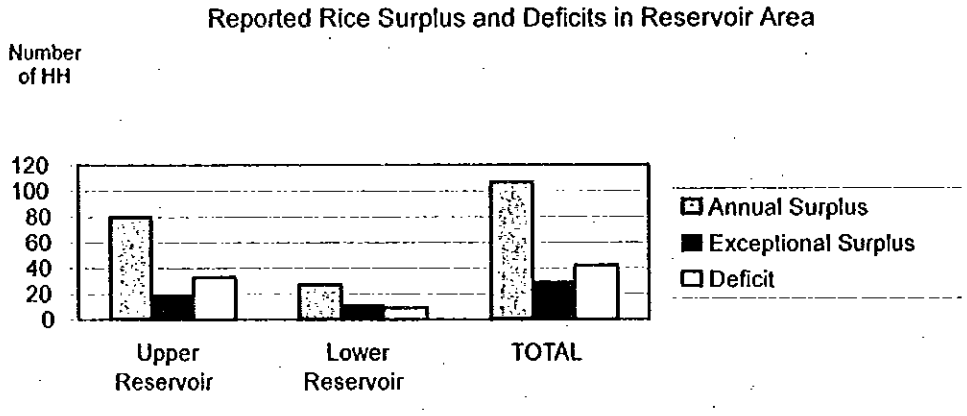

Figure 4.17 Reported (Unhusked) Rice Yields in Reservoir Area

Table 4.18 Yield Data for Ban Sangsi, 'A Riverside Village,' Bolikhamsay Province[121]

TYPE OF LAND	DESCRIPTION	ESTIMATED AVERAGE YIELD
Na Lum	Lowland fields, best quality close to the river	3.5-4 tons per hectare
Na Lum	Lowland fields, second quality, sandy soil	2.5-3.5 tons per hectare
Na Phon, Na Khok	Upland fields of good quality	2 tons per hectare
Na dom, Na Khok	Newly cleared upland fields	<1.5 tons per hectare

To determine the actual situation in the Reservoir Area will require close annual monitoring for a number of years during the preparation of the final RAP.

[120] Trankell 1999, p. 48.
[121] Trankell 1999, p. 48.

4.8.1.1 PADDY (*NA*) CULTIVATION ANNUAL CYCLE

Although not the only form of cultivation, paddy *(Na)* is the dominant mode of cultivation in the Reservoir Area. Typically in rural Laos, villagers work for only about 6 months cultivating paddy. The cycle starts with preparation of seedbeds for seedlings May or June. Plowing, using buffaloes as draft animals is done when the soil is sufficiently moist, after which fields are harrowed, preferably twice, to remove weeds uprooted by the plowing. Seedlings are transplanted when about one month old, usually late June or early July. , Weeding and making repairs can be a labor-intensive period during the rains, and harvest is usually in November-December depending on sort of rice grown. Paddy fields are usually located in immediate vicinity of a village, so that transportation is not as labor consuming as in swidden agriculture, where *'hai'* fields are usually several hours walk from the village.[122]

Properly managed paddy is not only superior in productivity per area unit to swidden but also preferable in terms of labor expenditure. The average labor per adult is reported to be only 97 days per year, compared to 111 days for swidden – not including transportation time and energy between the village and fields, which is much more in swidden agriculture.[123] In lowland rice agriculture, villagers are free to do other things for 6 months of year, to work as laborers, improve their houses, plant gardens, or fish.

Sparkes reports on the 'quite different experience' in visiting villages dependent primarily on *na* and *hai* cultivation in February and March. The hai villages are abandoned during day, with only the elderly, nursing mothers and children seen. In contrast, the *Na* villages have people about with lots of spare time to make repairs or to engage in other economic activities. *Hai* cultivation, he concludes, requires more time and limits the chances for economic advancement and diversity.[124]

The *na* cultivation annual cycle will be important to take into account in resettlement planning. One of the findings of a review of resettlement experience in the Lao PDR found that, "Relocation during the Dry Season was preferred everywhere, since relocations were often through difficult terrain and for most this is the slack period of the agricultural year."[125]

Trankell records that among the Lao Loum *na* landholdings are recorded under name of the male household head, even where they are recognized within Lao Loum culture as female property. Only in some of the cases where the household-head was a women (typically a widow) were landholdings registered in her own name.[126]

Land is officially classified into two categories, lowland and upland, and unofficially into three, taking into account the importance of swiddening in the informal economy. The locally recognized categories recorded by Trankell in Bolikhamsay Province are:[127]

- *Na tham*, locally referred to as the na hom hoej, the lowland fields for paddy

[122] Ovesen 1993. Ovesen 1995. Sparkes 1995.
[123] Ovesen 1993.
[124] Sparkes 1995.
[125] Goudineau 1997, p. 25.
[126] Trankell 1999, p. 39
[127] Trankell 1999, pp. 39-40.

cultivation.

- *Khaw pii*, the seasonal irrigated rice with a long growth cycle, is planted to a limited extent on these fields at the bottom of valleys. This rice is planted after the other kinds of rice and it is also harvested after the other rice, and after the soil has dried up enough to allow cutting. Trankell describes the number of traditional and local varieties still cultivated as 'remarkable.' The following traditional varieties of *khao pii* were mentioned: *phan nam, thib nam* and *man pet*, along with a number of modern varieties seen in Northern Thailand, such as *khao luang* and *san phutong*, as well as high-yielding hybrids 'K.Kh 6' and K.Kh.16'.

- *Khaw khang*, refers to the early varieties of wet rice planted on the lowest parts of slopes.

- *Na khoo*, upland fields, are located on the slopes of the hills and are progressively transformed into terraces. These fields are planted with khaw dok, which refers to the upland varieties of rice of fast growing rice usually requiring 3 months of growth; these are usually planted at the very beginning of the season.

- *Na hai*, swiddens are used for rice cultivation with the use of a dibble stick. In swiddens there is a practice of intercropping rice, maize, taro and vegetables such as cucumber, pumpkin, and longbeans. The fields are left after two years and presently rotated in a five year cycle (in the village Trankell describes, downstream from the proposed NNHP dam site).

4.8.1.2 SWIDDEN (*HAI*) CULTIVATION ANNUAL CYCLE

Typically in the Lao PDR, *hai* cultivation cycle starts early mid-March with the felling of trees and clearing of undergrowth. It is said to take about 3 weeks of very hard work, with the heaviest tasks undertaken by men. After the clearing, cut vegetation is allowed to dry for about 6 weeks which men consider free time. Burning goes on for some days and when the fires have died out, the field are cleared and prepared for sowing. These preparations take about a week, after which about 10 days is spent on sowing, often completed by the end of May. Weeding demands considerable labor by both men and (especially) women; villagers have reckoned that weeding takes up total of 3 weeks of full time work for all adults. Harvest is usually in October.[128]

Average productivity *hai* fields in Bolikhamsay Province has been calculated at about 1.5t unhusked rice per ha, but productivity varies considerably according to the length of previous fallow period(s) as well as with steepness of slopes and persistence of kinds of weeks growing in field (and diligence of farmer). Villagers calculate productivity in terms of the ratio between the amount of seed sown and the amount of harvest gained, which may vary from 6.67 for the poorest result to 40.0 for the best.[129]

The label 'swidden cultivation' in the Lao PDR covers wide variety of cultivation systems where 'variations in patterns of land use are associated with variations in

[128] Ovesen 1993.
[129] Ovesen 1993.

physical and social environment, population density, major crop plants, and balance between subsistence and cash operations, as well as cultural traditions." Three different systems of swidden cultivation may be distinguished, the:[130]

- *Syst em of Short Cultivation and Short Fallow* mainly resorted to by Northern Taï. Essentially as a way of preparing new land for eventual paddy fields and it is what in Laos is described as lowlanders' 'encroachment' or 'colonization' of forest areas.

- *Syst em of Short Cultivation and Long Fallow*, characteristic of the Karen in Northern Thailand and the Lao Theung in Southern Laos. Given absence of serious population pressure, this is the closest one can come to a system of sustainable swidden cultivation.

- *Syst em of Long Cultivation (i.e., Up To Five Years) and Very Long Fallow (i.e. In Practice Abandonment of Exhausted Plots).* This system is typical of Hmong and other hill tribes in N. Thailand and Laos who grow opium as a cash crop on high altitudes.

Ovesen has observed that the system in the Xaysomboon Special Zone does not fit this neat scheme. Where practiced by the Hmong, it is not 'typically Hmong' because climate is, compared with areas to the north, is less suitable for opium cultivation.

The Hmong are conventionally portrayed as swidden agriculturalists, and their practice of swidden cultivation is generally recognized as relatively destructive for the environment. Sparkes has noted that both the Taï tribes and the Hmong exploit the forest and its resources in very thorough fashion and then move on when a particular area exhausted. They are not 'forest dwellers' as are the Karen of Thailand and Burma, where a symbiotic relationship, creating a balance between the human and natural is the rule. The yearly cycle includes:

- *February and March*, cutting down trees and undergrowth in,
- *April*, burning and firing the fields to convert organic material to ashes to act as a fertilizer to the soils,
- *June*, planting in as the rains start,
- *July through October*, weeding throughout the rainy season, and
- *November through December*, eventual harvesting.

Sparkes refers to *hai* as 'an intelligent use of resources given the level of technology and landscape.'[131]

On the swiddens, rice is generally in the Project region only cultivated for the first year.

[130] Ovesen 1995, pp. 52-53.
[131] Sparkes 1995.

Rice includes several varieties of both the glutinous and the non-glutinous kind. The Hmong tend to prefer ordinary, non-glutinous rice. After the rice harvest, the field is either left fallow, or it is planted with cassava. Cassava, once planted, needs little further labor input and forms a natural crop storage, which may be utilized for five years. On fields where the soil more moist, maize and vegetables are grown. Also these fields are cultivated for one season only.[132]

Most swidden fields are cleared from secondary swidden regrowth, either because there is very little primary forest left on land which is suitable for cultivation, because clearing of primary forest is much more arduous than clearing of regrowth, or because of the Government's with three years as the absolute minimum. During the fallow period it is usual to burn the field a couple of times without cultivating it the same year. Fields are cleared of regrowth in late February and early March; if dense forest is cut, the clearing may start already in January.[133]

Depending on the moisture of the soil, rice or maize is grown on the swiddens usually in combination with vegetables, bananas, and cassava. A new field is called *hai lup*. After one year, the field is left fallow and is called *hai on*. The year after is it classified as *hai khee*, while fields of three years or more of fallow are called *hai padong*. The absolute minimum fallow period is three years. Unlike the Hmong who prefer non-glutinous rice, the Lao Loum grow only glutinous ('sticky') rice on both upland and paddy fields.[134] On the Phou Khao Khouay Plateau, though, Ovesen noted the Hmong also growing rice of the glutinous, or 'sticky' kind, of which several varieties were grown.[135]

Trankell has also observed in Lao Loum villages downstream from the proposed Nam Ngiep dam that the rice grown is mainly glutinous, with none for market in the villages she observed, not even non-glutinous, which is not considered by the Lao Loum to be a staple. Non-glutinous rice has value among the Lao Loum as a medicine and special food, classified as food for outsiders and guests and for important ceremonial exchanges, at the Lao New Year, for commemoration of deceased relatives and for travelling to see distant kin.[136]

In Bolikhamsay Province, Trankell found the Lao Loum villagers explaining that they apply a three-year rotation cycle to the swiddens.[137]

By this they meant that swiddens are cultivated for three seasons, after which they should be left fallow for two years. During the first year rice is cultivated, on the second year they grow spices and legumes, and on the third vegetables. While growing rice on the first-year swidden, farmers try at the same time to expand the land for new rice cultivation. On this second field rice is planted, while spices or vegetables are planted on the first. In due time the first field should be allowed to rest, while the second and third field is planted with vegetables and rice, respectively. Farmers realize that the fallow period is much too short, but even so they try to return to clear the fields for

[132] Ovesen 1996.
[133] Ovesen 1996.
[134] Ovesen 1996.
[135] Ovesen 1995.
[136] Trankell 1999, p. 41.
[137] Trankell 1999, p. 70.

cultivation only after two years of fallow, because they otherwise risk to lose their use-right.

After the rice harvest, the field is either left fallow, or it is planted with maize and/or cassava. Maize is also only grown for one year, while cassava – which, once planted, needs little further labor input – form a natural crop storage which may be utilized for five years. Most swidden fields are cleared from secondary swidden regrowth, both because there is very little primary forest left on land which is suitable for cultivation, and because clearing of primary forest is much more arduous than clearing of regrowth. A fair amount of the regrowth areas have been infested with *Imperata cylindrica*, a grass the roots of which make further cultivation next to impossible, and which thrive on periodic burning.[138]

The fallow period for fields, which have escaped the *Imperata*, is usually five to six years, with three years as the absolute minimum. During the fallow period it is usual to burn the field a couple of times without cultivating it the same year. Fields are cleared of regrowth in late February and early March; if dense forest is cut, the clearing may start already in January.[139]

The cutting is considered very hard work, and men carry out the heaviest tasks. The initial cutting, one man working alone may clear one *rai* (=1,600 m^2) in three days, but he is usually assisted by other members of the household. After the cutting, the vegetation is left to dry for a couple of weeks – 4 to 6 weeks in the case of dense forest or if larger trees have been cut down. The burning goes on for some days and when the fires have died out, the fields are cleared and prepared for sowing; the preparations take about a week, after which, and when sufficient rain has fallen, about 10 days are spent on sowing, usually in early to mid-June. The weeding demands considerable labor by both men and (especially) women; it is reckoned that weeding takes a total of three weeks of full time work for all adult members of the household. The harvest is normally in October.[140]

Carrying the harvest from the swidden fields to the village is another arduous task. The swidden fields are often located at a distance of several hours' of walking from the village, and the terrain can be very difficult to traverse. Sometimes, horses may be used as pack animals for some of the distance, but as often as not, humans are the only possible transporters.[141]

Ovesen in the Theun Hinbeun basin describes villages where villagers have reached the distance beyond which they feel it unreasonable to cultivate *hai*. He describes many households forced to seek *hai* about 6 km downstream, about 1 hour by motor boat, where bringing home the harvest requires about 10 boatloads per household.[142] Sparkes describes 2 hours as the outer limit for walking to *hai* fields.[143]

It is generally reckoned that a system of swidden cultivation can support a population

[138] Ovesen 1995, pp. 52-53.
[139] Ovesen 1995, pp. 52-53.
[140] Ovesen 1995, pp. 52-53.
[141] Ovesen 1995, pp. 52-53.
[142] Ovesen 1993.
[143] Sparkes 1995.

density of no more than about 5-6 persons per km^2 in mainland Southeast Asia, while paddy cultivation at the very least allow a population density of 100 persons per km^2.[144] Xieng Khouang Province has 13 persons per km^2 and Xaysomboon has 8 persons per km^2, with the national average being between 19-20 persons per km^2.

Given the relative merits favoring lowland cultivation, apparently hai cultivation continues as the combination of the two allows villagers to diversify their agricultural energy and enhance food security, as well as to spread labor input more evenly over the year. Clearing *hai* fields does not coincide with any paddy activities, and weeding of *hai* fields can be done while paddy is growing on its own.[145]

4.8.1.2.1. BREAKDOWN OF THE LONG-TERM HAI CYCLE

With proper techniques and low population density, swidden may be sustainable over the long term, but this depends on extended fallow periods for the soil to regain its fertility. In many parts of the Lao PDR, *hai* fields are said to be rapidly becoming exhausted, requiring 8 years of fallow at very best and where there has been a high rate of population growth, villagers find selves in a kind of *cul-de-sac.*, with no where new to move.[146]

In the Theun Hinbeun basin, Sparkes has described a situation that may or may not be the case in the Project area. This will have to be further assessed. He found a typical long-term cycle to involve cutting down of secondary forests that had not been used for 15 years. These lands were considered ideal, and their yields would be good for at least 8 years without villagers having to walk more than 30 minute from their village. After 8 years return villagers would return to the first fields which had now a fair amount of secondary growth. However, as population has slowly increased, larger areas are needed to be cut down to support a village.

The fields reclaimed from secondary growth are not quite as good as those from new forests, but they provide reasonable harvest given good conditions and ample rain. By the third time around villagers really need to wait 15 years to obtain a good yield. There comes a point when the distance to walk to new fields is too far (more than 2 hours), and the yield is too low from using the fields too often. Traditionally, after about 20 years, villagers find it better to move to a new location where cycle starts all over again. Some villagers have migrated for many generations. Increasingly, though, the problem is that now there is no place to move along the rivers.[147]

This situation in the Theun Hinboun basin is creating rice shortages almost every year. Villagers walk great distances and even stay in field huts for weeks at time. The cycle of at least 8-10 years for a reasonable harvest has been reduced to 3-5 years, and as a result fields are completely exhausted in some places. Where there are still new forests large trees even when possible in protected areas are being cut down, and villagers have little choice but to continue encroachment. Most harvests fall short of

[144] Ovesen 1995, p. 32.
[145] Ovesen 1993.
[146] Ovesen 1993.
[147] Sparkes1995.

needs and the difference is made up selling livestock, forest products, and working for cash. Since rice is synonymous with food (*khao* means both food and rice) all other resources are utilized in order to acquire enough before anything else is purchased.

Since most households in the Reservoir Area appear to have an annual rice surplus, the situation described above may be less dire. This is probably due to the existence of a number of irrigation schemes in the area as well as a fairly large amount of hectarage of rainfed lowland rice. However, some villages appear to have a great dependence on upland rice, B. Sop Youk with 1.87 hectares per household, and B. Namlong, Houaypamon each with 0.94 hectares per household. It is villages with a heavy reliance on hai agriculture that typically have an annual rice deficit, which must be made up through sale of livestock and other non-agricultural resources. The next feasibility study phase will require a socioecultural ethnographic study to actually listen to villagers on these issues and chart the experience of each village.

4.8.1.3 HMONG AND WET RICE CULTIVATION

The ethnographers who have examined the issue of livelihood and restoration have indicated that lowland rice cultivation is a high priority for villagers. In the case of the Nam Mang 3 Hydropower Project, for instance, Ovesen noted the Hmong strong preference for na cultivation since this had where achieved permitted Hmong villages 'grow far beyond the size of average Hmong settlements based on swidden'. He concluded:[148]

This should only surprise us if we believe that the historical, or perceived 'traditional' reliance of the Hmong on swidden cultivation is based on some deep-rooted 'cultural' inclination for swiddening, for migration, and for living on mountain slopes at high altitudes. It is not. The Hmong are no more (or no less) culturally 'irrational' in their economic strategies than, say, the Lao. They are perfectly well aware that swidden cultivation requires more labor in any given year than does paddy cultivation. They know that in contrast to paddy cultivation, the productivity of swiddens per unit of labor goes down rapidly as the quality of the land declines, since weeding is a very labor consuming activity. And for this reason they calculate that rice cultivation on swiddens is only worth the effort for the first year. When a Hmong household moves to a different location, they do not do so because of some 'cultural' urge for a change of scenery, or because they love to spend four weeks on dismantling a house, transporting the material to another place and rebuilding it. They do it out of economic necessity. Given half a chance, they would rather stay in one place, close to as many kinsmen as possible, and grow paddy.

[Their] desire is to stay where they are and to have enough paddy land to live on.... Given Hmong propensity for living together with close relatives, and the decisive influence such considerations often have on migration options, we may safely assume that the larger the settlement, and the more sedentary its character, the greater the likelihood that more close relatives will have congregated over time and are found together in the same place. So there is a direct correlation between the size and the age of a village and the stability of the community. The primary limiting factor is the

[148] Ovesen 1995, pp. 55-56, 70.

availability of paddy land.

[The Hmong] and the Lao government pursue the same overall goal, *viz*, to bring about sedentarization – albeit for slightly different reasons. The prime motivation for the government is to control its citizens – which is facilitated if they are spatially fixed – and to put an end to the environmentally destructive practice of swidden cultivation. The Hmong are hardly concerned about the environment (in a country which they have never been given the chance to regard as theirs anyway), but they have realized the greater welfare potential of paddy cultivation, and, not least, they welcome the greater possibility under paddy cultivation to realize the social ideal of spatial lineage cohesion. In view of this happy concordance of interests, it is highly important for all parties, if the hydropower project is realized that no effort is spared to develop as much paddy as physically possible on the plateau.

4.8.2 GARDENING

Trankell noted in rural Laos that the cultivation of secondary crops is seen as *haet soen*, 'gardening' as opposed to *haet naa*, rice cultivation, and is executed primarily on upland fields and swidden. Paddy is generally not used for the cultivation of secondary crops. This is seen as by villagers due to the lack of the required technology and other prerequisites for intensive production, such as tractors, mechanical cultivators, irrigation and fertilizers. Trankell found this difficult to understand, since in other areas of this part of the world, small landholdings have proved to be viable in intensive cultivation and with fine results. Upland fields, though, and more often swidden, are used for the cultivation of secondary crops after the harvest of seasonal rice, and besides, intercropping is practiced on swiddens.[149]

Generally, in rural Laos small fenced vegetable gardens *per se*, and not just secondary crops on swidden fields are found in or around villages themselves, and riverbanks are invariably turned into vegetable gardens during the dry season.[150] Within Lao Loum villages, the gardens will be in the low-lying center, with each plot meticulously fenced with bamboo sticks to prevent pigs from ravaging the gardens. Cultivated vegetables include primarily cabbage, a kind of mustard (leaves used in cooking), an occasional patch of pineapple and possibly a little opium.[151]

Among the Lao Tai, Sparkes described the rice barns and large gardens with banana, pineapple, fruit trees and some vegetables as located just outside the residential area. Vegetable gardens were located at the water's edge and on the sandy bank so as to make use of the ground water. Paths and steps were cut into the steep sandy banks due to constant use and lead to the water's edge where boats are tied up and where bathing and washing clothes takes place. All gardens are fenced in to protect them from roving chickens, pigs and cattle. Small coops, built of bamboo, are scattered about the village and chickens, ducks, geese and turkeys are rounded up at night and locked in. Buffalo and cattle were often kept underneath the house. Otherwise, cattle and buffalo roamed freely along the river, grazing in the shallows and undergrowth.

[149] Trankell 1999, p. 41.
[150] Ovesen 1993.
[151] Ovesen 1995.

Pigs fended for themselves.[152]

Garden holdings in the Reservoir area are given below, with an overall average of 0.12ha per household for the Reservoir Area and approximately similar averages for both the Upper and Lower Reservoir Areas. Holdings vary from, interestingly, none in Viengthong to about one half (0.56) a hectare in B. Phonyeng.

Table 4.19 Garden Land Holdings (Ha) in Reservoir Area

	NO. HH	GARDENS LANDHOLDING (HA)	HA/HH
UPPER RESERVOIR			
Phonehom	67	8.00	0.12
Namlong	17	2.00	0.12
Xiengkhong	39	4.50	0.12
Nakang	25	6.00	0.24
Nahong	75	5.00	0.07
Viengthong	46	0.00	0.00
Naxay	22	3.40	0.16
Naxong	81	0.80	0.01
Phonyeng	63	3.50	0.56
Dong	82	20.00	0.24
Hatsamkhone	27	4.00	0.15
Phiangta	49	5.00	0.12
Pou	66	8.00	0.12
Subtotal:	659	70.20	0.11
LOWER RESERVOIR			
Houaypamon	18	5.00	0.28
Nam Youk	86	6.10	0.07
Sopphouh	23	1.14	0.05
Sop Youk	67	20.00	0.30
Subtotal:	194	32.24	0.17
TOTAL	853	102.44	0.12

4.8.3 LIVESTOCK

According to the STS Consultant's survey, almost all 17 villages have buffalo and cattle, except B. Namlong where there is no buffalo and B. Phiangta and Nakang, which have no cattle. There are 1,282 buffalo and 817 cattle in the Reservoir Area. All villages have pigs (2,047). There are no horses in the Reservoir Area.

Approximate per household numbers for buffalo show 1.5 buffalo per household for both the Upper and Lower Reservoirs. There are 0.8 cattle per household in the Upper Reservoir and 1.5 in the Lower Reservoir, with a Reservoir Area average of 1.0 cattle per household. There appear to be a higher number of pigs per household in the Lower Reservoir Area, at 4.0 pigs per household compared to 1.8 for the Upper Reservoir. However, the 300 number for pigs attributed to B. Houaypamon should be confirmed, since it appears to be a typographical error.

Ovesen has reported from his work in rural Laos that while cattle do not have the same ceremonial importance among the Lao Loum as among the Hmong, and in general animal sacrifice is less prevalent, otherwise, the pattern of animal husbandry is more or less identical.[153] Although all are not reflected in the table provided by STS Consultants, domestic animals kept in the Reservoir Area include, besides cattle, buffaloes, and pigs, also goats, chicken, ducks, turkeys, and dogs.

[152] Sparkes 1995.
[153] Ovesen 1996.

Buffalo are quite numerous and like cattle they function as an important means of wealth storage and as a source of cash income if need be. Their religious significance is not so important as that of cattle among the Hmong, but they are indispensable for plowing the paddy fields, and the manure of both buffalo and cattle is important for fertilizing the paddy fields.

Among the Hmong cattle traditionally play a significant role. They are not only a means of accumulating wealth cattle and for pulling carts and transporting agricultural products or other goods, but they are also the prime sacrificial animals in connection with funeral ceremonies. Even if a man has not had any cattle in this life, it is important for him to have a herd with him in the land of the dead to facilitate an auspicious rebirth. At the death of a man, each of his sons and sons-in-law should ideally sacrifice a cow, while one additional cow should be sacrificed on behalf of all female relatives.[154]

Table 4.20 Livestock Holdings in Reservoir Area

	HHs	BUFFALO	PER HH	CATTLE	PER HH	PIGS	PER HH
UPPER RESERVOIR							
Phonehom	67	42	1.0	50	0.5	47	0.5
Xiengkhong	39	124	3.0	59	1.5	64	1.5
Nakang	25	3	0.1	0	0.0	58	2.3
Namlong	17	0	0.0	52	3.0	25	1.5
Naxay	22	40	2.0	3	0.5	19	1.0
Nahong	75	127	2.0	4	0.5	130	2.0
Viengthong	46	17	0.0	55	1.0	54	1.0
Phonyeng	63	26	0.5	67	1.0	206	3.0
Naxong	81	194	2.5	101	1.5	62	0.5
Dong	82	209	2.5	47	0.5	150	2.0
Hatsamkhone	27	18	0.5	25	1.0	104	4.0
Phiangta	49	106	2.0	0	0.0	96	2.0
Pou	66	110	1.5	100	1.5	201	3.0
Subtotal:	659	1,016	1.5	563	0.8	1,216	1.8
LOWER RESERVOIR							
Houaypamon	18	20	1.0	15	1.0	300	16.0
Nam Youk	86	104	1.5	103	1.5	187	2.0
Sopphouh	23	17	0.5	28	1.0	83	3.5
Sop Youk	67	125	2.0	108	1.5	261	4.0
Subtotal:	194	266	1.5	254	1.5	831	4.0
TOTAL	853	1,282	1.5	817	1.0	2,047	2.5

Also if a man falls ill, one or more cows should be sacrificed for his deceased father. As storage of wealth, cattle may be sold (but not gladly) in order to buy paddy land or, in case of dire need, rice. So, a substantial herd of cattle is a means of both economic and spiritual security. During the growth period of the rice, the cattle are kept in pens or tethered, but otherwise they are allowed to roam freely, grazing on the harvested rice fields and on the grassland.[155]

Pigs are primarily valued for their meat, but they are also very important for sacrifices among the Hmong in connection with shamanistic rituals. For each shamanistic performance at least one pig has to be sacrificed. The jawbones of the sacrificed pigs are hung on the shaman's altar where they remain until the Hmong New Year. The number of jawbones on the altar is thus an indication of each shaman's powers. The pigs also fill an important function as scavengers, keeping the village clean of edible rubbish and human excrement. Like chicken, but unlike cattle and buffaloes, the

[154] Ovesen 1996.
[155] Ovesen 1996.

people feed them; pig fodder includes maize, cassava and rice husks.[156]

Poultry are kept by most households and are bought and sold both locally and to passers-by. Chickens are used for minor sacrifices. Many young boys have a favorite cock, which they like to play with as pet.[157]

Dogs are kept as watchdogs and hunting dogs. Ovesen has reported that among the Hmong, in special cased-such as childlessness – the sacrifice of a dot (and /or a cat) may be necessary to ward off the evil spirits which cause the problems.[158]

STS Consultants report two diseases often found among buffalo and cattle in the Reservoir Area, *septicemia hemorrhage* and the foot and mouth disease. According to villagers interviewed, *septicemia hemorrhage* occurs during Winter and foot and mouth disease during June and July. The STS Consultant's socioeconomic report also mentions lack of fodder and grazing land as a locally perceived problem but gives no details.

The question of livestock during resettlement will be a particularly difficult one. According to the UNDP study of resettlement in the Lao PDR found that the transport of cattle, representing one of the main sources of capital for hill tribes, was a highly problematic area, generally seeming to be a delicate operation that often entailed loss.

Driving cattle to new areas when possible was an advantage for many for establishing rice cultivation, since the animals are used in the fields. However, families sometimes needed to raise capital to finance their move, renting trucks or purchasing rice, and they had to first sell their buffalo. Some had to leave their cattle because the journey was too long or difficult, and others, especially in Sekong and Attepeu, abandoned them on religious grounds since they were viewed as the property of the forest spirits. In many cases, many cattle were lost on arrival due to disease.[159] Loss of livestock at this critical time could lead to a spiral into debt and poverty, so the issue will need to dealt with carefully in the RAP planning.

4.8.4 FORESTRY

Forest in the Lao PDR are classified under The Forestry Law, No. 004 (October 11, 1996) into the following five categories:

- Protected Forests
- Reserve Forests
- Production Forests
- Regeneration Forests
- Degraded Forests or Bald Land

[156] Ovesen 1996.
[157] Ovesen 1996.
[158] Ovesen 1996.
[159] Goudineau 1997. p. 25.

Since 1996, the Forestry Department has been implementing a land and forest allocation. However, there is no evidence (as seen on sign boards showing the land use boundaries for villages) that this program has reached the relatively isolated Reservoir Area, although this program covers the downstream villages. Perhaps as a result of this, the categories for forest types collected by the STS Consultants did not match the legal definitions above.

Both Timber and Non-Timber Forest Products (NTFP) are important for village subsistence and as cash income generating resources. English notes the existence of customary systems for the management forests, about which we have little information in the Reservoir Area. These are traditional multi-use and conservation practices that serve to regulate extent to and area in which forest resources harvested.

Forest and pasture have been put together in the table below, since both serve as grazing lands for livestock, and for some reason the Upper Reservoir villages did not seem to respond to the STS questionnaire regarding 'pasture' lands, though they did to forest. The Lower Reservoir (0.50ha per household) appears to have about three times the pasture and forest resources the Upper Reservoir Area (1.62ha per household) has.

Interestingly enough the villages with less than average forest and pasturelands per household, Nahong, Naxong, Dong, and Nam Youk all have more than average holdings of irrigated lowland rice. It may be that they do not need as much access to forest lands to make up rice deficits as the other villages, though this is just speculation. Two of them, although older villages, B. Nahong and Naxong have considerable Lao Theun populations and almost half their surveyed households have been established less than five years.

Overall for the Reservoir Area the ratio of buffalo and cattle (2,099) to forest and pasture land (642.8ha) is 0.31ha per livestock head. For the Upper Reservoir it is 0.21ha and for the Lower Reservoir 0.61ha per head of livestock.

Table 4.21 Forest and Pasture (Ha) in Reservoir Area

Items	HHs	VILLAGE MANAGE.FOREST	PRIVATE FOREST	PASTURE	CONSERVATION AREA	TOTAL	PER HH
UPPER RESERVOIR							
Phonehom	67	32.0	14.0	0.0	0.0	46.0	0.69
Namlong	17	14.0	20.0	0.0	0.0	34.0	2.00
Xiengkhong	39	10.8	20.0	0.0	0.0	30.8	0.79
Nakang	25	10.0	10.0	0.0	0.0	20.0	0.80
Nahong	75	0.0	0.0	0.0	1.8	1.8	0.02
Viengthong	46	50.0	20.0	0.0	0.0	70.0	1.52
Naxay	22	15.0	10.0	0.0	0.0	25.0	1.14
Naxong	81	15.0	3.0	0.0	0.0	18.0	0.22
Phonyeng	63	8.0	7.0	0.0	0.0	15.0	0.24
Dong	82	0.0	0.0	0.0	0.9	0.9	0.01
Hatsamkhone	27	15.0	15.0	0.0	1.0	31.0	1.15
Phiangta	49	0.0	0.0	0.0	0.8	0.8	0.02
Pou	66	25.0	10.0	0.0	0.0	35.0	0.50
Subtotal:	659	194.8	129.0	0.0	4.50	328.3	0.50
LOWER RESERVOIR							
Houaypamon	18	0.0	30.0	7.0	0.0	37.0	2.0
Nam Youk	86	12.8	10.0	0.0	0.0	22.8	0.27
Sopphouh	23	48.4	10.2	10.1	0.0	68.7	2.99
Sop Youk	67	0.0	26.0	150	10.0	186.0	2.78
Subtotal:	194	61.2	76.2	167.1	10.0	314.5	1.62
TOTAL	853	256.0	205.2	167.1	14.5	642.8	0.75

To the east of the Reservoir Area, in Central Xaysomboon, tens of thousands Hmong encouraged to settle during last Second Indochinese War to clear more than 100,000ha of forest for cultivation and remove cover of Pathet Lao forces. The step and rugged terrain of the area has been largely stripped of its primary forest cover. Extensive grasslands and bush fallow mixed with active swidden plots prevail on the hillsides.[160]

The Reservoir Area appears to have escaped this fate, and forests are relatively plentiful. There is also no evidence of the large-scale commercial forestry prevalent in more accessible parts of the Lao PDR. Trankell has observed that villages having access to old growth forest (*pa dong*) "are comparatively much better off in terms of health, nutrition and household economy than those which are situated in the vicinity of logging enterprises and therefore depend for their forest resources on second growth forest (*pa lao*)."[161]

This would appear to be the case for villages in the Reservoir Area, where forest cover can be seen to be widely affected by swidden cultivation but so far as could be discerned not so far by commercial logging. On the other hand, a major objective of the UNDP Muang Hom Integrated Rural Development Project (1986-1989) which included the Lower Reservoir Area villages was the establishment of sawmills to provide the population with alternative cash income earning opportunities to poppy cultivation. This is evidenced by the existence of a small mobile sawmill in B. Sop Youk.[162]

Primary and secondary growth forests in the Reservoir Area provide hardwood for timber construction; both hard and softwood for cooking fuel; bamboo for construction, matting, roofing, fencing, baskets, household utensils, and food; rattan and grasses for matting and roofing materials; leaves, grasses, shoots for cattle grazing; bark for making paper and cloth; and wide range of medicinal and food plants including mushrooms, cardamom and resins. Much of this is consumed locally.[163]

Throughout the Lao PDR, fuelwood is the principal source of energy, constituting 98% of the average household's energy consumption, followed by charcoal (0.5%), crop residue (0.7%), gas cylinder (0.4) and kerosene (1.4%).[164] Average annual fuelwood consumption is 1km^3 per person, the average household consumes an additional 0.15km^3 of forest resources for construction purposes, and as means for generating cash income. English has noted a more extensive reliance on village woodlots – reserved for construction timber -- as a source of fuelwood since the increasing pervasiveness of field and forest burning, weed control and promotion of improved grazing has eliminated the capacity of many natural forests in the region to regenerate.[165]

[160] English p. 13.
[161] Trankell 1999. p. 58
[162] English 1998, p. 16.
[163] English 1998, p. 34.
[164] English 1998, p. 41.
[165] English 1998, p. 41.

4.8.4.1 IMPORTANCE OF FORESTS TO VILLAGE ECONOMY

From his ethnographic fieldwork in potential hydroproject areas of impact, Ovesen has observed that forests provide the single most important source of livelihood besides rice fields for people in all villages. Though rice is the staple food, and 'culturally defines human beings,' "it is a fact that physical survival would be quite possible without rice fields, but next to impossible without the forest." Indeed, during periods of war, many villagers have lived there. The forest provides material for houses and utensils, numerous important dietary items and is an important source of cash income. Gathering activities and hunting are also important.[166]

Ovesen has observed that whenever the rural Lao (of whatever ethnic group) leave their village for a shorter or longer time – whether hunting or gathering, travelling to far villages, or for *hai* cultivation – they also leave normal village life behind and live almost exclusively off the forest. This is not normally considered in portraying the Lao Loum as an agricultural people subsisting on rice as their staple food and leading a 'civilized' village life. With a shotgun, chopping knife and a box of matches (and their cultural knowledge and skills) most rural Lao can live weeks and months on forest resources. This does not alter the fact that they consider themselves culturally as basically rice cultivators. It does say a lot, however, about the salient importance that forest resources have for subsistence, and the economic importance of the forest cannot be overstated.[167]

4.8.4.2 NON-TIMBER FOREST PRODUCTS (NTFP)

The forest provides a number of resources, which may be utilized both for domestic purposes and as a means of cash income. Apart from structural materials, the main items of non-timber forest products that may be converted into cash include wild fruit, incense, resin, and medicinal herbs, twigs and bark, and grasses for brooms.[168]

Animal dietary items procured by men include snakes and ants' eggs and larvae. Snakes are fairly common. "Killing a snake is quite an emotional experience for the people, and snakes are believed to have magical medicinal properties. The blood of the snake is meticulously collected and dissolved in a bottle of local liquor (*lao lao*), as is the contents of the gall bladder. Both concoctions are relished as potency improving medicines. Otherwise, snake's meat is treated like any other kind of fresh meat, i.e., two different dishes are prepared from it, a soup (keng) and a stew. Ants' eggs and larvae are collected (inevitably together with a lot of ants) in buckets of water. When the majority of the ants have been separated from the eggs (a time consuming procedure), the eggs and larvae are made into keng and a spicy salad (lap)."[169]

Women collect vegetable forest products. These include a very great variety of leaves and herbs (for spices and condiments), roots (mostly for medicinal purposes), mushrooms, bamboo shoots and other young saplings that are cooked as vegetables. All are nutritionally highly important as they provide a source of calories, vegetable fiber,

[166] Ovesen 1993, pp. 27-30.
[167] Ovesen 1993, p. 29.
[168] Ovesen 1996.
[169] Ovesen 1993, pp. 28-29.

vitamins and minerals as well as culinary variation.[170]

Marketable products include resin, tree oil, and incense. Women exclusively collect resin. The resin is cut and pried loose from the base of the relevant kinds of tree. The dried lumps are collected in large carrying baskets and sold to buyers from outside the area along rivers or roads. It is said to be used for paint and varnish. Oil is extracted from trees by indenting the trunk and lighting a fire in the hole whereby heat will make the oil flow. The oil is sold or made into torches by mixing it with sawdust and wrapping the mixture in banana leafs. Oil extraction is a male activity, while its processing and marketing is done by women.

Incense (*mai ketsana*, or *mai dam*) is not easy to get but commands a high price, much of it ultimately going to Saudi Arabia. It is found inside trunks of certain rather soft trees where it consists of a 'black substance' left as a waste product by certain kinds of worm or insect. Apart from these commercial products, women often sell vegetable forest produce locally in the villages. A problem, particularly among the Hmong, noted by Ovesen was a lack of concern about sustainability of these resources.[171]

The knowledge of the medicinal properties of various herbs and parts of trees is the province, among the Hmong, of female experts, mainly elderly women. It is not uncommon that these women travel great distances to peddle their wares, and the journeys are mostly economically worthwhile, since the Hmong have a reputation for medical knowledge and powerful medicine among the lowland populations of both Laos and Thailand.[172]

4.8.4.3 HUNTING

Ovesen has noted that the Lao Loum are marginally less disposed to hunting and collection of NTFP than the Hmong, although all groups participate.[173] Usually men use a long-barreled, muzzle-loaded rifle with a simple lock, reminiscent of 18th century European firearms technology and will shoot at 'anything that moves' within a reasonable range.

Most game successfully hunted includes birds, lizards, squirrels, monkeys, pangolins and small species of deer. Larger game is also hunted, however, including deer and wild boar, and antlers are seen on the veranda of houses. Sparkes notes that villagers look upon the forest life "as a resource and the meat not only provides respite from a rather monotonous diet of rice and boiled fish but is also a source of protein since domestic animals are only consumed at rituals and on some special occasion." Among the animals he witnessed hunted were civet cats, otters, red squirrels, flying squirrels, golden cats, mouse deer, monkeys, wild boar, turtle doves and large species of green lizard (*kathang*).[174]

[170] Ovesen 1993, p. 29.
[171] Ovesen 1993, pp. 29-30.
[172] Ovesen 1996.
[173] Ovesen 1996.
[174] Sparkes 1995.

4.8.5 ORCHARDS AND PERENNIAL CROPS

Table 4.23 provides the distribution of orchard and perennial crops according to households surveyed. The Lower Reservoir Area villages had a higher percentage of households with mango and citrus trees than the Upper Reservoir villages. The Upper Reservoir had a higher percentage of households with raising jackfruit, coconut, and banana.

4.8.6 FISHING

It is generally is recognized that fish is the first source of animal protein in rural Laos. All 17 villages of the Reservoir Area engage in fishing, with Lao Loum and Lao Theung, or Upper Reservoir villages, more involved than the Lao Soung in the Lower Reservoir.

Fishing activities are present in all of the 17 surveyed villages. It was observed that the Lao Loum are more involved in fishing activities that the Lao Soung. It appears to be also the same case as for the Lao Theung. Some 75% of households interviewed fish all year long and all villages having some households that fish all year long. Relatively fewer villagers situated away from the Nam Ngiep River will fish the entire year.

Fish caught in the Wet Season are larger than those caught in the Dry Season. However, the total harvested quantity and weight is higher in the Dry Season, and consequently villagers eat less fish in the Wet Season. The price of fish per kg varies from 1,500 kip in B. Nalong to 3,000 kip in B. Soppouah. At the time of the STS fisheries survey in January 1999, the average price of fish was 2,300 kip/kg.

Commonly used fishing gear during the Wet Season are:

- Hook and line 88%
- Gill Net 7%
- Cast Net 3%
- Scoop Net 2%
- Funnel Trap 1%
- Basket Net >1%
- Basket Trap >1%

Table 4.22 Distribution of Orchard Trees and Perennial Crops

	SURVEYED HOUSEHOLDS	MANGO	% of HHs	ORANGE	% of HHs	LEMON	% of HHs	JACK FRUIT	% of HHs	COCONUT	% of HHs	TAMARIND	% of HHs	KAPOK	% of HHs	BANANA	% of HHs	PAPAYA	% of HHs	SUGAR	% of HHs
UPPER RESERVOIR	HH	HH		HH		HH		HH		HH		HH		HH		HH		HH		HH	
Phonehom	13	3	23%	0	0%	0	0%	3	23%	0	0%	1	8%	0	0%	0	0%	2	15%	1	8%
Namlong	5	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Xiengkhong	8	6	75%	0	0%	0	0%	5	63%	2	25%	2	25%	0	0%	1	13%	0	0%	0	0%
Nakang	5	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	20%	0	0%
Nahong	15	4	27%	3	20%	3	20%	2	13%	2	13%	2	13%	0	0%	0	0%	0	0%	0	0%
Viengthong	10	0	0%	0	0%	0	0%	1	10%	0	0%	0	0%	0	0%	2	20%	0	0%	0	0%
Naxay	5	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Naxong	16	4	25%	0	0%	0	0%	3	19%	7	44%	1	6%	1	6%	0	0%	0	0%	0	0%
Phonyeng	12	1	8%	0	0%	0	0%	1	8%	0	0%	2	17%	0	0%	4	33%	0	0%	0	0%
Dong	16	3	19%	0	0%	0	0%	2	13%	2	13%	4	25%	0	0%	0	0%	0	0%	0	0%
Hatsamkhone	6	1	17%	0	0%	0	0%	1	17%	0	0%	2	33%	1	17%	3	50%	1	17%	0	0%
Phiangta	10	4	40%	1	25%	1	25%	4	40%	4	40%	0	0%	0	0%	1	10%	0	0%	0	0%
Pou	12	3	25%	0	0%	0	0%	2	17%	2	17%	1	8%	0	0%	2	17%	0	0%	0	0%
Subtotal:	133	29	22%	4	3%	4	3%	24	18%	19	14%	15	11%	2	2%	13	10%	4	3%	1	1%
UPPER RESERVOIR																					
Houaypamon	4	0	0%	0	0%	0	0%	0	0%	1	25%	0	0%	0	0%	1	25%	1	25%	0	0%
Nam Youk	20	9	75%	8	40%	8	40%	0	0%	2	10%	0	0%	0	0%	0	0%	0	0%	0	0%
Sopphouh	6	2	33%	2	33%	2	33%	0	0%	0	0%	0	0%	0	0%	1	17%	0	0%	0	0%
Sop Youk	16	12	75%	0	0%	3	19%	3	19%	0	0%	3	19%	1	6%	1	6%	0	0%	0	0%
Subtotal:	46	23	50%	10	22%	13	28%	3	7%	3	7%	3	7%	1	2%	3	7%	1	2%	0	0%
TOTAL	179	52	29%	14	8%	14	8%	24	13%	22	12%	15	8%	2	1%	15	8%	5	3%	1	0.5%

During the Dry Season, cast nets are more frequently used, supplemented by hook and line.

Of the 17 villages in the Reservoir Area, only households in B. Viengthong, Naxay, Houaypamon and Soppouah reported fishing on a daily basis. Most households report fishing about 3 days per week in the Dry Season and 2 days per week in the Wet Season, largely due to greater water depth and the strong current. During the Wet Season, July to November, more fishing occurs in the paddy fields, with 102 households out of the 179 interviewed saying they engage in some form of aquaculture. The peak season for fishing in the rivers is May and June, when the discharge begins to increase and the fish migrate up river.

Most villagers prefer to fish late afternoon, as most of the catch is for home consumption. Whatever fish is not eaten immediately, is fermented and processed, usually by older people, into a fish paste called "*padek*". *Padek* is felt by villagers to be crucial to their well being. It is generally made August to December, during a period of fish surplus. A small amount of fish is dried and smoked.

About 53% of the villagers interviewed occasionally buy fish from the market or from other fishermen in the village or neighboring villages. Ban Dong buys relatively more fish compared to other villages, probably because it is better endowed with irrigated paddy fields and so can afford to.

While the Hmong do not traditionally engage in fishing on any significant scale, Ovesen has reported that rivers will afford them fishing opportunities 'which boys and young men do not disregard.' Very small fish (2-3cm long) are caught in nets, which are suspended across the river over night or early in the morning. Bigger fish – mostly catfish, but occasionally eel – are caught with lines with several hooks, or with a single hook on a small bamboo rod which is stuck into the mud on the river bank. Even in the dry season, rivers can supply fish of up to 30 cm.[175] Boys and sometimes women search banks and shallows for frogs, aquatic insects and small fish.[176]

4.9 ARCHEOLOGICAL SITES

Because of the strategic importance of the old Highway 4 that runs though the Upper Reservoir Area, the proposed NNHP Reservoir Area did play a an historical part in the Indo China War. However, the likelihood of their being any archeologically valuable sites in the area appears from site visits so far to be quite small.

Because of the strategic importance of the old Highway 4 that runs though the Upper Reservoir Area, the proposed NNHP Reservoir Area did play a an historical part in the Indo China War. However, the likelihood of their being any archeologically valuable sites in the area appears from site visits so far to be quite small. The project area does not appear to contain archaeologically interesting specimens, since it has presumably never been an area of 'civilization' in the sense of a permanently inhabited area,

[175] Ovesen 1996.
[176] Sparkes 1995.

populated by people of a materially sophisticated culture.

Nevertheless, an archeological review will be part of the SIA terms of reference, and a staff member of the Department of Museums and Archeology, Ministry of Information and Culture will visit the area to make an inventory of sites of possible national cultural-historic interest.