

Conflict between Water Buffalo and Market-Oriented Agriculture: A Case Study from Northern Laos

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Abstract

This paper is a case study of the decline of water buffalo husbandry under the pressure of land use change in contemporary northern Laos. Since 2000, with the spread of market-oriented agriculture and the implementation of land use zoning, fallow areas suitable for grazing have been squeezed leading to a conflict between grazers and cultivators. Local government has prohibited the former from allowing their livestock to graze freely in the areas designated for commercial agriculture, encouraging them to establish fixed pasture areas. These grazing lands have experienced a number of problems stemming from the difficulty of implementing co-management, and after several trials many of the grazers sold off their water buffaloes to traders. This is compounded by another incentive that pushes them to sell off their buffaloes: the development of buffalo meat distribution mechanisms. The demand for meat has risen steadily in densely populated areas where many the new migrants from rural areas have started to show a tendency to purchase foods such as buffalo meat. Commercial dealings in water buffaloes seem to have hit their peak around 2005. However, after the peak, the boom has been on the decline due to the number of water buffaloes falling sharply in rural areas leading to difficulty for villagers to continue to graze water buffaloes in both traditional and innovative ways.

Keywords: water buffalo, grazing, fallow, land use, conflict, distribution, migration

I Introduction

In recent years, market-oriented production systems have started to replace customary subsistence-oriented diversified livelihoods in contemporary Laos which has seen it become a land-linked country in the Greater Mekong Subregion. People living in northern Laos near the Laos-China international border have been experiencing this change on a daily basis and are presently faced with options about whether to take a risk of pursuing short-term benefits to adjust to the market economy or to maintain their rural lifestyles including water buffalo grazing. Having these options at hand, their economic interests have divided and this differentiation has become a source of conflict

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among them especially when concerned with their common resource land use management used previously for both swidden agriculture and water buffalo grazing. This paper aims to describe the processes of change of the local economy and its impacts on water buffalo grazing practices, to identify consequent conflicts among rural societies, and to examine the emerging vulnerability of the livelihood.

According to official statistics data, the number of water buffaloes (*Bubalus bubalis*) in Laos has ranged from about 1,000,000 to 1,200,000 head between 1990 and 2007 [NSC 2005: 73; MAF 2008: 55], while the national population estimates numbered 5,747,587 persons in 2006 [NSC 2007: 22]. Thus, on average, there is approximately one water buffalo kept per five persons in Laos. In the northern provinces, where this case study was undertaken, the number of water buffaloes was fewer than the central and southern provinces. Nonetheless, water buffaloes were commonly grazed by villagers as an important component of their livelihoods, particularly in the lowland areas along rivers and streams, until around 2004.

This paper introduces data collected in three provinces in northern Laos. First, we describe why and how villagers graze water buffaloes, focusing on grazers' decision-making processes. Secondly, we pay attention to the rapid decrease in the number of water buffaloes in the lowland areas of northern Laos. This paper explores these dynamics within the socio-economic background of the study area.

Official figures for the national and provincial water buffalo population have not shown any drastic changes over the past 10 years. However, information provided by local people, including village headmen, officers and traders, suggests that the number of water buffaloes has fallen sharply in the rural villages near the main roads between local cities and towns of northern Laos, starting around 2004.

The analysis presented here focuses on the growing conflict between grazers and cultivators and how this has brought about a decline in water buffalo numbers. The essence of this livestock-agriculture conflict is centered on a lack of grazing areas, as the implementation of land use zoning and the rapid expansion of commercial agriculture have squeezed the fallow lands previously used for grazing. Since the 1990s, there has been an expansion in the area under rainy-season cash crops in lowlands and foothills along the main roads. For example, hybrid corn provided by Thai and Vietnamese merchants has become popular in Oudomxay province. This corn is purchased by the merchants and sold at either Chinese markets by way of Mo Han or Vietnamese markets accessed through Dien Bien Phu. During this same period, dry-season paddy and vegetable cultivation has also expanded in the irrigated lowland areas.

On the other hand, since the end of the 1990s, the local government has started to implement land use zoning and land use planning based on the 1996 Forest Law. The intent of these policy directions was to promote both forest conservation and the development of a market economy in agriculture. In order to do this, a clear distinction between forest conservation areas and agricultural development areas was deemed

necessary. According to plans, forest lands are divided into several categories but no forest is allocated for swidden agriculture [Yokoyama 2004: 133]. As will be discussed in more detail below, young fallow in the swidden cycle is a suitable place for grazing water buffaloes. Fallow areas have decreased as swidden agriculture has been severely limited by land zoning and land use planning, and villagers have chosen to graze their water buffaloes and cattle in areas adjacent to agricultural fields resulting in a conflict with farming activities.

The analysis presented here is based on primary data gathered during the authors' field research in Oudomxay, Luang Phabang and Luang Nam Tha provinces, conducted from 2003 to 2009. Figs. 1 and 2 show the locations of studied villages, towns and cities. The next two sections introduce grazing practices in one of the study villages during the period of low conflict, and how those practices changed as conflict increased.

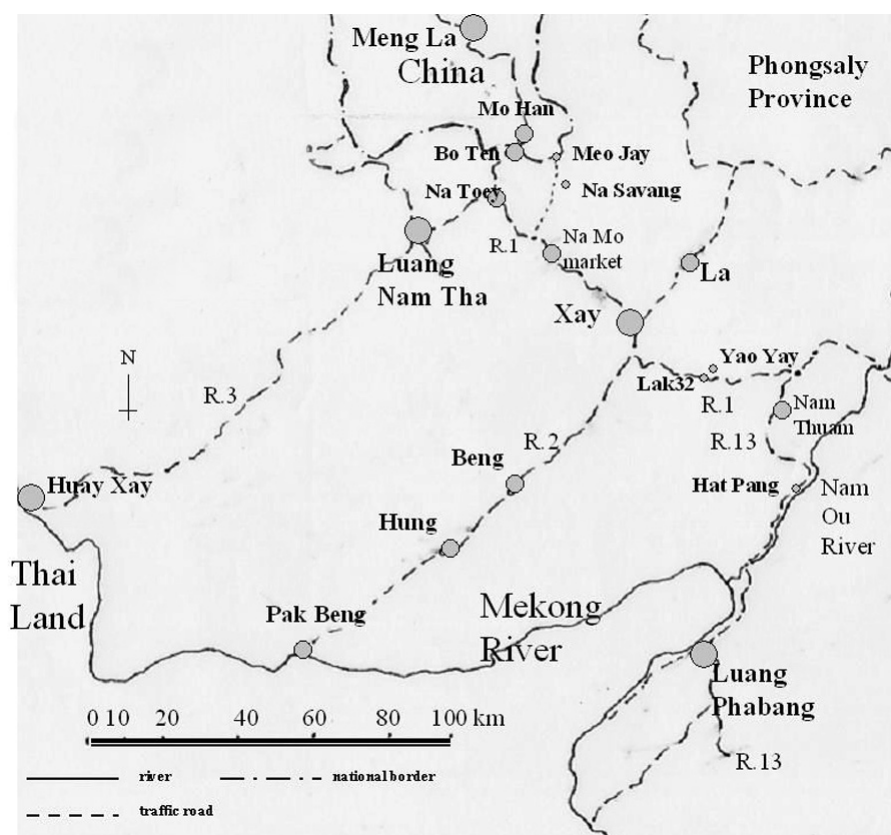


Fig. 1 Cities and Towns in Northern Laos

Source: Created by the authors

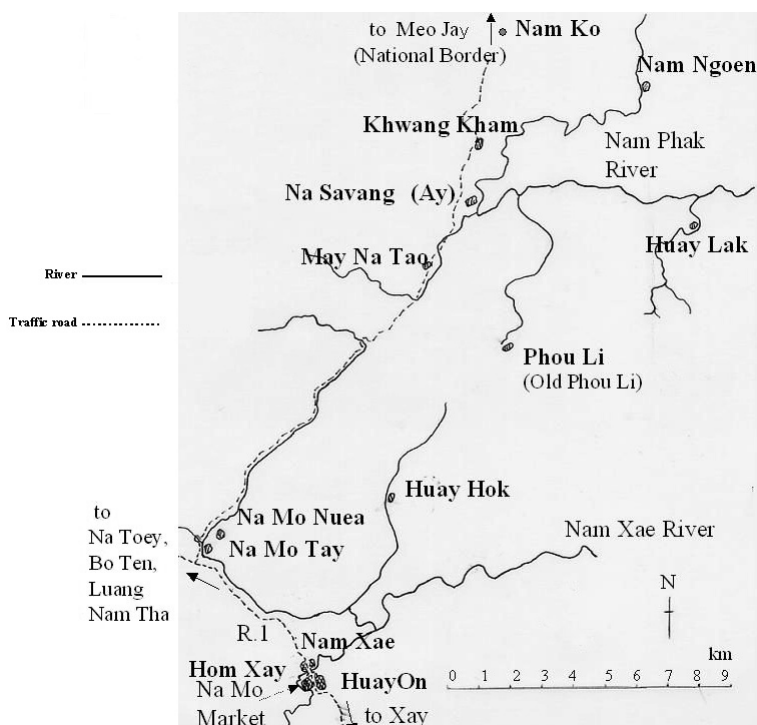


Fig. 2 Research Sites

Source: Created by the authors

II Use of Water Buffalo in the Study Village

Na Savang, an administrative village in Na Mo district of Oudomxay province, is our main field research site in this study.¹⁾ The village, also known locally by its former name, Ban Ay, is located in the Nam Phak River basin near the border between Laos and China. Most of the villagers identify themselves as Yang or Tai Yang, an ethnic category within the Tai-Kadai ethno-linguistic group that includes the lowland Lao and other Tai-Lao groups. The Yang have been heavily influenced by the culture of the Tai Lue, the Yang adopted Theravada Buddhists traditions, who have inhabited the area for generations.²⁾

- 1) Official data on the composition of households in terms of ethnic group show that the ethnic Lao are not the majority group in most of the provinces of northern Laos. In Oudomxay province, for example, 49.7% of the 1998/99 population was Khmu, while Lue, Hmong and Lao were 16.5%, 14.2 %, 12.3% respectively [NSC 2000].
- 2) According to ethno-linguistic classification, the Yang is a small group of the Tai family. They inhabit northern Laos, northern Vietnam and southern Yunnan. Na Savang villagers came more than two hundred years ago from northern Vietnam to their present location, which was an ancient Lue territory that had been abandoned [Chazée 2002: 30].

Na Savang (or Ay) has a comparatively large area of flat lands, so most of the villagers cultivate paddy in the rainy season and many of them can produce enough rice to satisfy their own consumption needs. Besides agriculture, they go fishing, hunting for insects and wild animals and gathering edible plants in the surrounding area for daily dietary needs.

Villagers had limited opportunity to exchange agricultural or forest products with outsiders for money or other articles until the 1990s. Since around 2000, when the road between Na Mo district town and the Meo Jay border crossing was completed, interactions with small traders or peddlers from other places in northern Laos and China have increased.

Domestic animals, including large livestock and poultry, were an important part of village livelihoods throughout the period of transition from a more self-sufficient peasant economy to a mixed commercial-subsistence economy after completion of the road. Villagers preferred not to slaughter and consume their animals for several reasons. First, large livestock and poultry offered opportunities for exchange with outsiders for money or other articles. Second, buffalo meat, pork and chicken were valuable in preparing feasts for guests that formed the basis of mutual exchange in Lao peasant society. These feasts were held on such occasions as agricultural labor exchanges, life passage rituals and village festivals. Furthermore, buffalo meat, pork or chicken were also offered to various spirits such as the guardian spirit of the village.

Na Savang villagers used to raise water buffaloes, cattle, pigs and chicken mainly in or around their village or fields. According to Matsuura's field survey data in 2004, the villagers owned water buffaloes more than cattle or pigs and the number of water buffaloes was more than double the number of households (see Table 1) [Matsuura 2004]. About 90 percent of the surveyed households possessed water buffaloes, at about 2.7 head per buffalo owner's household.

In addition to Na Savang, livestock data from Na Mo Tay village, located in a

Table 1 The Number of Livestock in Studied Villages (2004–08) (unit: head)

Village	Na Savang ^{a)}			Na Mo Tay ^{b)}		
	Buffalo	Cattle	Pig	Buffalo	Cattle	Pig
2004	309	129	134	200	0	—
2005	230	120	—	86	0	74
2006	192	76	159	—	—	—
2007	160	60	120	30	0	—
2008	126	79	129	0	0	10

Source: The Data of Na Savang (2004) were surveyed by Miki Matsuura (Graduate School of Asian and African Area Studies, Kyoto University at that time) [Matsuura 2004]. The others were from the village-head men of each village.

Note: ^{a)}Na Savang village was composed of 131 households in 2004.

^{b)}Na Mo Tay village was composed of 74 households in 2004. Most of the villagers were the non-Buddhist Yang.

riverside area along the main road is presented (see Table 1 and Fig. 2). Na Mo Tay is also a Tai Yang village that grows wet rice, yet in comparison to Na Savang, Na Mo Tay villagers were less well-off, with smaller residential sites and agricultural fields. The villagers owned many water buffaloes but no cattle in 2004.

Among the large livestock and poultry, Na Savang villagers looked upon water buffaloes as the most valuable and useful livestock. First, water buffaloes were necessary for most of the villagers for cultivating paddy fields before hand tractors started to be used in the second half of the 1990s. Water buffaloes were also used for transporting agricultural products. Second, even after hand tractors became popular, the villagers continued to keep water buffaloes as their most valuable fungible asset, as they can be exchanged for either a large amount of money or goods if necessary. The males were sold or slaughtered by the villagers at feasts as the most valuable and tasty dish.³⁾ The females were kept, because the full aged animals produce offspring each year or two, thereby increasing the villages' assets. Third, villagers could reduce weeding labor in and around the fields and the village because water buffaloes efficiently grazed on the weeds, and additionally their dung could be used as an effective manure for their paddy crop.

Water buffaloes were multi-functional livestock essential in maintaining the villagers' way of life. Until around 2006, the younger generation of village members maintained these animal husbandry practices in accordance with their cultural and economic norms.

Na Savang villagers used to inherit water buffaloes and cattle from their parents, who would normally pass on their animals to their sons and daughters equally. This can be best illustrated by the story of a 58-year old man and his family in 2007. He had inherited a water buffalo from his foster parents who had eight water buffaloes, while his wife inherited no water buffaloes from her parents. After the inheritance, they grazed the animals which subsequently produced offspring. They bought small Lao native cattle and grazed them, as well. Male offspring were sold when there was a need, and one male water buffalo was slaughtered for a feast for their first son's and the second son's marriages respectively. By the time the informant had turned 55, they owned 7 water buffaloes and 10 cattle. They divided them among his seven children, as can be seen in Table 2. In the next section, we describe how the villagers graze water buffaloes.

3) For example, Na Savang village and Khwang Kham village have a custom that the two villages slaughter a water buffalo jointly and villagers share the meat and drink liquors with their friends and neighbors on each precept day's eve called *mue hang* or *mue da* during the Buddhist Lent. Besides this custom, Na Savang villagers eat water buffalo meat at wedding parties and housewarming parties. They also eat it after sacrificing to the guardian spirits of Mueang Ay and the village every year. (In the old meaning, the *mueang* was a ritual or political unit binding local communities as villages.) They customarily have parties to eat the meat also during the *kin tiang* new year and the *Mahasat* Jataka Festival. Several villagers told us that it was a taboo for Na Savang villagers to eat beef during the Buddhist Lent because a cow was a foster mother of the Buddha in their local Jataka tales.

Table 2 Inheritance of Water Buffalo, Cattle and Paddy Field: A Case of a Villager in Na Savang in 2004

Children	Sex	Age	Marital Status	Feast at Marriage	Residence	Inheritance of Buffalo	Inheritance of Cattle	Inheritance Paddy Field
1	M	36	married	1 male buffalo	with parents	2 females	1 female	inherit
2	M	32	married	1 male buffalo	married out	2 females	1 female	inherit
3	F	29	married	non	married out	0	1 female	0
4	F	29	married	non	adopted out	0 ^{a)}	0	0
5	M	24	unmarried	—	with parents	1 female	1 female	inherit ^{c)}
6	F	19	unmarried	—	with parents	unfixed	unfixed	0
7	F	17	unmarried	—	with parents	unfixed	unfixed	0
parents						1 female ^{b)}	6 females	

Source: Surveyed and interviewed by the authors

Note: a) The third and fourth children were twins, so the latter was handed over to the adoptive parents. She already received a female buffalo and a female cattle from the adoptive parents.

b) The parents kept a female water buffalo and six female cattle with them at the division in 2004. They told us they would like to give the sixth and seventh children two female cattle each in the near future but the inheritance was unfixed. They also told us they would give water buffalo's calves to their younger children when a water buffalo gave birth.

c) The parents held one hectare of paddy fields which were not divided among their three sons in 2004. The parents told us they would give the fields to their sons after the third son's marriage.

III Water Buffalo Grazing and Fallow Land

In rural areas of northern Laos, land remaining fallow after the harvest of both paddy and swidden agriculture is used for grazing water buffaloes.

In 2006, many of Na Savang villagers cultivated paddy in the rainy season only and after the rice harvest in November or December, whereby villagers allowed their water buffaloes to graze in and around their own fallow paddy fields during the daytime. Before it got dark, water buffaloes returned to their owner's remote seasonal cottage or to nearby their paddy fields, where they were hitched to the pillars underneath the cottage, and given rice straw which was stocked there.⁴⁾

Water buffaloes were allowed to move together freely across each owner's field, and the animals tended to move in groups. Each group had a few leaders which had reached full age.⁵⁾ In February, the owner let male buffaloes mate with the females naturally.

4) For example, the rice straw of a popular traditional breed called *Khao Ta Kiat* is about 120 centimeters long and a traditional breed called *Khao Hok*'s straw is about 160 centimeters long.

5) The villagers call the leaders *huana hung khway* (the leader of water buffalo group), *mae phueng* (the mother of group) or *mae nyai* (big mother) in Tai or Lao. In most cases, the leaders are females about five to twelve years old. According to the villagers, the females ↗

Even if an owner has females only, he could expect his females to get pregnant because there were always a few males in or around his water buffaloes' group.⁶⁾

After half a year's grazing on the fallow paddy fields, they plowed, harrowed and leveled the fields using their water buffaloes in May, June or July until the middle of the 1990s. However, most villagers cultivated their fields with hand tractors in 2006.

When rice transplanting had started, the owners, their sons or sons-in-law let their water buffaloes move from the paddy fields to the forest area (*boy pa*).⁷⁾ According to villagers, *pa lao* — grass field, bush or young woods that have been fallowed for between one and four years after swidden cultivation — are appropriate for grazing lands.⁸⁾ The grazers selected points near streams or ponds where plants such as *Panicum notatum* (*nya nyung*), *Imperata cylindrica* (L.) Beauv. (*nya kha*) or bamboos grew in bunches and let their water buffaloes graze in these areas during the wet rice planting season.

Na Savang villagers' cattle grazing practices differ from water buffalo. Although the villagers allowed Lao native cattle to graze on fallowed paddy fields during the dry season, they do not release cattle into the forest during the rainy season. Rather, they choose to keep cattle near the village throughout the year, as they believe it is bad for cattle to get wet. Furthermore, cattle require less grass than water buffaloes, so they can be kept nearer to the house where villagers can keep a closer watch on them. This is in contrast to water buffaloes, which are believed to be well-adapted to the more natural environment of the forest.

Since the 1990s, people grazing water buffaloes have formed several small, informal groups in order to manage their livestock during the rainy season when they move into

↙ are able to move in a group, though the full aged males have difficulty living together. So the groups tended to be composed of full aged females and calves.

6) In some villages, we were told that they did not castrate the males at all, though in other villages, including Na Savang the males aged over about six years old were castrated because the villagers perceived un-castrated elder males tended to become thin and hot-tempered trouble makers. Na Savang villagers told us that they kept the males under about five-year-old un-castrated because the younger males are useful for breeding.

7) The word *boy* is used in contrast with the word *liang* which carries the meaning to feed, take care, keep, and domesticate. The former means to set the water buffalo free all day long, while the latter includes part-time grazing during the dry season, as mentioned above. The word *pa* means forest, woods, bush and grass fields in contrast with the word *na* (paddy field) and *hai* (swidden). The former is land left under semi-wild or fallow conditions, while the latter is land that is managed by humans, and kept under artificial conditions.

8) The word *pa lao* is used in opposition to the words *pa kae* and *pa dong*. *Pa kae* means aged fallow forest, of more than about five years after swidden harvest. *Pa dong* means natural forest and deep fallow forest many years after the last swidden agriculture. In many cases, water buffaloes do not enter into these kinds of forest, because of a shortage of edible under grass and young trees.

the forest.⁹⁾

As mentioned above, the water buffaloes grazing in the adjacent plots of a fallow paddy area tended to form groups naturally during the dry season in 2006. In many cases, the owners of the water buffaloes grouping together in the dry season formed a rainy-season buffalo management group. The core members of this group tended to be a close partilineal descent group members who often have paddy lands and residential sites close to each other, as according to local practice, these lands were passed on from parents to sons, which contrasts to the more equitable inheritance of livestock among both sons and daughters.¹⁰⁾ There were, however, several cases in which daughters inherited plots from their parents when the parents had large land or the daughters' husbands had little hope of inheriting land from their own parents.¹¹⁾

Each grazing group used the forests of the upper or lower reaches of a stream near the grazers' paddy field and moved along the stream. Each group was thus known by the stream's name, such as the Hoy Stream Line Group (*khum say huay hoy*), and the Nam Lao River — Mixay Line Group (*khum say nam lao mixay*), and so forth. The Nam Phak River Line Group (*khum say nam phak*) is introduced below.

In 2006, the Nam Phak River Line Group was composed of nine water buffalo' owners with all members residing in the same settlement in the village. Each owner had 1 to 5 water buffaloes with a total of 31 water buffaloes in the group.

During the dry season, the members allowed their water buffaloes to graze in the fallow paddy fields called Na Ma and Na Luang (see Figs. 3 and 4). The eight members had their plots in these fields (Fig. 4). Fig. 5 represents their kin relationships.

Among the members, Mr. S had no plots in the Na Ma- Na Luang fields but owned two plots in other paddy fields. One of his plots was located near May Na Tao (a Khmu village) and the villagers allowed their animals to graze in the plot with his consent.¹²⁾ Another plot belonging to Mr. S was used by the owner of a neighboring plot for grazing. The field where these plots were located were not large enough to accommodate a large

9) The members told us the local government officers advised them to organize the co-grazing groups, but they also explained to us that their groups were organized customarily before the advice was given.

10) The members who descended from the same patrilineal ancestor called each other *takun diao kan*. They tend to use their surname which include the same word showing this relationship.

11) For example, Mr. D inherited no pieces of land from his parents, so the parents of Mr. D's wife gave a plot of them to her. Mr. K's mother also inherited land from her parents for the same reason (see Fig. 5).

12) The Khmu, Kmhmu', Kamhmu or Kammu belong to the Mon-Khmer family of the Austroasiatic speakers, according to the ethno-linguistic classification. The Khmu are one of the original inhabitants of the Indochinese region, having lived here since before the arrival of other non-Mon-Khmer people. In old times, the Lao and Thai people called them by the name *Kha* which meant slave [Simana 1998: 1-2].

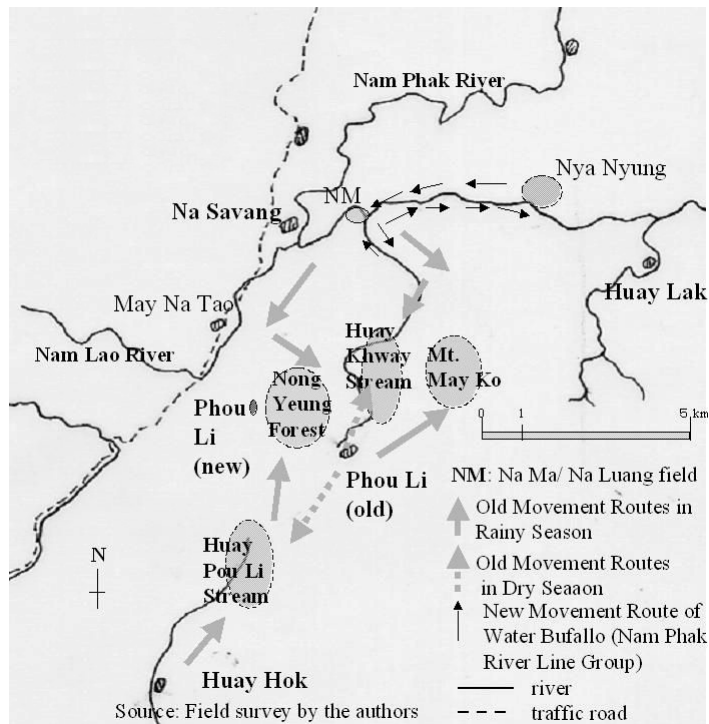


Fig. 3 Water Buffalo Grazing Routes

Source: Created by the authors

number of buffaloes grazing jointly, so Mr. S grazed his five buffaloes in the Na Ma field during the day and hitched them to the posts on the mountainside nearby during the night. This was done with the owners' consent, and demonstrates a case of the cooperation and compromise in using paddy fallow among the grazers during the dry season.

When the villagers started paddy transplanting, some or all members of the Nam Phak River Line Group encouraged a few water buffalo leaders to walk out of the paddy fields toward the eastern forest area along the Nam Phak River (see Fig. 3). The rest of the water buffaloes followed the leaders. The grazing area was located around the village border between Na Savang and Huay Lak (a Khmu village). Group members followed their water buffaloes and guided them to a suitable grazing area. After reaching this point, an elder male member performed an offering to the local spirits to ask for help ensuring the safety and good health of their buffaloes. After the offering, the members left their animals and returned home.

During the rainy season, the members walked into the forest area usually once every several days in order to check their water buffaloes. This was done by rotating group members, and they usually took a handful of salt in order to catch their interest. After

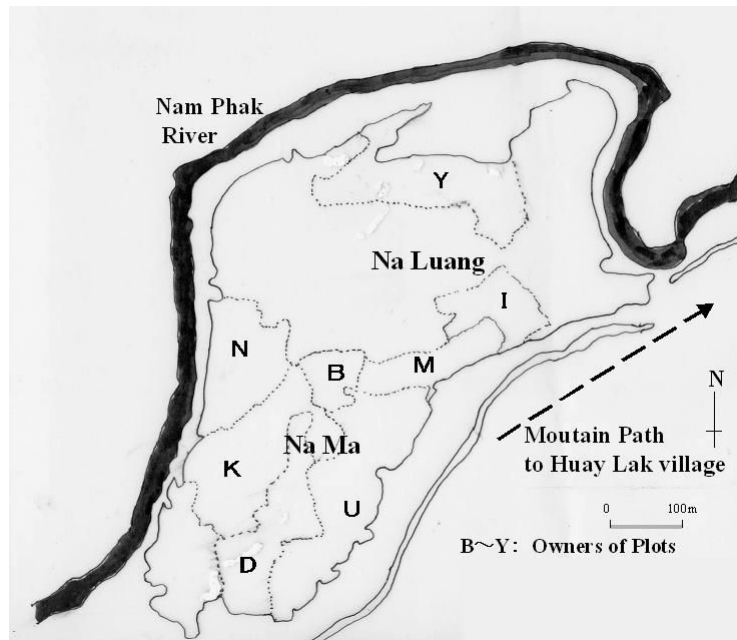


Fig. 4 Paddy Field Plots of Nam Phak River Line Group's Members in Na Ma-Na Luang area in 2006

Source: Created by the authors using Takashi Kotegawa's Field Data Map

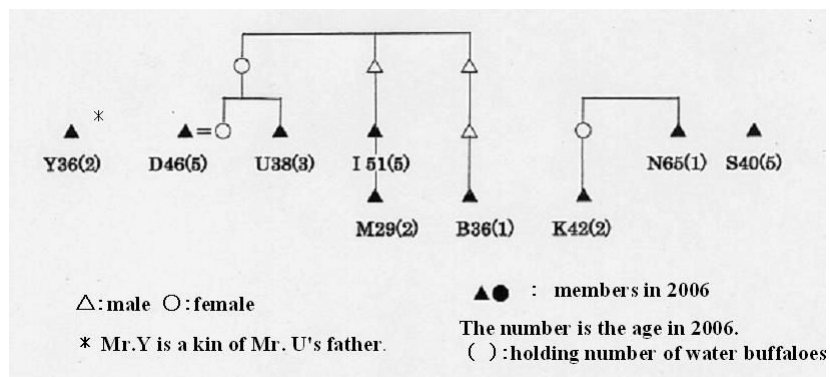


Fig. 5 Kin Relationship among Nam phak River Line Group's members in 2006

Source: Field survey by the authors

they found them, they inspected their bodies carefully and treated any injuries or illnesses with medicinal plants in the forest as necessary.¹³⁾ In any case, the person on duty had to report the conditions of each water buffalo to its owner. Before water buffaloes ate all the grass in the area, they were moved to a new spot. During the days when rice plants were in flower and they began to seed, the grazers moved water buffaloes to an area far from paddy and swidden fields and after the rice was harvested, water buffaloes were allowed to go back to paddy fields.

Na Savang villagers customarily graze water buffaloes as a component of their traditional livelihood, together with farming, fishing, hunting and gathering using both the fallow of both paddy and swidden fields for grazing. In this way, they are able to reduce the time and labor needed for feeding and weeding. Villagers prefer to graze water buffaloes and cattle freely, rather than resort to other options for more productive, low-risk grazing, despite damage they sustain from parasites, poisonous plants, wild beasts and injuries incurred during forest grazing. This is partially based on the thoughtful and restrained interactions among the members of local communities, where villagers, including both grazers and cultivators, cooperate closely with kin and neighbors to translate generalized norms of reciprocity into specific arrangements for managing natural resources.

IV Selection of Grazing Area and Latent Conflict

The annual calendar of water buffalo grazing mentioned above, however, shows the latent conflict between agriculture and livestock. Grazers must control water buffaloes to avoid damage to paddy rice and swidden crops as when conflict points flare up, the grazers are urged to change their grazing areas. This happened in Na Savang several times in the 1990s, which will be described in the following section below.

Until the 1980s, Na Savang villagers used to let all of their water buffaloes move out to the southern areas called the Pa Nong Yueng Forest and the upper reaches of the Huay Khway Stream during the rainy season, because the fallow areas near Na Savang were not large enough to cater for the needs of their water buffaloes (Fig. 3).¹⁴⁾ The grazing areas were located in the territory of the White Hmong village named Phou Li. During grazing, Na Savang grazers used to go into forest grazing areas to check their water

13) For example, a Na Savang grazer told us that he mixed Mercurochrome, lime and hot pepper and applied the concoction to the bite from a venomous snake. In addition to the grazers' daily care, veterinarians of the local government visit Na Savang to vaccinate water buffaloes against parasite diseases twice a year, for the buffaloes grazing in the forest are at high risk of getting the diseases.

14) *Nong Yueng* means swamp or damp ground which never dries up. *Huay Khway* means water buffalo stream.

buffaloes once every week or two. After the paddy rice harvest, they would let their water buffaloes back into their fallow paddy fields.

In contrast, Phou Li villagers used to let their water buffaloes and Lao native cattle move to the Mt. May Ko area during the rainy season, and let them move to the upper reaches of the Huay Khway Stream or the Huay Phou Li Stream during the dry season (Fig. 3). However, Phou Li villagers had no paddy fields and cultivated swidden fields in the Pa Nong Yueng Forest during the rainy season.

In those days, it appeared that Phou Li villagers were tolerant of the Na Savang grazing in their village territory. They gave permission to allow about 300 water buffaloes from Na Savang to move into the Pa Nong Yueng Forest and the upper reaches of the Huay Khway Stream every rainy season. In addition to Na Savang grazers, Khmu people from Huay Hok village also grazed about 100 water buffaloes in the Pa Nong Yueng Forest and the upper reaches of the Huay Phou Li Stream (Fig. 3).

But many of Na Savang grazers have shifted their grazing points back to their own village lands in the early 1990s when Phou Li villagers became intolerant to Na Savang villagers' grazing. According to the ex-village headmen of both Na Savang and Phou Li, the village-border was delineated in the early 1990s. Villagers related some trouble cases whereby Phou Li cultivators shot at water buffaloes owned by Na Savang villagers to express their discontent when their animals ate their agricultural products. The ex-village headman of Phou Li commented on the troubles that it was natural that the cultivators had a right to get meat if the grazer did not pay any form of compensation. What this scenario suggests is that the growing consciousness of the exclusive ownership of village territory and the commercial value of agricultural products might have made the villagers intolerant.¹⁵⁾

After the withdrawal from the Pa Nong Yueng Forest, most of Na Savang villagers continued to allow their water buffaloes to graze in several areas around their village during the rainy season between 1990 and 2008 as mentioned above. Each area was not large, so they had to subdivide their water buffaloes' group into smaller sizes.

Additionally, it has also become more difficult to graze animals in the fallow paddy during the dry season every year, as since the 1990s, farmers have started growing off-season vegetables after the rice harvest. Several land owners in the Na Ma — Na Luang fields have also been trying to grow various kinds of market-oriented agricultural products, such as watermelon, in the fields during the dry season. They have had to fence their plots to keep the animals out.

15) In 2004 and 2005, most Phou Li villagers moved to a new site near the Nong Yueng pond, following the local government's advice, because the new site was located near their agricultural fields and on the new road through this area. Cash-cropping has become popular among them since 2004. They left about 20 water buffaloes and 50 cattle in their pasture site near their old settlement in 2007. According to them, they reduced the number by half after migration. In 2007, the population was 268 persons in total 42 households.

In 2007, a member of the Nam Phak River Line Group told us that he kept his plot in the Na Ma field in order to let his water buffaloes graze during the dry season. He grew watermelons in his remaining plot in another field. However, another member of the group told us it became difficult for water buffaloes to graze in the Na Ma field. He subsequently moved his dry season grazing area out of the field.

Despite the Na Savang grazers' constant attempts to adapt to the changing conditions by shifting their grazing areas around, in the end many of them would abandon their husbandry efforts. In the next sections we describe how the growing sense of conflict led to a prohibition against free grazing in Luang Nam Tha and Oudomxay provinces, which ultimately brought about a decline in the number of water buffaloes in these areas.

V Deepening Conflict and the Decline in Water Buffalo Grazing

The conflict between grazers and cultivators has been a real problem since around 2000. Damages from grazing animals are regularly reported to the village headman, who typically acts as a mediator between the grazer and the cultivator who sustained damage. A set of mediation rules has emerged and is regularly applied. In cases where the victim's guard fence was prepared well, the grazer must pay the same amount of rice as the damage. If the fence was not well-prepared, the grazer would be partly excused from compensation.¹⁶⁾ Around 2000, many village headmen began to advise villagers to set up barbed-wire fences around their agricultural fields to keep the animals out.

The above-mentioned prohibition of swidden agriculture and the spread of cash-cropping have been a source of tension with regards to livestock management. However, in more recent years, the boom in rubber planting in the hillside areas along the main roads has served to exacerbate these tensions. In northern Laos, rubber planting started in Luang Nam Tha province in the middle of the 1990s. Some of the pioneer planters have already begun to reap large benefits in the form of cash income from latex sales. These success stories spread rapidly among the communities of the area, offering farmers an attractive alternative crop. Since around 2005, rubber planting, both in plantations and small holder plots, has reached unprecedented proportions.

In many cases, the upland rice and other cash crops are planted among the young rubber saplings that have been planted in the swidden fields. But in the third year, as the tree canopy begins to close, the fields give way to rubber mono-cropping. Planters can expect to start tapping the trees for latex in the eighth year, and can normally sustain collection for approximately 30 years.

16) In cases whereby a group of water buffaloes or cattle owned by several grazers have damaged the crops, each of them should share the burden of compensation according to the number of the holdings.

Water buffaloes like to eat the rubber saplings, which has made the task of controlling grazing animals all the more difficult. For example, in Phou Li village, five households started to plant the rubber saplings in 2005. In 2007, the villagers told us that if a water buffalo had eaten a two-year-old rubber sapling, the planters would demand compensation of 100,000 kip (about US\$ 10.4 or 1,235 YEN). The compensation for a three-year-old rubber sapling was 500,000 kip (about US\$ 52) and the compensation for a four-year-old tree was 1,000,000 kip (about US\$ 104). These penalties were high enough to discourage grazers from releasing their animals in the area of rubber gardens.¹⁷⁾

In addition to these local solutions, the provincial and district governments have developed several measures to resolve disputes between grazers and cultivators. On one hand, higher levels of government observed the success of local village headmen's prohibition against free grazing in populated areas and agricultural promotion zones. The Luang Nam Tha provincial government supported such regulations in the Luang Nam Tha basin around 2000.

For example, in Done Khoun village, located in the old populated area of Luang Nam Tha, the villagers had already fenced their paddy fields in the 1990s. They allowed their water buffaloes and cattle to graze freely outside of the fenced fields during the rainy season and then moved the animals into the fallow paddy fields during the post-harvest season. In addition, the provincial government gave notice of the prohibition policy and the village committee decided not to allow their animals to graze freely near the village in 2001. The government did not compensate the grazers for their loss of grazing land, but pledged to improve the traffic and educational conditions of the village in return.

Since 2005, the government of Oudomxay province has also carried out this policy in most parts of the basin and hillside areas around roads. The following case of Huay On village near Na Mo market (see Fig. 1) illustrates how this was done. Since the 1980s, both cash-cropping and commercial activities developed constantly in this area. According to the villagers, the soil of this area was fertile, so many migrants arrived to cultivate the fields and paddy, corn and rubber saplings were planted intensively by 2008. The district government and the village committee jointly prohibited the villagers from grazing their animals freely in the area since 2004 when the planting of rubber saplings started to gain momentum in the area. Since 2006, grazers had to pay 500,000 kip fine per water buffalo or cattle when it was found that animals were grazing in the prohibited area, even if they did not cause any actual damage to the crops. As a result of this regulation, the cultivators no longer need to fence their fields to keep water buffaloes and

17) The daily wage for physical labor was about 30,000 kip (about US\$ 3.12, 370.4 YEN) in Xay city and Na Mo market's area in 2007. The wage was 25,000 kip in 2006. The daily wages of rice transplanting and harvesting in Na Savang village were as follows: 15,000–20,000 kip (2006), 20,000 kip (2007) and 25,000–30,000 kip (2008).

cattle out, because the grazers are responsible for the damage caused by their animals in the prohibited areas, even if the damaged fields were not fenced.

On the other hand, the local government has been advising village headmen to fix the grazing areas and encouraging grazers to graze their animals together in groups. Starting in 2000, the government has left it to each village to decide whether it will establish designated areas for grazing or not. The villages are free to determine the grazing areas in their village, but government officers have recommended that the villagers establish these grazing areas in mountainous areas far from the residential and agricultural areas, where rivers and thick forests provide a natural ‘fencing’ for the animals.

In the Done Khoun village case mentioned above, the villagers decided to move their 200 water buffaloes and 300 cattle to a bamboo forest located about 10 kilometers south of the village. This site was used collaboratively with two other villages for four years. In 2005, however, villagers lost access to this forest because the provincial and district governments granted a long-term lease over the area near this forest to a Chinese rubber planting company. By 2009, the village had no fixed pasture areas, thus water buffaloes started to disappear and only about 50 cattle remained.

In Huay On village, the grazers sold about half of their animals after the prohibition against free grazing. The number of water buffaloes decreased from over 100 to 62, while the cattle decreased from 80 to 40 in these five years, as well. The grazers moved most of their remaining water buffaloes into fenced pasture sites in the mountains located in other villages and entered into collaborative land use arrangements with the local villagers.

The cases of Yao Yay and a neighboring village named Lak 32 in the eastern mountainous area of Xay district, Oudomxay province (see Fig. 1) provide more detail information on the impact of these restrictions. Yao Yay is a White Hmong village that migrated from Nga district in 1973 when Route No. 1 of Oudomxay province was paved. After settling, they allowed their animals to graze around their village freely. But the grass around the village ran out by the end of the 1980s. They consequentially moved their animals to a hill area named Phu Nya Kha where *Imperata cylindrical* (L) Beauv. (*nya kha*) grass grew abundantly. Lak 32 is also a new village along Route No. 1 established in 1976. This village is composed of migrants from various ethnicities around the areas and villagers here allowed their animals to graze freely in the southern riverside areas. But grazing became difficult as the population rapidly increased and the reclamation of paddy land in the riverside areas progressed. Lak 32 villagers and Xay district government asked Yao Yay villagers for permission to let a part of the Lak 32 animals move into the Phu Nya Kha area in 2002 and as a result of this the two villages started to jointly use the pasture. However, after trouble arose between the herds of two villages in 2004, Yao Yay villagers built a fence to divide their pasture area off from Lak 32's area.

Rubber planting has also become popular among the villagers since 2006. Lak 32

grazers moved the majority of their animals into the pasture land of Phu Nya Kha. The implementation of the Forest Land Allocation Program, carried out with assistance from the Oudomxay provincial Agriculture and Forestry Division and the Xay district Agriculture and Forestry Office, helped villagers begin planting rubber saplings in 2006–07.¹⁸⁾ Under the leadership of the village committee, fallow forest located in the non-protected zones was allocated to villagers. However, rights to use plots of allocated land are forfeited by farmers who leave the plot fallow, which provides a strong incentive for farmers to do intensive cash crop farming or planting rubber. This also provides them with cash to pay land tax.

As water buffalo and cattle grazing increased the pressure on the pasture area in Yao Yay, villagers began to sense the coming crisis of grass shortage through the increase in water buffaloes and cattle grazing on the pasture. At the same time, it seems that Lak 32 villagers did not grasp the actual number of animals grazing in this pasture. It seems probable that, with different socio-cultural backgrounds, these villages were not able to create the type of relationship necessary for effective rules for co-management.

In contrast to these cases where villagers set out clearly defined grazing areas, Na Savang, Na Mo Tay and Done Khoune villages already mentioned above decided not to set fixed pastures. In these villages, villagers tended to select from the following options. First, some of them stayed with the animals to watch over them during the day in all seasons so that they could continue grazing in the prohibited areas. The animals were tied to the post of the owner's cottage during the night. Second, some of them tied their animals to poles in fields or forests with a rope long enough for them to graze widely during the day. The animals were then tied to the poles of the cottage during the night. This was practiced throughout the year. And third, others made an agreement to leave their female livestock with grazers of their acquaintance in the mountainous region outside of the prohibited area under the agreement in which grazers receive the first calf while owners get the second one. The grazer and the owner share the offspring equally and the mother livestock is taken back to the owner after the end of the agreement. These arrangements were used by some villagers even in villages where grazing lands have been established.

However, many of the animal owners expressed displeasure with the outcomes. With the first option, grazers complained that they do not have enough time to watch over the

18) According to Takayuki Namura, the Forest Land Allocation Program is a set of policies as follows: (1) land zoning according to both the natural conditions and the purpose of using each area, (2) specification of management rights for each plot, (3) definition of land use and appropriate land management practices for each plot. According to the Ministry of Agriculture and Forestry, one of the purposes is to make full use the latent resource and to develop cash cropping, afforestation and livestock grazing. Another purpose is to allow villages to manage the forests for conservation. This program has been in operation since the beginning of the 1990s in Luang Phabang and Sayabury provinces [Namura 2008: 206].

animals. This is especially because both household heads and spouses have experienced an increase in workload with the rapid growth of cash-cropping and other economic activities. Younger members of the family attend school, so in reality animals are cared for by young children and the elderly, who are not appropriate for following animals into the mountainous forests for grazing. This has meant that grazing areas have contracted into the smaller available areas nearer to the village.

In the first and the second arrangements, villagers have to spend time on cutting and transporting grasses which were previously eaten by water buffaloes themselves. They must cut and carry fodder for the animals during the period of August to October, when there is no rice straw available. This physical labor is often more strenuous than the new economic activities. And considering that water buffaloes need more fodder than cattle, water buffalo husbandry has become a less attractive option, as it is increasingly difficult to meet the grazing and feeding needs of the animals. Water buffalo husbandry has become such a burden that many have chosen to stop.

Table 1 shows the rapid decrease in the number of water buffaloes in Na Savang and Na Mo Tay over the period covering 2004 to 2008. In 2008, most of the members of Nam Phak River Line Group sold their water buffaloes. Na Savang villagers have continued raising cattle and pigs, which is done in small contained areas near the village, although the total number of water buffaloes and cattle have decreased significantly in the past five years. Na Mo Tay villagers now have no large domestic animals.

In the third arrangement, we witnessed several tense situations between grazers and owners. A man in Done Khoune village had 8 water buffaloes and 50 cattle in 2000. But after the loss of pasture land in 2005, he sold all of his water buffaloes and some of his cattle to traders. He left 8 cattle with his friend in a village located in the mountains and left 9 cattle with another friend in another village. The cattle with the former friend bred 6 calves but all died and the 2 female cattle also died because of the shortage of fodder grass in his friend's village, where rubber tree planting had become popular. After a year and a half, he brought his cattle back from his friend. His friend requested 700,000 kip as a fee for grazing the animals. The owner felt the fee was unreasonable but paid it nonetheless so as to avoid destroying the relationship with his friend. The cattle with the latter friend also lost weight, and two died because the water of the stream was not good for cattle. After two years, he took his female cattle back and equally divided the four new-born calves with the grazer.

This kind of conflict between grazers and cultivators is reflected within the district government as well. According to an officer of the Livestock and Fisheries Section (of the Department of Agriculture and Forestry), the policy direction of his section was in conformity with that of the Agriculture and Forestry Section's direction until 2000, as the agriculture and forestry officials appreciated livestock's production of manure for agricultural fields. However, since 2000, the two sections' directions have parted ways. The Agriculture and Forestry Section's efforts have promoted market-oriented crops that use

chemical fertilizers while excluding grazing livestock. The department supported the latter's direction because the increase in export revenues is important for the government and foreign markets hold the highest potential for exporting Lao cash crops. Compared to the cross-border trade in agricultural products, livestock trade is troublesome because of the concern for disease and parasites.

The Livestock and Fisheries Section is well aware of the possibility of meat shortages, in the near future and has been promoting local varieties of livestock since the 1990s, in an effort to increase meat supply.¹⁹⁾ Some farmers responded to this by leasing cattle to graze on land provided free of charge by the government while other farmers are experimenting with new hybrid fodder grasses in or around their pasture areas.²⁰⁾ These innovations indicated farmers' adaptive capacity, but despite advances in management practices farmers still face serious constraints in accessing sufficient areas of land.²¹⁾

In the rural areas, the villagers have taken up the shift to market-oriented agriculture with great enthusiasm, and their limited labor resources are increasingly dedicated to cash cropping work and small-scale trading. There are wide-spread perceptions that water buffalo husbandry with the tasks of feeding and careful control is not a good use of precious time, and many have begun to sell off their herd. Villagers who liquidate their herd often purchase hand tractors.²²⁾ According to these people, the people dealing in the water buffalo trade tend to act as mediators between the villagers and the shops in the

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- 19) The Livestock section started to encourage villagers to graze Lao native cattle varieties instead of water buffaloes since the end of the 1990s because of the following points: (1) water buffaloes are not suitable for group farming on a large scale. (2) The breeding of cattle is faster and more productive than water buffalo. (3) Water buffalo meat poses a higher risk of parasitic disease than beef. (4) Beef is more preferential than water buffalo meat by the consumers in central Laos and foreign countries. (5) It is difficult for the villagers to graze foreign hybrid cattle in the natural environment of northern Laos.
 - 20) Various breeds of grass such as *Panicum maximum* (kinni), Paspalum, Stylosanthes guianensis have been introduced by Centro Internacional de Agricultura Tropical (CIAT) in Luang Phabang province since the middle of the 1990s. The project was also started in Oudomxay province in 2001. But according to the officer, the grass planting did not become popular among the villagers because they tended to suspect the grass made the soil poor.
 - 21) For example, a Tai Lue farmer from Hat Pang village, Phak Ou district, Luang Phabang province has rented 12 hectares of land from the government and started to grow varieties of fodder grass provided by the government since 2002 (see Fig. 1). He was the only innovator in his village. His trials were successful and he had a number of well developed livestock. But shortly after that, he found that the fodder grass supply was insufficient and he could not find new land to expand his pasture. In 2006, most of the surrounding lands were converted to rubber tree plantation. So, he started to graze goats in his pasture, leaving his cattle and water buffaloes to his friends who lived in the mountainous region. According to him, the government has promoted the rubber planting rather than livestock husbandry.
 - 22) Villagers of Na Savang and Na Mo Tay sold a full-aged water buffalo for 3,500,000–4,000,000 kip and purchased hand tractors for 8,000,000–12,000,000 kip in 2005–07. The hand tractors they preferred to purchase had Thai-made bodies and China-made engines. According to the village-head man of Na Savang, there were 60–70 hand tractors in the village in 2006.

municipal areas of Xay or Luang Nam Tha.

In summary, it has become increasingly difficult for villagers to continue keeping water buffaloes by either grazing freely in fallow fields or other ways. This is particularly so in villages located near roads with no fixed pasture areas. Local authorities have tightened regulations over land use in order to reduce livestock-agriculture conflicts, but priority is given to market-oriented agricultural development over the customary rights of grazers and potential for livestock development.

The land zoning policy has functioned to encourage and legitimize a restructuring of land use from water buffalo grazing based on customary land use management toward cash cropping by farmers who assert their exclusive rights on the land in which they have invested their money and labor intensively.

The decline of water buffalo grazing indicates the break-up of customary mutual agreement systems within a process shifting from previously diverse production systems to a more simplified cash-cropping one proceeded by both rural villagers and governments orientating toward a market economy and international trade in the current land-linked conditions.

In the following section, we turn to the local traders who deal in fresh buffalo meat, to highlight how the development of these distribution mechanisms is another incentive that pushes villagers to sell off their water buffalo herds.

VI Trade in Water Buffalo and Changing Life-style

The Lao government's policy on commercial trading has changed drastically in the past 40 years. In the early years of the socialist regime, the government dealt directly in the trade of livestock, though after a few years, state companies took over this role from the state, even if policy still formally recognized the government as having the central role. Since the beginning of the 1990s, private traders have reassumed an officially recognized role in the trade of livestock in Laos. After the open door policy was adopted, the number of traders rapidly increased in both urban and rural areas. Meanwhile, many state companies ceased their activities.

The rural villagers of northern Laos are able to choose where and to whom they sell their livestock, based on the consideration of price differences between traders in surrounding towns and cities. For example, Na Savang villagers have sold their water buffaloes and cattle to traders from an adjacent village named Khwang Kham, Huay On and the municipal area of Xay district (Xay city). Traders also come from Luang Nam Tha province and villages on the other side of the Lao-China national border. The following discussion introduces the role of traders from Huay On, Xay city and China.

VI.1 *Huay On Village and Na Mo Market*

A few Huay On villagers started to sell water buffalo meat at Na Mo market in 1990. In 2004, there were three co-business groups (*ju*) of the traders. The groups increased to five in 2008. Each group was also a formally authorized unit (*nuay*) under an obligation to pay taxes with each group composed of four or five small traders. Many of them were part-time traders who also engaged in paddy cultivation. The members of a group pooled their capital in order to purchase water buffaloes or cattle.

Huay On is located near Na Mo market along Route No. 1 which connects Xay city with Luang Nam Tha and Bo Ten (Fig. 1). The market is developing into a new trade center for Na Mo district. A small shop belonging to the district government was established in the early 1980s, and Na Mo market was formed later throughout the 1980s and 1990s.²³⁾ Huay On was composed of 40 Khmu families in 1980, and increased to 296 (1,492 persons) in 2008. Huay On and two neighboring villages have become a relatively densely populated area over the past 30 years. Some of the villagers have engaged in small-scale trading at the market, while cash-cropping spread throughout this area, as described above.

There are five groups selling water buffalo meat or beef at Na Mo market.²⁴⁾ The groups use a five-day rotational system whereby on a group's designated day, a water buffalo or cattle is slaughtered in the slaughter house at two o'clock in the morning, and the meat is sold at the morning market from five o'clock. During the four interim off-days, members of the group visit villages in Na Mo to purchase animals for the next market day. According to one of the traders, none of the group members has a car or motorbike, so they have to walk or take a mini-bus to their destination and bring the purchased animals home with them on foot. In 2008, he told us that water buffaloes and cattle have become fewer in villages near traffic roads, so he had to spend longer time than before to approach their owners in the distant mountainous areas from roads.

In 2008, the local demand for water buffalo meat and beef was not very high. But the emergence of the sellers itself shows that the local inhabitants have begun to purchase meat even on regular days, outside of their festival-days. This may be partially explained by the fact that it has become difficult for the people living in the densely populated areas to catch fish or insects in the surrounding environments. The local people indicated that fish in the Nam Xae River have decreased because of over-fishing and water pollution. They now purchase fish and meat from traders, though some people maintain fish ponds for self-consumption.

Besides selling at Na Mo Market, each group of local traders also sold water buffaloes

23) Besides small stands, there were about 60 shops, including clothing stores, daily necessities' shops, pharmacies and restaurants in Na Mo market area in 2006.

24) Some traders of Nam Xae village have taken charge of the sale of pork at Na Mo market since the middle of the 1990s. Most of the Nam Xae villagers are White Tai.

and cattle to traders in Xay city which is 52 kilometers east from Na Mo Market. In contrast to Huay On traders, the traders from Xay City transport the livestock they purchase in pickup trucks. They also use mobile phones to communicate with their business counterparts.

VI. 2 *Xay City and the Traders*

Xay city is the center of trade and transportation in Oudomxay province. There were only several Lue villages in the basin before the 1960s, but migrants from various ethnic groups started arriving from the surrounding mountainous areas in Oudomxay and other provinces in 1975 when the Lao P. D. R. was established. The total population increased to about 15,500 by 2008. Through a rapid development process, many of the swamps and forests have been reclaimed, so water buffaloes and cattle have decreased in the city area.

Until the 1980s, water buffaloes were sold officially by the state company of the province. The purchase clerk was a black Tai man, who walked to villages in and around the Xay basin in order to purchase water buffaloes. When the clerk was able to procure water buffaloes, the company slaughtered a few head each day. When he procured no water buffaloes, there was no more meat available yet, according to ex-workers, the inhabitants had few complaints about this because local people purchased meat in few amounts at that time.

In the first half of the 1990s, three Khmu men built a private slaughter house and started to deal in buffalo meat. Twelve Khmu traders who used the slaughter house formed an authorized unit. In 2000, a black Tai family from Luang Phabang built another slaughter house in the army station and formed another unit.²⁵⁾ The two units dealt in both water buffaloes and cattle. But the former were more frequently slaughtered, because northern Lao local people preferred buffalo meat to beef. In 2003, an average of four to five buffaloes would be slaughtered on any ordinary day.²⁶⁾

This number increased to six or seven head in 2008. The two units slaughtered more than 12 head on each of the four big festival days in 2008.²⁷⁾

In the case of the Khmu traders' unit in 2003, each trader brought water buffaloes or cattle to the private slaughter house on the determined day of a twelve-day rotation. After the slaughter, he sent the fresh meat to saleswomen. There were two units of saleswomen handling the retail supply of water buffalo meat and beef from this slaughter

25) In 2004, this unit had moved to the suburban area and a friend of the family took over the slaughter house at an army station between 2004 and 2007. During this period there were three units in the city.

26) When traders had no water buffaloes, cattle were slaughtered in their place. According to the head of the slaughter house, seven cattle need to be slaughtered to get the same amount of three full-aged male buffaloes' meat.

27) The four big festival days are New Year's Day, the Fifth Month Full Moon Festival Day and the day preceding the Beginning and End of Buddhist Lent.

house. Each unit was composed of 17 saleswomen and sold the meat retail every other day at either Nong Maeng Da market or Nong Leng-Ban Thin market in the city.²⁸⁾ The saleswomen were paid in piece rate.²⁹⁾ Traders also sold the skin to seven local food producers who processed it into *nang phon* (fried buffalo skin) and *nang yam* (dried buffalo skin). During the off-days, throughout the year, traders visited rural areas to purchase their stock.

In addition to the trade in Xay district, some traders of two units also dealt in the inter-district trade formally through contracts with other districts. They sometimes resold cattle out to traders from Vientiane. They were not, however, able to deal in inter-provincial trade since around 2006, as will be described below.

VI. 3 *Unauthorized Traders and Markets in Neighboring Countries*

The above mentioned cases are authorized by the government but it is very difficult to get an accurate volume of livestock trade, because quite a few unauthorized traders are operating in northern Laos. For example, villagers in the Nam Pak River basin told us unauthorized traders came from the Chinese side of the border area at night. According to the villagers, some of the traders resell the purchased animals to Thailand.

The livestock trade tends to be heavily influenced by cross-border markets. According to a Huay On villager, in 2008, unauthorized traders offered higher price than most of the traders of Huay On and Xay city for water buffaloes and cattle. He told us that Huay On traders offered 6,400,000 kip (about US\$ 736) for a large male water buffalo aged 10, while unauthorized traders offered more than 8,000,000 kip (about US\$ 920) for an animal of the same size in 2008, because the latter could sell water buffaloes to traders in the Chinese urban markets at higher prices than the local markets of Laos. The price of water buffalo meat was 30 yuan (about 37,500 kip, US\$ 4.3) per kilogram at Meng La City markets in Yunnan province of China, while the price was 25,000 kip (about US\$ 2.9) at Na Mo market and 27,000 kip (about US\$ 3.1) at Nong Maeng Da market in Xay city in 2008.

These traders supply livestock to markets in the densely populated urban areas of northern Laos and markets across the border in China. This is largely driven by the increasing demand for meat in both places.

According to a head-manager on food control at the industry and commercial department of Oudomxay province, the consumption of water buffalo meat in the province has been increasing by about 20 percent each year since 2000. The emergence of the densely populated areas appears to have driven up domestic demand. As mentioned

28) The retail price of water buffalo meat or beef per kilogram was 19,000 kip at the city markets in 2004. It increased to 25,000 kip in 2007. The daily wage was about 30,000 kip in the city in 2007. The prices were also influenced by the exchange rate between the kip and the U. S. dollar.

29) According to the contracts made with the saleswomen in 2008, they received one thousand kip per kilogram sold.

already, even rural lifestyles have been subject to influence from the urbanization processes. However, the lifestyle of urban residents has changed even more drastically. Customary livelihoods based on semi-subsistence and self-sufficient rural culture cannot be sustained for a number of reasons as follows: (1) They do not have enough land for agriculture and fallow lands for getting plants easily; (2) Water resources have been declining because of the reclamation, over-fishing or pollution of rivers and ponds near populated areas; (3) They do not have enough time for fishing, hunting and gathering, for they have become busy with either trading or wage labor. Many of them have come to believe that it is better to go into non-farming economic activities, including trade in livestock, so that they can purchase meat from merchants at the market, rather than spend time catching fish and collecting edible plants in the fields and streams.

But it must also be pointed out that the sustainability of the current trade in water buffalo may be doubtful. According to traders who deal in livestock in Xay city and Huay On village, their business reached its peak around 2005. However, since 2007, it has become increasingly difficult to purchase water buffaloes and cattle at reasonable prices from rural villagers, because of the marked decrease in water buffalo in villages near traffic roads, while the buyers have increased. The government of Oudomxay province has been trying to strengthen restrictions on the export of water buffaloes and cattle in order to ensure a reliable supply of the meat to the provincial market and to control the market price of the meat. In fact, the export of water buffalo meat from Oudomxay province to Thailand was formally stopped in 2001. Oudomxay province also stopped renewing contracts with other provinces on the number of exportable water buffaloes and cattle in 2006 and 2007. These restrictions seem relatively successful in relieving meat shortages, but a number of the traders, grazers and officers were all pessimistic about the future prospects of water buffaloes. The major concern is that water buffaloes will disappear completely from northern Laos in the near future.

VII Conclusions

In this paper, firstly, we began by describing how rural villagers in northern Laos graze water buffaloes. Our conclusions show that villagers are practicing a more subsistence-oriented, diversified livelihood strategy, including such activities as paddy planting, swidden cultivation, fishing, hunting, gathering and livestock. Within this subsistence-orientated context, grazing activities have been relatively successful.

The fallow in forests and fallow paddy fields are a kind of common resource shared among grazers, including people from neighboring villages. Mutually understood agreements were made on the selection of grazing points where cultivators are, in principle, tolerant of using fallow land for grazing. However, latent tension between grazers and cultivators became a real conflict, as fallow lands suitable for grazing diminished. This

conflict has been exacerbated by the rising popularity of market-oriented agriculture. With the introduction of rubber planting and struggles over land use we can also see the re-conceptualization of land ownership taking place.

Implementation of land zoning served to bolster the government's policy of promoting market-oriented agriculture. At the same time, land zoning increased tensions regarding access to common resource fallow fields, over which grazers did not have formal land use rights. To compensate for the loss of access to grazing land in areas designated as agricultural development land, local governments advised the grazers to establish fixed pastures in mountainous areas far from the agricultural development zone. However, the villagers have experienced problems with this shift. In many cases, it is difficult to find suitable sites large enough for grazing their animals in collaborative arrangements. Even in the cases where villages were able to establish grazing areas, these were used by the grazers whose home villages, ethnic identities or economical interests were different each other. New rules for managing these shared but limited resources have been slow to develop. Furthermore, with exposure to the penetration of the market economy, many villagers have decided to use their precious labor resources for commercially-oriented agriculture and wage labor, rather than water buffalo husbandry. As a result of the ban on free grazing, and the surrounding circumstances described here, many villagers stopped water buffalo husbandry and sold off buffaloes in urban markets.

While the number of water buffaloes in rural areas declined rapidly, the demand for meat among the urban population grew. Markets provide easy access to fresh meat if there is a reliable supply. But the continuing decrease in water buffalo husbandry means that urban consumers may not be able to purchase what they need in the near future.³⁰⁾ Alternatively, meat prices may rise if traders must rely on supply from more distant sources.

It seems to be a natural phenomenon that people pursue convenience, safety and prosperity through the adoption of urbanized and modern lifestyles. The market economy linked to neighboring countries' markets brings opportunities to realize new lifestyles. However, these opportunities are accompanied by risks, as many of the new trends are seen to be unsustainable. The spread of cash cropping and rubber plantation appears to homogenize the production systems of rural villagers in our study areas. But there is a strong element of uncertainty with the new cash crops that are dependent upon foreign markets. The future demand for these products cannot be predicted, and lifestyles that are intimately linked to the production and trade of cash crops can become unstable. This suggests that there may be an increase in the vulnerability of people's

30) It is noticeable that pig and fish farms have been growing in number and size in Xay city and its suburban areas since around 2007. Hybrid pigs provided by Thai and China merchants are bred in these farms.

livelihood.

Livestock, such as the water buffalo presented here, has been a beneficial and fungible asset for villagers. From our analysis we conclude that livestock husbandry is not only an important source of alternative or supplementary income, but forms a safety-net which can act as a buffer for rural people to weather some of the shocks of the market transition.

People in this area have also faced dilemmas whereby their pursuit of short-time cash income has been accompanied by the risk of the break-up of their traditional local communities and customary common resource management systems. We have identified the conflicts mentioned in this paper as a sign of this occurring. It is an urgent issue to re-construct mutual agreement systems for people who have various economical interests to manage their common resources.

The impacts of land zoning and cash-crop booms on the rural economic balance and people's livelihood stability need to be studied carefully. As Namura [2008: 227] pointed out, balancing the tensions between land use zoning, which tries to simplify the human landscape, and customary natural resource management, which tends to be based on diversity and complexity, is a key challenge to contemporary rural society. Adjustments between these two seemingly opposed systems should take place through processes such as the exchange of information, perspectives and options between livestock grazers, crop cultivators and local government officials. These exchanges form an essential foundation upon which trust, and understanding can be built, and eventually lead to effective and locally appropriate rules and regulations to guide resource management. Within this, another challenge is to provide innovative support to enable livestock grazers, both those who establish fixed grazing areas and those who graze their animals freely in the mountainous areas, to adjust their systems in the face of rapid socio-economic change.

Acknowledgement

We are grateful to have participated in the research project entitled "A Transdisciplinary Study on the Regional Eco-History in Tropical Monsoon Asia: 1945-2005" which was organized by Prof. Tomoya Akimichi, Research Institute for Humanity and Nature (RIHN). The project was supported by the Ministry of Education, Science and Culture of Japan. We sincerely thank Prof. Yasuyuki Kono, Kyoto University, leader of the forestry and agriculture group. We acknowledge with many thanks the assistance from Mr. Souriyanh Sisangrat (IDC), Mr. Souline Phompharchanh (ex-researcher, Institute for Cultural Research, Ministry of Information and Culture, Laos), Mr. Phuan Duangdala and Dr. Nathan Badenoch (Northern Agriculture and Forestry Research Center, Laos).

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