Wolf Depredation on Livestock in the Pamir

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Abstract

This study examined the wolf – livestock conflict and the wolf control measures in the Alai region, southernmost Kyrgyz and in the Karakul area, northeastern Tajikistan. Interviews with 14 local residents were conducted in 2008 and 2009. Questionnaire surveys were conducted in the Alai region in 2008 (N = 331) and in 2009 (N = 468). The number of 'rural wolves' has been increasing since the area's independence in 1991. The questionnaire survey shows that 70.8% of the respondents have actually seen wolves in the region, and 67.8% of the respondents answered that they have experienced wolf depredation on their livestock. Damage by wolves on livestock had been smaller in the former Soviet era, because the government had supplied guns and ammunition to local hunters. The wolf depredation on livestock, however, has been increasing since 1991, because the governmental supply had stopped. The local hunters face difficulties in renewing or fixing their guns due to serious poverty, leaving them unable to kill wolves even when livestock is attacked. Officers in the army and the National Security Agency equipped with automatic guns have practiced illegal massive hunting of ibex in the Alai Range, and the amount of prey of the wolves is likely to have decreased in the mountains. This in turn brought the communities into a conflict between wolves and livestock. The questionnaire survey shows that 94.4% of the respondents consider reducing the wolf population a necessity. The existing measures against wolf depredation on livestock do not function well, so they need to be improved and strengthened.

Key words：The Pamir, Kyrgyz, Tajikistan, wolf depredation on livestock, questionnaire survey

I. Introduction

The Pamir is one of the key regions for some rare animals such as argali (*Ovis ammon*) and snow leopards (*Panthera uncia*). The governments of the Kyrgyz Republic and the Republic of Tajikistan (hereafter referred to as Kyrgyz and Tajikistan, respectively), however, approve the trophy hunting of some animal species, and as a result target animals such as argali and ibex (*Capra ibex*) populations are in rapid decline (Watanabe et al., 2008). Both countries face problems with illegal hunting of these animals (Watanabe, 2005; Watanabe et al., 2008), creating international concerns, although almost no detailed studies on wildlife management in the Pamir are available (Izumiyama et al., 2009).

Meanwhile, the increase in wolf (*Canis lupus*) depredation on livestock is another primary social issue in the Pamir (Izumiyama et al., 2009). Wolf depredation on livestock and its mitigation measures are reported worldwide, especially in North America (e.g., Mussiani et al., 2003, 2005; Breck and Meier, 2004; Smallidge et al., 2008) and Europe (e.g., Ericsson et al., 2004; Gula, 2008). Detailed information of wolf depredation on livestock in the Pamir, however, is not available. This study aims to describe the current status of wolf depredation on livestock in the Pamir (southernmost Kyrgyz and northeastern

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Tajikistan), and to discuss the problems of the wolf control measures.

II. Study area

The principal study was conducted in the Alai valley, a region in the northern Pamir (Fig. 1). The region is located in the southern margin of Osh *Oblast* (Province), which is the most remote area in Kyrgyz; hence, economic development lags far behind the rest of the country (Watanabe et al., 2009; Gaunavinaka, 2010).

The Alai region is composed of Chon Alai *Rayon* (District); the western half of the region, and Alai *Rayon*; the eastern half of the region. Chon Alai *Rayon* is divided into three *Aiyl Okmot* (*A.O.*, or Village Administration): Kashka-Suu *A.O.*, Chon Alai *A.O.* and Jekendi *A.O.* Alai *Rayon* is also divided into three *A.O.*: Sary-Mogol *A.O.*, Taldy-Suu *A.O.* and Sary-Tash – Nura *A.O.*

In 2005, the number of households in the Alai valley was 7,836 with a total population of 39,199 (unpublished data obtained from the local administrative offices). Primary industry of the region is animal husbandry: transhumance of sheep, goats and yaks is the tradition. In 2009, the number of sheep and goats, cows and yaks, and horses in Chon Alai *Rayon* was 78,323, 13,859 and 3,915 respectively, whereas there were 101,569, 7,325 and 2,320 in 1992 (unpublished data obtained from the local administrative offices). Numbers of the same livestock in Alai *Rayon* were 17,532, 4,004 and 1,497 in 2009 (data in Taldy-Suu *A.O.* are of 2008) respectively, but those for 1992 were not available.

Additional study was conducted in the Karakul area, northeastern Tajikistan (Fig. 1). The Karakul village had 163 households and a population of 804 as of 2009 (Buajar, personal communication). The Karakul village depends heavily on animal husbandry: approximately, 2,000 sheep and goats and 1,000 yaks are grazed. They sell about 80% of their livestock in Sary-Mogol on the Kyrgyz side, so their economy is strongly connected with the Alai region, Kyrgyz, rather than

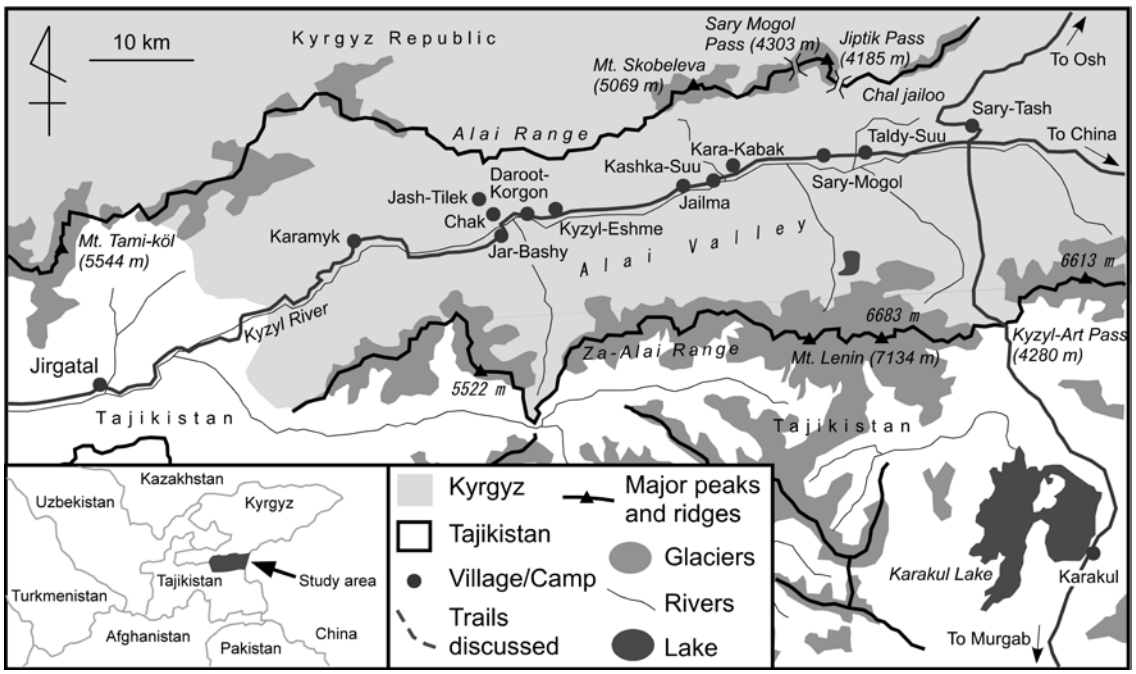

Fig. 1. Location of study area.

Tajikistan.

III. Method

Field surveys were conducted from 7th November to 23rd November in 2008 and from 20th July to 4th August in 2009. Interviews with 14 local residents including hunters, herders and administrative officers were conducted both in Kyrgyz and Tajikistan in 2008 and 2009.

The questionnaire survey was conducted in the Kyrgyz side only. In 2008, we visited seven schools in the six villages of Sary-Tash, Sary-Mogol, Kara-Kabak, Kashka-Suu, Jailma and Daroot-Korgon, and asked the teachers and children to take the questionnaire sheets home to their parents. We then collected them at a later date to find that out of the 514 households to which they were distributed, 354 households responded. In 2009 a total of 560 questionnaire sheets were distributed across eight schools in the seven villages of Sary-Tash, Taldy-Suu, Sary-Mogol, Kara-Kabak, Kashka-Suu, Daroot-Korgon and Karamyk, to which 468 households responded. In both surveys the questionnaire sheets were translated into Kyrgyz before distribution.

The percentages of male and female respondents were 71.4% and 28.6% in 2008 and 64.4% and 35.3% in 2009, respectively. A significant percentage (47.2%) of the respondents were in their teens in 2008 because many students incorrectly filled-in their ages while questioning their parents. Further, 16.1% of the respondents were in their twenties; 17.7%, in their thirties; 13.0%, in their forties; 5.0%, in their fifties and 0.9% were aged sixty or above in 2008. In 2009, 8.6% of the respondents were in their teens; 21.7%, in their twenties; 22.7%, in their thirties; 25.5%, in their forties; 13.5%, in their fifties and 7.8% were aged sixty or above.

IV. Results

1. Distribution of wolves and damage caused by wolves to livestock

The interview survey shows that wolves inhabit the areas around most, if not all villages of the entire valley. 'Rural wolves' staying in and around the villages make large-size packs, each of which is composed of 10–15 heads in winter (December to March). They stay in small-size packs (often in a couple) or alone during the rest of the season. They give birth in May and June.

Damage by wolves to livestock is reported in and around the villages throughout the Alai valley (Izumiyama et al., 2009). Most victims are sheep and goats, but wolves also attack larger animals including horse, donkey, cow and yak.

The interview survey indicates that Chon Alai *A.O.* has seen increasing damage by wolves to livestock. The attacks are frequent, especially in Jar-Bashy, Chak, Jash-Tilek and Kyzyl-Eshme, which occur at night from November to March with the peak damage from December to February. Some attacks are also reported in Daroot-Korgon.

The interview survey indicates that Alai *A.O.* has also seen increasing damage from wolves. In the winter season of 2007–2008, wolves killed about 20 sheep/goats in Kashka-Suu. Damages are reported in Sary-Mogol as well: wolves kill 25–30 head of sheep and goats every year, with occasional attacks on cows. Wolves attacked some sheep and goats in 2007, and killed three head of sheep on 8th November 2008. The damage occurred in Taldy-Suu in 2008–2009 was greater than normal seasons: at least seven sheep were killed. Recently, damages are caused for a longer period, even in summer. For example, a goat was attacked in *Kasher* (animal shelter) near a farmhouse in Taldy-Suu on the night of 29th July 2009.

In the Karakul area of Tajikistan, wolves inhabit the mountain areas in summer and come to the village in winter. The Karakul village incurs some damage by wolves every year. For example, wolves killed about 30 sheep in the winter season of 2008–2009.

2. Views of local residents of the Alai region

Views of local residents on the wolf issues were examined by the questionnaire surveys. First, we asked the local residents (N = 354) about their general views on wildlife in the region in 2008, and then about the wolf issues in 2009.

Table 1 demonstrates that the existence of wolves in the region is well known by local residents. Most local residents are aware of the current habitation of wolf (93.6%), red fox (92.4%) and long-tailed marmot (92.1%), whereas the percentage of local residents who know about the current habitation of argali (27.1%) and snow leopard (20.9%) was much lower (Table 1). The actual experiences in observation of the species were fewer: long-tailed marmot (82.8%), followed by red fox (80.8%), wolf (70.3%), argali (21.5%) and snow leopard (10.7%) (Table 1).

Table 1. Local residents' knowledge about the major fauna in the Alai region (N = 354).

	Q 1: Do you know the existence of the following wild animals in this region?		Q 2: Have you actually seen the following wild animals in this region?	
	Number of respondents	Percentage	Number of respondents	Percentage
Wolf	332	93.8	249	70.3
Red fox	327	92.4	286	80.8
Long-tailed marmot	326	92.1	293	82.8
Argali	96	27.1	76	21.5
Snow leopard	74	20.9	38	10.7

Data collected by the questionnaire survey conducted in the Alai region, Kyrgyz in 2008.

We questioned the local residents about whether or not they had heard about any damage caused by wolves to livestock in the region (Table 2). Almost 90% of the respondents (N = 415/468) had heard about wolf depredation on livestock. Residents of Daroot-Korgon showed the smallest percentage of 'yes' (83/109 = 76.1%) among the seven villages.

Table 2. Percentage of respondents who have heard about damage caused by wolves to livestock in the Alai region (N = 468).

Village	Number of respondents	Percentage			
		Yes	No	No answer	Total
Sary-Tash	61	95.1	4.9	0.0	100.0
Taldy-Suu	31	90.3	9.7	0.0	100.0
Sary-Mogol	78	87.2	10.2	2.6	100.0
Kara-Kabak	35	94.3	5.7	0.0	100.0
Kashka-Suu	109	93.6	4.6	1.8	100.0
Daroot-Korgon	109	76.1	23.9	0.0	100.0
Karamyk	45	95.6	4.4	0.0	100.0
Total	468	88.6	10.5	0.9	100.0

Data collected by the questionnaire survey conducted in the Alai region, Kyrgyz in 2009.

A similar trend was shown in Droot-Korgon from respondents on whether they have actually had wolf depredation on their livestock (59/109 = 54.1%, Table 3). Actual damage from wolf depredation in the entire region attains 67.8% (N = 317/468) with the highest percentage in Kashka-Suu (88/109 = 80.7%).

Table 3. Percentage of respondents who have actually had wolf depredation on their livestock in the Alai region (N = 468).

Village	Number of respondents	Percentage			
		Yes	No	No answer	Total
Sary-Tash	61	73.8	26.2	0.0	100.0
Taldy-Suu	31	64.5	35.5	0.0	100.0
Sary-Mogol	78	61.5	37.2	1.3	100.0
Kara-Kabak	35	68.6	31.4	0.0	100.0
Kashka-Suu	109	80.7	19.3	0.0	100.0
Daroot-Korgon	109	54.1	45.9	0.0	100.0
Karamyk	45	73.3	26.7	0.0	100.0
Total	468	67.8	31.8	0.4	100.0

Data collected by the questionnaire survey conducted in the Alai region, Kyrgyz in 2009.

It is hard to understand the number of wolves and the fluctuation of the number in the region. This study examined the perception of the residents in regards to the fluctuation of the number of wolves in the Alai region after the independence in 1991, with the questionnaire survey (Table 4). Among all respondents (N = 468), 87.6% believe there is an increase in the number of wolves. The view of the residents of Daroot-Korgon was somewhat different: only 63.3% of the respondents believe the number of wolves increased, and 36.7% do not believe so. Also, 90.0% of the respondents consider wolves to be an increasing threat to livestock in the Alai region, although the Daroot-Korgon residents have a different view (Table 5). The different view derived from the Daroot-Korgon residents may be partly related to the lower percentage of experiences of actual damage caused by wolves (Table 3). More importantly, Daroot-Korgon is the largest village in the region with a population of 4,393 (as of

Table 4. Percentage of respondents who believe that the number of wolves is increasing in the Alai region as of 1991 (N = 468).

Village	Number of respondents	Percentage					
		Strongly yes	Yes	No	Strongly no	No answer	Total
Sary-Tash	61	41.0	59.0	0.0	0.0	0.0	100.0
Taldy-Suu	31	9.7	70.9	6.5	12.9	0.0	100.0
Sary-Mogol	78	32.1	53.8	7.7	1.3	5.1	100.0
Kara-Kabak	35	28.6	71.4	0.0	0.0	0.0	100.0
Kashka-Suu	109	37.6	61.5	0.0	0.0	0.9	100.0
Daroot-Korgon	109	27.5	35.8	33.0	3.7	0.0	100.0
Karamyk	45	22.2	77.8	0.0	0.0	0.0	100.0
Total	468	30.8	56.8	9.4	1.9	1.1	100.0

Data collected by the questionnaire survey conducted in the Alai region, Kyrgyz in 2009.

Table 5. Percentage of respondents who consider wolves to be an increasing threat to livetock in the Alai region as of 1991 (N = 468).

Village	Number of respondents	Percentage					
		Strongly yes	Yes	No	Strongly no	No answer	Total
Sary-Tash	61	26.2	70.5	3.3	0.0	0.0	100.0
Taldy-Suu	31	12.9	67.8	16.1	3.2	0.0	100.0
Sary-Mogol	78	16.7	75.6	6.4	1.3	0.0	100.0
Kara-Kabak	35	20.0	80.0	0.0	0.0	0.0	100.0
Kashka-Suu	109	33.0	65.2	1.8	0.0	0.0	100.0
Daroot-Korgon	109	22.0	50.5	26.6	0.9	0.0	100.0
Karamyk	45	6.7	91.1	0.0	0.0	2.2	100.0
Total	468	22.0	68.0	9.2	0.6	0.2	100.0

Data collected by the questionnaire survey conducted in the Alai region, Kyrgyz in 2009.

2005), which would deter the wolves from lingering there. On the other hand, several small villages near Daroot-Korgon; Kyzyl-Eshme, Chak, Jash-Tilek and Jar-Bashy (Fig. 1), report a higher incidence of wolf attacks as stated earlier.

As Table 3 shows, the majority of the respondents have actually had wolf depredation on livestock, yet as many as 94.4% of respondents consider it necessary to reduce the number of wolves in the region (Table 6). In Sary-Tash, Taldy-Suu and Kara-Kabak, all respondents regard the reduction to be necessary. Even in Daroot-Korgon, 80.8% of the respondents believe the necessity of reducing wolves.

Table 6. Percentage of respondents who think that the number of wolves in the Alai region should be reduced by hunting (N = 468).

Village	Number of respondents	Percentage					
		Strongly yes	Yes	No	Strongly no	No answer	Total
Sary-Tash	61	34.4	65.6	0.0	0.0	0.0	100.0
Taldy-Suu	31	38.7	61.3	0.0	0.0	0.0	100.0
Sary-Mogol	78	29.5	66.7	2.5	0.0	1.3	100.0
Kara-Kabak	35	37.1	62.9	0.0	0.0	0.0	100.0
Kashka-Suu	109	37.6	61.5	0.0	0.0	0.9	100.0
Daroot-Korgon	109	40.4	40.4	17.4	1.8	0.0	100.0
Karamyk	45	33.3	64.4	2.2	0.0	0.0	100.0
Total	468	36.1	58.3	4.7	0.4	0.4	100.0

Data collected by the questionnaire survey conducted in the Alai region, Kyrgyz in 2009.

3. Hunting practice

The hunting system and practice were examined in the Kyrgyz side only, so the following description applies only to the Kyrgyz side. As of 2009, there were no registered hunters in the Karakul village, Tajikistan. Information of the wolf control measures on the Karakul side is extremely limited, but no measures to reduce the wolf population or to mitigate damages to livestock are practiced.

Hunters are required to be members of the Union of Hunters and Fishermen, as well as obtain a 'Permission Letter for Prey' to kill wolves. The authority that issues the 'Permission Letter for Prey' is the Osh-Batken Representative Office of the Department of Hunting Supervision and Regulation of Hunting Resource Quantity, which is a regional office of the Department of Hunting Supervision and Regulation of Hunting Resource Quantity under the State Agency on Environmental Protection and Forestry (SAEPF) of the Kyrgyz government. Local hunters have to go to Osh to obtain the 'Permission Letter for Prey'. Hunters also need a 'Hunting Ticket', which allows them to own and use a gun, and to buy necessary ammunition.

In addition to the local hunters residing in the Alai region, the Osh-Batken Representative Office of the Department of Hunting Supervision and Regulation of Hunting Resource Quantity regularly sends two hunter teams to Alai *Rayon* and one hunter team to Chon Alai *Rayon*. The Alai *Rayon* hunter team killed 20 wolves in the hunting season of 2008–2009.

All local hunters reported that the number of registered hunters in the Alai region has decreased since 1991, although an accurate number is not available. Several local hunters also reported that there are probably less than 10 hunters in Chon Alai *Rayon*. Kashaka-Suu *A.O.* had 3–4 registered hunters as of 2008. Sary-Mogol *A.O.* had two registered hunters and Taldy-Suu *A.O.* had no registered hunters in 2009. Further, not all hunters possess a gun or are able to fix an old gun. The registered hunters in the villages of Sary-Mogol and Kara-Kabak for instance, had no guns as of 2008. There are estimated 80–90 guns in Chon Alai *Rayon*, most of which are kept by farmers who have no 'Permission Letter for Prey'.

When farmers experience a wolf attack on their livestock, they ask hunters to kill the wolf/wolves. The main hunting season of wolves is in winter as already stated, but hunting is now permitted throughout the year. No wolves were killed in Kara-Kabak in 2007–2008 because no guns were available. One hunter stated that he kills only 4–6 wolves per year in the entire Chon Alai *Rayon*: the number is low because he no longer owns a gun, cannot afford to buy a gun and ammunition, and therefore has to borrow a gun from his friend when he goes hunting. In Sary-Mogol, hunters and volunteers hunt wolves together, where more than 10 wolves were killed in the season of 2008–2009.

4. Measures

As described by Izumiyama et al. (2009), the government held an important role in controlling the wolf population in the former Soviet era. Local hunters had received guns and ammunition from the government before the 1991 independence. After the independence, they have no such support from the government.

Today, two types of measures are taken in regards to wolf control. One of the measures is occasional patrols by volunteers and police officers at night when demanded by the villages. This patrol system has been practiced since the Soviet era; however, it is now ineffective because the number of guns is extremely limited.

Another measure is a reward system, in which a reward is paid from the Republic Fund by the SAEPF. The amount of the reward is Som 2,000 for a male wolf (Som 100 = USD 2.21 as of 1st April 2010), Som 2,500 for a female wolf and Som 1,000 for a cub (as of 2008–2009). No actual reward payment occurred in the last season (Nov. 2008 to March 2009) because there was no claim made by local hunters. Yet another system exists in which live wolves can be sold to Chinese buyers for more than Som 10,000 per head. This happens occasionally when Chinese buyers contact the locals to

purchase wolves, which are then smuggled into China. Dead wolves can also be sold at Som 5,000 per head.

The reward system tends to be ineffective partly because a hunter has to go to Osh, some 7–8 hours away by car, to show the dead body of the wolf that he killed; and partly because hunters tend to prefer to sell the hunted wolves on the black market to earn more money. The current system therefore, needs to be improved.

V. Discussion

1. Increasing wolf depredation after the independence

The increase of wolf depredation on livestock in the Alai region is due to the decline of wolf control measures after 1991. Furthermore, another factor seems to be contributing to the increase: it is easily speculated that wolves in the Alai region had relied more on ungulates such as ibex (*Carpa ibex*) as their prey before, although in-depth studies on the wolf – ibex relation are necessary. According to a local account, wolves in the eastern area of Murgab, Tajikistan, do not attack livestock even today because the ibex population is abundant. Ibex still inhabit the Alai and Za-Alai ranges, but their population has probably been decreasing mainly due to widespread illegal hunting with automatic firearms by officers in the army and the National Security Agency (NSA); the successor to the former Soviet KGB (Izumiyama et al., 2009). This decrease of the ungulate population has created a disparity in the wolves' traditional source of prey, which in turn resulted in their increasing dependence on livestock (Fig. 2). The number of sheep and goats, which are the major target of wolves, has decreased since the independence, whereas that of larger livestock has increased as stated earlier. The current number of sheep and goats in the Alai region attains nearly one hundred thousand, which is most likely to be large enough for the wolves to attack easily.

This condition, combined with the decline of the wolf control measures after the 1991 independence, resulted in the increase of wolf depredation on livestock in the Alai region (Fig. 2). According to one local hunter, wolves gradually began to 'ignore' people after the collapse of the Soviet Union. They became more aggressive, especially since around 2002–2003.

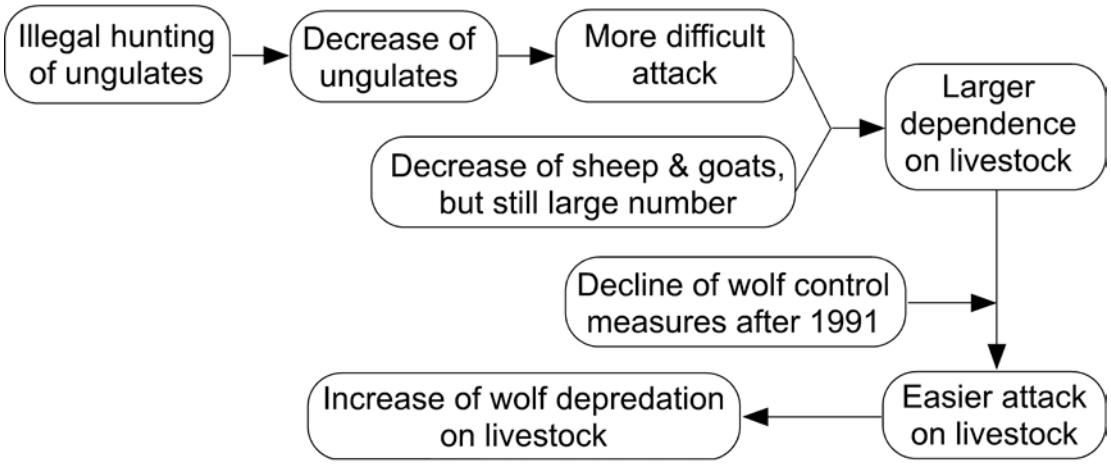

Fig. 2. The major factors contributing to the increase in the wolf depredation on livestock in the Alai region after the 1991 independence.

2. Necessity of improving the current measures

Various kinds of measures to mitigate wolf depredation on livestock are practiced throughout the world (Bjorge and Gunson, 1985; Coppinger and Coppinger, 1980; Smith et al., 2000a, b; Ericsson et al., 2004; Marker et al., 2005; Smallidge et al., 2008; Urbigkit and Urbigkit, 2010). Among those measures, wolf hunting has been practiced in the Alai valley, although it faces some problems today. Introducing other kinds of measures, such as poisoning the wolves may possibly be considered in the Alai region. Improving the current measures of hunting wolves, however, should have the first priority. The following section discusses the hunting system conducted in the Alai valley.

The importance of the improvement of the hunting measures is directed toward ecosystem conservation. As stated earlier, widespread illegal hunting of ibex by the army and NSA, is reported in the Alai region (Izumiyama et al, 2009). The army and NSA officers are equipped with automatic guns, whereas most local hunters have difficulties finding small arms. Assigning the army and NSA officers to a new duty of wolf hunting with reward would lead to stopping or at lest mitigating the illegal ibex hunting. Including the army and NSA officers as well as the local hunters should be part of the nature conservation strategy in the region.

The largest problem for the local hunters is that they cannot renew a gun and cannot buy ammunition. Nevertheless, local hunters are enthusiastic about controlling the wolves in the Alai region, and the government should reintroduce the supply system of guns and ammunition to local hunters to allow them to do so. Aging and decreasing the number of local hunters make wolf control difficult, and in this aspect, involving the army and NSA would help strengthen the wolf control measures.

VI. Conclusions

The number of wolves has been increasing in the Alai region since the 1991 independence. More than 70% of the respondents (N = 249/354) to the questionnaire survey in 2008 have actual experiences of seeing wolves in the region. From the 2009 questionnaire survey, 67.8% of the respondents (N = 317/468) experienced wolf attacks on their livestock (minimum: 54.4% in Daroot-Korgon, maximum: 80.7% in Kashka-Suu). The increasing wolf depredation on livestock is strongly related to the social transformation after the independence: the government in the Soviet era had controlled the wolf population, which is now left for the local communities. The local hunters face difficulties in renewing or fixing their guns due to serious poverty, leaving them unable to kill wolves even when livestock is attacked. Officers in the army and NSA equipped with automatic guns have practiced illegal massive hunting of ibex in the Alai Range since 1991. The population of the wolves' prey is likely to have decreased in the mountains, and as a result the wolf–human conflict became one of the most serious social issues in the region.

The questionnaire survey shows that 94.4% of the respondents consider it necessary to reduce the wolf population. The existing measures against wolf depredation on livestock do not function well. The Alai valley area needs strong and effective measures not only to eliminate the 'rural wolves' from the residential areas, but also to conserve endangered species. In this regard, involving the officers in the army and NSA, who are creating an impact with illegal massive hunting of ibex, into the wolf control measures is important. Finally, wolf control should be placed in a nature conservation strategy in the region.

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パミールにおけるオオカミの家畜への被害

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要旨

キルギス共和国南部のアライ谷とタジキスタン共和国北部のパミール北部で，1991年独立後のオオカミによる家畜への被害と被害の軽減策の問題点を明らかにした。2008年と2009年に合計14人から聞き取りを行い，また，キルギス側ではアンケート調査を行い，2008年に331軒から，2009年に468軒から回答を得た。

アライ谷では1991年以降，集落の周辺に住む「里オオカミ」の頭数が増加しており，アンケート調査によれば70.8%の住民が実際にオオカミを目撃している。オオカミによる家畜の被害を実際に経験した世帯は，７つの集落の平均で67.8%に達し，なかでもカシカス村では80.7%の世帯が家畜への被害を経験している。この被害は，1991年以降，中央政府によるオオカミの駆除がなくなり，住民自身の手で駆除しなければならなくなったために増加している。ところが，現地のハンターは，貧困のため銃の修理や買い換えの資金がなく，銃弾の購入さえ困難な状況におかれている。このため，オオカミを自分たちの手で駆除できずにいる。一方で，銃や銃弾が容易に入手できる軍人や国家保安委員会職員が，野生動物（アイベックス）を大量殺戮しており，オオカミの餌資源である野生動物が減少していることも，家畜への依存を高めた原因の一つとなっている可能性が大きい。

このように，アライ谷におけるオオカミによる家畜への被害の増加は，国家独立後の社会変容と大きく関係している。オオカミが家畜に与える脅威が増大していると考えている住民は全体の90.0%に達しており，オオカミの頭数のコントロールが必要がと考えている住民は94.4%にのぼる。地元ハンターがオオカミを駆除すると報奨金が支払われる制度が存在してはいるものの，機能しているとはいえない。報奨金制度を有効なものにするには，支払いが地元で行われるように制度を変更し，地元ハンターに銃・銃弾の支給を行うなどの改革が必要となる。また，野生動物の大量殺戮を防止するためにも，軍人や国家保安委員会職員がオオカミ駆除に加わり，報奨金を得られる制度にすべきである。

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