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# Conservation and the Current Status of the Golden Langur in Assam, India, with Reference to Bhutan

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**Abstract:** The golden langur (*Trachypithecus geei*), which only became known to science in 1953, is endemic to western Assam, India, and southern Bhutan. The Indian population had been greatly depleted due to a fragmented range and the species was declining radically in 1997 with a pessimistic view for its future. The Golden Langur Conservation Project was begun in 1998 with the goal of protecting the golden langur within its entire Indian range. At the time of the project's initiation, the species was considered India's most endangered primate due to limited range and major deforestation (50%) as a result of a complex political situation from militants in the forest threatening the Assam Forest Department staff, and ethnic violence. The project worked with regional non-governmental organizations and government agencies using the following tools to effect conservation contagion: 1) community meetings; 2) involving villages in forest committees and "Self Help Groups" for economic development; 3) formal seminars; and 4) celebratory events for the creation of the Manas Biosphere Reserve. The project developed conservation contagion, resulting in villages creating their own conservation groups to participate in the project, eventually resulting in 18 community groups forming Forest Protection Forces collectively, under the Unified Forest Conservation Network, to protect almost the entirety of the Manas Biosphere Reserve as well as other reserve forests in Assam. This community protection resulted in an increase of the Indian population of golden langurs from c.1,500 in 1997 to c.5,600 langurs in 2007 to 2012. The project also resulted in the lifting of the "in danger" listing for the Manas Biosphere Reserve by UNESCO. The Indian population of golden langurs mainly resides in the Manas Biosphere along the Bhutan border and in a number of southern isolated reserve forests north of the Brahmaputra River. In adjacent Bhutan, the southern subspecies is contiguous with its Indian counterpart and with the northern subspecies, which has more gray on its arms and tail and inhabits higher altitudes. The Bhutan population is grossly estimated at over 6,600 langurs based on a population census of 60 km<sup>2</sup>, giving a total estimate for the species in Assam and Bhutan of over 12,000 individuals. The potential for community conservation in Bhutan is also discussed.

**Key Words:** Golden langur, *Trachypithecus geei*, *Presbytis geei*, golden leaf monkey, Assam, Bhutan

## Introduction

The Golden Langur Conservation Project (GLCP) was initiated in 1998. It brought together methods, developed elsewhere, of catalyzing communities to become involved in conservation (Horwich and Lyon 2007; Horwich *et al.* 2011, 2012), with the goal of protecting India's most seriously endangered primate (Mukherjee and Southwick 1997). In the course of its progress, the project demonstrated the power of using the golden langur as a flagship species to protect landscapes and ecosystems in western Assam, including those of the Manas Biosphere Reserve forests (Horwich *et al.* 2010).

The golden langur, *Trachypithecus geei* (Fig. 1), formerly *Presbytis geei*, was one of the more recent primate discoveries to the scientific community in India. Its striking golden-orange pelage attracted attention as early as 1907 but it was formally discovered by E. P. Gee in 1953 and described by Khajuria in 1956 (Gee 1955, 1964; Khajuria 1956, 1978). Its restricted range between the Sankosh and Manas rivers in western Assam and Bhutan (Choudhury 1996, 2008) has made it, since its discovery, one of India's rarest and most endangered primates (Mukherjee and Southwick 1997). It is listed in Appendix I of CITES, as Endangered on the *IUCN Red List of Threatened Species*, and in Schedule I of the Indian Wildlife (Protection) Act, 1972 (amended 1991).

Its range has been considerably depleted and fragmented (Choudhury 2002), with a total gross estimated population in Bhutan and India of about 4,500–5,000 individuals (Biswas 2005). This was based on absolute counts in Assam of 1,064 monkeys (Srivastava *et al.* 2001b) and an estimate for Bhutan of over 4,000 langurs based on a census in one small area (Wangchuk 1995). Their long-term survival depends on genetic exchange; golden langurs are now restricted to small, isolated populations through much of their range (Biswas 2005). In 2001, the Indian population was estimated to be less than 1,500 langurs (Srivastava 2006).

The golden langur occurs in lowland evergreen, semi-evergreen and riparian moist deciduous and sal-dominated, moist deciduous forest (Srivastava *et al.* 2001a; Biswas 2005; Bezbaruah 2004) in the Brahmaputra River valley and the foothills of the Black Mountains of Bhutan. Its range is bordered in the north by the Bhutan hills, in the south by the Brahmaputra River, in the west by the Sankosh River on Assam's western border, and by the Manas River in the east (Fig. 2). In Assam, its main population is in the Manas Biosphere Reserve, a forested area along the border of Bhutan. There are also some significant populations in isolated forests south of the Manas Biosphere Reserve (Deuti 2005) (Fig. 2).

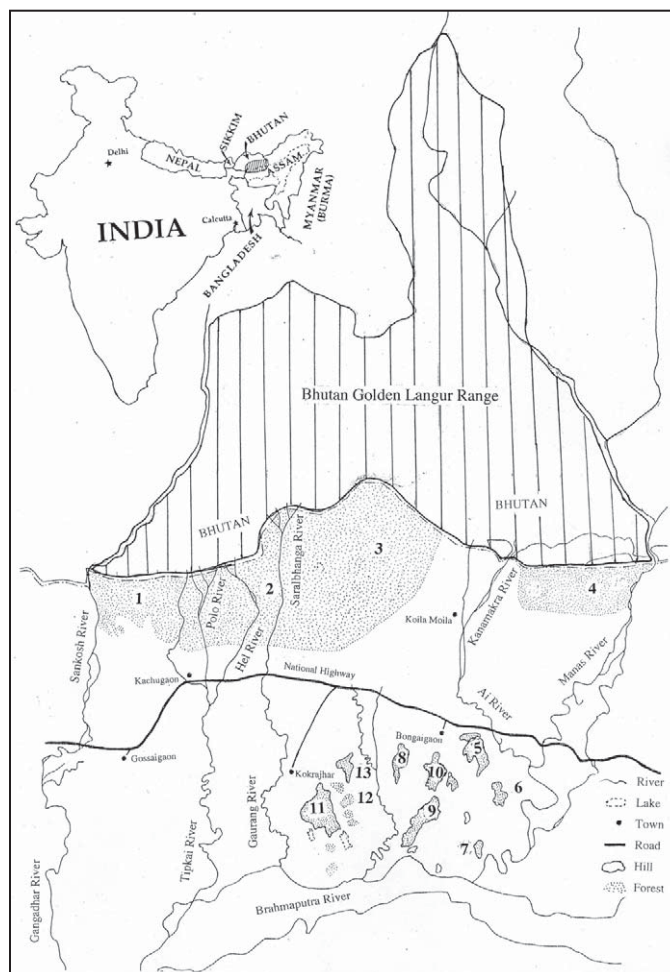
#### Reasons for population decline

With the initiation of the Bodoland autonomous movement in 1993, a result of increasing numbers of non-Bodos entering Assam, extremist groups took refuge in the Assam forests. This led to major deforestation. Initially, some extremists financed their movement through timber extraction. Illegal logging increased, encouraged by the lack of forest protection by the Assam Forest Department. The local people were employed to cut the trees, receiving a pittance in return. This lack of forest protection continued as extremist groups harried the Forestry Department staff and other government workers by murders and kidnapping. Forestry



**Figure 1.** Male golden langur from Kakojiana with subgroup in village bamboo before reaching their new home in Bhubeshwar (see Fig. 4). Photograph by Arnab Bose.

staff were unable to enter the forest because of the extremist groups. Deforestation was further compounded by corruption on the part of some forestry staff, and exacerbated by ethnic clashes between Bodo and Adivasi tribes in 1996 and 1998. Villagers at that time were forced to leave the forest to reside in relief camps on the southern borders of the reserve forests. Although the encroaching villages could not be reestablished in the reserve forests, some villagers began to harvest timber for the illegal loggers as well as for firewood. In Kokrajhar District alone there were 200,000–300,000 refugees in relief camps, which were still in existence in 2005 if on a smaller scale (Horwich 2005). This complex political situation resulted in the deforestation of almost 50% of the reserve forests in western Assam. The increasing human population in proximity to langur populations in reduced, degraded and fragmented forests has resulted in langurs being killed by people and dogs or succumbing to electrocution when jumping onto power lines.



**Figure 2.** Map of the geographic range of the golden langur with the Indian locations censused (see Table 1). 1. Kachugaon Division, 2. Haltugaon Division, 3. Chirrang Division, 4. Manas National Park, 5. Kakojiana Reserve Forest, 6. Baumugaon Reserve Forest, 7. Khoragaon Reserve Forest, 8. Bhumeshwar Reserve Forest, 9. Bhairab Reserve Forest, 10. Nakati Reserve Forest, 11. Chakrashila Wildlife Sanctuary, 12. Abahaya rubber garden, 13. Nadangiri Reserve Forest. The range of the golden langur in Bhutan follows Wangchuk *et al.* (2008).

## Conservation Action – The Golden Langur Conservation Project (GLCP)

The Golden Langur Conservation Project (GLCP) was begun in 1998. Its basis was a scheme of community conservation that has been used effectively elsewhere to bring about a regional change in the exploitation of agricultural land and forests which promotes wise use, sustainability, and the conservation of the forests and their wildlife (Horwich and Lyon 2007; Horwich *et al.* 2010). In this case, the project targeted most of the range of the species, including its principal strongholds in the Manas Biosphere Reserve.

The GLCP began as an extension of the Indo-US Primate Project to address the plight of the golden langur and its habitat in western Assam (Horwich *et al.* 2010). It was initiated by three non-governmental organizations: Community Conservation, Nature's Foster, and Green Forest Conservation. Later, five Assamese non-governmental organizations and one from the US joined forces to create the Manas Biosphere Conservation Forum (Aaranyak, Community Conservation, Green Forest Conservation, Green Heart Natures Club, Nature's Foster and New Horizon) with the specific aim of protecting the golden langurs and their habitat in western Assam. Each regional NGO focused on a specific area in the range of the golden langur. The Forum worked collectively with over 140 communities, assisting them in creating "Self Help Groups" (for the improvement of their economic situations) and forest protection committees. The interaction of these groups has empowered these communities that now actively replant, patrol, and protect their forests in coordination with the Assam Forest Department and the Bodoland Territorial Council (Horwich 2005).

A number of strategies were used to motivate the communities (Horwich *et al.* 2010). They included: 1) setting up a series of small community meetings requesting help from the communities to protect their unique forests and wildlife; 2) involving communities in creating forest protection committees and Self Help Groups for economic development; 3) holding more formal seminars that included communities, government agencies and NGOs; and 4) organizing four Manas Biosphere Celebrations reaching 8,000, 5,000, 20,000 and 35,000 participants across the biosphere reserve.

The NGOs worked with individual communities, and the interaction of the Forest Protection Committees and the Self Help Groups evidently empowered the communities in their actions. Over the years, the GLCP encouraged communities in the biosphere reserve and other reserve forests to form groups, and an atmosphere of conservation contagion (Horwich *et al.* 2012) developed around the projects as community conservation groups formed and joined the conservation activities of the project.

## Results

In 2004, with an accord signed between one Bodo militant group and a second group declaring a ceasefire, and the

establishment of the Bodoland Territorial Council (BTC) to administer the area under the state of Assam, it seemed that there was renewed hope for the forests. The illegal loggers, however, still logged the forests with impunity, threatening both villagers and the Forest Department staff alike. In an attempt to halt this situation, the late Rajen Islari of Green Forest Conservation approached Kampa Borgoyari of the BTC requesting support for a 100-man Forest Protection Force that he would appoint and organize to protect the western reserve forests. Other community groups followed suit and began to protect their adjacent forests. Currently, with support from BTC and grants from the United States Fish and Wildlife Service Asian Elephant Program, 18 community groups are protecting almost the entire biosphere reserve. Six groups working with the GLCP protect Kachugaon, Ripu, Chirang and Manas reserve forests, while another 11 groups are clustered around the Manas National Park working with their staff, and an 18th group protects an area of the biosphere reserve east of the national park. The Golden Langur Conservation Project by 2005 had evolved into the Manas Elephant Protection Project that has catalyzed the formation of these community forest protection forces into the Unified Forest Conservation Network, which collectively, with the Bodoland Territorial Council and the Assam Forest Department, protects almost the entire Manas Biosphere Reserve.

In addition, Kakoijana Reserve Forest (17 km<sup>2</sup>) has become a model project, and 34 villages created two federations (Green Conservation Federation and Nature Guard) to jointly protect their forest. Their work has increased the canopy from 5% to 80%, which has been accompanied by an increase in the golden langur population from less than 100 to now over 500 animals (Horwich *et al.* 2012).

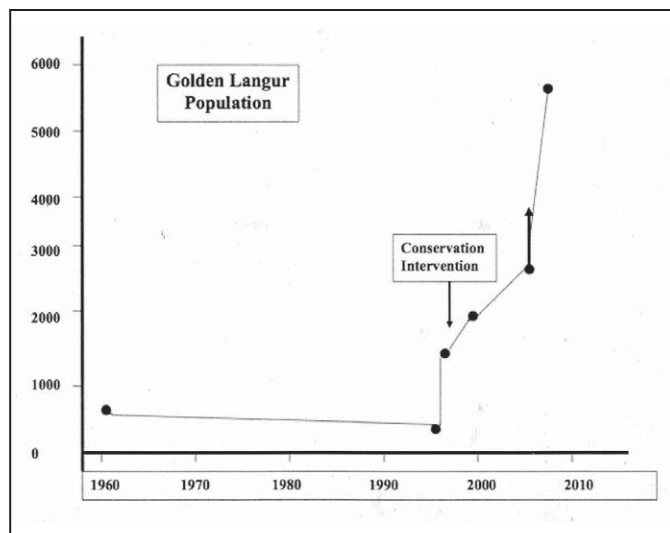
The actions of the GLCP generated over time a great deal of enthusiasm and community action that has resulted in a major revival of the Indian population of the golden langur. The most recent censuses in 2008–2012, which used project-trained villager researchers, of the entire Indian golden langur population have shown a major increase from 1,500 langurs in 1997 (Srivastava 2001b) to over 5,600 langurs in 2008–2012. This was thanks to the communities who have helped protect the forests in western Assam.

Table 1 and Figure 3 show the results of these censuses. The 1960 estimate is from Gee (1964), that for 1996 was from Mukherjee and Southwick (1997), the 2000 estimate from Choudhury (2002), the 2008 estimate from Ghosh (2008a, 2008b) and the 2009 estimate and Table 1 are a collective estimate from a compilation described in the *Assam Tribune* (2009; J. Biswas pers.comm.; Ghosh 2008a; A. Bose unpubl. data 2007, 2012).

The results of the GLCP and what it has become has stimulated the delisting of the "in danger" label to the Manas Biosphere Reserve by UNESCO. Besides the increase in golden langurs there is also evidence that the elephant population (Ghosh 2008b) and the tiger population (India Ministry of Environment and Forests 2011) are remaining stable and perhaps even increasing as well.

**Table 1.** Recent censuses of golden langur. *Trachypitecus geei*, in India.

	Area censused	Population	Reference
1	1. Kachugaon Division	2,293	<i>Assam Tribune</i> (2009)
2	2. Haltugaon Division	1,461	<i>Assam Tribune</i> (2009)
3	3. Chirrang Division	263	<i>Assam Tribune</i> (2009)
4	4. Manas National Park	214	<i>Assam Tribune</i> (2009)
5	5. Kakoiijana Reserve Forest	507	Bose (2012)
6	6. Baumugaon Reserve Forest	30	Bose (2007)
7	7. Khoragaon Reserve Forest	36	Bose (2012)
8	8. Bhumeshwar Reserve Forest	53	Bose (2012)
9	9. Bhairab Reserve Forest	49	Bose (2007)
10	10. Nakati Reserve Forest	14	Bose (2007)
11	11. Chakrashila Wildlife Sanctuary	501	Ghosh (2008a)
12	12. Abahaya rubber garden	112	Ghosh (2008a)
13	13. Nadangiri Reserve Forest	66	Ghosh (2008a)
	<b>Total</b>	<b>5,599</b>	

**Figure 3.** Golden langur population estimates for its geographic range in India (Gee 1964 for 1960; Srivastava *et al.* 2001b for 1997; Choudhury 2002 for 2000; Ghosh 2008a, 2008b for 2008; *Assam Tribune* 2009, Bose 2007, 2012, and Ghosh 2008a for 2009).

## Community Conservation

Community conservation projects have been criticized by both biologists (Oates 1999; Terborgh 1999) and sociologists (Belsky 1999). This has mainly been due to lumping them with the large-scale Integrated Conservation and Development Projects (ICDPs), which are top down and treat rural community members as the problem rather than the solution (Horwich and Lyon 2007; Horwich *et al.* 2011, 2012). The GLCP has shown that communities when treated with respect and when asked for their help respond overwhelmingly positively. The GLCP developed slowly and had a contagious effect on the communities that often joined the project on their own and formed their own community conservation groups. They show what a powerful ally and partner local rural people can be, because they are on-the-ground partners. India seems to be particularly fertile ground for community conservation and a recent directory shows a minimum of

hundreds of community conservation projects throughout the country (Pathak 2009).

Because of the success of this project in motivating communities to protect their environment, we are now attempting to interest the Bodoland Territorial Council and the Assam State government in community co-management for the Manas Biosphere Reserve and experimental community village forests for Kakoiijana and other reserve forests (Horwich *et al.* 2010; Horwich 2011).

## Golden Langur Population in Assam and Bhutan

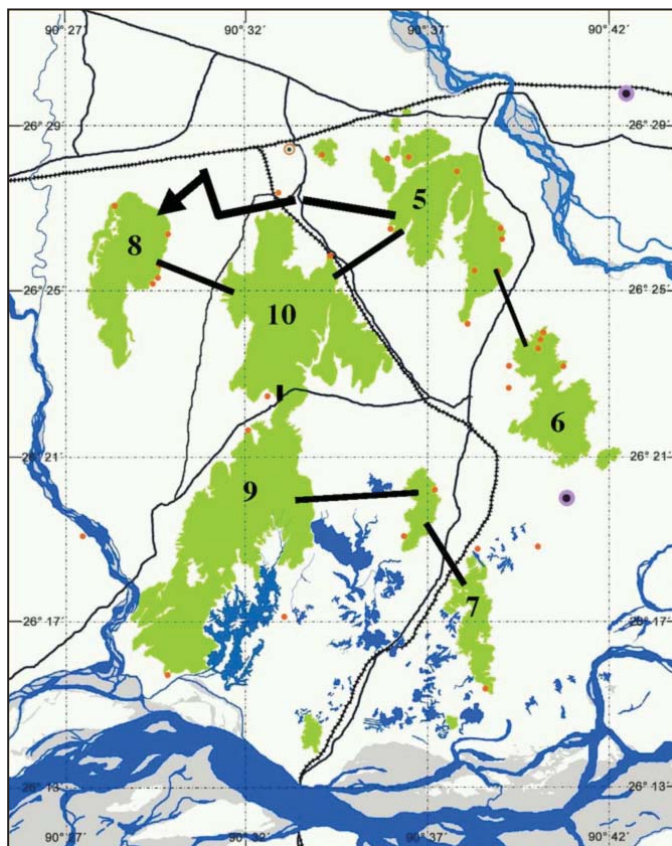
The community reforestation and forest protection efforts showed how resilient the golden langur species is once they and their habitat are protected. Despite continued negative references by scientists about signs of a declining population (Srivastava *et al.* 2001b; Srivastava 2004, 2006; J. Biswas in the *Assam Tribune* 2009), the community protection efforts have led to a major increase in the golden langur population from an estimated 1,500 langurs in 1997 to currently over 5,600 langurs. The southern “island” fragmented populations, also thought to be not viable, have responded extremely well. Thirty-four communities surrounding Kakoiijana Reserve Forest have formed two federations that worked together to bring the 17 km<sup>2</sup> forest back from 5% to 80% canopy cover, and the langurs responded by increasing from less than 100 animals to now over 500. Despite the isolated appearance of these reserve forests, a few golden langurs have left Kakoiijana and found their way via existing corridors to Bhumeshwar Reserve Forest about 10 km away (Fig. 4).

It seems, therefore, that there are now four principle viable golden langur populations. 1) Kachugaon, Ripu and Manas reserve forests have continuity, although there is a major gap around Koila Moila. This is the largest population with 3,754 langurs. 2) A population of eastern Manas Reserve Forest. It is degraded but connected to the Manas National Park that has 477 langurs. Both of these populations have continuity with the Royal Manas National Park, Phipsoo Wildlife Sanctuary and Jigme Singye Wangchuck National Park in Bhutan. 3) A population centered on Chakrashila Wildlife Sanctuary, Nadangiri Reserve Forest and the rubber garden on the west side of the Champamati River, which has 679 langurs. 4) A population centered on Kakoiijana, Nakkati, Bhairab and Bhubeshwar Reserve Forests to the east of the Champamati River, which has 689 langurs. With continued protection and added reforestation, the two biosphere reserve populations may continue to increase, and, due to their being adjacent to the Bhutan populations, they may be considered connected to the population in the south of Bhutan (Wangchuk 2005).

The two southern populations although seemingly fragmented have been shown to have at least some viable corridors to each of their respective fragments on the west and east of the Champamati River. Given the langur response to the protection of Kakoiijana, it is probable that with increased community protection and reforestation these two populations

could increase to about 1,500–2,000 langurs each. The GLCP is now focusing on them for community protection and creating corridors between the island forests (Fig. 4). A long-term goal is to eventually connect these island populations to the Manas Biosphere Reserve with a corridor along the Cham-pamati River and beyond.

In Bhutan, Wangchuk (2005) conducted two censuses in 1994 and 2003 in the Mangde Chu Valley in Central Bhutan on ten 4-km transects on trails for convenience in the rugged terrain, over a period of seven days. He found 127 langurs in 58.5 km<sup>2</sup>. From that census, he estimated the available habitat under 2,300 feet in altitude. The geographic range of the species in Bhutan is roughly 2,000 km<sup>2</sup> giving an estimate of 4,341 langurs. In 2003, he found 130 langurs in 60.5 km<sup>2</sup>, almost the same density as in 1994. However, in 2003 he was able to survey more habitat and could make a better estimate of the total available. He adjusted it to 3089 km<sup>2</sup> and thus revised the estimate of the total golden langur population in Bhutan to 6,637. The substantial increase was largely due to a more accurate understanding of their distribution in Bhutan. Wangchuk (2005) noted that his estimate may be a bit high due to his censuses having been carried out in pristine habitat; some of the available habitat, especially, in the south may be more degraded due to human activities and consequently have lower densities. The density which Wangchuk noted as being relatively high, was 2.1 individuals/km<sup>2</sup>. Wangchuk



**Figure 4.** Map showing the 10-km path traveled (thick black line with arrow) by a subgroup leaving Kakoijana Reserve Forest (5), bypassing Nakkati (10) due to rice fields and ending in Bhubeshwar (8) about four months later. Thinner black lines between reserve forests indicate the plan for potential corridors.

(2005) differentiated two subspecies of golden langurs: the northern subspecies that has more gray in the arms and tail and the southern (nominate) subspecies that is similar to the langurs in Assam. He notes that the habitat available to the northern subspecies, which is higher in altitude and is a more temperate forest, is almost three times the area of the southern subspecies that inhabits a subtropical habitat as in Assam.

In Assam, using the absolute count in this paper of now over 5,600 golden langurs and Srivastava's estimate of the golden langur range to be 1506.47 km<sup>2</sup>, the density has increased from 1 individual/km<sup>2</sup> in 1997 to about 3.71/km<sup>2</sup> in 2009; almost twice the density in Assam compared to Bhutan. This high population density in Assam may be due to the difference in the altitude between the southern and northern subspecies. With the increase of golden langurs in Assam due to our community conservation intervention, and the Bhutan estimate, the total golden langur population could be estimated now at over *c.* 12,000.

There is an area of overlap of golden langurs with the capped langur, *Trachypitecus pileatus*, in Bhutan where hybridization has occurred (Wangchuk 2005; Choudhury 2008). Choudhury (2008) saw these langurs in Zhemgang District. He noted that they resemble more the golden langur with some non-uniform variations from the capped langur including blackish horn-like tufts and grayish forearms, thighs, and tails. Wangchuk noted that the contact zone was adjacent to the Chamkhar River valley in Zhemgang District. He felt that the Chamkhar River complex had acted as a restrictive boundary until recently constructed bridges allowed the langurs to cross the river and interbreed.

### Community Conservation in Bhutan

Wangchuk (2005) discussed the historical and current land practices in Bhutan. He noted that customary law in the past was overlain by government laws when the forests were nationalized in 1952 but that customary law is maintained still in its historical practices as evidenced by interviews he conducted. Landowners continue to make decisions about their lands and its management. They have left the environment in its natural state and thus have things to teach us. This is most important since the Bhutan government capacity to protect the forests is limited.

Wangchuk (2005) examined the various structures of the Bhutan governmental agencies in regard to their abilities and the terrain and makes the case that they are not in a position for complete command and control of all of the country's forests and wildlife. This is emphasized by the fact that 80% of Bhutan's population is rural and depends on forest resources and can thus "make or break Bhutan's biodiversity conservation objectives." He showed that the village systems are basically democratic while the government system is more bureaucratic and authoritarian. In golden langur habitat there is inadequate enforcement, yet the golden langur population remains stable. Wangchuk thus suggests that the solution to his extensive analysis is to enlist support of the main stakeholder—the rural

populace—as forest protectors. The long-term recommendation is to return the traditional community forests to the local people with a system of monitoring and evaluation in place. He developed a plan for gradual transition from government to village control. This is similar in function to the community co-managed system we have recommended to the Bodoland Territorial Council for the Manas Biosphere Reserve. Perhaps, if Wangchuk's concepts can come to fruition, the possibility may arise for villager groups from Assam and Bhutan to ensure important protection of the transnational boundary to jointly protect the contiguous border forests and the wildlife that does not recognize such political boundaries.

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