

# Socioeconomic Analysis of the Toorsa Strict Nature Reserve and Jigme Dorji National Park Conservation Corridor in Bhutan

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*The conservation of cultural and natural heritage is inherently linked to human well-being, the effective management of conservation areas, and developing conservation corridors*



## Introduction

Bhutan has identified nine per cent of its total geographical area as biological corridors (NCD 2003). The westernmost corridor, which connects Toorsa Strict Nature Reserve (TSNR) with Jigme Dorji National Park, forms an important land-use unit in the proposed Kangchenjunga landscape, since it connects to the Bhutan conservation complex. This is one of the six corridors identified by ICIMOD for re-establishing natural connectivity among the protected areas in the Kangchenjunga landscape (Sharma and Chettri 2005). The corridor covers an area of 149 sq.km with a north-south length of 30 km. It passes through Bji 'geog' (local subunit) in Haa 'dzongkhag' (district) and Tseno geog in Paro dzongkhag and connects to protected areas in the southern part of the Kangchenjunga landscape.

As per the recommendations of the stakeholders during a national consultation in 2003, a socioeconomic survey was carried out in the proposed corridor. The major objectives were to generate information on household and settlement patterns, livelihood options, resource use, grazing patterns, and human-wildlife conflict issues and to develop an action plan with the local communities addressing the conservation and development issues.

## **Topographic Overview**

The survey was carried out in Bji and Tsento geogs, the largest geogs in Haa and Paro, respectively. Bji geog, with an area of 802.2 sq.km, has seven villages with 260 households. The climate is characterised by cool summers and extremely cold winters with heavy snowfall in the northern part. Tsento geog occupies 575 sq.km and is divided into 14 'chiwogs' (villages) with 330 households. Almost 80% of this area falls inside the corridor. This geog has a cool to extreme temperate climate with mean temperatures of 17°C during the warmest month and 4°C in winter.

## **Socioeconomic Profile**

### **Demographic structure and land-use patterns**

The total population of Bji geog is 2,038 with the highest number (666 people) in Hatey village. In Tsento 'geog', the total population is 2,190. Within the villages, houses are mostly scattered but sometimes grouped into one or more clusters. In Bji, the land-use pattern consists of dry lands, kitchen gardens, orchards, 'sokshings' (leaf-litter collection areas), native pastures and improved pastures. Of the total arable land of 657 ha, native pasture dominates with 54 ha (AEO 2004). The high percentage of pastureland clearly indicates the importance of livestock rearing in these two 'geogs'.

About 85% of the total land area is under forest cover which is mainly dominated by blue pine and other conifers. A similar land-use pattern is evident in Tsento where native pasture occupies the biggest area of 16 ha. The agricultural land here is mostly dry with only 3% of the total area under wetland cultivation.

## **Livelihood Strategies**

In both 'geogs', people are mostly subsistence farmers who depend on agriculture and livestock for their livelihoods (NCD 2000). Almost all households have some land for cultivation; the size of landholdings varies according to the social status of the villagers. Since the landholding of most villagers is small (<1 ha), people are often engaged in other livelihood activities such as daily labour, trade, pottery, and carpentry. In Bji, farmers have easy access to markets for their products because of excellent road networks that connect to major market towns such as Haa, Thimphu, Paro, and Phuntsholing, whereas Tsento is comparatively remote.

### **The farming system**

The farming system is characterised by two inseparable components of agriculture and livestock. People depend on agriculture for cereals (red rice, wheat, and barley) and vegetables (potatoes,

radishes, and turnips) whereas livestock provide dairy products, draught power, and farmyard manure. Farmyard manure combined with leaf litter from the forest forms an excellent fertiliser for organic farming.

As reported by the locals in Bji, the yields of wheat, barley, and potato have decreased drastically over recent years due to crop damage by wildlife, decreasing fertility of the soil, and unpredictable climatic conditions. Paro is generally the most fertile 'dzongkhag' in Bhutan. Important agricultural crops in Tsento include rice, wheat, barley, buckwheat, oil seeds, potatoes, and other vegetables. Apples are also an important horticultural cash crop. The livestock population in Bji and Tsento is given in Figure 1.

The important livestock products marketed by villagers are milk, butter, and cheese from yaks and cattle. Eggs and pork are also common. Horses and mules are used as pack animals and provide additional income to some farmers (LEO 2004). The yaks are reared at Soeyaksa village which is located within the proposed Toorsa Strict Nature Reserve-Jigme Dorji National Park corridor.

Regarding livestock migration, the migration of yaks is locally referred to as 'ri nor' meaning high-altitude livestock migrating to the northern areas bordering Tibet, China. The migration of local cattle is called 'tha nor' or low-altitude cattle migrating to the southern areas in Bhutan such as Samtse and Dorokha. Migration involves a mutual ownership system which is a traditional practice. In addition, people rear cattle in the homestead that are not involved in migration, mainly jersey cross-breds.

With support from the livestock centre, the fodder species cultivated by the locals to overcome the fodder shortage are Italian rye grass, tall fescue, cocksfoot, white clover, rubinia, willow, and oat.

The registered pastures in these 'geogs' belong to communities, monasteries, and outsiders. All villagers have their own specific communal 'tsamdrog' (grazing area) for grazing which is strictly inaccessible to other villagers outside the specific community. Internal agreements can be made in cases in which the community does not have its own pastures. As indicated by the locals, the community pastures are better managed than natural pastures which have open access.

## Forestry

Both Bji and Tsento have good forest cover with 70-80% of the total land under forest. People depend on the forest for timber, fuelwood, leaf litter, fodder, and incense and also collect wild mushrooms and ferns. Blue pine (*Pinus wallichiana*) is the most favoured timber species while fir (*Abies densa*) and hemlock (*Tsuga dumosa*) are used for roofing shingles. Local people are positive that forest cover has now increased in comparison to the past as a result of strict enforcement of forestry rules and regulations.

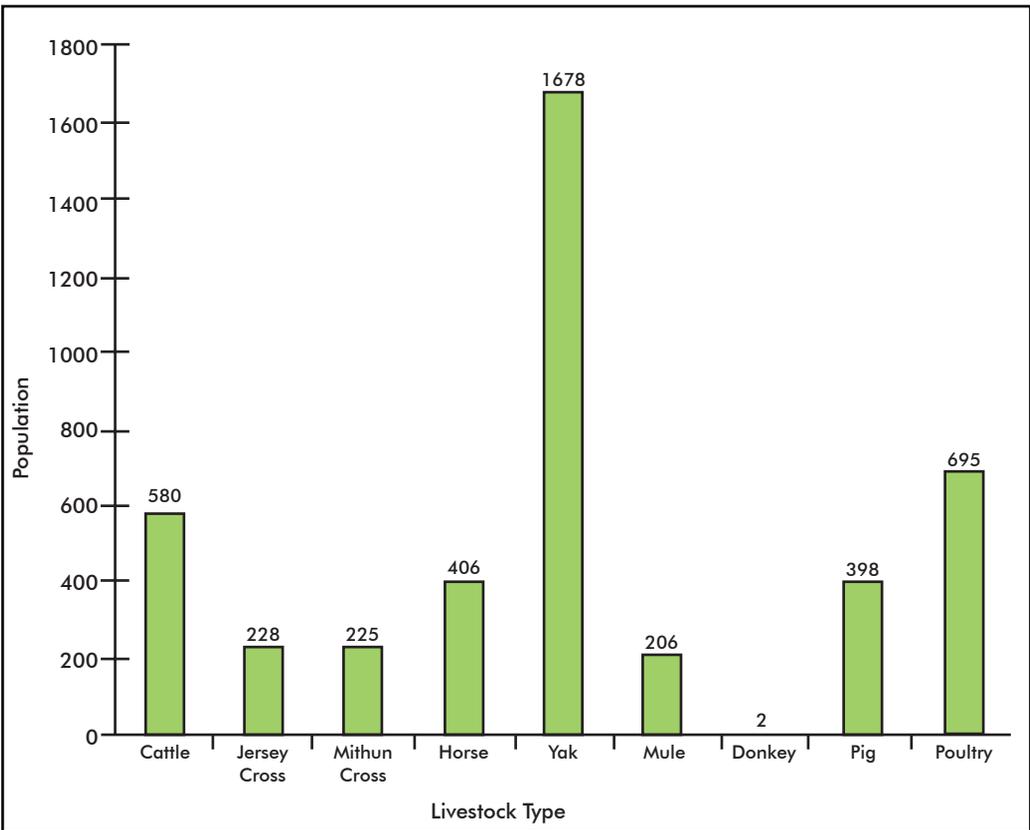
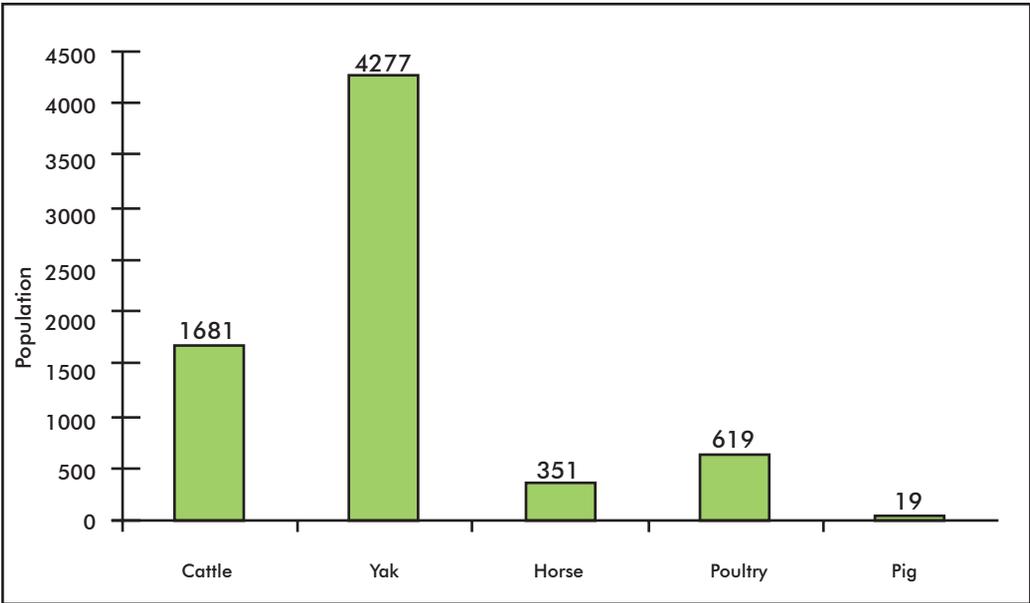


Figure 1: Livestock population of Bji (top) and Tseno (bottom) (source: Livestock Extension Centre, Bji and Tseno geog, 2004)

People are entitled to two standing trees per year for firewood. The permit is issued by the Forest Range Office, but dry firewood can be collected without a permit. During winter, firewood doesn't seem to be enough, therefore there is increasing difficulty in finding dry firewood. People also use kerosene, electricity, and liquid petroleum gas (LPG) to meet their energy needs.

## Community Activities and Belief

Community activities mostly revolve around Buddhist religious beliefs and festivals. Religious ceremonies such as 'Mang Rimdo', 'Nungney', 'Bumday' and 'Kanjur' recitations are performed and local deities associated with lakes, forests, and mountains are also worshipped. One of the most popular festivals in Tseno is the annual 'Paro Tshechu' often known and enjoyed by tourists. People also celebrate annual festivals like 'Lochey' and 'Lomba'. The local people have traditional beliefs that prevent them from polluting and destroying sacred sites. Festivals and other social and cultural gatherings bring the communities together and strengthen their cooperation and goodwill.

## Conservation and Development Issues

Tseno is very remote compared to Bji and many villages do not have access to good roads. The national highway goes as far as Drugyel, after which feeder roads connect a few villages, and the remainder of the villages are connected only by trails. The forests in these 'geogs' host considerable numbers of wild animals such as sambar, barking deer, serow, wild pigs, wild dogs, leopards, musk deer, goral, and monkeys. The farmers in Bji often report human-wildlife conflicts, mainly related to crop damage and livestock predation by wild animals. People take protective measures, such as fencing, guarding the crops and livestock, and scarecrows, which they think are laborious and not too effective.

The conservation and development issues for the two geogs lying within the corridor include the following:

- Crop damage by wildlife and how to address this issue: by compensation or change in cropping patterns?
- Community forestry programmes are needed to handle both institutional and natural resource management issues.
- Livestock depredation: compensation mechanisms should be embedded within local institutions or come from the local government.
- Improved breeds should be introduced as a strategy to reduce animal populations and increase yields, thus contributing to conservation by reducing pressure on grazing lands.
- Access to markets for agricultural and livestock products needs to be improved to ensure better returns than at present.
- Sanitation improvements are essential to ensure good health, especially of women and children.

The 'Ninth Five Year Plan(2002-2007) for Bji Geog (RGOB 2002 a) and Tsento Geog' (RGOB 2002 b) includes improvement of livestock breeds, establishment of backyard farms, animal health services, crop improvement, income generation schemes, and institutional and capacity development programmes. This strategy should be linked to the programmes of the Ninth and Tenth Five Year Plans (2008-2012) with conservation links from additional projects.

## Recommendations

Based on the issues discussed, the following action plan was prepared by the local communities.

- Develop a strategy, such as compensation or technology, to reduce crop damage
- Develop the infrastructure for easy access to and marketing of local goods
- Find alternatives to timber
- Develop a strategy and the technology to control landslides in villages like Jamtey Gonpa
- Streamline the compensation scheme for livestock damage
- Encourage introduction of improved breeds to reduce unproductive livestock
- Develop pastures by means of innovative technologies and options

## Conclusion

The report provides an overview of the socioeconomic conditions of the local people residing within the Toorsa Strict Nature Reserve-Jigme Dorji National Park conservation corridor. It presents the conservation and development issues identified by the local communities and gives a priority action plan based on the participatory village planning meetings held for villagers in Bji and Tsento 'geogs'. The recommendations given above should be developed and integrated into the National Plan of the Royal Government of Bhutan. For the present, operationalisation of the three remaining protected areas in Bhutan (including Toorsa Strict Nature Reserve) should be given top priority, simultaneously considering implementation of the management plan of the Toorsa Strict Nature Reserve-Jigme Dorji National Park biological corridors.

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