

Belgaum District, Karnataka State

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State Overview

Karnataka is one of the four southern states of India. Control of the region changed hands from the Wodeyars to Haidar Ali and Tipu Sultan before being incorporated into the British Raj at the turn of the 19th century. Karnataka lies in the Deccan Plateau and borders with Maharashtra, Goa, Andhra Pradesh, Tamil Nadu and Kerala. The modern state of Karnataka came into existence with the passage of the States Reorganisation Act (1956), with the incorporation of districts under the dominion of Bombay, Hyderabad, Madras State and Coorg within the existing state of Mysore State.

The state is situated in the Deccan Plateau and is bordered by the Arabian Sea to the west, Goa to the northwest, Maharashtra to the north, Andhra Pradesh to the east, Tamil Nadu to the east and southeast, and Kerala to the southwest. It is situated at the angle where the Western Ghats and Eastern Ghats of South India converge into the Nilgiri Hills.

The state has three principal physical zones:

- The coastal strip, between the Western Ghats and the Arabian Sea, which is lowland, with moderate to high rainfall levels. This strip is around 320 km in length and 48-64 km wide.
- The Western Ghats, a mountain range inland from the Arabian Sea, rising to about 900 m average height, and with moderate to high rainfall levels.
- The Deccan Plateau, comprising the main inland region of the state, which is drier and verging on the semi-arid. The humidity in these plains or *maidans* never exceeds 50%.

Demography

Total State Population	52,733,958
Male Population	26,856,343 (50.93%)
Female population	25,877,615 (49.17%)
Population density	275/km ²
Urban Population	33.98%
Rural Population	66.02%
Population growth	17.25% 1991- 2001
Literacy	67.04% (male: 76.29% female: 57.45%)

Agriculture

Karnataka is the largest producer of coffee, raw silk and sandalwood-based products, and is also responsible for 75% of the Indian floriculture industry. The lower slopes of the Western Ghats in Kodagu District, Chikmagalur District and Hassan District are the main coffee producing areas whilst sandalwood comes from the dense forested areas in the south of the state. Raw silk comes predominantly from Mysore. About 70% of the people live in the villages and 71% of the total work force is engaged in agriculture. The main crops are rice, ragi, jowar, maize and pulses besides oilseeds and number of cash crops, including cashew, coconut, arecanut, cardamom, chillies, cotton, sugarcane and tobacco.

Forests of Karnataka State¹

History: The present forests of Karnataka State belong to the forests of Coimbatore, Coorg, North Canara (formerly in Bombay State) and the princely State of Mysore. There was no forest administration or management in this region prior to 1864. The first Conservator of Forests was appointed in 1864 and it was from this date that rules regarding felling and preservation were first developed. In 1867, three forest divisions were created in Karnataka: Ashtagram, Nuggar and Nandhidurg. Initially forests were looked upon as the main source of State income and therefore forest management was mainly based on a reservation policy of consolidation. Some forest blocks were protected from fires, grazing etc. Common lands were also recognised as areas to meet the needs of local people, and occupied nearly twice the area of the forests.

Following Independence, much emphasis was laid on developmental activities, which took a heavy toll on the forest wealth of the State. Forestry as a form of land use was not recognized until 1974, when the Karnataka Forest Act was amended. In 1976, the Tree Preservation Act was enforced to protect trees in private lands. In 1987, a total ban was imposed on the felling of trees in wet evergreen forests and from 1991 onwards, extraction of timber was limited to the removal of dead and felled trees only.

Current Situation: Presently about 20% of Karnataka's lands are under the Forest Department but within that only 11% is actually wooded. The forests in the State are managed as divisions by the Forest Department, with 36 forest divisions in the State. The notified forests are managed as Reserve forests, Village forests, Protected forests, Private forests and Deemed forests. Population growth has put pressure on these reserves, resulting in illegal felling to meet the demands of fuel, timber and industry. This has had a significant impact on the local inhabitants, who are heavily dependent on these forests. In addition to this, between 1980 and 1996 26,500ha of forest were cleared and diverted to non-forestry purposes.

The legal status of state forest lands are listed in the table below:²

Forest type	Area (km ²)	Area (%)
Reserved Forest	28,689.96	74.93
Protected forests	3,930.72	10.26
Village Forests	124.20	0.32
Unclassed Forests	5231	13.66
Private Forests	308.42	0.81
Total	38,284.30	100

Belgaum District Overview

Among the 27 districts of Karnataka, Belgaum is situated in the Northwest part of the state. The district is bordered by Maharashtra state to the North, Bagalkot district in the East, Dharwad & Uttar Kannada districts in the South, Goa and Maharashtra state in the west. The area of the district is 13,415km², which has been divided into ten blocks, and the population was 4,214,505 at the last census in 2001.³ The main economic activities of the district are sugar and jaggery cultivation and processing, milk production, vehicle

¹ Bioresource Potential of Karnataka TV Ramachandra and G Kamakshi Energy and Wetlands Research Group, Ministry of Environment and Forests 2005

² From Karnataka Forest Department Annual Report 2001

³ From <http://www.kar.nic.in/zpbelgaum/area.html>

construction, weaving, leather and tanning industries and foundries. The languages spoken in this district include Kannada and Marathi.

The table below gives a brief overview of Belgaum District:⁴

Blocks	10	Gramapanchayats	485
Villages	1,138	Population (2001 Census)	4,214,505
SC Population	462,020	ST Population	243,451
No. of small and marginal Farmers	333,764	No. of Agricultural Labourers	395,876
Area Under Irrigation in hectares	338,605	Geographical Area in hectares	1,344,382
Area Under Cultivation in hectares	1,001,780	Literacy Rate (%)	64.42
Population Density	314	Sex Ratio (Male:Female)	1000:959
Families below poverty line	116,108		

Topography

The topography of the district can be divided into four key zones:⁵

- 1) On the western side, the district is covered with thick forests along the Western Ghat ranges. These western fringes are the most elevated area of the district, running along the Sahyadri Hills, and stand at 450 to 900 metres above msl. The tops and upper slopes of these hills are almost bare and heavily degraded, but the lower slopes are fairly wooded with moist deciduous and evergreen species. This area receives high rainfall during the southwest monsoon.
- 2) The Northern belt of the district between the Ghataprabha and Krishna rivers makes a second zone. The west of this area is marked by plateaux of poor soil, further east there are rolling hills also of poor soil quality. In the northwest the land is also degraded and of low quality, but north of the Krishna River there is a belt of rich deep soil. Most of the forest areas of the district are concentrated in this zone.
- 3) The central zone of the district is defined by hills to the west and a succession of bare sandstone ranges to the east. The western end of the Ghataprabha valley is rugged with some forests on its slopes but this changes as the valley progresses eastwards near Daddi and passes through a black soil plain. The Gokak hills are flat-topped; their sides are terraced and covered in deciduous tree crops. Much of the rain comes from the northeast, leaving the south and west rather dry.
- 4) The lands are more open in the southern zone of the district; here arable crops occupy the majority of the land. To the far west and south of the district high rugged hills and forests break up the landscape, though in the extreme south the area becomes increasingly less wooded with larger outcrops of rock.

The pastoralist communities are found predominantly in the north and central areas of the district (zones 2 and 3). Their flocks of small ruminants prefer these drier areas to the heavy rainfall areas of the southwest.

Agriculture

Land utilisation is as follows:⁶

⁴ From <http://www.kar.nic.in/zpbelgaum/area.html>

⁵ p.35 District Infrastructure Plan Belgaum District National Bank for Agriculture and Rural Development, (NABARD) Bangalore 2005

Total Geographical Area	1,344,382 hectares
Net Sown Area	738,473
Gross Cropped Area	870,100
Forest	224,557
Fallow Land	44,342
Land under other usage	69,067

The major commercial crops are maize, rice, wheat sugar cane, tobacco and cotton, there has been a 45% increase in sugar cane cultivation since 1993 and currently sugarcane, tobacco and cotton account for 22% of the gross cropped areas of the district. Medium and large-scale farmers own nearly 70% of the cultivable land in the district. Agriculture is the main source of livelihood for 71% of the district population.⁷

Forests and Common Lands

There are few common lands remaining in Belgaum District, following the extensive redistribution of lands in 1975 by the State Government, where many common lands were divided into plots and allocated to landless people. The actual area of common lands in the district varies from source to source, but all sources show that the commons occupy only a negligible area in Belgaum District.

According to the District Gazetteer, the common lands in the district stand as follows:⁸

Type of land	Area in hectares	Area as Percentage
Total District area	1,344,382	100
Forest area	191,000	14.2
Barren and uncultivable land	44,400	3.3
Permanent pastures and grazing	25,000	1.9
Total Common Lands	260,400	19.4%

Common Land⁹

In Karnataka, common lands include *gomaal* lands, regarded by villages as a CPR (Common Property Resource), which traditionally were used - especially poorer members of the community - as a source of fodder and fuel, for grazing livestock, and to produce income in times of stress. It would seem however that *gomaals* used to be more of use than they are today, due to degradation, encroachment and reallocation of lands. *Gomaals* today vary greatly in size, (from 5 to 30ha), in ratio of land:villager, and in the number of villages that use the *gomaal*. Apart from the *gomaals*, tank foreshores are also used extensively as a common area for grazing as well as some forest product collection. Revenue lands in the C and D categories are classed as wastelands (a centuries old land classification given to areas unsuited to rainfed agriculture) and are also used as a CPR, though sometimes the FD and local people seem to have contradictory views of what constitutes wasteland. The Government, in order to increase the land under vegetation, has ordered the transfer of C and D lands to the Forest Department, and the FD annual report

⁶ p.15 District Infrastructure Plan Belgaum District NABARD Bangalore 2005

⁷ From <http://www.kar.nic.in/zpbelgaum/area.html>

⁸ p.265 Belgaum District Gazetteer figures for 1982-3

⁹ p.7 Village level management of common property resources, especially fuel wood and fodder resources, in Karnataka India David Brokensha World Bank March 1988

1986/87 states that 760,000 ha of C and D lands (of a total target of 870,000 ha) have been transferred, however it seems that this has not always been well communicated to villagers themselves.¹⁰

Forests

Belgaum District has a recorded forest area of 191,000 hectares, however, the actual area of forest cover is 116,400 hectares. The breakdown of forest cover is shown in the table below:¹¹

Recorded Forest Area	191,000ha
Actual Forest Area	116,400
Of which – dense forest	83,600
Of which – open forest	32,800
% Of district occupied by actual forest	8.68%

In addition to forest, the district contains 12,761 hectares of cultivable wasteland and 7299 hectares of permanent fallow land. In the long term, according to the National Bank for Agriculture and Rural Development, around 50% of this could be available for forestry development.¹²

The legal status of the recorded forest areas is as follows:¹³

Reserved Forest	205,742 hectares
Protected Forest	1178
Unclassed Forest	5294
Private Forest	12343

The district is divided into two forest divisions, namely Belgaum and Ghataprabha. Belgaum division covers the southwest of the district, and includes the forests of the Western Ghats. This division characterised by heavy rainfall, whereas Ghataprabha, to the northeast, is much drier. The northern forests have been severely degraded due to human activity, including over-grazing and demands from agriculture, as well as due to fire and invasion by foreign species such as *Opuntia* and *Lantana*.

Animal Husbandry

The current livestock population of the district is as follows:¹⁴

Buffalo	701,196
Cattle	507,583
Sheep	902,255
Goats	508,776
Pigs	27,983

¹⁰ p.7 Village level management of common property resources, especially fuel wood and fodder resources, in Karnataka India David Brokensha World Bank March 1988

¹¹ P.35 District Infrastructure Plan Belgaum District NABARD Bangalore 2005

¹² P.38 Potential Linked Credit Plan 2006-07 Belgaum District NABARD Bangalore

¹³ P.37 Potential Linked Credit Plan 2006-07 Belgaum District NABARD Bangalore

¹⁴ 2003 livestock census

Belgaum is known for buffalo milk production, and out of Karnataka State's annual production of 13.58 lakh tonnes of milk, Belgaum contributes 3.83 lakh tonnes, or 28%.¹⁵ Approximately three-quarters of the milk produced comes from buffaloes. However, pastoralists remain external to the dairy sector of the district economy; in this district the Kuruba and Golla pastoralist communities mainly herd sheep and goats. This is in part due to tradition, but also in part due to the low quantity and quality of grazing lands available in the district. Poor quality grazing lands can lead shepherds to favour small ruminants as they do much better on low quality fodder. Regarding this pattern, Cincotta and Pangare of the Indian Institute of Rural Management, Anand (IRMA) have formulated the following theory:

Where common grazing land is scarce, and difficult to manage because of a large number of users who maintain customary access, vegetation degradation tends to lead to the growth of thorny, sprawling, and toxic species resistant to grazing, thus further reducing the grazing options available to pastoralists. Faced with such a lack of production options, agro-pastoralists are left with three strategies for utilising their knowledge of livestock:

- 1) Sell their services as livestock keepers for farmer-owned herds
- 2) Buy imported high quality feed (which must be continuously available at reasonable prices)
- 3) Switch to small ruminant (goat, sheep) production¹⁶

The latter strategy is viable because small ruminants are well suited for the grazing conditions of degraded commons. Goats and sheep are selective feeders, and thus capable of learning to choose nutritious vegetation among an array of defensive plant parts. These behavioural traits are more conducive to animal survival, health and production on degraded grazing land than are the bulk feeding capabilities of larger ruminants (cattle, buffalo).

Fodder: given the lack of common lands in the district, the cultivation of animal fodder becomes crucial. Fodder production is estimated at 68 lakh tonnes per year, and the major fodder sources are sugarcane, jowar, hybrid maize, wheat, pulses and perennial grasses.¹⁷ African tall maize is grown in 8,000ha of land as perennial fodder.

Pastoralism

Pastoralists are an important sub-section of the animal husbandry sector in this district, and shepherds predominantly herd sheep and goats. Deccani sheep are the most popular amongst pastoralists. Despite consecutive droughts in the area in recent years the Deccani sheep population has not declined, indicating the good herd management of shepherds.

Pastoralists in this area tend to combine nomadic animal husbandry with small-scale crop cultivation in their 'base' villages. Living in a mixed crop and livestock production system, most of them have acquired permanent homes and some even have agricultural lands in their native villages. They migrate generally for short periods of a few months since the biomass available from their lands or their villages is not sufficient for them to rear the animals.¹⁸ With minimal common lands available, pastoralists mainly rely on the crop residue from cultivated fields of settled farmers, on which they may be invited to graze their herds

¹⁵ p.3 District Infrastructure Plan Belgaum District NABARD Bangalore 2005

¹⁶ p.21 Population growth, agricultural change and natural resource transition: Pastoralism Amidst the Agricultural Economy of Gujarat Richard P. Cincotta and Ganesh Pangare

¹⁷ p.41 Potential Linked Credit Plan 2006-07 Belgaum District NABARD Bangalore

¹⁸ Dhas, M, How the Migrant Sheep and Goat Rearers of Maharashtra Manage the Water Requirement of Their Herds paper presented at the Annual Partners Meet of IWMI-Tata Water Policy Programme, Anand March 8-10 2006

in exchange for the manure their animals can provide. A few shepherds in Ramdurg block are adopting innovative methods of rotational grazing by growing fodder crops on their own lands.¹⁹ Growing fodder crops for their herds on their own lands (rather than relying on other farmers' crop residues) is a relatively new initiative, and one that NGOs in the district such as Jana Jagaran are keen to encourage.

Pastoralists originate mostly from two communities in Karnataka, the Gollas and the Kurubas (also known as Dhangars). Gollas are mainly from the southern part of the state, but there are many Kurubas in Belgaum district. Pastoralists in this district can be broken down into three categories:²⁰

- 1) Settled or stationary shepherds who normally also work as cultivators or labourers
- 2) Semi-nomadic communities that migrate over an area of 20-60km. These pastoralists may be accompanied by their families, or families may remain in the villages undertaking agricultural work
- 3) Completely nomadic pastoralists who migrate over long distances (over 60km) and who maintain few permanent links with any base village or homestead

These categories are not static and many shepherds move from one form of pastoralism to another depending on changing circumstances, for example drought in a particular year may force pastoralists to travel further afield in search of fodder.

Kurubas: The Kurubas or Dhangars are found all over the Deccan Plateau, in Maharashtra and in Karnataka. In Belgaum district their estimated population was 866,267 in 1984²¹. Their traditional occupations are rearing sheep, weaving blankets and agriculture. Most pastoralists in Belgaum District are Kurubas; 80% of Kurubas are landless sheep rearers or labourers, whilst around 20% own land and keep large ruminants.²² The number of landholders is increasing however, with some acquiring land in Chikodi, Raibag, Hukeri Ramdurg and Athni. These livelihood systems tend to be mixed with emphasis on both sheep rearing and cultivation.

Key Issues

Pastoralists and Lack of Common Lands

Common lands currently make up only 19.4% of the Belgaum District area, and given the priority given to buffalo and cattle in these areas, this leaves little space for pastoralists and their herds of small ruminants. *Gomaals* are one type of grazing land, typically around 10-20 hectares in size, but are generally reserved for the grazing of cattle and buffalo. Their frequency has diminished over the past two decades for a variety of reasons. Under the 1974 Land Tenancy Act, allotments of housing were made to the rural poor and those returning from the military. In the 1980s *samaj parivartna* brought the distribution of a lot of 'surplus' lands to landless and marginalized people, and this land was often taken from village *gomaals* which has further increased the diversion of common land to private use. *Gairans* are another category of village common land and are generally managed by the shepherds themselves, though the land rights are officially held by the *inamdar* who traditionally would have conducted surveys and allotted settlement rights.²³

¹⁹ p.46 Potential Linked Credit Plan 2006-07 Belgaum District NABARD Bangalore

²⁰ Vivek Vyas, fieldwork October 2006

²¹ Karnataka Backward Classes Commission 1984

²² Vivek Vyas, fieldwork October 2006

²³ Vivek Vyas, fieldwork October 2006

The commons are negligible, and are in any case degraded, encroached and poorly managed and thus unable to meet the shepherds' needs. Over-pressure on the *gomaals* available has led to reduced vegetative growth and increased pressure on the forests which are themselves often highly degraded. This is especially a problem in Gokak forest division, as this is particularly bare and barren. Belgaum division, which features denser forest cover with moist deciduous and semi-evergreen cover, is under less pressure. However, sheep do not flourish in high rainfall areas, and thus are more common in Gokak division where the forest density is relatively sparse. In Gokak there is a high dependence on sheep rearing, but contrary to popular opinion the degradation of forest cover is not due to the numbers of sheep, as they are mostly grazed on the roadside. Here pastoralists are reliant on forestlands not so much for grazing as for fuel wood as they pass by.²⁴

The pastoralists in Belgaum District have responded in two ways to this situation. Increasingly, sheep rearers are adopting land-based livelihoods or working as labourers in other industries in the region.²⁵ For those that continue to pursue a nomadic lifestyle, herding sheep for at least part of the year, they have become increasingly reliant on agricultural land to meet their grazing needs. Pastoralism and crop cultivation have traditionally been integrated and synergistic. Land owners appreciated the manure provided by herds spending the night on their harvested fields and compensated pastoralists in cash or in kind. However, in recent years this relationship has become unbalanced. Increased frequency of double-cropping due to irrigation, reforestation projects, and alienation of village grazing grounds have eliminated many pasturing opportunities, and the availability of chemical fertilisers has made manure to some extent redundant.²⁶ Thus on the one hand shepherds' access to common lands is declining, and on the other, farmers' need of pastoralists' herds is also deteriorating.

Modernised agriculture and pastoralism

Karnataka state and Belgaum District have been the location of several government-sponsored irrigation projects over the last two decades. Current irrigated land stands at:

Total irrigated land	325,476 hectares
Canal irrigated land	41,952
Well and borewell irrigated land	200,384
Lift irrigated land	39,248
Other sources of irrigation	43,882

This growth in irrigated land has dramatically increased cash-crop production, with shorter fallow periods and increased opportunity for double cropping. In the short term this has been good for pastoralists, increasing the need for their herds as intensified cropping provides an abundance of seasonal crop residues and also has a high demand for manure for re-fertilization. This is in line with findings in Gujarat, where the proliferation of irrigation schemes and increase in cropping frequency increased demand for manure.²⁷

²⁴ From interview with Mr Hombal, retired DFO in Belgaum District. Vivek Vyas, fieldwork October 2006

²⁵ Vivek Vyas, fieldwork October 2006

²⁶p.5 Pastoralism in Western India from a Comparative Perspective: Some Comments Ilse Köhler-Rollefson

²⁷ Traditional livestock production systems among pastoralists: Their perceptions of the production system and attitude to change DV Rangnekar (1993)

However, despite these short-term benefits of irrigation for pastoralists, in the long term this relationship may not be sustainable. Farmers' demand for the removal of crop residue and fertilization of fields can now be met with new technologies, such as mulching of the residues, and the use of chemical fertilizers. Moreover, the proliferation of irrigation projects further decreases the availability of common lands available for grazing. Thus any benefits initially gained from irrigation and intensified cropping may be short lived - in the long term it would seem that as new technologies are more widely taken up so agro-pastoral relations are likely to decay.

In addition to irrigation, the growth of the dairy sector has had an impact on pastoralism. As already mentioned, Belgaum District is a major milk producer and dairying is now a key sector of the district economy. Government investments into the sector have emphasised improving dairy cattle; farmers can increase milk yields and therefore profits by feeding their own-grown fodder and high quality residues (e.g. groundnut leaves) to their own livestock. This system reduces the need for pastoralists' herds, as their manure is no longer required since it can be provided by the dairy farmers' own cattle.

In summary, it seems that as modern agricultural practices are more widely taken up, so sedentary farmers' need for pastoralists is declining and the traditional inter-reliance is breaking down. In their research into pastoralists from the Deccan Plateau, including the Kuruba community found in Belgaum District, Dhas et al observed that farmers now see pastoralism less as a contribution to the sedentary farm economy, providing fertilizer in exchange for biomass and water, and more as a hindrance to new modern agricultural systems.²⁸

Other issues in the District

Encroachment: encroachment on government wastelands is a significant problem in the district, and many land disputes have emerged. Poor maintenance of land records at the village level has compounded this problem, and thus grazing lands available for pastoralists' herds are diminishing.

Drought and migration: reduced rainfall in the district and a depleted ground water table has forced many of the rural poor, including shepherds, small farmers and marginal agricultural labourers to seek work in urban areas, usually in Maharashtra or Goa. This has been particularly noted in the northern and eastern blocks of the district, as these are rain shadow areas and hence drought has been particularly sorely felt.

Land degradation: poor water management, over-intensive cultivation and population pressures have led to considerable soil degradation of land, estimated at around 10,000 hectares and predominantly in Chikodi, Gokak and Raibag blocks.

Government Projects: The National Wastelands Development Programme (NWDP) was implemented in Karnataka State and Belgaum District in the mid 1980s, with a major emphasis on afforestation of both private and common lands. The NWDP combines Farm Forestry, with distribution of seedlings to villagers for planting on private lands, and Social Forestry, under which tank foreshores, roadsides, canal banks, Railway line sides, *Gomaal* lands, C and D class lands and degraded forests are all targeted for plantation projects.²⁹

²⁸ p.10 'Water for migrant livestock: issues, concerns and policy' M Dhas, K Vivek and S Phansalkar in Livestock Research for Rural Development 18 (9) 2006

²⁹ p. 30 Karnataka FD Annual Report 1986/87

Whilst afforestation aims to improve soil quality and security and is important in stemming degradation of lands and improving drought-prone areas, targeting common lands means that these objectives are often achieved at the expense of grazing lands that are so vital for pastoralist communities. Re-planted areas are usually closed for grazing to protect the saplings, and small ruminants are seen as particularly destructive. In this way, government initiatives undertaken in the district have further decreased the options available for pastoralists.

Responses to decreasing options available to pastoralists

A Case Study from Jana Jagaran

As noted above the fodder options available to pastoralists are gradually decreasing, both in terms of access to common lands and also with regards to their relations with settled farmers. However, most pastoralists in Belgaum district are not 'pure' nomads, and have permanent village homes. Although many shepherds are landless, some Kurubas have acquired land in recent years, and for the most economically secure of these, a new option emerging is to start cultivating their own fodder crops for their herds. The NGO Jana Jagaran based in Belgaum town is promoting this as a new alternative for local shepherd communities. With access to a few acres of irrigated land, shepherds can grow fodder crops such as maize and cowpea for their own herds, and this, according to Jana Jagaran, can have much higher economic returns than sugarcane cash crop cultivation. The case study below details how such an initiative could work.

Two shepherd brothers from Chunchnur village practice mixed farming, with livestock and crop cultivation. They have 197 ewes and four rams, as well as 8 acres of irrigated fodder land and 8 acres (6 semi-irrigated and 2 irrigated) of sugarcane land. Previously they would have migrated with their sheep and goats for part of the year when their own lands could no longer support their flocks. However, Jana Jagaran's initiatives related to fodder cultivation made them look critically at the economics. As well as growing sugarcane on prime irrigated land the shepherds have dedicated two acres of their land for fodder cultivation for their 201 sheep, this has been supplemented by another six acres of semi irrigated low-grade land, exclusively for fodder cultivation, which they have taken on a ten-year lease for a sum of Rs. 60000/-. With the help of grazing hands they graze their sheep from morning till evening in the free grazing lands in exchange for sheep droppings. In the evening from 5 pm to 7 pm they graze their sheep directly on the 8 acres of standing fodder land, section by section, which they have planted with a mixed crop of maize, jawar and cowpea. The land is very well managed to provide additional fodder for their 201 adult flock and the young ones throughout the year.

Their flock is robust and the healthiest among all the flocks of the village. The ewes conceive regularly and deliver healthy lambs that fetch around Rs.1250 – 1300 each. They have hardly any disease problems. Jana Jagaran's village level veterinary workers work with the shepherd brothers, and their flocks are regularly de-wormed and vaccinated. The shepherds also give mineral supplements to their ewes during pregnancy and after lambing.

One of the brothers, Mr. Bassappa, said that even though the economic returns were higher per acre through shepherding with fodder cultivation, one should opt for mixed farming for greater security. But he confessed that since he was a shepherd by birth, he would not trade his ancestral profession even for 100 acres of irrigated land.

His brother Fakirappa compared the advantages of sheep husbandry using cultivated fodder over cash crop agriculture.

Fodder cultivation for sheep and goats	Sugar cane cultivation
Meat price is on the increase year after year	Price of sugarcane is stagnating
The lamb market is cash, easy liquidity, don't have to go far, no panic selling	It takes months to en-cash, difficult if cutters are not available, cutting cannot be delayed
Limited water required for fodder, crops don't suffer too badly during lack of rain	Needs a lot of water, during water scarcity the crop suffers
Less manure and no pesticides needed	Needs more manure, more pesticide
Enriches soil in the long run	Depletes soil in the long run
Fodder can be grown on inferior soil	Needs superior soil

Jana Jagaran have prepared a cost-benefit analysis to demonstrate the economic returns possible if shepherds cultivate their own fodder for their herds. Their calculations establish that improving sheep flocks on own-cultivated forage can bring more than double the income per acre of land than the cultivation of sugarcane. See Appendix 1.

Jana Jagaran³⁰

Over the last two decades JJ has been working among the Nomadic Shepherds in the twelve districts of North Karnataka. Jana Jagaran is half way through its new project phase concerned with empowerment/organization building processes amongst traditional shepherding communities. The efforts of the organisation are directed towards formation and animation of eighty-three SHGs of shepherd women and forty-one SHGs of shepherd men.

Jana Jagaran states: "We have not solved their stress of migration and other problems completely but we address them systematically. There is an improved understanding among shepherds on sharing of grazing grounds and water resources on the migratory routes. By and large their relationship with the landowners is also congenial. There is a shift to cooperation from the earlier conflict situation."

The shepherds are well informed about markets, diseases, fodder and water scarcity. There is a consensus approach to sharing the common grazing lands. Through their participation in Migration Heads and SHGs the overall development of the community has increased. They are now much better prepared to accept scientific methods of sheep rearing and management of their resources.

The pastoralists support programme attempts to -

- ❖ Establish links with bank and government agricultural departments for financial support and inputs in modern agricultural technology and practices.
- ❖ Network with other village groups, panchayat officials for socio economic development of the village including infrastructure development.
- ❖ Build relations with landlords in the grazing area and promote sharing of natural resources such as fodder and water.

³⁰ From Annual Report 2005-06 Jana Jagaran, Belgaum, Karnataka

- ❖ Promote fodder cultivation to overcome scarcity during summer.
- ❖ Promote village hygiene, addressing problems of drinking water scarcity, roads, electricity, sanitation and related issues.
- ❖ Initiating programmes to promote wool utilization, value addition and marketing.

Migration Head is a JJ project that has been running for almost two years. MH is a thrust group, active in socio-economic, political, educational issues in OB areas, and is a new concept for many shepherds. The MH has formed 30 SHGs with 510 active members. The role of MH groups is to lead advocacy and networking with institutions such as banks, government officials, veterinarians in order to promote the needs of the pastoralist community, to develop a good rapport with local landholders to optimise access to grazing and water resources, to promote village level community development projects and to encourage support for JJ programmes such as those related to wool utilization, value addition to herds and marketing of produce.

Lamb fattening project - JJ have undertaken a Lamb Fattening project with thirteen pastoralist SHGs. the project was able to improve lamb survival rates and increase profits, and many members are now keen to pursue new techniques of feeding and care at flock levels. Participating women were taught about disease affecting the health of lambs, were trained in how to manufacture the feed concentrate and were encouraged to maintain a record of the daily feed consumption and the corresponding weight gains in the lambs. In addition, training on markets was given, such as how to make the most of periods of peak demand (e.g. the festival season), which can give 30% to 40% higher prices. This experiment produced 404 fattened lambs adding an extra 600kgs of meat with a value addition of 88% giving an average profit of Rs.1427 for two batches of the lambs fattened. The total profit for the 13 SHGs from two batches of fattened lambs was Rs.294 600.

Deccani Seed Ram Production

JJ has been working to promote the Deccani breed and encouraging good practices of ram raising and breeding. The region needs over 55000 good breeding rams, and to address this JJ encouraged women from SHGs to undertake a seed ram breeding exercise. Raising breeding rams had traditionally been seen as a male role, but these women showed that they also had the capacity to raise the breeding rams. They have learnt techniques of handling, managing and feeding the rams scientifically and taking care of their prophylactic vaccinations and medication. The high demand for good rams and the improved profit margins have encouraged many women to continue with this exercise.

Income-Generating Activities - Many of the SHGs were enabled to initiate income-generating activities such as value addition to wool and fodder cultivation. Extensive study and successful experiments were made in the production and marketing of jute, cotton, coarse wool items in the national and international markets. JJ tries to protect the interests of the traditional social groups and promote their traditional skills and knowledge whilst enabling them to continue with traditional occupations. Presently there are one hundred and sixty two persons working in weaving, dyeing and value addition to jute, cotton and wool yarn and fabrics.

Watershed Development Programme - In the northern blocks of Belgaum district, rainfall is scanty. Livelihoods of the people are dependent on rain fed agriculture on marginal lands with eroded soil. During the agricultural season people get employment for about four months in a year. During the rest of the year they gather forest produce and remain virtually unemployed. The seasonal nature of employment compels them to migrate to neighbouring states of Maharashtra and Goa. Our watershed development programme

has helped to ameliorate the problems of degradation of environment drinking water, low ground water table and low productivity in Kattanbhavi, Ningenhatti, Bambarge and Guramathi villages.

Fodder Cultivation

Another project conducted by JJ relates to fodder cultivation. Given the poor access to common lands and insufficient grazing available, fodder production by shepherd communities themselves provides an alternative means of sustaining their herds. JJ has distributed free seeds of African tall maize and *Susbania* (Chogachi) – a legume plant) to motivate them. They also grew Cow Pea, *Glyricidia* and G. Grass. The maize and *Susbania* covered 56.75 acres that gave an output of 108.8 tons of fodder. Shepherds made good use of fodder during the deficient period of Jan - March and invested more on fertilisers and on replanting of the fodder crops. Fodder cultivation is now an accepted concept and many small and big fodder pockets are coming up. MHs are playing a leading role in propagating the advantages of organised fodder cultivation. In many areas shepherds have made a separate provision of land for this purpose.

Networking Advocacy and Research

MHs actively interact with the local government veterinarians in order to get the various government schemes and free supply of vaccines and other medicines. They also provide feedback on the health of their livestock to local diagnostic and surveillance authorities. MH groups have also pressurised the political leadership for additional vaccines and medicines. In many MH areas blue tongue, PPR and other infectious diseases prevailed. The local vets were unable to control these diseases. JJ initiated a dialogue with the prestigious “Central Sheep and Wool Research Institute”, Avikanagar in northern India. There was a favourable response from the authorities, and links have also been made with the Indian Veterinary Research Institute.

Conclusions

The pattern observed amongst pastoralists in Belgaum District is in keeping with studies of pastoralism and changing land use in other areas of India. On the basis of fieldwork in western India, Cincotta and Pangare have developed a base model applicable to pastoralists in India facing difficult choices in a world of increasingly modernized agriculture.³¹ It is clear that as available common lands shrink and the ratio of livestock to forage increases, pastoralists must adjust their production practices to cope with the increased risk of fodder shortage.

Shepherds are presented with various choices, all of which have been adopted to varying degrees by pastoralist communities in Belgaum District. Such options available are to abandon herding altogether and seek entrance into rural or urban labour markets, to change herd migration patterns to cover longer distances in search of grazing lands, to increase reliance on small ruminants which are better able to thrive on less nutritious and/or toxic forage plants, or to increasingly utilisation of fodder available on agricultural lands, i.e. crop residues and weeds.

It is becoming clear that although reliance on agricultural residues might in the short term be able to sustain pastoralist livestock production, the longer-term sustainability of such agro-pastoral relations is threatened by intensifying modern technologies and techniques. Given such recent changes in Belgaum District as the

³¹p.20 Population growth, agricultural change and natural resource transition: Pastoralism Amidst the Agricultural Economy of Gujarat Richard P. Cincotta and Ganesh Pangare

development of Ghataprabha and Mallaprabha irrigation projects, the redistribution of common lands for residential purposes and the initiation of social forestry schemes, the solutions being implemented by Jan Jagaran seem to very apt in making use of the increasingly limited options available for the pastoralist people. Their depleting resource base makes it imperative for them to realise the best possible prices for their produce (animal produce as well as wool), and this is only possible if there are enough value addition possibilities available. Therefore the approach of Jan Jagaran in terms of enhancing animal production as well as promoting value addition seems to be farsighted and beneficial.

But at the same time one must not forget that pastoralism as a land use practice might be short lived and may lose out in the long run given the emphasis being put on a settled way of life by government policies and systems of land tenure. Institutional rules and regulations are all geared towards facilitating a fixed settlement pattern and rights and facilities are allocated on this basis. Therefore there maybe a need to explore the future of pastoralism and how the shepherd communities can respond to these circumstances. At the moment, as Cincotta and Pangare have noted, with quality biomass confined principally to croplands - since common land is limited and degraded - and with subsidized chemical fertilizers available, sedentary farmers can clearly obtain the economic 'upper hand' over pastoralists in the latter stages of rural land conversion.³²

³² p. 21 Population growth, agricultural change and natural resource transition: Pastoralism Amidst the Agricultural Economy of Gujarat Richard P. Cincotta and Ganesh Pangare

Appendix 1

ECONOMICS OF FODDER PRODUCTION – A COST-BENEFIT ANALYSIS					
Irrigated sugar cane crop - 8 acres			Semi irrigated Fodder crop – 8 acres		
INCOME			INCOME		
Average yield per acre	60 tonnes		Ewes	197	
Average yield per year	480 tonnes		With an average of 2 lambings per year, a Conception rate of 80%, and taking into account lamb and adult mortality, then approx lambs per year	212 male, 212 female	
Price per tonne of sugarcane	850 Rs		212 male lambs sold at 3 months for Rs. 1250 each	212 lambs x 1250R	Rs. 265000
Total receipts per year	850Rs x 480		106 female lambs sold at 3 months	106 lambs x 1250R	Rs. 132500
			106 female adult ewes Rs1800 each	106 x 1800R	Rs. 190800
			Total income from sale of animals		Rs. 588300
			Manure	600 grams per adult x 201 x 365 days = 44019 kg	
				300 grams per young stock x 212 x 365 days = 23214kg	
			Total income from manure	67233kgs @ Rs. 2	Rs. 134466
			Wool 300 grams wool per adult x 2 shearings/year	300gm x 201 x 2 = 120 kgs	
				100gm per lamb x 212 x 1 shearing = 21 kgs	
			Total income from wool	120kg + 21Kg @ Rs10 per kg wool	Rs. 1410
Total Income from sugar cane		Rs. 408 000	Total Income from sheep	Sale + manure + wool	Rs. 724 176
EXPENDITURE			EXPENDITURE		
Labour 3 labourers for 25 days a month @ Rs. 40/day	25 x 3 = 75 labour days/month 75 x Rs 40 = Rs3000/month Rs 3000 x 12 months =	Rs. 36000	Lease of 2 acres irrigated land per year	10,000Rs/acre	Rs. 20000

Planting and fertilizer Rs. 2000/ acre	8 acres x Rs 2000	Rs. 16000	Lease of 6 acres semi irrigated land	1,000Rs/acre	Rs. 6000
Electricity for one year		Rs. 14000	Labour costs for grazing	Rs.10800/year x 4 labourers	Rs. 43200
Pesticide Rs. 2000/acre	8 acres x Rs 2000	Rs. 16000	Vaccination and De-worming Adult @ Rs. 15 Young @Rs. 10	(201 x Rs15)+ (424 x Rs10)	Rs. 7255
Harvesting Rs. 30/tonne	Rs30 x 480 tonnes	Rs. 14400	Supplements Adults @ Rs. 5 Young @ Rs. 3	201 x 5 424 x 3	Rs. 2277
Ploughing & pruning Rs. 1600/acre	8 acres x Rs 1600	Rs. 12800	Sheep fertilizer for 8 acres, 3x/year 200 kg per acre, Rs. 2 per k.g	8 x 3 = 24acres 24 x 200kg = 4800kg 4800 x Rs 2	Rs. 9600
Weeding 12 women for 90 days Rs20/day	12 x 90 = 1080 days 1080 x Rs20	Rs. 21600	Seeds for 8 acres, 3x/year Rs 600 per acre	8 x 3 = 24 acres 24 x Rs 600	Rs. 14400
			Shearing 201 adult sheep 2x/year Rs. 2.50/sheep 212 young sheep 1x/year Rs.2.50/sheep	201 x 2 = 401 shearings 401 x Rs.2.5 212 x Rs 2.5	Rs. 1535
			Electricity for 8 acres		Rs. 10000
			No pesticides		Rs. 0.0
			Weeding	12 women @ Rs. 20 for 50 days	Rs. 12000
			Ploughing and pruning 3x/year	12800 x 3	Rs. 38400
			Field labour for 120 days	3 labourers @ Rs. 40/day	Rs. 14400
Total Expenditure		Rs. 130 800	Total Expenditure		Rs. 179 067
Total Income		Rs. 408 000	Total Income		Rs. 724 166
Profit		Rs. 277 200	Profit		Rs. 545 099
Profit per acre		Rs. 34 650	Profit per acre		Rs. 90 520