

SILVIPASTURE DEVELOPMENT ON COMMON LANDS IN RAJASTHAN: ITS IMPLICATIONS FOR LIVESTOCK¹

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Introduction

The poorer rural livestock-keepers in Rajasthan tend to be small or marginal farmers (or landless people) who do not have sufficient land to grow forage crops, preferring to give priority to food crops and cash crops. For them, common lands, particularly village grazing lands and state-owned forest lands, are often the most important source of forage for their goats and other livestock. Use of common lands in Rajasthan has been primarily open access during the last few decades, and a large proportion of them has become degraded. During the last 15 years or so there have been many initiatives to rehabilitate and protect them. These protected areas are referred to here as Protected Silvi-Pasture Areas (PSPAs).

The approach taken has normally involved enclosure of the area and exclusion of all ruminants. The standard technological package has been to construct a boundary wall, and to plant trees and sow grasses within the protected area. Forage is normally only obtained from the enclosed areas through cut-and-carry, and has to be stall-fed. In joint forest management (JFM) programmes lopping of trees tends to be prohibited. Thus, the principal (sometimes only) kind of forage harvested from the protected sites is grass.

There was very little information in the existing literature on the effect of these initiatives on livestock, including their feeding systems and numbers. Thus, in late 1999 the project commissioned 15 case studies of silvi-pasture development interventions, with a view to filling in these and other knowledge gaps. The main findings will now be presented².

Ruminant Feeding Systems

Seasonal feed calendars, one each for large and small ruminants, showing the contributions of different sources at different times of the year, were prepared by livestock-keepers in most of the study villages. These enabled us to see how fodder from the PSPAs fitted into the overall feeding systems.

There are a number of important sources of feed for *large ruminants*. In most villages, open grazing makes a significant contribution throughout the year. Cut grass is important during the rainy season, and thereafter stored crop residues and stored grass from the PSPAs make substantial contributions until the following rainy season.

A striking aspect of the feeding systems for *small ruminants* is the overwhelming importance of 'open grazing' throughout the year. In many villages, the minimum contribution from open grazing in any month was 80%. There are three sources of grazing for small ruminants that are likely to be available in most villages, but the contributions from each can vary considerably between villages and between different groups in the same village. These are common land, privately owned pastures and private crop land.

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² The full study was published in April 2002, and can be ordered from BAIF - email: baif@vsnl.com
It is: *Silvi-Pasture Development and Management on Common Lands in Semi-Arid Rajasthan*, by Czech Conroy and Viren Lobo.

Common land makes its biggest contribution during the rainy season. In villages with PSPAs the contribution of common lands to 'Open grazing' may be reduced. Privately owned pastures are also used throughout the year. Private crop land is grazed as an open access resource after the rainy season and winter season crops have been harvested.

Utilisation of forage from PSPAs

In all but two of the cases the grass from the PSPA was harvested, usually in November or December, and then stored for a period of time, which varied considerably (see Table 1). In several villages people stored the grass for a few months, feeding it in the dry season or even in the early rainy season. The harvested grass was fed almost entirely to large ruminants, which in most cases were given grass from the PSPA for at least half of the year. Small ruminants do not receive any forage from the PSPAs in most villages; and, in the few villages where they do, it only constitutes a small proportion of their diet for a short period in the year.

Table 1 Timing of Grass Utilisation from PSPA

Village	Period of feed utilisation from PSPA ¹											
	1	2	3	4	5	6	7	8	9	10	11	12
Sagatadi	+	+	+									
Fila -Dangis	+	+	+	+	+	+	+	+			+	+
Fila – Rawats	+	+	+									
Patukheda ²	50%	50%	12.5%									
Selu ³	+	+	+	+	+	+					+	+
Salukhera	+	+	+	+	+	+	+	+	+	+	+	+
Suali ⁴	**	**	**	**	**	**	**				**	**
Bada Bhilwara	+	+	+	+	+	+					+	+
Jodha ka Khera ⁴								**				
Gudha Gokulpura												
Chota Saradhna	+	+	+	+							+	+
Jogio ka Guda	+	+	+	+	+	+	+	+			+	+
Keli			+	+	+	+	+	+				
Seedh	+	+	+	+	+	+	+	+				
Tank				+	+	+						
Barawa												

¹ The numbers 1 to 12 correspond with the months of the year, starting with January.

² The percentages given here represent the contribution of grass from the PSPA to the total feed intake of large ruminants during these months.

³ In Selu, harvested grass accounts for a large proportion of the diet of large ruminants during the November-February period, and a small proportion from March to June.

⁴ In these two villages there is grazing rather than cutting of grass.

Where the forage is being stored for use in times of scarcity it may mean that the owner no longer needs to purchase forage at those times, or that the animals can be maintained in a better condition nutritionally. In a drought year, grass from the PSPA enables some people to avoid purchasing grass from outside; and may even save them from selling off their animals.

For those maintaining milch animals, the PSPAs have made fodder available for longer periods than was the case under grazing regimes; and this has reduced the demand for purchased fodder and enhanced the viability of dairying. Some families have managed to change their livestock composition in favour of milk animals as a result. The period of time over which the grass is stored before being fed to the animals depends partly on the

availability of forage from other sources and partly on the storage space available to the owner.

Impact of PSPAs on livestock numbers

The researchers collected data on the current populations of each kind of livestock in the village, and attempted to obtain similar data for the year in which work on the PSPA was initiated. The general results are summarised in Table 2. Interpretation of changes in livestock populations is a challenge, as the PSPA may be only one of several factors that have contributed to changes. Other factors include: shifts from draught power to tractors; the introduction of irrigation facilities, which may increase the demand for draught power; reduction in farm sizes; and the establishment of dairy milk cooperatives in some villages.

The findings were mixed as far as the numbers of cows and bullocks is concerned, with numbers increasing in some cases and decreasing in others, and in two cases remaining fairly constant (see Table 2). The picture is also mixed for goats. Much clearer trends emerge, however, for buffalo and sheep. In most villages there have been marked increases in the buffalo (and in some cases cross-bred cow) populations. In contrast to buffaloes, the sheep population declined in most villages where they were kept, not increasing in any.

Table 2 Summary of Changes in Livestock Populations

Trend	Buffalo/ milch cattle	Bullock	Cow	Goat	Sheep
Increased	10	6	4	5	-
Decreased	3	4	5	6	5
Stable	1	2	2	1	2

Differential impact of silvipasture development

Most of the villages for which the case studies were undertaken contain socially heterogeneous communities. In such communities the pattern of livestock ownership can vary considerably between sub-groups: hence this kind of intervention can affect different sub-groups in different ways. Tribals are the largest groups in most of the villages studied, and also the poorest. Rajputs are one of the higher castes, and tend to be better off (in terms of natural, financial, human and social capital) and more powerful than the tribals. Rebaris and Gayris are two castes for which livestock husbandry, as well as crop production, is a major livelihood activity.

Goat ownership was higher among the Bhils than the Rajputs in all cases but one. Gayris and Rebaris generally keep similar numbers of goats to Bhils. Ownership of **sheep** is limited almost entirely to Gayris, for whom sheep-rearing has been a traditional livelihood activity. **Buffalo** ownership is generally low amongst the Bhils, and higher among the better-off castes, such as the Rajputs. In one or two of the villages, there has been a shift among the Gayris from sheep to buffaloes.

The research found that livestock-keepers who primarily own **small ruminants** are adversely affected by enclosure of common lands when the enclosed site constitutes a large proportion of the common grazing land in the vicinity of their village. This was more common under government programmes, such as Joint Forest Management, but sometimes occurred under NGO programmes as well. The size of the goat herds owned by these households was found to decline by as much as two-thirds, for example from 15 to five. The *Gayri* caste, who own large flocks of sheep and are more dependent on livestock than the other castes, were perhaps

the worst affected. In one case, they were obliged either to sell-off their sheep or migrate for several months to grazing areas distant from their village.

Conclusions

Silvipasture development initiatives on common lands, including watershed development and joint forest management programmes, can have significant impacts on livestock feeding systems and on the types and numbers of livestock that people keep. The enclosure of large areas of common lands, and the switch from grazing to cut-and-carry systems, tends to go hand-in-hand with intensification of large ruminant production, and to undermine extensive small ruminant production. Development agencies need to anticipate the implications of their programmes for different groups of livestock-keepers, and design them in such a way that they do not penalise the poor.