

**SILVIPASTURE DEVELOPMENT AND
MANAGEMENT CASE STUDIES BY
BAIF DEVELOPMENT RESEARCH FOUNDATION**

BAIF/NRI Goat Research Project Report No. 8

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Preface

This report is based on work undertaken in connection with a goat research project that is jointly managed by the Natural Resources Institute (NRI) and BAIF Development Research Foundation (BAIF). The BAIF/NRI Goat Research Project is concerned with easing seasonal feed scarcity for goats in semi-arid India, through a participatory approach. The project is funded by the UK Department for International Development's Livestock Production Programme¹, whose support we gratefully acknowledge. This is the eighth report of the project: copies can be obtained from BAIF or NRI.

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, such as 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 them. A review of the literature on silvi-pasture development in Rajasthan, commissioned by the project, found that there was very little information in the existing literature on: (a) the effect of these initiatives on livestock feeding systems and numbers; or (b) the economics of this kind of intervention. Thus, the project commissioned 15 case studies of silvi-pasture development interventions that had been initiated in the 1980s or the early 1990s, with a view to filling in these and other knowledge gaps. This report contains three of these case studies: the rest have been published as separate reports in this series (see below).

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Previous Silvi-Pasture Development Reports in this Series

Conroy, C. and Paterson, R. (2000) *A Review of The Literature on Silvopasture Management and Development on Common Lands in Semi-Arid Regions*. BAIF/NRI Goat Research Project Report Number 3. BAIF/NRI.

Saint, K. (2000) *Silvipasture Management Case Studies by Ubeshwar Vikas Mandal*. BAIF/NRI Goat Research Project Report Number 4. BAIF/NRI.

Jain, N. *et al.*, (2000) *Silvipasture Management Case Studies by Seva Mandir*. BAIF/NRI Goat Research Project Report Number 5. BAIF/NRI.

Maneesh Pandey & Mini Thakur (2001) *Silvipasture Development & Management Case Studies by Prayatna Samiti: Sagatdi, Patukheda and Phila*. BAIF/NRI Goat Research Project Report Number 6.

Rajkaran Yadav and Anil Vyas (2002) *Pasture Development and Management in Taank Village: A Case Study by Hanuman Van Vikas Samiti*. BAIF/NRI Goat Research Project Report Number 7.

¹ This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

INTRODUCTION AND OVERVIEW

The village should be the primary unit of planning in independent India, and the aim of planning process should be the development of self-reliant and self-sufficient villages. This aim can be achieved by educating people in a manner that will equip them with the capacity to better their own health as well as that of the village, improve their productivity and economy, make appropriate use of science and knowledge and handle day to day matters of justice and administration through panchayat system... to enable this process, the country needs selfless and committed social workers. Such planning will help the country to retain her independence, peace and prosperity. India should demonstrate how this could be made possible through the 'ideal' village systems.

-Mahatma Gandhi

Pasture lands are a major focus of attention for development of Rajasthan. Historically, pastures have provided livelihood to large numbers of human beings. Unfortunately, because of inappropriate use, these resources have been seriously degraded, but in recent years NGOs from Rajasthan have made efforts to rehabilitate these pasturelands by developing the techno-managerial capacity of the local people.

BAIF Development Research Foundation (BAIF) is a public charitable trust established by the Late Dr. Manibhai Desai, a disciple of Mahatma Gandhi. BAIF's mission is to create opportunities of self-employment for the rural families, especially disadvantaged sections, ensuring sustainable livelihood, enriched environment, improved quality of life and good human values. BAIF is a non-political, secular and professionally managed organisation. Its programmes include livestock development, tree-based farming systems, watershed development, women's empowerment and helath.

BAIF and its sister concern, Rajasthan Rural Institute of Development Management (RRIDMA), are working in Rajasthan for rural development. RRIDMA is involved in livestock development in 13 districts of south and east Rajasthan. It has undertaken transfer of technology, cattle development, pasture development, soil & water conservation and promotion of people's organisations in its project areas. BAIF and RRIDMA have been collaborating with the Natural Resources Institute (UK) on a Goat Research Project. The three case studies in this report have been produced as part of that project, and are from three districts: Bundi, Bhilwara and Ajmer.

In Bhilwara the case study is of silvipasture development undertaken in the early 1990s in a village in which BAIF was operating a Livestock Development Programme. In Bundi the case study is of a more recent intervention that is part of a BAIF project entitled "Water Resources Development and Energy Conservation For Sustainable Management of the Environment". The third case study was undertaken outside BAIF's programme area - in Chota Saradana, Ajmer district. The silvi-pasture development work here was supported by a local NGO called Magara Mewar Vikas Santha (MMVS), and is one of the earlier cases of this kind of work in the state.

The interventions and strategies are somewhat different in all three areas, due to differences in socio-economic situations, agro-climatic conditions, norms of the

funding agencies and philosophies of the implementing organisations. Nevertheless, they all have various things in common, such as: tree-planting and re-seeding of grasses; construction of soil and water conservation structures on site; and construction of a stone wall along the boundary of the protected silvi-pasture area (PSPA). Each case is briefly described below.

Jodha ka Kheda Regeneration of village pastureland was desperately needed for livestock development in Jodha Ka Kheda (JK). This kind of work was a new experience for BAIF and the local people, and the development work was initiated with a limited budget and time. Due to party politics, people from the surrounding villages encroached the pasture with their animals and severely degraded it. Despite these handicaps and challenges, the villagers of JK are still actively protecting and managing the PSPA, and have developed an unusual management system. The project received techno-managerial and financial support from Swiss Organisation for Development Cooperation.

Gudha Gokulpura Silvi-pasture development from Guda Gokulpura (GG) is a part of the watershed and energy conservation project. The major project interventions are for soil and water conservation and energy conservation. It is funded by India-Canada Environment Facility (ICEF), New Delhi. The project started in 1995 in Bundi district. In India very few watershed projects have given serious attention to livestock development, but in this project livestock development is considered to be one of the main components.

Chota Saradana Evolving the concept of 'Rural University' in action was a challenge to the department of education of Rajasthan. After identifying the needs, priorities and solutions, the department of education prepared the action plan. Prof. Ravi Matthai, Ex-Director of Indian Institute of Management - Ahmedabad, initiated the concept of 'Rural University' with a dedicated and committed team of teachers. The team was known initially as Jawaja Project Group (JPG), after the name of the block in which they were working - Jawaja block of Ajmer district. Mr. Dhaneshwar Acharya was selected as a group leader. Subsequently, Mr. Dhaneshwar Acharya, with the help of local people, established an NGO called Magra Mewar Vikas Sanstha (MMVS) to manage project activities. MMVS had implemented the project with the technical and financial support from the Society for Promotion of Wastelands Development (SPWD).

Dr. C. Conroy, NRI-UK, prepared the guidelines for the case studies, in consultation with BAIF and other collaborating NGOs. Some changes in the guidelines were incorporated according to the local situation. Different issues and emerging learning experiences were included in each case study. The following individuals were involved with the case studies:

1. Jodha ka Kheda ; Conroy Czech, Ghorpade Ashwini, Rathod B., Vadher M.
2. Gudha Gokulpura : Ghorpade Ashwini, Chourasia A., Naik S.
3. Chota Saradana : Naik S., Ghorpade Ashwini

The authors are researchers and development officers from BAIF and RRIDMA, except for Czech Conroy. We would like to acknowledge the contributions (direct and

indirect) of others, including: Dr. M. S. Sharma, Mr. D. Acharya, Mr. Rajendrasing, Mr. Bhawarlal, Mr. Mithusing, Mr. Nadoda M. and Mr. Panchal.

JODHAKA KHEDA¹

Conroy Czech. - NRI-UK,
Ghorpade Ashwini, BAIF,
Rathod B. G, Vadher Madan, RRIDMA

1. INTRODUCTION

Cattle breeding had been a major focus of BAIF's work in many parts of India since the 1970s and 1980s. Then in 1991-92, BAIF decided to begin a goat-development programme, in Rajasthan, which included some silvipasture development work.

BAIF received technical support from Inter Cooperation (NGO), and funding support from Swiss Organization for Development and Cooperation (SDC), for pasture development, and since then has made efforts to improve fodder availability through planned pasture development. The pasture development activity was considered as supplementary activity for providing green and dry fodder to the animals in the lean period. The activity was taken as supplementary activity to the cattle development and goat development programmes.

Open grazing was the main source of forage for most of the large and small ruminants. The gap between supply and demand of forages is widening mainly due to increase of livestock population and also to a certain extent due to poor attention paid to grassland improvement and intensive fodder cultivation in the village called Jodha-ka-Kheda (JK) from Bhilwara district.

1.1 Background of the Village and its People

Long before India gained independence the area where Jodha-ka-Kheda (JK) is now located had been inhabited, and then abandoned as people sought to escape from epidemics of plague. Many years later a man called Jodha, who had leadership qualities, resettled the village, and that is how it gained its name. (Kheda means small village.) Jodha's family members are still living in JK.

JK is a small village of 151 households, located in Asind block of Bhilwara district. The caste composition of the households is given in Table 1. Agriculture and livestock rearing are the main sources of livelihood and are practised by almost all the households in JK. Livestock are kept by 144 households, and 146 households are involved in agriculture. The area is sub-humid.

JK is one of the villages belonging to a group Grampanchayat called Borela. The Panchayat's office is in Borela. There are 12 villages in the group gram panchayat

¹ We would like to acknowledge the contributions (direct and indirect) of others to this paper, including: Dr. M. S. Sharma, Mr.S.D.Naik, Mithu Singh, local men and women, and Members of Pasture committee

(Borela, JK, Arjunpura, Sadakabadiya, Beed-ka-Badiya, Amali-khera, Rebari-thani, Gopalpura, Pratappura, Devpura, Bamani, Bheru-khera).

Table 1 Caste Composition of Households in JK

Caste	No. of households
Gujar	80
Rajput, Kumar	20
SC/ST/OBC (including Bhil, Dohli and Luhar).	51
Total	151

The data in Table 2 (from the baseline report) show the landholding sizes:

Table 2 Size Distribution of Landholdings

Landholding sizes	Percent
<3.5 ha	51.4
3.5 to 7 ha.	32.7
> 7 ha.	14.0
landless	1.9

The majority of the households have land, but the land size is small and there are no facilities for irrigation. Most of them use the field bunds for grazing their animals. The landless and small landholders depend heavily on the common pastureland.

1.2 Livestock

The livestock population figures, according to household surveys conducted in 1991 and 1999, are given in Table 3. Before and after pasture development there were more small animals than the large animals in the village. The small animals are maintained for trade and business and ensured quick financial support to the family when they require. The women prefer goats to sheep, as sheep have a higher mortality rate. Goats can survive even in the drought and hot summer. The woman Panchayat member was of the opinion that the sheep population had declined in the year 1997 because of disease. She said goats also experience some disease problems but mortality was less as compared to sheep. Disease is less of a problem for large ruminants, but they require more fodder than small animals. The villagers generally prefer buffalo as its milk fetches a higher price than cow milk.

Table 3 Ruminant Livestock Population of JK*

Year	Cross-breeds	Local cows	Bullocks	Buffaloes	Goats	Sheep
before pasture 1991	03	175	25	150	600	1000
after pasture 1999	15	200	20	225	800	800

* *Source: Household survey conducted in the village.*

1.3 Development Efforts before Silvipasture Development

1.3.1 Cattle Breeding Centre

One of Jodha's descendants, Mithusingh, was working with BAIF, in charge of its cattle breeding centers in the area. He was interested in improving the socio-economic situation of his own village, and in 1990 BAIF started a cattle breeding centre in the village.

1.3.2. Milk Cooperative Society

After availability of surplus milk some of the pasture committee members took interest in promoting the milk co-operative society. Both women and men are members of the milk cooperative society. The men members had exposure of the outside world. Immediately they took leadership in the milk society. The women were not aware of their role and responsibilities in milk society. They thought that being a member of the society they could sell milk through the society and they would get milk payment in time within 15 days. Daily milk sale has increased from 25 litres to 100 litres. Milk produced in the morning is used for home consumption, and that produced in the evening is sold.

2. SILVIPASTURE DEVELOPMENT

2.1 Origin

Native pastures in the village were very poor in productivity and lacked vegetative cover. In essence, they were more like exercise ground for cattle, rather than pasturelands. Multifarious problems were associated with low productivity, some of them technical and others social. Most of the pastures had been harvested (grazed) for years together, without any input, not even the recycling of animal dung. As a result, a heavy decline in soil fertility had taken place over the years.

With the funding support of Swiss Organisation for Development and Cooperation (SDC), some of the NGOs from Rajasthan took initiative in pasture development in 1991. Inter Corporation (NGO) was given responsibility for technical and social science inputs to the partner NGOs.

After understanding the socio-economic situation of JK village and consultation with the villagers, particularly men, BAIF decided to promote pasture for supporting livestock development activity.

2.2 Selection of the Pasture Land

In 1991, the common land from JK village was selected for protected pasture development. The local men selected the site for the protected silvi-pasture area (PSPA). When they did so their main concern was to stop the open grazing of neighbouring villagers, particularly from Chainpura village. Thus, their main criterion was to choose an area adjacent to the village boundary, so that this could be used to demarcate the boundary and prevent outsiders from crossing it. Some of the JK villagers had seen the pasture land developed by the villagers of Chota Saradana in Ajmer district. On basis of their experience it was decided that benefit of the protected pasture should be restricted to the villagers from JK.

The following criteria were *not* given much importance in the site selection process:

- Easily accessible to women and grazers;
- Quality of soil;
- Availability of water resources.

The selected land was rocky, and only a few trees were present. According to the women, the PSPA is located too far away from the village (2-3 kms) for them to be able to collect fuelwood or fodder from it. Thus, the men have to carry both fodder and fuel from the pasture land, although most fodder is consumed by livestock at the PSPA: while the women collect fuel and fodder from their own private lands. It is a good division of work amongst the men and women.

Out of total 170 ha. of common grazing land in the village, only 10 ha. of land were selected for protected pasture development. Another 30 ha. of land, also on the village boundary, was protected and developed by the forest department (FD). Thus, 130 ha. of land are still available for unregulated grazing.

2.3 Pasture Committee

Pasture committee members were selected in the Gramsabha. Twenty members of the committee were selected from all sections of the society, covering a representative range of castes, ages, and occupational backgrounds. The caste representation is: Gujar 9, Rajput 02, Nath 02, and one male member from each of the remaining castes (i.e. Doli, blacksmith, Regar, Bhil, Rawat, Daroga, and Kalal).

The criteria of selection were the person's capability and his interest in pasture development. The age groups of the committee members are as follows: nine out of 20 are from the age group 50 to 60; seven are from the age group 40 to 49; and four members are from the age group 25 to 39. Most of the members (16) are farmers, two are agricultural labourers, one member has a small trading business and only one

member has a job. More or less there was proper representation in the pasture committee of both castes and age groups, but not gender. The community did not accept the woman's participation outside the house, and the extension staff of the organization were not sensitive enough about women's participation.

The Forest Department developed 30 ha. of land nearby, but since the community was not aware that they might have some rights to the fodder resources of this land, they did not make any requests or demands to the FD. BAIF, however, talked with the local FD staff and put the villagers in touch with them. As a result, the PSPA committee also took on the responsibility of managing the forestland in 1995-96. This was seven years after the FD had developed the land. In principle, they could have taken over after five years, but they were not ready to do so then as they had just been established at that time.

2.4 Physical Structures

At first, the people of JK used 'social fencing' to exclude people and their animals from the site. However, there was initially a conflict with other villages over their exclusion from the protected silvi-pasture area, and social fencing was not very effective. Consequently, the villagers of JK decided to construct a stone wall along the boundary of the site, primarily to keep out people from neighbouring villages, particularly Chainpura.

Protecting run-off rainwater was also a priority. The villagers identified the natural flow of water and constructed stone bunds in the dry stream to retain the water. (They also planted grass for soil and water conservation.) However, the funds available for this were limited. In the rainy season water is available in a tank near the PSPA.

2.5 Planting of Trees and Grasses

2.5.1 Selection of species

The priority was fodder trees rather than timber and fuel. Only the traditional grass called 'Lapada' (which is thorny and disliked by the animals) and a few fodder trees (such as *Acacia nilotica*, *Acacia leucophloea*, *Zizyphus mauritiana*, *Acacia senegal*, and *Butea monosperma*) were available on the common land. BAIF selected primarily native species of trees for plantation that small and/or large ruminants like. The main tree species planted were *Acacia catechu*, *Acacia senegal*, *Azadirachta indica*, *Leucaena leucocephala* and *Zizyphus mauritiana*. Most of the *Azadirachta indica* and *Leucaena leucocephala* did not survive. BAIF did re-planting (1993) with some of the local varieties such as *Acacia catechu*, *Zizyphus mauritiana*, *Azadirachta indica*, *Pithecellobium dulce*, *Acacia leucophloea*, *Acacia senegal*, and *Prosopis cineraria*.

BAIF also sowed Dhaman grass (*Cenchrus ciliaris*) and *Stylosanthes hamata* (a legume), which are more nutritive and sturdy than the native 'lapada grass'. The villagers said they liked Dhaman because it has good taste and good growth immediately after the rains. They could get grass for the livestock and they could earn

money by selling the seed of Dhaman.

According to the villagers, most of the tree and grass species were chosen by BAIF. They saw BAIF as the experts, who knew which species of fodder trees and grasses would grow best in the area. BAIF organised the villagers' technical training, particularly in fodder cultivation. While planning, the women were not involved in selection of the trees and fodder. After withdrawal of BAIF the community did not take up re-planting activity due to water scarcity.

BOX Some Views on Tree Species

The case study team talked with a few villagers about their views and preferences regarding different tree species. The elderly people's preference was for *Anogeissus pendula*, for goats to browse on. These trees are existing on the pastureland. The women's preference is *Acacia catechu*, because its leaves, pods and timber are all valuable. They are not so keen on *Prosopis juliflora*, because the small animals do not eat its leaves, and it does not make good timber. It is only for fuel. However, it has lots of thorns, which can cause injuries while people are cutting the trees. They preferred *Butea monosperma* for fodder and fuel. The Panchayat woman member said she preferred *Acacia nilotica* and *Ziziphus mauritiana* to *Butea monosperma* and *Terminalia tomentosa*. She would like to see more trees planted, particularly *Pithecellobium dulce*, which is sweet in the taste and easy for goats to browse on. She would also like to have more *Butea monosperma* trees planted, as it increases the milk yield of buffalo. She also likes *Leucaena leucocephala* because its leaves and pods are good fodder for small and large animals, and it provides shade.

2.5.2 Establishment Techniques

The pastures are best established if they are sown in the beginning of the rainy season. In the first year of the project, the local people were trained in broadcasting seeds. The seeds of legumes, *Stylosanthes hamata* and *Stylosanthes scabra*, were mixed with local material like sand and mud. The seed mixture was broadcasted after the rain when humidity is high and fertilizer was broadcasted immediately after broadcasting the seeds.

2.5.3. Watering facility

There was no scope for availability of water for watering before the monsoons. During the plantation period most of the local women worked as labourers. Their contribution focused more on the environment protection rather than how much they earned. They worked hard for the survival of the plantation. Daily they were walking more than 10 to 15 km. to bring one pot of water (at least five times a day) for the survival of the trees. Stone bunds and small check dams were constructed, but due to lack of maintenance the check dams have been destroyed. At present there is no water facility.

3. PROJECT COSTS

3.1 Establishment Costs

The actual expenditure on silvi-pasture development during the first three years of the project is given in Table 4. Almost all the major activities were completed during the first year. Plantation of trees and grasses, along with corrections, was done in the second and third years of the project.

Table 4 Establishment Costs at Jodha Ka Kheda (1991 - 1993)

Sr No	Cost Details	Amounts		
		1 st Year	2 nd Year	3 rd Year
1	Protection of site			
a	Fencing (Stone wall) (2½*2*4) @Rs. 24.75 / meter	30,369.00	0.00	0.00
b	Pits 8000 Nos. 10 hect (1½*1½*1½) Rs. 1.50 / pit	12,000.00	1,758.00	1,590.00
2	Soil Treatment			
a	Termite control (BHC 400 kg. @Rs. 5.00 / kg)	2,000.00	500.00	250.00
b	Fertilizer (DAP 400 kg @Rs. 8.00 / kg)	3,200.00	800.00	400.00
c	Labour for a & b (72 man days @Rs. 33.00 / day)	1,782.00	0.00	0.00
3	Input			
a	Saplings of fuel / Fodder Demonstration (10000 Nos. @Rs. 1 / plant)	10,000.00	0.00	0.00
b	Transport of plants (10 trips @Rs. 200 / trip)	2,000.00	0.00	0.00
c	Dhaman Grass (200 kg @ Rs. 40 / kg)	8,000.00	0.00	0.00
d	Sowing of seeds (Tractor charges @Rs. 200 / hect)	2,000.00	0.00	0.00
4	After Care			
a	Correction of pits (soil work) / mulching (8000 pit) (@Rs. 0.41 paisa / pit)	3,300.00	1,500.00	600.00
5	Watch & Ward (Rs. 660 / month)	7,920.00	7,920.00	7,920.00
	Total	82,571.00	12,478.00	10,780.00
	Per Hectare Cost	8,257.00	1,247.80	1,078.00

*Ref. Progress report of the project (1994) BAIF.

3.2 Operational Costs

3.2.1 Repair of boundary wall

Maintenance work consists mainly of repair of stone wall, which is done every year after the rainy season. One person from each household must contribute labour, and they all work together until the work is completed, which takes 4 - 5 days. Old people do supervisory work. As they are working together, there is mutual monitoring and nobody can get away with being lazy. If someone does not provide labour they must contribute the equivalent of a daily wage. The amount varies according to the individual and the kind of work they do: a female -headed household would have to pay Rs 30/- and others have to pay Rs. 40 to 50.

3.2.2 Chowkidar's wage

The major operational cost is the *chowkidar's* (watchman's) wage. Initially, the

villagers tried out social fencing, but they observed that the people from the neighboring villages started encroachment for grazing. After withdrawal of BAIF, other maintenance cost like replantation, and soil and water conservation activities did not continue. To begin with, the chowkidar's wage was paid entirely by the project; then during 1993-1995 50 % from the project and 50 % by the committee; and since 1995 entirely by the committee

To ensure that he remains diligent he is not paid a regular monthly wage. Instead, he is paid every six months, with the payment being conditional on him doing his job well. To enable him to manage financially during the six-month period, he is given an advance of 1,500 rupees. Since the withdrawal of BAIF, the money to pay the chowkidar's wages has been raised by contributions from the villagers. The committee members do the collection - each has to collect money from the families in his hamlet. Each member estimates the number of animals in his hamlet, and this is used as a basis for determining what the charge per animal should be, so that the total figure collected will correspond to the one agreed on, in the village meeting). The amount of money paid by households depends on the number of animals they own.

3.2.3 Other aspects of maintenance

For maintaining or improving the PSPA there is only a limited fund, as the pasture committee could not develop strategies for generating income from the pasture. The committee collects only grazing charges and utilizes this for the maintenance. The amount is just hand to mouth and there is no surplus for other development.

At present there is no maintenance of soil and water conservation, for two reasons. First, the people have the necessary information and knowledge, but they do not have the budget. Second, there is no motivation for free labour for a longer period, as the villagers are still not sure about the Panchayat's decision of sharing the benefits due to the changes in 73rd and 74th amendments of the constitutions. Thus they prefer only protection of the pasture rather than investing labour for increasing resources.

The woman grampanchayat member's parents are from Kavlas village (BAIF promoted the pasture in Kavlas). She says that pasture committee there is more homogeneous than JK; they earned more income from pasture by selling the Dhaman seeds. That is why they have bank balance. In JK there are differences of opinion amongst the pasture committee about investing money on the pasture.

4. SILVI-PASTURE MANAGEMENT

4.1 Protection System

Physical and social fencing is required for enforcing controls on the grazing of livestock and encroachment of human beings. Social fencing is possible only when there is a commitment for protection of the pasture. The intervention involved construction of a boundary wall and planting of thorny trees near the boundary wall. The physical work started in 1991 / 92, with construction of the stone wall.

The villagers tried rotational patrolling initially, but some of the families had only old people or women, did not follow the idea of rotational patrolling. Subsequently in 1991, they started to employ a Chowkidar. The current Chowkidar is Chatur Ram, a Gujar. He has been doing the job since four years, and was being paid 9,000 rupees in 2000. He was chosen for the job, because: (a) he was landless (he shares crop from 1 ha. of land with his brother); (b) moreover, he has no livestock, so he would not be tempted to break the rules; and (c) he was in a position to do the job all year as he had no family, and hence no distractions.

The previous *chowkidar* was irregular in carrying out his duties, so at a village meeting it was decided to replace him. People voted for Chatur Ram in preference to two other candidates. He took his duty very seriously as the Gram sabha had selected him as a responsible person, thereby expressing their trust in him. There was no complaint against him.

Since 1995 the *chowkidar* has also protected the PSPA that was promoted by the FD (see section 2.3). Three neighboring villages - Chainpura, Kidmal and Salia - are not getting benefit from the PSPA that was developed by the FD. The *chowkidar* is able to protect himself by carrying an axe, and having a dog with him. If there are several offenders he makes a lot of noise and attracts the support of his fellow villagers.

The Gram Sabha decides the size of the penalty to be applied to offenders. There is a fine of Rs. 21 for the large animals and Rs. 11 for small animal like goats (even if they are in a group). According to the *chowkidar*, the fine does vary according to the frequency of the encroachment. If the offender breaks the rules again and again, the fine can be increased, to Rs. 51 for a large animal and Rs. 21 for small animals. Goats are not spared from the fine because a cow may enter on its own, but goats are in a group *with the grazer* and thus the offence is a deliberate one.

If an offender refuses to pay, the *chowkidar* calls the committee members and they put pressure on him to pay. As a last resort they refer the matter to the police: this has happened on two occasions. The offenders had to pay the charges to the police, as well as the fine, and the police beat them severely. The police only released the offenders when they promised, in front of the *chowkidar*, not to offend again, and put this in writing.

At first, outsiders did not accept the *chowkidar's* authority, but now they do, because they know he has backing of the committee and the police. Offences have more or less stopped since the police cases. However, there is a problem of animals without herders coming to the protected silvi-pasture area, and this has been happening more frequently during the recent drought period.

4.2 Grazing system

While developing a system for grazing management, some important things were realized, especially about overgrazing, stocking density and need of small animals. It became possible to minimize overgrazing and under grazing. Overgrazing does not only depend on the number of animals present in a pasture, but also on the period (how

long) the plants are exposed to the animals. If animals remain in any one area for too long they graze regrowth, or if they return to previously grazed areas before the plants have recovered, they overgraze plants. Seed collection of the grass was not possible, as the yield was limited. So the seed was allowed to fall down on the pastureland.

The villagers decided to graze animals in the protected pasture only when the grass was green, as this is when its nutritive value is highest and it has the maximum effect on milk production. The same system is followed on the FD's pasture. This system is different from the conventional cut-and-carry one, in which grass is harvested in November/December after the seeds have fallen. There appears to be a potential problem of not much seed being shed, and hence reduced grass production in subsequent years. However, according to the villagers, the grass seed returns to the soil in the animals' dung, which people are not allowed to remove from the protected silvi - pasture area.

Only tree fodder is available throughout the year, with different species reaching maximum fodder production in different months (see 4.3), but this alone could not fulfill all the fodder needs of the small and large animals. The villagers and BAIF developed a specific grazing system, in which large ruminants and small ruminants graze on the PSPA for a short period and at different times of the year. Details of how this system has been applied are shown in Table 5.

Table 5 Details of Yearwise Grazing System on PSPA

Year	Large Ruminants		Small Ruminants	
	Period	Numbers	Period	Numbers
1993-1994	Sept/October*	150	December	1000
1994-1995	Sept/October	200	December	1000
1995-1996	Sept/October	300	December	800
1996-1998**				
1998-1999	Sept/October	450	December/ January	All
1999-2000	Sept/October	500	December/ January	All***

* According to Mitthusingh (BAIF field Officer) September - October normally means 15 days in September and 15 days in October i.e. only 30 days grazing in total.

** During this period the PSPA was open to all animals from the 12 villages of the group Gram Panchayat .

*** In this year there would have been about 1800 SRs (see Table 3).

Grass - cutting was tried in 1993-94. However, the cut and carry method was not appreciated by the local people, for various reasons. These included the fact that the distance to and from the pastureland (6kms) is quite far. The Rajputs did not allow the women to go cutting the grass in the PSPA; and the women from other castes were busy in their agriculture work. In addition, there was a stealing problem and assessing equal benefit was also a problem.

Finally, the nutritional value of the grass is higher if the grass is consumed in September or October, at the end of the monsoon season. If the grass was cut in

November/December (as is done in many other villages) and stored, it would lose some of its nutritive value and the animals would not like it as much.

In a normal *rainfall year*, large ruminants are allowed to graze in the protected silvi - pasture area for about one month, after the festival of *Raksha bandan*. If not much rain has occurred by this time, people assume it is a *drought year*, and they adjust their grazing system accordingly - people are advised to continue grazing in the protected silvi - pasture area instead of outside land for another month after November. In 1999 there was *extreme drought*: there was no grass outside the protected silvi - pasture area, so they allowed extended grazing inside. Large ruminants were allowed in first, for 1.5 months; then goats were allowed in.

4.3 Tree Lopping

Lopping started in 1994 for *Acacia leucophloea* and *Butea monosperma* trees that had regenerated, as by that time some of them had reached a reasonable size. However, planted trees were not large enough to be lopped at that time. The tree fodder loppings are carried to the boundary wall, where they are given to the goats, which are kept outside.

Generally *Acacia leucophloea* is lopped in November / December, and *Acacia nilotica* in March - May. However, there has not been much lopping of *Acacia nilotica* yet, as the growth of the trees has been slowed down due to two consecutive years of drought. If growth of the trees is not satisfactory lopping is not allowed, but people can still collect the pods. *Prosopis juliflora* is lopped for firewood rather than fodder, but its pods are collected from the ground. *Azadirachta indica* is lopped twice a year (October and March). *Zizyphus mauritiana* is generally maintained for fruit for the grazer, and also for goats which enjoy both fruits and leaves. It shows a consideration of the grazer along with the animals. The lopping system is summarised in Table 6.

Table 6 Details of the Lopping System

Tree species	Animal	Lopping period	leaves / pods
<i>Butea monosperma</i>	buffalo	December/January	leaves
<i>Acacia leucophloea</i>	goat	November/December	Leaves and pods
<i>Acacia nilotica</i>	goat	March-May	Leaves and pods
<i>Azadirachta indica</i>	goat	October and March	Leaves

4.4 Contribution of grass from the PSPA in the feeding system for large ruminants

Before the PSPA was established there was fodder scarcity in the summer, but since then this has been reduced. Previously, in August livestock-keepers grazed their animals on the panchayat land and on their private pasture land. Now, they graze them on the PSPA during this period, thus enabling them to cut and carry fodder from their private land and store it for use during the summer months when fodder is scarce.

5. IMPLEMENTATION ISSUE: GRAM PANCHAYAT AND PSPA

The protected silvi-pasture area was established on the common land of JK village. In the beginning (1991) the Gram Panchayat members and villagers from other nearby villages were not interested in establishing the protected pastureland. It was only the people from JK who took initiative in developing the pastureland in their village, and contributed their labour for developing and protecting the pasture. However, after seeing the growth of fodder trees and grass the people from other villages in the group gram panchayat expected that they will get the benefit from the PSPA.

In 1996 the protected silvi-pasture area became a party based political issue. The Congress party representatives were elected on the Gram panchayat. The Sarpanch, who was not from JK, decided to open up the PSPA to all 12 villages in the Group Gram Panchayat. The JK villagers and the opposition political party - Bharatiya Janata Party (BJP) - on the other hand, wanted to restrict the use of the PSPA to the village JK.

The Sarpanch demanded Rs. 450 per year from pasture-related revenue for the Gram Panchayat. The JK pasture committee did not agree to this, and, as a result, the PSPA was opened to all villages in the group Gram Panchayat. For two years people from other villages grazed their animals not only in the protected silvi-pasture area, but also in the rest of the Panchayat land of JK, encroaching right up to the villagers' private land and housing area. The decision of the Sarpanch very badly affected the developed pasture of JK. The people from the outside village broke the boundary wall, grazed their animals and destroyed the fodder trees. As a result the animals from JK were only able to consume a small amount of forage from the PSPA.

In opposition to this destruction, the villagers of JK prepared an affidavit, for maintenance and benefit sharing from the protected pastureland, and submitted it to the court. They collected the old land records, and demonstrated that the land belonged to their village. They also obtained a statement from the collector that JK was more capable than the panchayat of maintaining the pasture properly.

The BJP forced the holding of a Gramsabha (village meeting) at which it was decided that Rs. 450 should be given to the pasture committee for protection of the pasture and the villagers from JK should contribute free labour for repairing PSPA wall. The villagers should pay the grazing charges, and only the people from JK should enjoy the benefits of the pasture.

Before the pasture development the sarpanch had allotted 2 ha. of land from the common land to three Bhil families. However, the people of JK argued (in 1996-97) successfully with the Panchayat and the Court that the land should remain as common

land and not private land of any particular community. The JK villagers said that the land could not even support their own animals in the past, in spite of the livestock population being less than what it is now. They felt that the Grampanchayat should support other villages for pasture development rather than share the already developed pasture of JK. In 1998 the people of JK once again had exclusive rights to, and control of, the PSPA.

6. CURRENT VEGETATIVE CONDITION AND YIELD OF THE PSPA

6.1 Grass

When the authors visited the site in November 1999 there was not much grass to be seen in standing position. We were told this was partly because it had already been grazed, and partly because two successive years of drought (with rainfall little more than 300 mm each year) had reduced grass production. The amount of grass produced annually by the PSPA is not known. It is practically difficult to estimate the consumption of each animal; and the committee has no records except the minutes of their meetings.

6.2 Stock of Trees and Shrubs

The commonest species in the protected silvi - pasture area (ranked by 2 - 3 men) are:

1. <i>Terminalia arjuna</i>	2. <i>Acacia catechu</i>	3. <i>Acacia senegal</i>	4. <i>Ziziphus mauritiana</i>
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Other species include *Prosopis cineraria*, *Butea monosperma*, *Prosopis juliflora* and *Pithecellobium dulce*. The latter suffers from termite attacks (observation of the authors during the pasture visit), but the pasture committee has not taken any special measures for prevention. They said they are reluctant to make investments in the site, because they are worried about 73rd & 74th amendment in the constitution, by which they might be forced to share the benefits with the other villages of Group Gram Panchayat. Secondly, they believe that if the vegetation growth of fodder trees is good then again there will be demand for benefit sharing by the panchayat.

7. BENEFITS OF SILVI-PASTURE DEVELOPMENT

Everyone in the village was happy with the idea of establishing a protected silvi-pasture area, as the villagers are getting a share of the benefits:

The benefits are briefly tabulated below -

1. Big animals (cattle, buffalo) - grass and legumes.
2. Small animals (goats and sheep) - leaves and pods.
3. Livestock grazers get a share of the wood after lopping.
4. Increase in the livestock population and productivity.
5. Livestock management considered as a supportive income generation activity.

6. Reduced dependency on crop production income.

7.1 Direct Benefits of the Pasture

7.1.1 Effect of PSPA on large ruminants

Overall, there has been little change in large ruminants numbers in the village (see Table 3), except for buffaloes whose numbers have increased by 50%. The apparently limited impact on livestock numbers is perhaps not surprising, given that: (a) the combined area of the BAIF and FD PSPAs is only a small fraction of the total common pasture area; and (b) the condition of the BAIF PSPA is not particularly good, for the reasons mentioned earlier.

The productivity of large ruminants, particularly milch animals (cows and buffaloes) has increased. The grasses such as *Dhaman* and *Hamata* fulfill the proper nutritional requirement of the fodder, and fodder from private land helps to sustain the animals during the lean summer months. As a result health and productivity of the animals has improved, and sale of milk outside the village has increased.

7.1.2 Effect of PSPA on goats

According to Table 3, small ruminant numbers have not changed, but the number of goats has increased by 25% and the number of sheep has decreased. Before the PSPA the trees on the village pastureland were too small to be lopped. The benefits of tree lopping in the PSPA depend on the species. *Runjia* (*Acacia leucophloea*) lopping takes place around the main kidding season, so feeding of runjia increases milk production; feeding of *desi babool* (*Acacia nilotica*) pods brings on heat and facilitates breeding.

According to one woman, goats have benefited most from the protected silvi-pasture area, as large ruminants only have access to fodder from it for one month, whereas goats get tree fodder from the PSPA in several months. Goats are allowed into the protected silvi-pasture area and fulfil their requirement. For the goats, tree leaves are an important type of fodder and they can climb the tree to a certain extent thus enjoying fresh fodder, even when there is no lopping.

7.1.3 Capacity development

The technical or managerial trainings and people's organization trainings were arranged by the funding agency. As a part of the trainings BAIF arranged exposure visits to other villages with PSPAs (Chota Saradna and Kavlas), and immediate follow-up was done by the project team by conducting repeated meetings of the committee for planning and monitoring purposes. Changes observed by the BAIF staff are listed below:

- The committee became more confident about maintaining pasture;
- They began to make additional demands, particularly for water resources development both for the livestock as well as for irrigation;
- They realized that the committee should be for social and cultural activities as well as for management of the PSPA.

- There was an awareness about the common land records and legal rights for benefit sharing;
- The committee members, with the newly acquired knowledge, had a vision for increasing the coverage of the pasture. However, obtaining sufficient funds for developing the pasture has been a problem;
- The feeling of ownership of the pasture was awakened.

7.2 Indirect Benefits

According to a group meeting with men from the village (which was dominated by Gujars, including 1 - 2 committee members), there has been an increase in the amount of manure. Thus, they are able to apply more cow dung with farmyard manure to their land; and there has been an increase in crop yields, especially wheat. They said that the increased quantity of manure is partly due to an increase in the animal population and partly to an increase in the amount of manure per animal: both of which are due to increased forage production.

According to the chowkidar and Mithu Singh, all households benefit from the protected silvi - pasture area. Even people without livestock help to maintain the fencing, because they know that they may benefit from it in the future.

8. PROBLEMS ENCOUNTERED

8.1. Conflict with Panchayat and Other Villages

The conflict with the Gram Panchayat and other villages, over their exclusion from the protected silvi - pasture area, was described in section 5. The decision of the group Gram Panchayat to open up the PSPA to all of its member villages highlights the important influence that panchayats can have on the management of common pastures, and the sometimes antagonistic relationships between certain villages and the panchayat. Although JK has regained control of the PSPA, the villagers are apprehensive that the panchayat may mount another challenge to their exclusive rights to the resource, and this is apparently discouraging them from investing further efforts in improving the condition of the site.

This case study shows how rights to common lands are often contested and unclear; and hence how pasture development initiatives are sometimes a political issue, being used by one village to strengthen its claims relative to other villages. Even the selection of the location of the PSPA, along the village boundary, was based primarily on the JK villagers' desire to exclude other villagers and their animals from what JK claims is its common land.

Some of the villages near JK do not have their own pastureland, and therefore they appear to have been losers in this development process. One neighbouring village, Bernagar, does have some *charagah* of its own, and approached BAIF for support in

developing it: the village is 5 - 6 kms away from JK.

8.2 Offenders Challenge Pasture Committee's Authority

As discussed in section 4.1, some offenders challenged the authority of the *chowkidar* and pasture committee to exclude them and their animals from the site, forcing the committee to turn to the police for support. The police provided strong support. The fact that there have been few offences since then suggests that this was very important and has reinforced the authority of the *chowkidar* and committee.

8.3 Scarcity of water

At present there is no drinking water source near the pastureland. The animals have to walk at least 3 kms to find drinking water, which means that they have to stop grazing 3 to 4 hours earlier than they would if there was a water facility nearby. This reduction in grazing time adversely affects milk production. The problem is worst in May and June, when the animals have to return to the village to get water. However, we were told that there is no point in making drinking water available near the protected silvi - pasture area unless forage production is increased.

There is a stream that runs across the protected silvi-pasture area during the monsoon season, before reaching another village. Two members of the management committee said that they want check dams to be constructed just inside the protected silvi-pasture area boundary, so that the water can be trapped. They said the trapped water will enable the development of the adjacent area of charagah, which is inherently better suited to grass production than the current PSPA, as it is not as stony and rocky. The woman Grampanchayat-member also felt the need of water-storage structures in the protected silvi-pasture area, so that the infiltration rate can be increased, which would facilitate tree-planting and improve biomass production. She had seen anicuts in other villages, and suggested that one was needed in JK's PSPA. The villagers have knowledge and vision of development, but they do not have financial support. They have requested BAIF to support them in developing the pasture and submitting a proposal for water resource development.

8.4 Gender Issues

The common property should be common for the poor-landless, marginal landholders and women. They should get access to and control over the common resources. From the beginning of the project the local women were not involved in the decision making and planning. In the Gramsabha the women were not selected as members of the pasture committee. The women themselves were not able to attend the Gramsabha. They are not supposed to participate in any function attended by the elderly men from their own families; and if, for some reason, they did attend they are not supposed to talk, only listen. After the reservation of seats for women in the Gram Panchayat, they started attending the panchayat meetings accompanied by their husbands.

The woman Grampanchayat member attends pasture committee meetings. She said there are a lot of members and in-laws on the committee and she did not feel free to express herself so she does not insist on women being represented on the committee. She (or for that matter all women) is not able to talk or raise any issue in front of her male in-laws. If she tries then it is considered as arrogance or violating cultural norms. The members of the committee do not recognize her presence or value her views. The unmarried girls and women from outside (other villages, or BAIF or government staff) have freedom to talk in the meeting. The Panchayat member said that she could attend meetings more comfortably in other villages than in her own village. Even the woman who was elected as a grampanchayat member, and who appeared to us to be capable and knowledgeable, did not get any respect. The young men and children laughed at her in our presence – it was clear that the men considered her to be ignorant on pasture and livestock issues.

9. CONCLUSIONS AND LESSONS LEARNED

9.1 Claims, Rights and Politics

- Pasture development on common lands can be highly political. Villagers may have their own (sometimes hidden) agendas that may differ from that of the development agency. Development agencies should be aware of the political context in which they are operating, and the likely impact of their interventions on inter-stakeholder dynamics.
- Land selection: while selecting land for protected pasture development the title of the land, tenancy and encroachment should be verified through checking land records and the actual physical position.
- The support of police (or other government agencies) in dealing with offenders can be very important in strengthening the authority of the *chowkidar* and pasture committee.
- Panchayats are potentially important stakeholders in pasture development, and are likely to become increasingly involved. Thus, rights of the pasture committee and community to the proposed protected pastureland should ideally be agreed by the Grampanchayat at the beginning of any initiative.
- If rights to the PSPA are not perceived by the villagers to be clear and secure they may be discouraged from investing effort in upgrading the site.

9.2 Planning Process

- Selection of pasture: When the size and location of a PSPA are being determined account should be taken of the total grazing land available and the size and type of livestock population.
- Before pasture development the implementing agency and local community should study the current feeding systems of the livestock (large and small ruminants) and any feed-related constraints, and consider how the PSPA will fit into the feeding systems and alleviate the constraints. This process may influence the choice of tree and grass species.
- There should be a drinking water facility for both livestock and humans on, or close to, the pastureland.

9.3 Institutional Arrangements

- Pasture committee should be established before the pasture development begins. There should be representation of all castes, classes and gender.
- The local women's participation must be ensured right from the inception of the project for strengthening their knowledge and technical capacity.
- The Gramsabha should approve terms and conditions for maintenance and benefit sharing.
- The development agency should continue to provide back-up support to the community, as and when needed, for protecting, developing and managing the resource.

References:

1. *Baseline report 1991 - 92.*
2. *Household Survey 1999.*
3. *Progress Report of the Project 1994.*

Gudha Gokulpura Pasture Development Case Study

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1. INTRODUCTION

1.1 Background of the Village and its People

Gudha Gokulpura (GG) is a small village in Hindoli block of Bundi district of eastern Rajasthan. It has six hamlets: Devpura, Pathiyar- pada, Mawa-ka-gudha, Reggar -Basti, Miyala-ka gudha and Gudha-gokulpura. One of the major sources of livelihood for the people is livestock production. 'Gudha' means mount and 'Gokulpura' represents the Lord Krishna's village, where the majority of population is involved in cattle-rearing. Once upon a time the cattle population may have been greater than that of any other type of animal in the village.

The total population of the village is about 1450 (276 households), with 55.5% males and 44.4% females. (954 females per 1000 males as per the health monitor 1997). The data in Table 1, which are based on a door to door survey by BAIF'S Staff conducted in June 2001, show the size distribution of landholdings. More than half of the households have landholdings that are less than 1 ha., and the vast majority of farmers have less than 2 ha. Hardly any Regar have more than 1 ha. of land.

Table 1 Caste Composition and Landholdings of the Village Households

CASTE	S/T	S/C				OBC		TOTAL
		Meena	Regar	Bareth	Chamar	Meghwal	Barber	
Landless	0	0	1	2	0	0	0	3
0.1 to 1	113	35	0	0	3	1	0	152
1 to 2	89	2	0	0	0	0	3	94
2 to 3	8	0	0	0	0	0	0	8
3 to 4	7	0	0	0	0	0	0	7
4 to 5	12	0	0	0	0	0	0	12

² We would like to acknowledge the contributions (direct and indirect) of others to this paper, including : B.K.Kakade, S. E.Pawar, and local men and women, and Members of Pasture committee .

TOTAL	229	37	1	2	3	1	3	276
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The Meena tribe (STs), whose members constitute 94% of the population, is politically and socially dominant and commands a higher status than Reger. The Regers (SCs) are in minority i.e. 6% and are treated as untouchables. Meena tribe is influenced by Rajputs. In the olden days they were involved in agriculture and watch and ward systems. The Meenas traditionally have a deep bond with their natural environment. The bond was weakened after independence when the government asserted its rights and took over the forests (Anna Hazare *et al.*, 1996).

1.2 Agro-Ecology of the Area

1.2.1 Land

The area is characterised by the presence of hills and ridges made up of Vindhyan rocks. In the project area, ‘kuranda rock’ is used in farm bunding, grinding machines and house construction. The soil in the project area is medium black. Due to the low fertility of the soil, yield per hectare is very low. Slope of the land is 10-15%. The Soil analysis of the project area indicates low nitrogen and organic matter in the soil (Project Baseline Report, 1997).

The major natural resource in the village is land. According to the Bundi district census (1991) the total land in the village is as follows :

Table 2 Status of Lands in Gudha Gokulpura

<i>Land Use</i>	<i>Area (Ha)</i>
<i>1. irrigated land</i>	<i>148</i>
<i>2. non-irrigated including fallow land</i>	<i>188</i>
<i>3. forest land</i>	<i>195</i>
<i>4. cultivable waste : Pasture & groves</i>	<i>144</i>
<i>5. area not available for cultivation</i>	<i>271</i>
TOTAL LAND	946

The cultivable common land is degraded. The villagers from GG and its surrounding villages sent their cattle for free grazing, and the consequent deforestation and soil erosion have undermined the life of local people³. There have been no efforts for replantation and protecting the common land for the last 50-60 years. The dictum “Everybody’s property is no one’s property” rules here⁴.

³ **Editor’s note** N.S. Jodha’s work (1985) has shown that in other parts of Rajasthan privatisation of common lands, both legal and illegal, has greatly reduced their size, and hence increased the pressure on those lands that remain. It would be surprising if that were not a factor here. The assertion of government rights to forests (see previous section) may also have increased pressures on village pastures.

⁴ **Editor’s note** N.S. Jodha identified the establishment of the Panchayat Raj system, shortly after Independence, as an important contributor to degradation of the commons. The creation of the Panchayats undermined the authority of traditional leaders and institutions that had previously enforced

The elderly people remember that the hillocks surrounding the village and the farm bunds of private lands were covered with dense *Khejadi* (*Prosopis Cineraria*). The leaves of *khejadi* provide excellent fodder and are generally lopped in winter. Dry leaves and pods have considerable nutritive value: 14% crude protein, 3% nitrogen (Saxena, 1993).

1.2.2 Climate

GG village is situated in a predominantly rainfed area, in which annual rainfall is normally in the range of 450-750 mm. July to September is the rainy season. January is the coldest month, while May and June are the hottest months, in which the temperature reaches 41 degrees Centigrade.

1.3 Trends in Common Grazing Areas

For 2-3 centuries certain communities in western Rajasthan, called Bishnois, have made special efforts to protect the flora and fauna. Unfortunately, the tradition of the Bishnois to protect flora and fauna is not carried out by other communities in the state. Repeated drought is a feature of life in the village. There has been deterioration of common pool land in the village due to easy and unrestricted access, and increased population of livestock. The forest department took up afforestation on their own land. However, it was not made accessible to the villagers. Due to limited fodder availability, the capacity of producing milk in animal has reduced. There were two options for the local people: selling the animals or increasing the productivity of animals by making sufficient provision for fodder.

Various practices are followed in the villages in this area as far as livestock grazing is concerned. However, the general practice is to allow livestock to graze freely on the common lands and other open spaces, which causes several problems. Firstly, the animals exhaust their energy in the search for food, with the result that very little of what they eat gets converted into milk. Secondly, the animals trample upon the newly grown plants. Thirdly, they eat up all the grass within a few months soon after the monsoons, leaving only a few shrubs for the later months. Further, if the grass is grazed before the seeds fall, there is a significant decrease in the quantity of grass. Thus, in the absence of grass cover, the direct impact of the rain on the soil causes erosion (Anna Hazare, Ganesh Pangare and Vasudha Lokur, p.23).

1.4 Developmental Efforts before the Project

Before 1996 the major developmental activities undertaken in the village were: development of the forest land; a community Lift Irrigation scheme on the river Blandi; and setting up of a primary school. The lift irrigation scheme was sanctioned to the local 'user group' under the chairmanship of the present

management controls on use of the lands, but the Panchayats themselves were unwilling to take over responsibility for managing the commons, so controls broke down and usage became unregulated.

Sarpanch Mr. Raghunathsingh Meena. There was a dispute, due to irregular payments and defaulters in payment of electricity bill. As a result, the electricity board discontinued the power supply. The scheme was not able to achieve the desired results. The villagers from the opposition party (BJP) raised this issue in the Gram Sabha in presence of the BAIF staff. Due to lack of transparency in the financial matter, a clear picture could not be portrayed.

Raghunath Singh is one of the influential persons in the Congress Party. In 1999 he was able to receive Rs.100000 from the personal fund of Member of the Parliament, Mr. Rajesh Pilot, for construction of a percolation tank. As a result the people from Thane village were able to reap the benefits of the scheme.

2. PROJECT OBJECTIVES AND IMPLEMENTATION

2.1 BAIF Project

In order to regenerate the degraded common lands, and improve people's livelihoods, silvipasture development was taken up on priority basis in the village. Since September 1996, BAIF Development Research Foundation has been implementing a project entitled "*Water Resources Development and Energy Conservation for Sustainable Management of the Environment*" in Hindoli block of Bundi district. The core villages are GG and Gowardhanpura. The project is financially assisted by India-Canada Environment Facility (ICEF), New Delhi. The long-term goal of the project is "management of natural resources for improving the quality of life". The major potential threats are: drought; opposition of a political party called BJP (Bharatiya Janata Party); and people from inside and outside the village who take benefits of uncontrolled grazing.

The project involves watershed management and energy conservation, not just silvipasture development. Its general objectives are as follows:

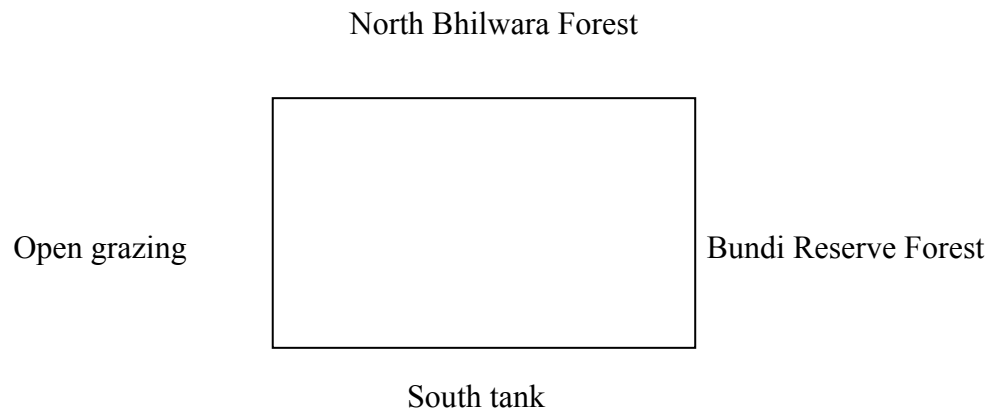
- *To identify and develop water resources and equip rural communities for sustainable management of the natural resources.*
- *To promote relevant technologies to enhance the living conditions of rural people especially aimed at reducing physical drudgery of women with regards to water and energy availability in the rural areas.*
- *To build capacities of the rural community, BAIF and other NGOs to manage environment conservation programmes.*

2.2 Beginning of the Pasture Development

Raghunath Singh is a progressive farmer, and has a vision of development. Hence in May 1997 BAIF staff contacted him to discuss strategies for sustainable development and environmental protection. This was an opportunity for Raghunathsingh to prove his developmental and organizational abilities. He worked hard to organize the people. Along with this, 45 ha. (out of 70 ha.) of Gram Panchayat/village grazing land was made available for silvipasture development on 2nd June 1997. The northern side of the pasture is flanked by the Reserve

Forest of Bhilwara district, the southern side has a percolation tank, the eastern direction comprises of Reserve Forest of Bundi district and the western side is for open grazing (see Map 1).

Map 1 Location Of Protected Pastureland



2.3 Opposition to Pasture Development

The villagers from the neighbouring villages and the BJP opposition party from GG opposed the idea of developing a protected pasture. One of the major reasons was that they were suspicious about intention of pasture development. Secondly, the proposed ban on free grazing, without an alternative arrangement, led to distrust of Sarpanch and BAIF. Only the local women were interested in developing pasture land to get the employment and also fodder and fuel.

An elderly woman raised the gender issue in the Gram Sabha, at a meeting attended by the project team and management staff of BAIF. She was in *'Pardha'*. In a determined voice, she asked the Gram Sabha: 'Who will bear the child for nine months with additional burden of fuel and fodder on the head' ?

“ Who and what efforts are made to change the situation”?

“ In future who will carry the burden if ‘we’ women refuse to carry it”?

There was complete silence: you could have heard a pin drop.

The Executive Vice-President of BAIF explained the concept of development. Then as he finished he said: “You are very clever and capable people. You can conquer the war of poverty. BAIF’s role will be like ‘Krishna’⁵. The project will be implemented by you and there is significance in the name of your village”.

2.4 Initiation of the Local Women

⁵ Lord Krishna only guided the people in the ‘Kuruksheetra’ war. The people listened to his words carefully, acted as per his words and ultimately the people who had values and virtues won the war.

Very soon the villagers, particularly the landless women, requested BAIF staff to start the pasture development in their village. The staff were not confident about women's capacity of learning soil and water conservation measures and basic technical applications. In the project there was provision of a budget for silvipasture development. It was decided to start stone fencing on the selected 45 ha. of land. The men opposed the women's involvement, but the women did not pay attention.

After observing the sustained efforts of the women and the tireless work they put into pasture development, BAIF arranged practical training for them. The women devoted their time even in the hot summer season. Some of the landless women would not have had sufficient food to eat if the pasture work had not been available to them: they received food security as well as employment. They put in hard labour. After a while a few men also worked with the women on pasture land.

One of the senior field officers of BAIF, Mr. N. Mohan, strengthened the confidence of the women in technology applications. He encouraged the women in functional and numerical literacy. While working with them, he gathered information about indigenous systems of livestock-keeping, local varieties of grasses and fodder trees. In the village the men normally did not allow women to talk to any outsiders. But the women freely interacted with Mohan and the male villagers did not object.

2.5 Selection of Pasture Land

The following selection criteria for the protected pasture site were chosen by the villagers:

1. Protect the boundary line of Bhilwara district and forest land.
2. The pasture land should not be far away from the village-Gouda Gokulpura.
3. Land near housing area should be kept for open grazing.

They decided to give priority to the first and thris criteria, and selected an area of land some distance from the village housing area. The piece of unprotected common land that was converted into protected pasture was barren and did not have any drinking water facility for the livestock: the animals were not getting sufficient grass or water. On 4th June 1997, in the presence of the villagers and Panchayat members, the size of the pasture (i.e. 45 ha.) was decided and the boundaries of the pastures were fixed.

2.6 Norms for Pasture development

The following norms were decided for pasture development:

- Major expenses of the technical activities and material costs will be paid from the project.
- Daily wage support would be the same for men and women .

- 10% of wages would be contributed to the project, and later it would be transferred to the pasture committee.
- The women and men who expressed interest in working on the pasture would gradually become trainers.

2.7 Pasture Committee

BAIF sought to mobilise the community to manage their resources. Keeping in mind democratic principles, BAIF suggested to organise the Gram Sabha for selection of members for the pasture committee. The selection criterion was one member from each hamlet. Five men and two women were selected as members of the pasture committee in Gram Sabha on 15th August 1999. For some reason the Sarpanch was not willing to select the members in the Gram Sabha. BAIF expected 30% women members from the group that had been trained and actively involved in pasture development. The villagers selected two members of self-help groups (SHGs). One of the male members of the Gram Panchayat was selected as the President of the committee, who stays near the pasture. For strengthening democratic functioning and developing transparency, one of the senior BAIF staff who worked from the beginning with the local people was nominated as the secretary of the committee.

2.8 Pasture Development Activities

2.8.1 Physical Pasture Development Activities

The activities listed in Table 3 were planned and completed on time.

Table 3 Pasture Development Structures

	Structure	Quantity	Unit
1	Stone fencing	1.2 cubic metre	2565 Metre
2	Continuous contour trench	12008	Metre
3	Stone bunding	5176	Cu. metre
4	Gully plug	112	Cu. metre
5	Pits for plantation	15315	Sq. metre
6	Drainage system	52.5	Sq. metre

The drainage system was undertaken at the suggestion of the local people. The rain water from Bhilwara district flowed with high force, which was the main cause of soil erosion from the pasture land. However, the same water benefited the plantation.

2.8.2 Vegetative Pasture Development Activities

Grasses For land cultivation a tractor was used, and seeds (600 Kg.) of Dhaman grass (*Cenchrus ciliaris*) were sown. The seeds were mixed in mud for preparation of small tablets. The tablets were thrown all over the 45 ha. of pasture land. The

mud tablets prevented the seed from being carried away by the rain water, and also protected them from damage by sparrows and small ants. As a result the seed plantation was dense. To strengthen the Continuous Contour Trenches Hamata grass (20 kg.) was planted on them. Nutritious grass was procured for the animals.

Trees PRA exercises were conducted with groups of women and men for selection of fodder, fuel and timber species. Before pasture development was initiated some trees were already present on the land (see Table 4), but their canopy and height were less than those of trees in the forest.

Altogether, 22298 trees were planted in 1997 and 1998. Of these 18938 (85%) were still surviving in the year 2000 (Progress report of the project December 1999). 'Stone mulching' was done as an experimental method for ensuring survival of the trees and clearly received good results: this was suggested by BAIF's President, Dr. N. G. Hegde, after his first visit to the site. Another experiment, plantation of trees between two trenches, also contributed to the high survival rate, by improving water retention and making water available to the tender roots for a longer period.

Table 4 Trees Before and During the Project Period

	<i>Tree species</i>	<i>Before development</i>	<i>1997</i>	<i>1998</i>	<i>Survival in 2000</i>
1	<i>Khejari (Prosopis cineraria)</i>	3960	2860		2060
2	<i>Ber (Zizyphus mauritiana)</i>	5638		1000	657
3	<i>Deshi Babul (Acacia nilotica)</i>	81	5125		3925
4	<i>Neem (Azadirachta indica)</i>	378		1000	1000
5	<i>Bamboo</i>		200	500	521
6	<i>Rose-wood (Dalbergia latifolia)</i>			28	12
7	<i>Subabul (Leucaena leucophela)</i>		7130	1920	8431
8	<i>Salar (Boswellia serrata)</i>	2187			
9	<i>Kher (Acacia catechu)</i>		35		29
Other trees: Local names					
1	<i>Chola</i>	23		2500	2303
2	<i>Ghokada</i>	258			
	TOTAL Planted Trees		22298		18938

The subabul trees were planted along the stone wall on all sides of the pasture.

3. PROJECT COSTS

3.1 Establishment Costs of Pasture

The total establishment costs of the pasture were Rs. 620337, i.e. Rs. 13785/ha. (pers. comm., Chourasia, A.K. June 2000). The breakdown of expenditure on the

pasture land is given in Table 5.

The amount budgeted for was Rs. 11030 per Ha. (This includes Rs. 9275 per ha. for Labour, Rs. 1755 for Material costs and Rs. 400 per. ha. for Plantation). The actual expenditure of pasture development per ha., was Rs. 2755 more than this. This was because the reduction in distance between the two trenches for water percolation, led to an increase in the number of plantations and protection of pasture with live hedge and stone fencing. The labour cost was more during the first year. Nearly 80% of the labour cost was received by women.

Table 5 Establishment Costs (Rs)

No	Particulars	Labour costs	Other costs (e.g. material)
	<i>Surveying (traveling)</i>		1152
1	<i>Trenching</i>	86921	
2	<i>gully plugging</i>	63268	
3	<i>stone collection</i>	22484	
4	<i>digging pit</i>	10277	
5	<i>planting</i>	17078	
6	<i>grass seedling</i>	20427	279992
7	<i>weeding & water mulching (including Watch & Ward)</i>	66369	
8	<i>gap filling planting</i>	29990	15535
9	<i>fertilizer</i>		6844
	Total	316814	303523
	Total Labour & material	620337	

3.2 Maintenance/Operational costs

From the beginning of the project till date, the maintenance costs have been paid by the project. The major maintenance cost is salary of the watchman. Lakha Daloo is the watchman, having been selected by the villagers. He is from the Reggar community, is about 55 years old, and is one of the opinion leaders in the village. So far nobody has dared to encroach on the pasture land. During the period 1.10.98 to 30.9.99 the total payments to the watchman were Rs. 14,720/-.

Due to the dispute over contribution for maintenance of the pasture between the gram panchayat and the pasture committee (see Section 5), the local people did not come forward for grass cutting. The project team gave the contract for grass cutting to outside labourers. The expenditure of Rs.17540 in the last year was on grass-cutting and collection of seeds and bundles of grass. Total expenditure was Rs. 37680/-, while the revenue received from selling grass and seed was Rs. 20, 775/-. The project bore the difference of Rs. 16,905/-.

4. FODDER PRODUCTION AND UTILISATION

4.1 Production from Pasture Land*

Table 6 Seed and Grass Production and Income from Pasture

	<i>Item</i>	<i>Year</i>	<i>Production or income</i>	<i>Production or revenue per unit</i>
1	<i>Dhaman seed</i>	<i>1998</i>	<i>180 Kg.</i>	<i>Per hectare 4 Kg.</i>
2	<i>Dhaman grass</i>	<i>1998</i>	<i>22886 k.g. (508.6 ton)</i>	<i>Per hectare 11.3 ton</i>
		<i>1999</i>	<i>8 ton</i>	<i>Per hectare 0.17 ton.</i>
3	<i>Sale of Dhaman seed</i>	<i>1998</i>	<i>10 Ton</i>	<i>Rs. 16463 @Rs. 1640 per ton</i>
4	<i>Grass sale</i>	<i>1999</i>	<i>Rs. 456200</i>	
5	<i>Contribution from the wage support</i>	<i>10%</i>	<i>Rs. 38554/-</i>	<i>labour contribution</i>

* source Progress report 1998-1999

4.2 Livestock Situation in Gudha-Gokulpura

The large animals (including horses) were 1791 in 1996-97, and 1478 in 1999-2000. Small ruminants were 2382 in 1996-97, 1714 in 1999-2000 and 2233 in 2001 (see Table 7). Generally, the Regar keep small animals, like sheep and goats, while the Meena keep both small and large ruminants.

Table 7 Livestock Population of Gudha-Gokulpura

Sr. No.	Animal's Breed	Total no. of animals		
		1996 -- 97	1999 - 2000	June - 2001
1.	Non – Descript Cow	658	295	282
2	Non -- Descript Bull	432	216	119
3.	Cross Bred (male)	0	56	49
4.	Cross Bred (female)	0	42	44
5.	Buffaloes (ND)	672	779	611
6	Buffaloes (Murrah)	26	86	204
7.	Goat	1110	655	1878
8.	Sheep	1272	1059	355
	Total	4170	3188	3542

* Source :Socio-economic baseline report 1997, & progress report June .2000

4.3 Reasons for Changing Livestock Numbers

4.3.1 *Small ruminants*

It is difficult to explain the changes in goat and sheep numbers since the silvipasture development work began. There is very little land remaining in the village where small ruminants can graze, as most of it was fenced off after soil and water conservation activities had been undertaken. There has also been very little lopping of tree fodder, which is important to goats. Small ruminants prefer free grazing, and collecting forage to stall-feed them is a laborious activity that owners tend to find too time-consuming. Thus, one would expect the numbers of sheep and goats to decline substantially following these interventions.

The data in Table 7 show the expected decline in sheep numbers, but goat numbers were much higher in 2001 than they had been in 1996-97. (The decrease in 1999-2000 is thought to have been due to an outbreak of Haemorrhagic septicaemia.) There is a strong demand for goat meat, with markets available in nearby cities of Rajasthan (e.g. Kota, Jaipur and Tonk) and beyond (Delhi and Mumbai), but how people are able to feed a much higher number of goats is not clear. There is a need to investigate further the factors affecting the number of the small ruminants.

One of the suggestion from the Reggar community was rotation grazing i.e. the following year the other piece of land might be developed as a protected pasture and protected pasture could be open in a few months.(discussion dated 7.6.2000 at the reggar hamlet with the Reggar community - Dhani , Mohan and Narayani Gopal members of SHG and also they worked on the pasture land in the beginning).

4.3.2 *Large ruminants*

Table 7 shows there has been a sharp decrease in the numbers of non-descript cows and bulls. Previously, most of the agriculture operations were done by bullocks, but nowadays these tasks are increasingly being mechanised, with farmers switching to tractors and threshers. The fact that less bullocks are required means that less cows are needed to produce bullocks.

The number of milking animals (mainly cross-bred) is increasing in the village, partly due to work of the artificial cattle breeding centre that BAIF has established. Generally, villagers keep high milch animals like buffaloes because there is a high demand for buffalo milk and byproducts⁶ of buffalo milk. The prices for cow milk and buffalo milk are Rs. 8 and Rs 10 per litre respectively. Hence the number of buffaloes has increased, while most of the non-descript cows have been sold. As milk production has increased, so the villagers are able to sell additional milk (after retaining 1 to 2 litres for consumption), or convert it into by-products for sale.

⁶ Generally villagers do not sell the milk of milch animals. Instead, they prepare byproducts of milk, like whey, curd, butter and clarified butter (Ghee). They sell Ghee in the nearby markets of Bundi and Kota.

4.4 Grass from Pasture and Livestock System

The livestock from the village are getting fodder from a variety of sources, including private lands and common pasture lands. More specifically, the villagers obtain fodder from the protected silvi-pasture area (PSPA), field-bunds, *beeds* (private pastures), road-side open space and crop residues. Different sources are used at different times of the year, as can be seen from Figure 1. Generally villagers offer crop residues as fodder to animals during summer season; Green Grass from Field-Bunds & Pasture Land during rainy season; and straws and leaves of maize, sorghum and waste vegetables during winter season. Quality fodders (like paddy husk, waste of maize wheat and other pulses) are often mixed with local grasses.

During April to June Regar migrate with their small ruminants to the nearest hillock. By contrast, the Meena migrate during rainy season with their small and large animals to the nearest hillock for grazing and security of small animals from rain.

Generally speaking, the milking animals (cows and buffaloes) and the young bullocks that are working on the land are given priority in fodder allocation. There is a sense of gratitude towards the animals.

Figure 1 Seasonal Feed Calendar

Forage source	Months											
	Jan	Feb	March	April	May	June	July	August	Sept- ember	Oct- ober	Nov- ember	Dec- ember
Grazing owner's crop fields												
other's crop field												
Open grazing land and pasture developed by FD												
Stored crop residues												
Grass from PSPA ¹ (may be stored)												
purchased fodder and concentrate												

¹ Cut grass tends to be stored for a few weeks or more before it is used, the length of storage varying from one livestock-keeper to another. On average, each villager has enough to last for about 40 days.

5. PASTURE COMMITTEE AND GRAM PANCHAYAT

From the beginning of the project, BAIF made it very clear that it would withdraw from the project area within a period of five years. The local people were involved in all stages of the project development. BAIF tried to strengthen techno-managerial capacity of the pasture committee. The Gram Panchayat members were aware about the role and functions of the pasture committee. Both the Panchayat and pasture committee members were exposed to various experiments of pasture land rehabilitation and management in Bhilwara and Ajmer districts of Rajasthan. After a year the Gram Panchayat insisted that the pasture land should belong to the Gram Panchayat so the cash can be deposited in the Panchayat's account. The Sarpanch opposed the opening of a separate bank account in the name of pasture committee.

The 73rd and 74th Constitutional Amendments of the Panchayati Raj have given more power to the Gram Panchayat. Rajasthan is one of the first states in India that has given the 'right' to the people and has implemented Panchayati Raj. However, some of the rules are not practicable.

In GG village the panchayat was not interested in selection of the pasture committee members in the Gram Sabha. As a result, BAIF had to take the initiative in pressing for the Gram Sabha to act as the forum for selection of the members of the Panchayat committee; but without Panchayat support the committee was not active. In October 1999, the pasture committee was not able to collect the Dhaman seeds, nor were they able to cut the grass in time. To enable the poor to derive the benefit of grass, BAIF paid the labour charges and hired outsiders to cut the grass.

BOX Rajasthan's Panchayati Raj Legislation

Rajasthan Panchayati Rules no.169, 170, and 171 (in 1996) spell out specifically the rights and duties of Panchayat regarding the pasture land, particularly regarding protection and development. Maximum grazing charges for one year are Rs. 5 per small animal is and Rs. 10 per big animal. The Panchayat can earn income from tree plantation, sale of dry and weak trees, sale of dung from the pasture, and sale of dry grass. For controlling encroachment (the first time restricted by the people) pasture committee will appoint a sub-committee for each ward (hamlet). Transparency of accounts is expected for financial transactions. The Panchayat is responsible for forming the pasture committee. They have to select pasture committee of four members in the Gram Sabha, and one of the Panchayat members should be selected as the President of pasture committee.
(Rule no. 170).

Following this incident, BAIF reached the conclusion that it would be best to transfer the people's contribution (i.e.10% of their wages, Rs. 38554) to the Panchayat's account. The money will be used for maintenance of the pasture. It

was a “chicken and egg” situation - first transfer the amount then Panchayat will take the responsibility; or first complete the work then transfer the money to the pasture committee’s account in the bank.

A number of government officials visited the project area on 16th February 2000, i.e. the District Collector (Mr. Kuldeep Raka), Additional Collector (Mr. P.C. Meena), Block Development Officer from Hindoli (Mr. Brajmohan Brian) and Development Officer of Hindoli (Mr. Gopal Verma). They held discussions with the local people after observing the impact of the project, namely: availability of water; good growth of the trees and the grass on the pasture land; and changes that have occurred in people’s lives. They suggested to open a separate bank account for the pasture committee with three signatories; one each from pasture committee, panchayat and BAIF. They also suggested that the pasture committee should earn the confidence of the Panchayat in taking responsibility for control, protection of the pasture, and benefit distribution. If the pasture committee or any of its members is inactive, then in such a case they will have to select a new pasture committee.

6. BENEFITS OF THE PASTURE

The natural resources from the village GG were degraded before the project. After the pasture development and watershed activities it is recognized as the best village in the area for environment protection.

6.1 Environmental Protection

Due to systematic application of soil and water conservation methods, the top soil of the pasture land does not get carried away by the rain water. Water is now available all year round, and the water table has risen. This has made it worthwhile for the people to dig small wells and install handpumps: 52 women and 4 men have been trained in maintenance and repair of handpumps.

GG is a model for other villages that want to develop pasture land. During the summer season (year 2000) the neighbouring villages faced scarcity of drinking water for human beings and livestock, and scarcity of fodder. By contrast, the people from GG village had enough resources to minimise these scarcity problems. Now there is an awareness of, and demand for, environmental protection activities from the neighbouring villages. The Reggar women (schedule caste) were happy as they received grass for broom making, and in near future lopping would start and dry twigs could be used as fuel wood.

As a result of increased soil moisture, the green cover has improved recently, and extended to the common and the private lands as well. The amount of land under crops has increased as shown in Table 8.

Table 8 Area of Land under Crops (Ha.)

	1996	1999
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Kharif	268	349
Rabi	272	449

The crop yield per hectare has also increased, as shown in Table 9.

Table 9 Crop Yields in 1996 and 1999 (Kg/ha.)

Crop	1996	1999
Maize	1608	1800
Wheat	2713	3600 to 4800*

*Note: Four times irrigation of water gives yield of 3600 Kg. and 6 times irrigation water gives 4800 Kg per ha.

Apart from the regular crops, the farmers have started growing a 'Basmati' variety of rice, which is an additional source of income for the family.

6.2 Milking Animals

As we saw earlier, the number of buffaloes and cross-bred cows, particularly milking animals, had increased. The owners are selling 3-4 litres of milk daily, or converting the milk into by-products for sale; while they themselves consume 1-2 litres of milk. Some of the people purchase young animals at a low price and after 6-8 months sell them at a higher price. Yet the benefits have yet to reach a large number of villagers particularly the landless and small land holders.

6.3 Common Assets

The villagers now have 45 ha. of productive common land and are getting green fodder and fuelwood. 50% of the grass is available for open sale to outsiders, and the rest is for the villagers. The trees will be lopped in 2002 for fodder and fuel. The number of trees for fodder, fuel and timber on the pasture land has increased from 278 per ha. to 7000 per ha. in the year 2000. The illegal sale of stones from the pasture land has been prohibited.

6.4 Capacity Building

The people have received benefits from other components of the project as well. They learnt the techniques of soil and water conservation, and tree and grass plantation. Some of the women played the role of technical trainers. They also applied their newly-acquired knowledge on their private lands: for example, use of 'A' frame, gully plugging, trench and bunds. In addition, the villagers started production of vermi-compost and NADEP compost⁷ on their own farms.

The women were given the opportunity of participating in developmental activities. They organized themselves into Self Help Groups. The watershed

⁷ Namdev Pandharipande developed a low cost technology of composting that is now known as NADEP compost.

committee and the pasture committee still have to develop their capacity and sense of ownership for managing their groups.

6.5 Wild Life

The pasture supports: mammals like Blue bulls, rabbits, and rats; birds like peacock and pigeons; and reptiles and amphibians, such as snakes and frogs. Before the pasture development the Blue bulls used to graze on farmers' maize and wheat crops: whereas now the Blue bulls have taken shelter in the pasture, and consume different grasses instead of maize and wheat⁸.

7. LESSONS LEARNT

- The development agency should study the political situation, changes or amendments of the constitution and norms of the state for pasture development etc. before implementing the project.
- Gram Sabha should be organised for assessing needs and priorities of the people and decisions for developing people's organisation.
- From the very beginning, it is essential that local resources should be raised no matter how much or how little, up to the capacity of the people, for the activities of their organisation, This makes their identity and helps enable to 'own' the process. The people's organisation should have an in built mechanism for sustainable development.
- It should make it clear to the community about the development agency's roles and responsibilities and duration of the project.
- The implementing strategy should decide with consultation of the people. Encourage the local women and men both for their active participation in planning to the monitoring and evaluation stages.
- Usually the weaker sections work on pasture land and contribute their labour. But benefits shared by all the villagers so rest of the villagers have to contribute equal amount of the labour charges.
- The norms of sharing the benefits, utilisation of income of the pasture should be decided before pasture development with the community and Gram panchayat.
- For holistic approach- require Zero year for planning, motivation and formation of PO.

⁸ Editor's note: It seems unlikely that the effect of enhancing the productivity of the pasture would be as simple and as benign as this. Increased biomass production on the protected site could also have negative implications for farmers' crops by, for example: (a) improving the breeding performance and/or survival chances of the local Blue bull population; or (b) attracting more Blue bulls to the area from outside.

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CHOTA SARADANA

A CASE STUDY ON “CPRs managed by People’s Organisation.”

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1. INTRODUCTION

This case study describes the process of evolving strategies for need identification, land selection, implementation, crisis management, benefit sharing and protection of Common Pool Resources (CPRs), with the active participation of the local people in Chota Saradana (CS). CS is located in Jawaja block in Rajasthan’s Ajmer district: development work began in this area in 1975. It started as Jawaja Project called “Rural University,” which envisaged the process of learning with Rural People and Workers to strengthen their capacity to secure livelihood opportunities and environmental regeneration through non-formal education. Initially, Jawaja Project Group (JPG) was working on non-formal education, then its work was further extended to include CPR development. In 1986 JPG metamorphosed into an NGO, calling itself Magra Mewar Vikas Sanstha (MMVS), with Mr. Dhaneshwar Acharya as its President.

MMVS’s CPR development programme in CS village was supported by the Society for Promotion of Wastelands Development (SPWD) and Education Department. Initially, fuelwood scarcity was identified as a major problem. Approach adopted was to tackle the problem through de-centralized nursery: saplings were distributed to school children and thereby plantation work was done in Ajmer district. After addressing this problem, MMVS, together with villagers of CS, identified that the village was facing fodder shortage, and therefore it started to identify means achieving fodder security.

This case study was selected for two reasons. First, it is one of the oldest pasture development initiatives in Rajasthan that is managed by a people’s organisation. Thus, there is plenty to learn from its relatively long history, regarding processes, implementation strategy, management practices, crisis resolution and approach towards CPRs development in general. Second, the high degree of participation by the villagers of CS in pasture development is noteworthy, and may also hold lessons for other agencies.

1.1 The Village and its People

In 1987 there were 82 households with a total population of about 800. Castewise break-up of population of CS is given in Table 1. The Gujjar and Jat communities are politically and socially dominant. Major livelihood sources are agriculture and livestock production, and a very few households are involved in mining work. Table 1

⁹ I would like to acknowledge the contributions (direct and indirect) of others to this paper, including: Dr. Ashwini Ghorpade, Social Scientist – BAIF Development Research Foundation, Pune; Mr. Acharya Dhaneshwar, President of MMVS; Mr. Rajendrasingh – Coordinator; Mr. Bhawarlal - Coordinator of MMVS; and Members of Pasture committee and villagers of Chota Saradana.

shows that landless families belong to Sadhu, Vaishnu, Rawat and Kumhar Caste/communities and they are 11 out of 80 families of CS village.

Table 1 Caste and Occupational Composition of the Community*

Caste/ Community	No. of families	Primary/ secondary occupations
Gujjar	35	agriculture/ Live stock and wage labour
Jat	34	agriculture/ wage labour
Sadhu	4	Handloom (Landless)
Vaishnu	3	Handloom (Landless)
Rawat	2	Landless/wage labour
Kumhar	2	Labourer (Landless)

* These data were collected in 1987.

Source: Documents and reports of MMVS.3

1.2 Agro-Ecology of the Area

1.2.1 Land

The area is located in the Aravalli hills and hence is characterized by the presence of hills and ridges: slope of the land is 10% -15%. Agriculture is predominantly rainfed, as can be seen from Table 2.

Table 2 Land Details of Chota Saradana

<i>CS's land</i>	<i>In hectares</i>
Irrigated land	<i>2.43</i>
<i>Rainfed (including fallow land)</i>	<i>127.48</i>
<i>Cultivable waste land (including gaucher and groves)</i>	<i>27.32</i>
<i>Area not available for cultivation</i>	<i>10.12</i>
Total land	<i>167.35</i>

Ref. District census of Ajmer-1991.

1.2.2 Climatic condition

Annual rainfall is normally in the range 350-550 mm. July to September is the rainy season. January is the coldest month, while May and June are the hottest months, when the temperature normally reaches up to 42 degree C.

2. SILVIPASTURE DEVELOPMENT: ITS ORIGINS AND NATURE

2.1 Origins of Pasture Development Initiative at CS

This initiative began in the context of drought in 1986, and increasing degradation and deforestation of the land. A revenue forest is located one and a half-kilometres away

from this village, which comes under the district of Pali. According to the villagers, there were dense forests here, 45 - 50 years ago. The villagers in turn exploited the forest, which was not properly guarded by the forest guard.

The degradation was due to several factors, including state-led, commercial exploitation of forests and open grazing by local population. Traditionally, people have managed their common lands through planned and systematic grazing, and lopping and browsing trees (rather than complete tree cutting), thereby fulfilling their basic requirements from natural resources. Nevertheless, human, livestock and other pressures increased, resulting in over-exploitation of the CPRs.

During the severe drought in 1986 members of the Gujjar and Jat communities of CS were forced to migrate to Jaipur and Delhi in search of employment. Livestock owners also migrated south-eastwards towards Kota for grazing. In the absence of grass cover, the direct impact of the rain on the soil caused erosion. The silvipasture initiative started in 1987 as the circumstances during the severe drought were threatening the survival of animals and people in the village.

In a village meeting a decision was taken to initiate pastureland development activity. The need to develop irrigation facilities, soil and water conservation measures and technical skills was felt. The strategies mentioned below were determined by the people of CS village in consultation with MMVS and with active participation of SPWD. Therefore, the decision to promote the pasture development was a 'collective decision' (of CS village, MMVS and SPWD) to overcome shortage of fodder and fodder-related migration of families.

2.2 MMVS Philosophy and Approach to Pasture Development

MMVS's approach was based on a number of principles, which are listed below.

- Select the local people to work directly with the community rather than qualified staff from outside the project area.
- Invite experts and researchers to village CS for preparing the action-plan with the villagers, rather than preparing the plan in the office and requesting the people to implement the same.
- Strengthening the process of empowerment rather than delivering the services.
- Exploring the local resources rather than bringing resources from outside.
- Learning and developing tailor-made models rather than following a set of models.
- Focus on livelihood development approach.

2.3 Strategies for Pasture Development

In the village meeting an agreement was signed between MMVS and villagers of CS to initiate pastureland development activity under the following norms/ conditions:

- Villagers will contribute 25% of their wage labour as their voluntary (*shramadan*) contribution;
- Villagers will develop a sense of ownership with the common pasture, so that each individual will protect it as their (common) own;
- For effective implementation two villagers and one representative from MMVS will supervise the implementation process;
- Villagers would undertake tree plantation without any remuneration.

The villagers also developed norms for equal rights for sharing of benefits. They have adopted a “Cut and Carry” system. People are allowed to cut grass in November or December, when it is ready for harvest. They are allowed to take half of the cut grass home, while remaining half of the grass is kept with pasture committee.

2.4 Initiative of Local leadership in Pasture Development

Mr. Devaji Patel (opinion leader) was a progressive and respected farmer. He had a vision of development, which led to the development of the pastureland. Therefore he was instrumental in getting sanction from the authority (Govt.) to undertake the watershed structures at CS, for conserving water. Due to his efforts one earthen dam and four other similar small water conservation structures were constructed within the vicinity of the CS open grazing area. Due to the efforts put in by Mr. Devaji Patel, the villagers of CS realized the benefits of pasture development.

2.5 Site Selection and Treatment

The villagers selected two patches of land, whose areas were 511 bhiga (100 ha.) and 75 bhiga (15 ha.). The protected pasture is a common and wasteland area that was openly grazed, before the initiative of MMVS began in 1987. The animals could wander and graze on whatever vegetation emerged on this land after the monsoon rains, but the vegetation only lasted for a short period of time.

Land preparation started in 1987 on the common land of Gram Panchyat (GP) CS. After the construction of boundary wall, work was undertaken on trenching, gully plugs and construction of checkdams.

Tree plantation activity was carried out. Some of the species planted were Deshi Babool (*Acacia nilotica*), Ber (*Ziziphus mauritiana*), Gonda, Aldo, Neem (*Azadirachta indica*), Bamboo (*Dendrocalamus strictus*), Khachnar, Anar and Goondi. Villagers and MMVS decided to plant above mentioned species, because they are local ones and can survive better.

2.6 Pasture Committee

A village level Gram Vikas Samiti Chota Saradana (GVSCS) was formed to manage the programme at the village level. The GVSCS organises village meetings, manages the village fund and takes decisions for the management of the protected silvi-pasture area (PSPA). Initially, there was a seven-member executive committee with a

President, Vice-President, Secretary, Treasurer and three members appointed for two years, after which the committee was again reconstituted. Now there are 16 executive committee members (including one woman and one representative of MMVS), each representing different castes and the general body comprising of 80 households. The GVSCS was registered in 1989, under Societies Registration Act. The leadership has undergone a formal change several times through elections or due to old age/ death of executive member. Informally, the leadership has remained with Mr. Devaji Patel. After him his nephew was elected as president of GVSCS.

2.6.1 Village Common Fund

The GVSCS is managing village common fund and it also manages its expenditures like: salary of chowkidar (watchman); maintenance of pastureland; and payment of electricity charges. (In the pasture area electric motor is fitted to borewell, through this facility irrigation is made available to cultivate green fodder). The sources are income from the pasture (see Table 5 for details).

3. PROJECT COSTS

3.1 Establishment Costs of the Pasture

Table 3 shows that the villagers contributed the equivalent of RS. 3,46,704/- (contribution includes cash and voluntary labour) towards pasture development. This reflects the commitment and unity of the village towards pasture development and their realization that it is necessary for fodder and fuel security.

Table 3 Establishment Cost of CPRs - Chota Saradana 82 ha land by villagers^{3*}

No	Details Activities	Expenditure (in Rupees)				
		Total quantum of work	Total Man days	Contribution Physical	Cash Contribution	Total of Villager's Contribution
In 1987						
1.	Stone wall (5'X2'X10000) Stone work	100000 cft	5000	28000	42000	70,000
2.	Cattle proof Trench, Earth work	51870rft	519	2906	4360	7,266
3.	Check Dams, Stone Work and Earth Work	40800cft	2040	11424	17136	28,560
4.	Contour Channels - (35 ha.) Earth Work	123000 rft	1230	6888	10332	17,220
5.	Staggered Trenches, 35 ha.	6,3000rft	5000	28000	42000	70,000
6.	Contour Stone Bunds, 20 ha.	61500cft	615	3444	5166	8,610
7.	Tillage of the Upper Crust, 15ha.	806880 sqft	1717	9615	14423	24,038
In 1988						
8.	Sowing of Grass Seed, 60 ha.	---	2040	28560	---	28,560
9.	Grass Seed 400 kg	---	---	---	6000	6000
10.	Forestry Seed	---	---	---	3000	3000
11.	Sapling	---	---	---	56250	56,250

12.	Plantation	---	---	27200	---	27200
	Grand Total		18161	146037	200667	3,46,704

*Ref: Documents and reports of MMVS³.

Table 4 shows that total cost of developing the pastureland at CS, including funding organisation's contribution and CS villagers' contribution was Rs. 9,07,406/-. Hence per hectare cost of development was @ RS. 11,066/-.

Table 4 Total Cost of Pasture Development by CS Villagers and MMVS/SPWD.*

Sl. No	Activities	SPWD	Community's contribution in Cash and labour	MMVS contribution
1.	For Charagah devp.	216702	346704	Organisation's contribution was the role of a catalyst in promotion, implementation etc.
2.	For Electricity and Motor	184000	--	
3.	Pipeline	160000	--	
Total		560702	346704	907406 (G. Total)

*Ref: Documents and reports of MMVS³.

3.2 Operational Costs

For protection of CPR "Rotation of Stick" method was adopted by GVSCS. To implement this the entire village was involved in protection: each day a different household would send someone to patrol the pasture and make sure nobody was grazing their animals in it, cutting trees, etc. Nevertheless, people from Rajpura, a neighbouring village, were entering pasture area in the night, so the villagers recently decided to appoint a watchman on a salary of Rs.1500/- per month. He is on round the clock duty and stays in the pastureland. Due to watchman's presence in pastureland for twenty-four hours, the above-mentioned problem is decreasing, but not fully stopped. In spite of watch and ward system, encroachment continues, because trespassers reside close to the pastureland.

3.3 Opportunity cost

The land had no productive uses except that animal could wander and graze whatever emerged from the ground during rains; therefore the opportunity cost of the land is negligible.

4. FODDER PRODUCTION AND UTILISATION

4.1 Fodder Production

Biophysical data on fodder production were not available to the author. Table 5 shows the revenue generated from sales of fodder, which may give some indication of production. However, care should be taken in interpreting these data, as not all fodder produced is sold; and, of course, fodder prices may fluctuate over time.

Income from the production of green fodder (green fodder is produced in pasture area, where water facility is available to cultivate maize for fodder) is decreasing, because inputs (like, manure, local seeds and maintenance) have been low. Income from dry fodder production has more or less remained same.

Data on livestock populations before silvipasture development and recently are not available, so it is not clear what effect, if any, the PSPA has had on livestock numbers.

4.2 Fodder Utilisation by Large Ruminants

Large ruminants consume harvested grass from the PSPA, which is cut in November or December¹⁰. Other forage sources, and the timing of their contributions, are shown in Figure 1.

Figure 1 Seasonal Feed Calendar for Large Ruminants

Forage source	Months											
	Jan	Feb	March	April	May	June	July	August	Sept- ember	Oct- ober	Nov- ember	Dec- ember
Grazing owner's crop fields												
Other's crop field												
Unprotected village grazing lands												
Stored crop residues												
Grass from PSPA harvested (may be stored)												
Purchased fodder or concentrate												

4.3 Pasture Development and its Effect on Sheep and Goats

Small ruminants are an important aspect of livelihoods in the region, which has 2.5 million sheep and 1.8 million goats. Small ruminants are not given harvested grass from the PSPA. They prefer to be actively grazing, and goats prefer to browse on the leaves and pods of trees and shrubs. Sheep/goat owners are entitled to tree fodder from the PSPA, on condition that they cut and carry it from the site, but the volumes of tree fodder are not yet large enough to meet all needs.

¹⁰ **Editor's note.** We do not know when the grass is fed to the animals, but we know from other case studies in this series that grass is sometimes stored for a few weeks or months for use in times of scarcity.

Owners of small ruminants (there are 11 herders' families) are entitled to take grass from the pasture area, as everyone else does. If they do not have large ruminants to feed it to they can exchange it within the village for more useful items. Thus, the people of CS were able to convince the families of herders that development of the pasture was desirable, despite the fact that they would no longer be able to graze their small ruminants there. These 11 families belong to Sadhu, Vaishnu, Rawat and Kumhar castes. The herder families are absent from the village after the *kharif* season, and it is significant that they are willing to abide by the PSPA rules, despite their short stay in the village.

5. IMPLEMENTATION ISSUES

5.1 Pasture Committee and Gram Panchayat

The GVSCS has purposely made efforts to elect one of their members as Sarpanch in order to maintain harmony with the GP¹¹: Mr. Prabhulal Gujjar, president of GVSCS, is elected to GP. Hence relations with the GP are cordial, in terms of protection, development and benefit sharing from the pasture; and GVSCS has not had to face any confrontation with the GP over leadership, control, benefit sharing etc. It shows the people of CS have been effective in bridging the gap between GVSCS and GP.

5.2 Obtaining Permission to Use Revenue Department Land: the Wisdom of Mr. Devaji Patel and MMVS

While demarcating the land for pasture development, the villagers informed MMVS that the large patch was in the name of Gram Panchayat, but the smaller patch of 75 bhiga belonged to revenue department (RD). The project did not have permission to develop the RD land, so the villagers had deliberately not told MMVS, until then, that this was RD land. They had a special reason for including it. They were afraid that it might be allotted by government to ex-service men and their families, because this had already happened in the adjoining village of Rajpura.

When the Revenue Department found out that that the village had encroached upon their land they objected, which put MMVS and the villagers in a difficult position. A village meeting was held, also involving MMVS and Mr. Devaji Patel, to discuss what to do next. They decided to meet Dr. B. Shekar, Sub-District Magistrate (SDM) of Ajmer.

The approach decided by Mr. Devaji Patel and MMVS was to bring the SDM to the pasture area and impress upon him the merits of the pasture development initiative taken by the village and MMVS, and thereby obtain his support for it. When Dr. Shekar visited CS he was impressed, and he suggested that if the pasture society

¹¹ The 73rd and 74th Constitutional Amendments have given more power to the Gram Panchayat. Previously, Gram Panchayat was not involved in the formation of pasture committees, but due to these amendments Gram Panchayat is now responsible for this.

(*Charagah samiti*) was legally registered then the revenue department could allot the encroached land to the samiti under 'Tree patta scheme'. (This scheme is meant for undertaking pasture and plantation development, initially for a period of ten years, after which the same land can be converted into agricultural land.)

The villagers and MMVS organised a meeting at CS and decided to follow the SDM's suggestion: accordingly, the samiti was registered as *Gram Vikas Sanstha Chota Saradana* (GVSCS). After the registration, the SDM allotted the encroached land to GVSCS under the tree patta scheme. In the process of land allotment Mr. Devaji Patel's role in successfully resolving this issue was crucial.

5.3 Rule-Breaking by Outsiders

As was mentioned earlier (section 3.2), Chota Saradana's PSPA is battling with the problem of repeated rule-breaking by outsiders from the neighbouring village of Rajpura. At this stage the 'protection process' is not fool-proof, but things are definitely improving (Singh, 2000). Appointing a full-time chowkidar, and charging a fine for trespassing, have not been entirely effective, and GVSCS has also taken up the issue with the police department and even in the court of law. The case still continues in the court. In this process of getting a solution GVSCS has been spending a large sum of money (which is contributed by CS's village members) on the same. This process has made the representation strong at different levels: at the village level, the entire village became united when the trespassers resorted to encroachment.

5.4 Mining - Threat to Sustainability of Pasture

Mining work is going on unabated at CS, and is an employment opportunity for the villagers. Mining work is to draw stone for cement factories. However, this is not a sustainable activity. The mining will soon affect the pasture area, as it is carried out nearby. The GP is short-sighted about the consequences of the mining activity, and GP restricts itself to collecting a toll @ Rs.5 per truck for entry into CS's mining area.

5.5 Role of women

Though GVSCS has one woman member, this member has not attended its meetings regularly for social reasons. As a result, she has not been able to take part in the decision-making process, although she is informed of the decisions. This shows that GVSCS does not consider participation of women important in pasture development and management. Women are not actively involved in the dairy cooperative either. Due to promotion of dairy all the milk produced is sold, and consumption by women and other family members (and hence their health status) has sharply decreased. Not only are women unable to maintain good health; they do not even have the right to money from the sale of milk.

6. BENEFITS FROM THE PASTURE

6.1 Revenue

Table 5 shows the income generated from green and dry fodder, which are auctioned to the highest bidder. First opportunity is meant for villagers to bid: if villagers are not participating in bidding then people from outside the village may bid for the same. The income data suggest that dry fodder production may have more or less remained constant, and fuel wood production may be increasing. The income goes into a common fund and is utilised for payment of watchman and maintenance of pastureland. Apart from this, GVSCS has plans for providing pipeline for potable water to their village from pasture borewell.

Table 5 Details of Income Generated from Pasture Development at CS*

Sl No	Details	Income from different produces of the Charagah (Rupees)					
		Income generated Yearwise	Dry fodder	Green fodder	Fuel-wood	Timber	Other (seeds)
		(Through Sale by auction)					
1.	1988-89	4523					4523
2.	1989-90	8545				3560	12105
3.	1990-91	6010		2500			8510
4.	1991-92	9937					9937
5.	1992-93	3032	14200	11614	8690	2458	39994
6.	1993-94	4900	12000				16900
7.	1994-95	5795	10777				16572
8.	1995-96	10500		6000			16500
9.	1996-97	5716	7800				13516
10.	1997-98	8545	9200	5538			23283
11.	1998-99	8385	3618	14796			26799
	G. Total	75888	57595	40448	8690	6018	1,88,639

*Ref: Documents and reports of MMVS³.

6.2 Milking Animals

The small landholders (15) and landless families (11) have increased the number of buffaloes and crossbred cows. Both these groups of families are getting fodder from pasture area and they buy additional fodder if it is required. They have purchased young animals at a low price and maintained them for milk production. Due to this development, milk production has increased and cooperative dairy is being promoted in the village.

6.3 Capacity-Building Efforts

The people received benefits from other components of the project rather than

exclusively from the pasture. MMVS has unique example for capacity building of local people. Two local people, namely Mr. Bhavar Singh and Mr. Rajendra Singh, have gained expertise in the process of pasture development. Now they are handling projects in other villages of MMVS project area and more than five pasture development initiatives are under their supervision.

GVSCS members are gaining experience in management of pasture and this knowledge is shared with other villages. MMVS is not in favour of having hitech staff undertaking development activity. If need arises they invite experts from outside agencies like SPWD or ARAVALI from Jaipur.

7. CONCLUSIONS AND LESSONS LEARNED

A number of lessons learned from this case study, and associated conclusions, are listed below.

- Pasture development on common lands can be highly political. Villagers may have their own (sometimes hidden) agendas that may differ from that of the development agency. Development agencies should be aware of the political context in which they are operating, and the likely impact of their interventions on inter-stakeholder dynamics.
- Land selection: while selecting land for protected pasture development the title of the land, tenancy and encroachment should be verified through checking land records and the actual physical position.
- Land title should be clear and transferable to pasture committee for development of pasture.
- Demand from the village should emerge first before pasture development activity is initiated.
- Voluntary labour and financial contribution is pre-requisite for the initiative of the pasture.
- An enthusiastic and wise leader (in this case, Devaji Patel) can play a major role in making this kind of initiative successful.
- It is essential to recognise the fodder requirements of small ruminants and plan accordingly for them, so that pasture development does not marginalise the existence of sheep and goats owned by small and marginal farmers and landless.
- Select local people to work directly with the community rather than qualified persons from outside.
- Invite the experts and researchers to the village for discussions with villagers when preparing the action plan, rather than preparing the plan in the office and requesting the people to implement it.
- Women's involvement is likely to be minimal, unless the development agency makes a major effort to promote it.
- Strengthen the process of empowerment rather than delivering the services.
- Collaborate with other players rather than going it alone¹².

¹² MMVS has not appointed highly qualified people for implementation of pasture development programme. Instead, MMVS has established good network linkages with different institutions like IIM-Ahmedabad, SPWD and ARAVALI for supporting its activities.

- Learning and developing tailor-made models rather than following set models.

This case study throws light on important experiences/ lessons for all. It is an example for others of how to develop a strong people's organisation. Even after withdrawal of MMVS, pasture development activity continued, with considerable progress through management, protection and benefit sharing equally. Lessons learnt and experience gained from this project may be used in developing guidelines for similar initiatives in future.

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