

Charcoal Making as a Sustainable Livelihood Option

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Background:

Rapar and Bhachau blocks of Kutch are highly susceptible to frequent droughts and disasters. Livestock rearing and dryland agriculture are the two main sources of livelihood. Recurrence of droughts created long term impact on the lives of the people of the area. Cultivable lands are often abandoned by farmers due to uncertainties in rainfall. Increased land salinity and neglect of water bodies further complicated the life supporting systems. Prayas an NGO working in Rapar in partnership with CARE felt that long term sustainable alternatives could be explored in the region with the available resources. Hence this study was carried out in this area.

Objectives of study:

- To know the production process of charcoal making and possible improvements (technical) in it.
- To assess the markets of this charcoal and its possible improvements.
- Financial feasibility of charcoal making as a gainful livelihood.
- To know the process of getting permit for charcoal making and an effort to orient the targeted population towards the same.

Rationale:

The need to look for alternative sources of livelihood and at the same time ease the pressure on agriculture is the main rationale behind conducting this study.

Methodology:

Primary data was collected with the help of interviews with almost all the stakeholders involved in the process of charcoal production i.e. the producers, owners, permit holders, middlemen, government officials etc. For the same purpose a sample survey with the use of a structured questionnaire was conducted among the charcoal producers. Secondary data was gathered from various research reports on related topics.

Limitations:

The study despite being thoroughly researched cannot claim to be absolutely accurate. The information gathered can include some approximations as per the answers given by the village community. Since our study universe was limited to the Rapar and Bhachau blocks, the survey is also not representative of the entire Kutch District.

Chapter 1:

Executive summary:

The preparation of this report has one principal objective in mind- the feasibility of charcoal production as a sustainable livelihood option for the Kolis. To embark upon this project a sample study in 13 villages of the Kolis of Rapar and Bhachau talukas was conducted. With the help of a questionnaire and discussions with the Koli population of the study area, minute details of the coal production were discovered.

Prosopis juliflora that was introduced in Kutch to stop the desertification of the area, later became a menace, as its growth was uncontrollable. Government had earlier forbidden its cutting but soon due to its unwanted omnipresence, areas of Kutch needed to be clear of *P.juliflora*. The only solution was to put it to some more effective use. Its ability as a good fuel source has always been local knowledge. The Koli tribe excels in this job of converting *P.juliflora* to charcoal using purely indigenous methods. This research focuses on the dynamics of the coal trade right from its production to sale and how this entire process has serious socio-economic implications on the lives of the Kolis.

The study is part of the larger programme for Natural Resource Management. The objective is also to look for alternative sources of livelihood using whatever is naturally available in the area and at the same time ease the pressure on agriculture. Intermittent drought and scarcity periods are an intrinsic feature of life in dryland systems like Kutch.

Empirical data suggests that coal making is one of the coping mechanisms for the Kolis.

The study examines the government policy regarding charcoal trade. The Forest Department has been made the over all in charge and performs the function of issuing permit for the coal trade. Research found out that more than 50% of the actual coal producers are not permit holders. Access to education and local political power has a direct bearing on who can have the license. The uneducated, marginalized Kolis consider it beyond their capacity to obtain the permit. Hence the nexus of middlemen and village traders in the coal business. It did not even need a survey to know the difference in rates of coal bought from the Kolis and that sold in the markets. Nevertheless the survey conducted reconfirmed the fact. Besides features of the coal trade, the study also brings to light other sociological aspects of the Koli life.

The findings of the study have given rise to a number of recommendations. There is ample scope for some positive changes mainly for the benefit of the Kolis. The collaborated effort of government and non-government agencies becomes important here. Development initiatives are likely to succeed only if grass root level awareness is spread amongst the Kolis. The coal trade cannot be regulated well (even if the permit obtaining system is made simpler) unless the Kolis are made aware of their own rights. Their transition from being mere laborers to full fledged traders gradually can take place smoothly only if the Government joins hands with other agencies and the Kolis themselves are part of this developmental process.

There was also a hint of petty corruption found at the official level. This is a matter that can be corrected only by changing the current system of licensing. Suggestions ranging from introduction of royalty system to making the Panchayat the permit issuing authority have been given.

Chapter 2:**Prosopis juliflora and charcoal production**

Prosopis juliflora commonly known as vilayati babool, introduced in India only about 130 years ago has now been well naturalized and spread over in large parts of arid and semi arid tropics of India. The species has the tremendous ability to colonize even such climatically inhospitable sites where a single blade of grass does not grow. Therefore it has been proved most versatile woody species for conservation forestry.

Prosopis juliflora was initially planted by the Gujarat Forest Department in 1960-61 on the boundaries of Banni in Kutch, along the desert margins to stop the Rann ingressions. Due to its tolerance against salinity and drought, it has out competed all other species from that area and invaded almost every part of Kutch because of its very rapid growth and seed dispersal through cattle. Prosopis juliflora has invaded at the expense of the native tree and grass species. Its biggest disadvantage is that it decreases the fertility of agricultural land and affects the main livelihood that is agriculture of the rural population. By cutting of Prosopis Juliflora it helps in both the ways like reduction in agricultural land wastage and provides livelihood by charcoal making to the rural population.

There are a large number of ways in which various parts of Prosopis juliflora (its wood, seeds, pods etc) can be potentially utilized. Our main concern is with the utilization of its wood as fuel. P.juliflora wood is an important source of domestic fuel. It is in fact the most easily available wood resource in tropical arid and semi-arid India. It burns evenly and does not spark or smoke excessively. The calorific value is quite high being 4200kcal/kg.

Nevertheless firewood is bulky and expensive to transport as it is a low value product. Conversion to charcoal reduces the weight and increases the energy and economic value of the product. Besides the domestic usage charcoal is consumed mostly in urban areas in restaurants, small hotels, bakeries, small-scale iron works, and for parching and popping food grains like corn and rice. Other important uses are in making cotton, medicines, cells, fuel for the tiles industry etc.

Charcoal is often produced at considerable distance from the point of consumption. In the Kutch area charcoal manufacturing from P.juliflora forms an integral part of daily activity of a large part of the rural population. Revenue earned from charcoal production plays a vital role in rural livelihoods of this area.

Process of charcoal manufacturing.

Before processing, wood is first sorted into more or less similar diameter trunks/branches. These pieces of wood are stacked and after that moistened slightly. Then the stack is covered with soil. This arrangement looks like an earthen mound. Once the process is completed this earthen kiln is fired. The stack burns very slowly for several days. The burning depends on size and condition of stack and site. Consequently 3-8 days are required to complete the process. The stack is then opened, and the charcoal is removed and allowed to cool. The chopped trunk is the source of better coal. The roots and the branches produce lesser quality coal. Finally it is graded and bagged up for sale.

Enquiry with the local coal makers and traders revealed that this indigenous way is the best coal making technique. The coal produced by Prosopis juliflora in such a way in Kutch is of the highest quality. However there are always some scope for technical improvements. For instance,

Retort kilns though not yet available in India are becoming quite popular. Wood is stacked into one or two large metal cylinders (approx. 2m long and 1m in diameter) and heat from a small wood fired oven is circulated through the metal cylinder. Charcoal can be prepared within 8-48 hours in such kilns¹.

¹ Managing *Prosopis juliflora*- A Technical Manual – DFID and CAZRI.

Chapter 3:

Study findings:

Survey area: Our study was conducted in 12 villages, mainly in the Rapar taluka (except one village in Bhachau). The list of the villages and the no of households is attached as appendix II.

About the producers: People involved in charcoal making in Rapar are the Kolis. They belong to the Scheduled tribe listed in the Constitution of India. Kolis are present in significant number in villages of the Rapar Block. They are economically, socially & educationally very backward as most of them are unskilled labourers and also dependent on dry agriculture which gives livelihood only during four months of rainy season and the remaining period of the year they have to survive by labour work. The education rate is also very low. It is below 2% in the Koli women because most of their life they are engaged in labour work and migration. Their social condition becomes very unique as they cannot survive within the village with other community and mostly they create separate wandhs. They usually locate the wandhs near their agricultural land where they do not have basic facilities like electricity, roads, primary health center, schools etc Their status as a scheduled tribe is justified given their presence at the margins of settled society. They are the only community some of whose members still live in Kaccha houses. Kolis own very small landholdings. Wage labor is the dominant mode of employment. Agriculture, salt making, coal making are some of the main areas where they find employment. Coal making is an exclusively Koli activity.

Production and sale: Charcoal making has expanded in the last two decades with the aggressive take over of the Kutch landscape by the Prosopis. As a means to reduce the P.juliflora incidence the government offered licenses for making charcoal in forest areas. Also coal making began to emerge as a local supplementary activity with well developed markets outside of the region as well.

Though coal making is usually done by the Kolis in the absence of alternate employment some Harijans have also taken up this work. Coal making is governed by the forest department that gives out areas on lease for removal of Prosopis and making coal from the wood. The lessees may sub-lease and draw in families looking for additional incomes even though these are small.

Coal making is more prevalent in villages that are a little remote and where other avenues of employment are not many.

Generally coal is made during the four winter months. A few do this in the summer months as well, but at that time the output is not very good. For production, kilns are prepared. In each kiln 10 mounds (400 kgs) of firewood is placed. This yields about about 5 maunds (200 kgs) of charoal at best though the average output varies between 3-5 maunds. The contractor buys coal from the coal makers at the rate of Re 1 per kg thus the return to the coal producer for each kiln is Rs200. Daily return to the coal producer falls between Rs.30 to 50 per day.

Permit process: Permission to make coal and its transportation requires a series of complicated clearances from revenue and forest authorities. There is also a provision to

delegate this authority to the village panchayat by the district administration. At present the Forest Department is the Licensing Authority.

In order to apply for the permit an application has to be addressed to the concerned authority. Along with that the applicant also needs to attach proofs of his/her land area, Form Nos. 6, 7 and 12 of the Revenue Dept. and a No Objection Certificate from the Panchayat. The documents are attached as appendix VII.

The market: Rapar is the main local market for most of the producers who are selling in retail. The major wholesale markets are Ahmedabad, Rajkot and Morbi.

Need for an institutional support:

The entire process of production and sale of charcoal stands in great need for support from both the government and non government institutions, if charcoal making has to become a strong source of supplementary income for the Koli people. The erratic pattern of rains and ever decreasing ground water level call for reducing the pressure on agriculture and a necessity for more alternative sources of livelihood. Charcoal production, if regulated well can be one of the main solutions to this problem.

The most significant problem area is the lack of awareness about the procedure of obtaining the permit among the Kolis. This gives rise to a vicious circle of problems. Since the actual producers are not the permit holders, they are compelled to work under middlemen who have obtained the permit. This implies that they sell their charcoal in whatever rate fixed by the agents. Sometimes the Kolis take loans from the bigwigs of the village as well as the contractors and to repay that they have to produce coal for them. These richer people or the middlemen sell the coal in the market at a much higher rate. There are times when they might not even be permit holders but due to their ability to give some sort of a commission to the authorities concerned, they get away with it and sell the stuff in the markets at the rates of their choice. Essentially the actual producers do not get their due.

The need therefore is to organize the Kolis and make the charcoal business more systematic so that the real producers are the profit gainers as well. An attempt like that was made in the past when the District Rural Development Agency under Development of Women and Children in Rural Areas made committees of Kolis and gave Rs20, 000 to each for better and more organized charcoal production. The scheme did not succeed for the simple reason that no grass root level awareness was spread prior to implementing the scheme. The illiterate Kolis were in no position to make full use of the programme. The scheme was misused by various elements for vested interests.

Nonetheless one failure like this does not undermine the importance of the need to organize the Kolis. With the support of many Non Government Organizations that are working in the area after the earthquake, such schemes of the government can be successfully implemented. The job to sensitize the Kolis about the features of such plans and their advantages can rest with the NGOs working in this area. They can take the initiative of spreading mass awareness among the Koli people. Information is power and this will be as true in the case of the charcoal manufacturing Kolis as well. Once they are aware of the provisions of the government regarding charcoal trade, they will also know how to make use of them.

The next problem to be tackled is the permit issue. The uneducated and extremely poor villagers are too intimidated by the seemingly complicated process of applying for the permit. They do not mind selling their coal to the middlemen at rates that are much lower than what they can actually get. All the documents to be attached with the application for permit are in the custody of the village Panchayat. Thus the functioning of the Panchayat becomes significant here. The Sarpanch and Talati gain extreme power and can easily misuse it to exploit the ignorant Kolis. Talks with the villagers during the survey conducted revealed that there have been instances like this.

One of the senior forest department officials suggested eliminating the system of permit required for trade in the local markets. This will give the Kolis an opportunity to be not under the pressure of the middlemen and have a choice regarding rates. They will also get a better idea about the market situation of places like Ahmedabad etc.

It is also advisable to delegate the authority to issue license to the village Panchayat. This will make the process much easier for the villagers. The Panchayat is by all means a more approachable body for the villagers. Even the permit holders and traders are in favor of this arrangement. The most interesting fact is that in the whole of Gujarat, it is only in Kutch that the function of issuing coal permit does not lie with the Panchayat. Due to an unfortunate incident of corrupt practice this authority was taken away from them on 25th May 2002. However this fact was only released in the press and there has been no written statement issued in this regard².

The Forest officials claim that this should not be part of their duty but at the same time the department seems to be happy with the arrangement as the authority to issue the coal permit is rather profitable for them.

One of the suggestions by a coal trader is that of introducing the system of Royalty in the business. This way the hassles at each step, right from applying for the permit and passing each check post dealing with the forest officials, will automatically vanish. An advance in the form of Royalty will be paid to the authority concerned for a particular period and amount of trade to be held. This system of a fixed payment in advance will help in reducing trade by illegal means and also put a check on the unlawful activities of the Forest Officials. In fact a proposal to introduce the Royalty system is lying with the Gandhinagar Legislative assembly.

Primary data: findings, analysis and summary

(Attached as Appendix III -*occupational pattern*, Appendix IV -*working pattern*, Appendix V-*procedural awareness* and Appendix VI -*Information about markets*)

- ◆ Out of the total 753 houses, the number of houses surveyed was 74
- ◆ The average family size was 5.3

- ◆ 52% of the respondents claimed agriculture to be their main occupation

² Discussion with a senior trader.

- ◆ 28% were landless and worked as agricultural laborers
- ◆ 19% considered charcoal making as their main occupation

- ◆ 81.8% considered charcoal making as their secondary occupation
- ◆ 18.9% have other labors has their secondary occupation

- ◆ No. of family members involved in coal making ranged from 2-7

- ◆ 100% producers had their own kiln.

- ◆ 28.7 % go to nearby village to work
- ◆ 73.3% work in their own village.
- ◆ No permit holders among the respondents in the villagers.

- ◆ Production in 2002: 4,91,240 kg

- ◆ 87% of the respondents were not aware of the permit procedure
- ◆ 12.2% had partial information

- ◆ 41.8% of the producers sell in retail market
- ◆ 66.21% sell via agents

- ◆ Local markets: Rapar, Lakadia, Ramvav
- ◆ Rates in local markets : Rs 60- 70 per kg

- ◆ Main markets: Ahmedabad, Morbi and Rajkot
- ◆ 50% of the respondents were aware of the main markets.

On the face of it, the above data can lead one to infer that agriculture is the main occupation of the section of respondents surveyed and coal making comes only as a secondary option. However ground reality shows that the agriculture produce is for self-consumption and it is not an income generating activity. The Kolis are owners of considerable amount of land holdings due to the government policy, which gave them land and forbids its transaction. But the fact of the matter is that most of this land is unirrigated and therefore cannot be permanently depended on.

Every Koli irrespective of the fact whether he/she has land or not prepare their own kiln. This proves that they are always involved in charcoal making. Moreover due to the successive failure of the monsoons the only thing that sees them through is their income by selling coal.

The fact that they are not the permit holders and are thus in a way making charcoal illegally also might have discouraged the Kolis to acknowledge coal making as their main occupation. Almost

82% considered it their secondary occupation and this shows the significance of coal making in the Koli occupational pattern.

28 % respondents work as agriculture labourers. There is a particular type of migration pattern followed by the landless Kolis who go to far off places like Bhuj, Anjar, Surat etc to work as agricultural labor. This implies that such migrants would be unable to avail of educational and health facilities and various other developmental schemes of the government introduced in their villages.

The lack of literacy and education is absolutely clear when the Kolis are asked about their awareness regarding the procedural information of obtaining permit. Maximum coal producers had no information and only a small number had partial knowledge. This proves to what a great extent the Kolis are dependent on the agents and permit holder traders to sell their product and also their complete ignorance of their rightful income. They seemed too intimidated to get into the legal hassles and written documents. Talking to the respondents brought out the fact that the main difficulties in the permit process are its lengthy procedure, financial constraints, and lack of co-operation by the Forest officials and their basic lack of awareness. That is essentially the reason why most of them sell via agents.

Rapar, Lakadia, and Ramvav are the main local markets. If coal is sold directly by the Kolis in the retail market they can fetch up to Rs70 per 40 kg. However the agent makes a huge profit by buying the coal at Rs 40 per 40 kg from the Kolis.

Data shows that half of the respondents in the villages are aware of the main markets for coal which are Morbi, Rajkot and Ahmedabad.

Can charcoal making be considered as a sustainable livelihood option?

On analyzing the data, the importance of coal production for the area in general and its significance for the Kolis in particular becomes abundantly clear. Kutch is blessed as an area to produce very high quality coal. This natural resource must be tapped to its fullest capacity. Kolis have been using *Prosopis juliflora* for making coal since generations and are absolute experts in this field. If the coal trade is properly regulated and the current system of the actual producers not getting their due is done away with, coal production can become the main source of income for the Kolis. The respondents were asked that if they were assured of proper rates and if the permit process was made easier, how willing they were to take up coal making full time. All of them replied in positive.

The migration rate among the Kolis can be also arrested if they are sure of their income. Thus they can be part of the larger development programs.

The permit holder traders claimed that if there were no drought relief work going on in the area, no Koli would leave their kiln or stop coal making. It is true that such relief work is easier. But even the Kolis know that through it they earn much lesser than compared to the amount they can earn by coal selling.

The researchers feel that coal making can indeed be considered as a sustainable livelihood option because of three main reasons:

- ◆ Coal-making is the best use of *Prosopis juliflora* so abundant in Kutch
- ◆ Kolis have excelled in this art
- ◆ Coal production due the extremely important usage of coal is a very profitable trade.

Therefore if the revenue generated by the coal trade is shared adequately with the coal making Kolis, it can be the single source of income for them and a sustainable livelihood option.

The practice of selling coal via the agent and the apparently complicated permit procedure along with the non-cooperative attitude of the officials are grave problems. They most certainly cannot be sorted out in a short span of time. Besides the literacy rate among the Kolis is really low and that is why it would require a mammoth effort to spread awareness among them. However it is not an impossible task. The positive sign is that the Kolis are at least willing to take up the trade on their own if they have proper information. If this report has to have any real implication, then we need to work on the following suggestions...

Key recommendations:

- Need to spread more awareness among the Kolis regarding the advantages of selling on their own and getting rid of the middle-men
- For meeting the above objective the Kolis have to be organized.
- The Non Government Organizations working in the area can act as a bridge between government policies and their implementation at the grass root level.
- Panchayat should get more involved and the authority to issue license should rest with it. This step can give a boost to the institution of local self-government at a larger level.
- The proposal to introduce the royalty system should be discussed thoroughly with the actual producers with the help of organizations involved in development work.
- Some NGO should take up the Koli cause specifically and become a platform from where the Kolis of the area can voice their grievances.
- Micro finance institutions should work more efficiently in the area, sensitizing villagers about their functions. This will discourage the Kolis to take loans from the big traders which makes them oblige to work for them
- Self- Help Groups of coal workers should be formed and their proper functioning regulated by both government and non-government agencies.

Appendix 1: The questionnaire.**Household information for Charcoal Making**

Name: _____

Village: _____

Taluka: _____

District: _____

Age: _____

Caste: _____

Family details

Name	Age	M/F	Education	Occupation	Relation

Land: YES/NO

Irrigated / unirrigated

Beside Agriculture what is your other Occupation?

1. Salt labour 2. Charcoal Making 3. Agriculture labor 4. Other

Do you make your own Kiln? Yes/No

What is the cost of making Kiln?

1. 2. 3.

How much charcoal did you produce last year?

What rate did you get?

Do you sell it to any agent? If yes, Name of Agent? _____

How many family members are involved in charcoal making?

Do you go for labour work to any permit holder? Yes/No

Where do you go for charcoal making?

- 1.
- 2.
- 3.
- 4.

Anybody from your village has got permit in past? Yes/No

If yes then name of the person who got the permit. _____

Do you know the documents needed for getting permit?

According to you what are the difficulties of obtaining the permit?

- 1.
- 2.
- 3.
- 4.

Do you sell charcoal in retail Market? If yes, Where?

- 1.
- 2.
- 3.
- 4.

What kind of health related problems do you face while making charcoal?

- 1.
- 2.
- 3.
- 4.

If you get permit, do you know about the market of charcoal selling?

Appendix II

Study Villages.

	<i>Name of the village</i>	<i>No of Households</i>	<i>No of households surveyed</i>
1	Pagiwandh	110	12
2	Ganeshpura	53	8
3	Khadtalwandh	45	5
4	Suraniwandh	28	4
5	Paginiwandh	54	5
6	Mandhavawandh	55	5
7	Saranwandh	77	5
8	Sodhacamp	34	5
9	Gajjuwandh	51	5
10	Ramdevpirwandh	72	5
11	Balasari	82	5
12	Hanjyiwandh	34	5
13	Kaluvandh	58	5

Total No of Households	753
Total No of Households Surveyed	74

Appendix III**Occupational Pattern**

	Name of the village	HH	Family Size	Main Occupation	Secondary
1	Pagiwandh	1.1	5	Agri.Labour	Charcoal Making
		1.2	2	Agri.Labour	Charcoal Making
		1.3	8	Agriculture	Charcoal Making
		1.4	5	Agriculture	Charcoal Making
		1.5	5	Agriculture	Charcoal Making
		1.6	3	Charcoal Making	Other Labor
		1.7	4	Charcoal Making	Other Labor
		1.8	5	Agriculture	Charcoal Making
		1.9	5	Charcoal Making	Other Labor
		1.1.0	3	Agriculture	Charcoal Making
		1.11	5	Agriculture	Charcoal Making
		1.12	7	Agriculture	Charcoal Making
2	Ganeshpura	2.1	8	Agriculture Labor	Charcoal Making
		2.2	5	Agri.Labour	Charcoal Making
		2.3	4	Agri.Labour	Charcoal Making
		2.4	4	Agri.Labour	Charcoal Making
		2.5	4	Agri.Labour	Charcoal Making
		2.6	6	Agriculture	Charcoal Making

		2.7	9	Charcoal Making	Other Labor
		2.8	10	Agriculture	Charcoal Making
3	Khadtalwandh	3.1	7	Agri.Labour	Charcoal Making
		3.2	7	Agriculture	Charcoal Making
		3.3	5	Agriculture	Charcoal Making
		3.4	2	Agri.Labour	Charcoal Making
		3.5	7	Charcoal Making	Other Labor
4	Suraniwandh	4.1	6	Agriculture	Charcoal Making
		4.2	5	Agriculture	Charcoal Making
		4.3	2	Agriculture	Charcoal Making
		4.4	6	Charcoal Making	Other Labor
5	Paginiwandh	5.1	9	Charcoal Making	Other Labor
		5.2	5	Agriculture	Charcoal Making
		5.3	4	Agri.Labour	Charcoal Making
		5.4	8	Agri.Labour	Charcoal Making
		5.5	5	Agriculture	Charcoal Making
6	Mandhavawandh	6.1	4	Agriculture	Charcoal Making
		6.2	6	Agriculture	Charcoal Making
		6.3	5	Agri.Labour	Charcoal Making
		6.4	4	Agriculture	Charcoal Making
		6.5	7	Agriculture	Charcoal Making
7	Saranwandh	7.1	2	Agri.Labour	Charcoal Making
		7.2	6	Agri.Labour	Charcoal Making
		7.3	4	Agri.Labour	Charcoal Making
		7.4	4	Agriculture	Charcoal Making
		7.5	3	Charcoal Making	Other Labor
8	Sodhacamp	8.1	3	Agri.Labour	Charcoal Making
		8.2	4	Charcoal Making	Other Labor
		8.3	7	Agriculture	Charcoal Making
		8.4	5	Agri.Labour	Charcoal Making
		8.5	6	Agriculture	Charcoal Making
9	Gajjuwandh	9.1	2	Agri.Labour	Charcoal Making
		9.2	6	Agriculture	Charcoal Making
		9.3	6	Agri.Labour	Charcoal Making
		9.4	5	Charcoal Making	Other Labor
		9.5	10	Agriculture	Charcoal Making
10	Ramdevpirwandh	10.1	6	Charcoal Making	Other Labor
		10.2	9	Charcoal Making	Other Labor
		10.3	3	Charcoal Making	Other Labor
		10.4	6	Agriculture	Charcoal Making
		10.5	7	Charcoal Making	Other Labor
11	Balasari	11.1	5	Agriculture	Charcoal Making
		11.2	5	Agriculture	Charcoal Making
		11.3	6	Agriculture	Charcoal Making
		11.4	5	Agriculture	Charcoal Making
		11.5	4	Agriculture	Charcoal Making
12	Hanjyiwandh	12.1	4	Agriculture	Charcoal Making
		12.2	5	Agriculture	Charcoal Making

		12.3	6	Agri.Labour	Charcoal Making
		12.4	4	Agriculture	Charcoal Making
		12.5	3	Agri.Labour	Charcoal Making
13	Kaluvandh	13.1	5	Agriculture	Charcoal Making
		13.2	5	Agriculture	Charcoal Making
		13.3	6	Agriculture	Charcoal Making
		13.4	4	Agriculture	Charcoal Making
		13.5	5	Agriculture	Charcoal Making

Average family size is 5.3

Primary Occupation

52 % agriculture is the main occupation

28% are landless and work as agriculture labourers

19 % charcoal making is the primary occupation

Secondary Occupation

81.8 % Charcoal making

18.91 % Other labour

Appendix IV

Charcoal Production.

HH No	Members Involved	Own Kiln	Cost	Production in Kgs 2002	Rate/40 Kg-2002	Rate by Contractor
1.1	2	Yes	4000	16000 Kg		Rs.50
1.2	2	Yes	4000	16000 Kg		Rs.50
1.3	2	Yes	3000	8000 Kg	Rs.70	Rs.50
1.4	3	Yes	2800	9600 Kg	Rs.70	Rs.50
1.5	2	Yes	2000	12000 Kg	RS.60	Rs.50
1.6	2	Yes	2500	12000 Kg	Rs.70	Rs.50
1.7	2	Yes	2500	12000 Kg	Rs.60	Rs.50
1.8	2	Yes	2000	6000 Kg	Rs.70	Rs.50
1.9	4	Yes	2000	7200 Kg	Rs.60	Rs.50
1.1.0	2	Yes	2400	9200 Kg	RS.60	Rs.50
1.1.1	3	Yes	3000	6000 Kg	RS.60	Rs.50
1.1.2	2	Yes	3000	7200 Kg	Rs.60	Rs.50
2.1	4	Yes	500	4800 Kg	Rs.60	Rs.40
2.2	2	Yes	1500	800 Kg	Rs.50	Rs.40
2.3	2	Yes	1500	12000 Kg	Rs.60	Rs.40
2.4	2	Yes	3000	12000 Kg	Rs.60	Rs.50
2.5	3	Yes	3000	12000 Kg	Rs.60	Rs.50

2.6	2	Yes	3000	9600 Kg	Rs.60	Rs.50
2.7	2	Yes	3000	6000 Kg	Rs.60	Rs.50
2.8	3	Yes	1000	8000 Kg	Rs.60	Rs.50
3.1	3	Yes	1500	2000 Kg		Rs.50
3.2	3	Yes	500	2400 Kg	Rs.60	Rs.50
3.3	4	Yes	600	2400 Kg	Rs.60	Rs.50
3.4	2	Yes	1500	12000 Kg	Rs.60	Rs.50
3.5	3	Yes	1500	2400 Kg		Rs.50
4.1	5	Yes	3000	4800 Kg	Rs.60	Rs.50
4.2	4	Yes	1000	6000 Kg	Rs.60	Rs.50
4.3	2	Yes	1200	4000 Kg	Rs.60	Rs.50
4.4	2	Yes	2000	6000 Kg	Rs.60	Rs.50
5.1	6	Yes	3000	12000 Kg		Rs.70
5.2	5	Yes	2000	6000 Kg		Rs.70
5.3	2	Yes	4000	16000 Kg		Rs.70
5.4	4	Yes	3000	4000 Kg		Rs.70
5.5	2	Yes	1500	3600 Kg		Rs.70
6.1	4	Yes	3000	8000 Kg		Rs.70
6.2	3	Yes	3000	8000 Kg		Rs.70
6.3	2	Yes	3000	6000 Kg		Rs.70
6.4	2	Yes	2500	8000 Kg		Rs.70
6.5	3	Yes	3000	4000 Kg		Rs.70
7.1	2	Yes	3000	2000 Kg		Rs.50
7.2	2	Yes	1100	7000 Kg		Rs.50
7.3	4	Yes	500	1600 Kg		Rs.50
7.4	4	Yes	900	3200 Kg		Rs.50
7.5	2	Yes	1000	4000 Kg		Rs.50
8.1	2	Yes	3000	3600 Kg		Rs.50
8.1	2	Yes	3000	1800 Kg		Rs.50
8.3	4	Yes	1500	3600 Kg		Rs.50
8.4	3	Yes	3000	3600 Kg		Rs.50
8.5	5	Yes	3000	4000 Kg		Rs.50
9.1	2	Yes	2000	2000 Kg		Rs.50
9.2	3	Yes	2500	5000 Kg		Rs.50
9.3	2	Yes	3000	6000 Kg		Rs.50
9.4	2	Yes	2500	5000 Kg		Rs.50
9.5	7	Yes	4000	10000 Kg		Rs.50
10.1	4	Yes	1500	3200 Kg		Rs.50
10.2	7	Yes	2000	8000 Kg		Rs.50
10.3	3	Yes	3000	10000 Kg		Rs.50
10.4	4	Yes	1500	4240 Kg		Rs.50
10.5	5	Yes	3000	8000 Kg		Rs.50
11.1	4	Yes	3000	8000 Kg		Rs.50
11.2	2	Yes	3000	6000 Kg		Rs.50
11.3	3	Yes	3000	6000 Kg		Rs.50
11.4	3	Yes	3000	7000 Kg		Rs.50
11.5	2	Yes	3000	6000 Kg		Rs.50
12.1	4	Yes	2500	6000 Kg		Rs.50

12.2	3	Yes	3000	6000 Kg		Rs.50
12.3	2	Yes	2500	8000 Kg		Rs.50
12.4	4	Yes	3000	8000 Kg		Rs.50
12.5	2	Yes	2500	6000 Kg		Rs.50
13.1	2	Yes	800	2000 Kg	Rs.60	Rs.50
13.2	3	Yes	1500	6000 Kg	Rs.60	Rs.50
13.3	3	Yes	1500	6000 Kg	Rs.60	Rs.50
13.4	4	Yes	1500	6400 Kg	Rs.60	Rs.50
13.5	2	Yes	1500	4000 Kg	RS.60	Rs.50

Two members are involved in 35 families
 Three members are involved in 17 families
 Four members are involved in 15 families
 Five members are involved in four families
 Seven members are involved in two families

Contractor pays Rs 40 to 50 per 40 kg.
 Direct Selling fetches 50 to 70 per 40 kg

Total No of coal production in year 2002- 4, 91, 240 Kg

Appendix V.

Working Pattern

HH No	No of Permit Holders	Labour under permit holder	Place of work
1.1	No	Yes	Own Village
1.2	No	Yes	Own Village
1.3	No	Yes	Own Village
1.4	No	Yes	Own Village
1.5	No	Yes	Own Village
1.6	No	Yes	Own Village
1.7	No	Yes	Own Village
1.8	No	Yes	Own Village
1.9	No	Yes	Own Village
1.10	No	Yes	Own Village
1.11	No	Yes	Own Village
1.12	No	Yes	Own Village
2.1	No	Yes	Own Village
2.2	No	Yes	Own Village
2.3	No	Yes	Own Village
2.4	No	Yes	Own Village
2.5	No	Yes	Own Village

2.6	No	Yes	Own Village
2.7	No	Yes	Own Village
2.8	No	Yes	Own Village
3.1	No	Yes	Own Village
3.2	No	Yes	Own Village
3.3	No	Yes	Own Village
3.4	No	Yes	Own Village
3.5	No	Yes	Own Village
4.1	No	Yes	Own Village
4.2	No	Yes	Own Village
4.3	No	Yes	Own Village
4.4	No	Yes	Own Village
5.1	No	Yes	Own Village
5.2	No	Yes	Own Village
5.3	No	Yes	Own Village
5.4	No	Yes	Own Village
5.5	No	Yes	Own Village
6.1	No	Yes	Own Village
6.2	No	Yes	Own Village
6.3	No	Yes	Own Village
6.4	No	Yes	Own Village
6.5	No	Yes	Own Village
7.1	No	Yes	Nearby village
7.2	No	Yes	Nearby village
7.3	No	Yes	Nearby village
7.4	No	Yes	Nearby village
7.5	No	Yes	Nearby village
8.1	No	Yes	Nearby village
8.2	No	Yes	Own Village
8.3	No	Yes	Own Village
8.4	No	Yes	Own Village
8.5	No	Yes	Own Village
9.1	No	Yes	Own Village
9.2	No	Yes	Nearby village
9.3	No	Yes	Nearby village
9.4	No	Yes	Nearby village
9.5	No	Yes	Nearby village
10.1	No	Yes	Nearby village
10.2	No	Yes	Nearby village
10.3	No	Yes	Nearby village
10.4	No	Yes	Nearby village
10.5	No	Yes	Nearby village
11.1	No	Yes	Own Village
11.2	No	Yes	Own Village
11.3	No	Yes	Own Village
11.4	No	Yes	Own Village
11.5	No	Yes	Own Village
12.1	No	Yes	Nearby village

12.2	No	Yes	Nearby village
12.3	No	Yes	Nearby village
12.4	No	Yes	Own Village
12.5	No	Yes	Own Village
13.1	No	Yes	Nearby village
13.2	No	Yes	Nearby village
13.3	No	Yes	Nearby village
13.4	No	Yes	Own Village
13.5	No	Yes	Own Village

No permit holders in the village

28.27 % work in nearby villages

73.31% work in their own villages

Appendix VI.

Procedural Awareness.

HH No	Info about documents	Difficulties faced
1.1	No	
1.2	No	B,C,E
1.3	Partial	B,C
1.4	No	
1.5	No	B,C
1.6	Partial	B,F
1.7	Partial	F
1.8	No	D,C,E
1.9	No	C,E,B
1.1.0	No	B,C,E
1.11	No	B,E
1.12	No	D,E,B
2.1	Partial	
2.2	Partial	
2.3	Partial	
2.4	No	B,C,D
2.5	No	E

2.6	No	A,B
2.7	No	B,C,D
2.8	No	B,C,E
3.1	Partial	
3.2	No	
3.3	No	
3.4	Partial	
3.5	No	D,E,B
4.1	No	D,E,B
4.2	No	D,E,B
4.3	No	
4.4	Partial	
5.1	No	B,E,D
5.2	No	E,B,C
5.3	No	D,C,B,A
5.4	No	B,D,C
5.5	No	C,D,E
6.1	No	A,B,C
6.2	No	D,E,B
6.3	No	B,D,C
6.4	No	B,C
6.5	No	C,D,E
7.1	No	C,D,E
7.2	No	C
7.3	No	B,C
7.4	No	C
7.5	No	C,B,D
8.1	No	C,
8.2	No	C,B,D
8.3	No	C,D
8.4	No	E,C
8.5	No	C,D,B
9.1	No	C,D,E
9.2	No	C,D,E
9.3	No	B,C
9.4	No	B,C,D
9.5	No	A,D,E
10.1	No	B,D,E
10.2	No	D,B,E,C
10.3	No	B,D,C,E
10.4	No	B,D,C,E
10.5	No	B,D,C,E
11.1	No	B,D
11.2	No	B,D,E
11.3	No	B,D,C
11.4	No	D,B,E
11.5	No	A,D,B
12.1	No	C,B

12.2	No	D,C
12.3	No	C,D,E
12.4	No	C,B,E
12.5	No	C,D,E
13.1	No	C,B
13.2	No	C,E
13.3	No	B,C
13.4	No	C,D
13.5	No	C,B

A- Lengthy Process
B- Financial Constraint
C-Lack of awareness
D- Attitude of the Panchayat
E-Lack of education
F- Harassment by the Forest Department

87.8 % of the respondents were not aware of the procedural information

12.2 % of the respondents had partial information

Appendix VII

HH No	Sale in retail market	Location	Rate (Per 40 Kg)	Info about main markets	Location
1.1	Yes	Rapar	60	Yes	A
1.2	Yes	Rapar	70	Yes	A
1.3	Yes	Rapar	70	Yes	AMB
1.4	Yes	Rapar	70	No	
1.5	Yes	Rapar	60	Yes	RM
1.6	Yes	Rapar	70	Yes	AMB
1.7	Yes	Rapar	60	No	
1.8	Yes	Rapar	70	No	
1.9	Yes	Rapar	60	Yes	AM
1.1.0	Yes	Rapar	60	Yes	A
1.11	Yes	Rapar	60	Yes	AM
1.12	Yes	Rapar	60	Yes	AM
2.1	Yes	Rapar	60	Yes	AMR
2.2	Yes	Rapar	60	Yes	A
2.3	Yes	Rapar	60	Yes	AMR
2.4	Yes	Rapar	60	No	
2.5	No			Yes	AMR

2.6	Yes	Rapar	60	No	
2.7	Yes	Rapar	60	No	
2.8	Yes	Rapar	60	Yes	A
3.1	Yes	Rapar	60	Yes	A
3.2	Yes	Rapar	60	Yes	A,M
3.3	Yes	Rapar	60	Yes	A,M
3.4	Yes	Rapar	60	Yes	A
3.5	No			No	
4.1	Yes	Rapar	60	No	
4.2	Yes	Ramvav	60	No	
4.3	Yes	Rapar	60	No	
4.4	Yes	Rapar	60	No	
5.1	No			Yes	AMR
5.2	No			Yes	AMR
5.3	No			Yes	AMR
5.4	No			Yes	AMR
5.5	No			Yes	AMR
6.1	No			No	
6.2	No			No	
6.3	No			No	
6.4	No			No	
6.5	No			No	
7.1	No			No	
7.2	No			No	
7.3	No			No	
7.4	No			No	
7.5	No			No	
8.1	No			Yes	A,M
8.2	No			Yes	A,M
8.3	No			Yes	AMR
8.4	Yes	Lakadia	60	Yes	MR
8.5	No			No	
9.1	No			No	
9.2	Yes	Lakadia	55 to 60	Yes	AM
9.3	Yes	Lakadia	60	No	
9.4	No			Yes	AMR
9.5	No			Yes	AR
10.1	No			Yes	AMR
10.2	No			Yes	AMR
10.3	No			Yes	AMR
10.4	No			Yes	AMR
10.5	No			Yes	AMR
11.1	No			No	
11.2	No			No	
11.3	No			No	
11.4	No			No	
11.5	No			No	
12.1	No			Yes	AMR

12.2	No			Yes	AMR
12.3	No			No	
12.4	No			No	
12.5	No			No	
13.1	No	Ramvav,Chobari	60	Yes	AM
13.2	No	Ramvav,Chobari	60	Yes	AM
13.3	No	Ramvav,Trambau	60	No	
13.4	No	Ramvav,Chobari	60	Yes	AM
13.5	Yes	Ramvav	60	No	

A- Ahmedabad**M- Morbi****R- Rajkot**

41.8 % sell in the retail market

66.21% Do not sell in the retail market

Rapar, Lakadiya and Ramvav are the local markets

Rate in local market varies from 60 to 70 Rs

50 % of the respondents were not aware of the main markets

50 % of the respondents were aware of the main markets

Ahmedabad, Rajkot and Morbi are the main markets

Glossary:

1. *Kaccha houses*: shelters of a non-permanent nature made out of materials like mud, wood etc.
2. *Rann*: salt marshlands/ desert plains
3. *Sarpanch*: village head
4. *Talati*: village revenue officer
5. *Wandh*: village hamlet or scattered settlement

References:

- 1) Department for International Development (DFID), Managing Prosopis juliflora: A Technical Manual, 2000.
- 2) Gujarat Institute of Desert Ecology, Status of Banni Grassland and Exigency of Restoration Efforts, 1998.