## VII. HOUSEHOLD AND VILLAGE SURVEY

Secondary data was particularly inadequate in capturing the human and socio-economic dimensions of drought. Therefore, we undertook a massive household survey in three blocks that were both drought prone and drought vulnerable. We purposively selected DPAP blocks in order to assess the performance of the programme in these blocks. We also made sure that the blocks fell in different Agro-climatic Regions of Chhattisgarh as per the all-India classification. Hence, these blocks were dry and drought prone and in diverse agro-ecological settings both, by the criteria of our study, as well as that of previous studies. It will be interesting to select blocks that were drought vulnerable but not covered by the DPAP coverage, which we plan to do at a later date.

Thus, Dondi block in the central plain (Durg), Marwahi block towards the northern hills (Bilaspur) and Kondagaon in the Bastar plateau (Bastar) were selected. The tribal peasantry of Dondi has a long history of settled cultivation with the use of plough and embankments, as well as a multiple cropping system of *kharif* and *utera*. Marwahi is a part of the lateritic thin and light soils and is home to many primitive tribes like the *baigas*, whose traditional subsistence came from a combination of slash-and-burn shifting cultivation, hunting and gathering. The British, destroyed this system without providing any alternative. This resulted in widespread destitution and deprivation. Kondagaon represents an intermediate situation between 'peasants' and 'forest dwellers', having both. These differences result in differing manifestation of drought vulnerability.

The villages for the survey were selected on the basis of drought vulnerability and terrain. All these villages report high crop failure and drought-induced out-migration. The field survey was conducted in two phases. In the first phase, group meeting were held in the villages, which were well attended. In the second phase, we undertook household surveys. For the household surveys, a stratified sample was selected from a complete village census on the basis of landholding covering 20 per cent of the population. The immediate objective of the survey was four fold:

1. To estimate and document the impact of drought on various aspects like food, fodder, fuel, water, livelihood security.
2. To examine the causes of drought vulnerability in terms of the resource base of the village and its distribution across residents.
3. To get an idea of the extent of shortfall, in a normal and in a drought year, in the availability of food, fodder, etc.
4. To draw learning points for possible solutions and interventions.

### *7.1 Drought Vulnerability, Land And Water Use And Food Insecurity: Findings Of Survey In Dondi Block*

Dondi falls in Durg district and borders Bastar. The terrain is no longer completely plain. The selected block, i.e. Dondi is on the southeastern ridge of Durg district, roughly 100 kilometers from the headquarters, in the newly formed state of Chhattisgarh. It roughly extends between 80º57'30''E to $81^0$22'30''E longitude to 20º22'30''N to 20º43'30'N latitude. It has been selected under the Drought Prone Areas Programme and as a Tribal Welfare Block. 32 per cent of the families are below the poverty line, and the Gini coefficient of land distribution is 0.74.

The low-lying central belt runs north south through the watershed. Around this plain, the land rises steeply in almost every direction. The highlands on the eastern and western side form a ridge running parallel to each other. The general slope of the watershed is from the southwest to the northeast direction. The central undulating plains are dissected by ridges, which jut out into the plains. The average altitude of these hills ranges between 490m to 550m in the southern part of the region but towards the western part the altitude further rises to 610 m or even higher. It is a hard rock area and a part of the gradually sloping Cudappah or Purana shallow sedimentary beds resting unconformably on Archaen granites and gneisses. 22 percent of the area is under forests, which is nearly 90 per cent of the area under forests in Durg district.

The availability of water, in aggregate terms, is not abysmally low. In a normal year the rainfall ranges from over 800 mm to more than 1400 mm, and in the worst year there was 500 mm of annual precipitation while the highest recorded rainfall in 50 years was 200mm in the average annual rainfall is 1000mm. The interspell duration is high, and the co-efficient of variation is amongst the highest in the state, indicating an uneven and unreliable distribution of rainfall. The rainfall intensity (rainfall per rainy day) is 20mm, which is as high as the high rainfall areas of the state. Given the high gradients, hard rock sub-surface characteristics and low percolation, there is massive and rapid run-off of rainwater and the streams are susceptible to flash flooding. There is also late commencement of sowing rains and early termination

As mentioned earlier, the main drainage channel, the Tandula River flows in a southwest to northeast direction through the central plains. The Tandula River drains into the Tandula Reservoir in the northeast, while its tributary i.e. the Kinyakasa *nala* drains towards the west into the Boirdih Reservoir. Both the rivers remain dry during the non-rainy seasons with a narrow water channel at the center. There are several non-perennial and some perennial tanks within the region. Most of the small shallow reservoirs dry up during the summer season. The drainage pattern in the hilly regions is radial in nature but they join the tributaries at right angles as they are structurally guided by the under lying hard rock structure.

The villages falling in the low gradient zone are Gujra, Adjal and Khalari. The mid-gradient villages are Jamih, Kurubhat, and Dhobani (A). Tekadhodha and Puttarwahi are the high gradient villages.

### 7.1.1 *Low Gradient Villages*

1. Gujra

In Gujra, as indeed in most villages, the forest land has been encroached upon, and was either degraded or denuded. Still, Gujra retains high forest cover. Most of the southern and eastern parts of the village are fully covered by dense forest. During the survey, we also found some patches of degraded forest in the western and northern parts. During our biomass survey we found 135-155 big and small trees in three different locations of 15 plots. The total area so covered was 1 sq. km. though the village forest was dense; inhabitants the neighboring eight villages met their daily requirement from this forest. If some protective measures are not undertaken quickly, and this situation allowed to continue unabated, within a few years we might witness further denudation. Since the forest fulfills the fuel, fodder, NTFP, and wood needs of

all the neighbouring villages which have lost their forest cover the long term viability of the standing cover in Gujra, remains threatened and precarious. Vegetative cover on the farm bund was high in comparison to other neighboring villages. But within the village there was unequal vegetative cover on the farm bunds on different plots. The southern and eastern parts had far more trees on farm bunds, with about 6-7 trees per acre. In the central parts about 4-5 trees were found, and the figure fell to 2-3 trees as we moved westwards.

*Kanhar*[56] is the dominant soil type in the village. Almost all the land in the western and northern parts and one-third in the southern part of the village were covered by *kanhar* soil. It was found in patches also in the northwestern, central and southern parts. This is followed by *matasi* in central and eastern parts of the village. *Murrum* and *bhata* soils are found in the northeast, the extreme north and the extreme southern parts of the village. Soil depth was medium to high everywhere.

The land was relatively plain compared to other villages. A significant proportion of the area under *bhata* soils was under-utilized and left fallow. There was very sparse or no cover at all on the common land, which can be put to better use. Except for the ridge area and some hillocks in the village, the surface landform is that of rolling plains. There were two 4$^{th}$ order streams flowing in the south to north direction, one about 1300 meters long and the other about 800 meters. Other drainage lines had been encroached upon and converted into *bahara* land except for the first order streams, which lie in the ridge. In all there were five tanks, in the village; of which one was privately owned. All structures were being used for domestic purposes. It was ironical that the new tank (built in 2001), specifically made for irrigation purposes under drought relief works, remained dry even during the rains because of its bad location. If the village community had been taken into confidence while selecting the site, this tank for rainwater harvesting structure could have served the villagers better in their agricultural work. This problem arose because most of the suitable land was under private ownership. There were 7 private bore wells, with whose help a few farmers could harvest take a second crop in *rabi*, including paddy.

Unlike that in other parts of the region, the social composition of Gujra village was far more cosmopolitan and represented a larger range of castes, tribes and religious groups. People from 16 different castes and communities lived in the village, including Muslims and Brahmins. However, the socio-economic profile was in keeping with that in the rest of the region. By virtue of their land-holding and per capita income the Gonds and Halwas (Scheduled Tribes) are the dominant groups. The Brahmins (upper castes) are landless and do not own even a small plot to build their own houses, and live on common land. The rural artisans and Scheduled Castes like Nai, Satnami[57], Raut[58], Mahar, as elsewhere, do not own sufficient land to eke out a sustainable livelihood, falling back on inadequate income from traditional occupations. Thus, while both Adivasis and Scheduled Castes suffer from poverty and lack of livelihood, the causes are different in both cases.

[56] *Kanhar* is the local term for clayey soils, *matasi* for sandy-loam, *dorsa* for clayey-loam, *bhata* is sandy, *kachhar* is alluvium-colluvium, *murrum* is coarse sandy cum disintegrated rock
[57] Cobblers
[58] Cowherds/goatherds

2. Adjal

As in the other villages, the forestland in Adjal is covered by sparse vegetation. There is dense forest cover only in the southeastern part of the village. The remaining forestland has been converted either into agricultural fields, or village grazing land or open scrubland. Vegetation on the farm bund is very low too, with an average of 3-4 trees per acre. Slopes in the village are not very high, except in the ridge area and on a few hillocks. The rest of the land is relatively plain. *Matasi* is the most dominant soil type in this village found in the southern and northeastern parts of the village. *Bhata* soil, is found in the northern and central parts, while *murrum* is found in the ridge area and the northwest. *kanhar* is lighter in texture than in other parts of the block and restricted to the area adjoining the drainage line. Soil depth is as in other plains villages, varying from medium to high. As in Gujra, in Adjal too there is in urgent need of measures to control rapid soil erosion in the ridge area, which has very low vegetative cover and loose soil; the topsoil of the ridge is already severely eroded.

During our survey we found heavy silt deposition in the water harvesting structures and those agricultural fields that were closer to drainage lines. Although these have been depicted most clearly on toposheets, one $4^{th}$ order stream and one $3^{rd}$ order stream, and some $1^{st}$ and $2^{nd}$ order streams could be located on the ground only near the ridge area because most of the drainage network has been converted into private *bahara* land. There were seven water harvesting structures and one *nala* diversion scheme on the Tedhagi *nala,* whose irrigation potential was about 100 acres of land. However actual irrigation was far lower for two reasons: the gate of the diversion was broken and the submergence area and the canals were heavily silted. Therefore, lack of catchment area and drainage line treatment to check siltation and disregard for operational and maintenance investment have lowered utilization.

Another irrigation tank was unviable due to poor site selection, resulting in inadequate catchment. In all there were 179 households in the village, comprising 89 Halwas, 63 Gonds, 11 Raut, 5 Marar, 4 Nisad, 3 Nais, 3 Sahus and 1 *Lohar*. Among these eight communities the Halwas and Gonds were dominant in most aspects, which includes numbers, land holding and employment in the non-farming sectors. Members of the remaining 27 households worked as daily wage agricultural labour in Adjal itself or in the nearby semi-urban village of Kusumkasa. In the lean period they collected firewood and sold it in the nearby town or worked as daily wage labour in Kusumkasa. This is clearly an inadequate basket of livelihood strategies and they migrate in search of work after the *kharif* crop is harvested every year.

Table 7.1: Cropping Pattern in Adjal and Gujra[59]

| Soil | Tikri | Doli | Bharrie | Bahara | Bunds |
|---|---|---|---|---|---|
| *Kanhar* | | Short duration Paddy | Urad, Kodon, Kutki, Short term fallow | Long duration Paddy, *Utera* (Lakdi, Alsi, Lakh, Batra) | Arhar, Tilli, Jirra Bhaaji, Vegetables like beans, tubers, etc. |
| *Kachhar*[60] | | | Long term Fallow | Long duration Paddy, *Utera* | Arhar, Tilli, Jirra Bhaaji, Vegetables like beans, tubers, etc. |
| *Matasi* | Long duration Paddy, *Rabi* (wheat, gram, paddy with help of diversion canal and Borewell) | Short duration Paddy | Urad, Kodo | Long duration Paddy, *Rabi* (wheat and gram) | Arhar, Tilli, Jirra Bhaaji, Vegetables like beans, tubers, etc. |
| *Bhata* | | | Arhar, Till, Jirra Bhaaji | | |
| *Murrum* | | | Arhar, Till, Jirra Bhaaji | | |

3. Khalari

Khalari, the northern most village in our selection, lies just above the Tandula Reservoir. For this reason a significant proportion of the agricultural land and common property resources lie submerged under water for a good part of the year. It is possible to turn this to some advantage. The farmer can lease land from the irrigation department and when the water recedes use the soil moisture to plant a second crop of vegetable, gram, wheat during *rabi*. Though important, yet this is not always possible due to various reasons. When the water level in the reservoir is high the water does not recede on time for *rabi* sowing. When the rainfall is deficient, then the reservoir fills far below normal capacity, and there is not enough soil moisture to sustain a *rabi* crop. In addition the irrigation department insists on a three-year lease for these lands irrespective of whether or not cultivation is possible.

This submergence has given rise to a higher proportion of small farmers and a completely different agricultural pattern. Although agriculture is still the main source of livelihood, the main season has shifted from *kharif* to *rabi*. Even the feasibility of this depends on rainfall, perhaps far more than perhaps even paddy. When possible farmers cultivate *rabi* crops like wheat and gram followed by seasonal vegetables. Apart from this, the remaining agricultural land is under long duration paddy followed by *utera* (Table 7.2).

As much of the forestland lies submerged in the Tandula reservoir, the standing forest cover and vegetation are extremely low. Vegetative cover on farm bunds is also not high at 2-3 trees per acre. Except for the ridge area and hillocks, most of the village landform is rolling plains. The

[59] Note: *Tikri* is the local word used for upland; *Bharrie* is the local word used for midland; *Bahara* is the local word used for lowland farms and *Doli* is the local word used to describe small bunded plots prepared in the uplands
[60] *Kachhar* is not found in Adjal

dominant soil types are *matasi* and *kanhar,* except in the forest and hill regions where *murrum* is found. The soil depth is medium to high.

The main drainage is the Tandula river, along with 2-3 3rd order streams that drain into Tandula reservoir after passing through Khalari village. But these streams do not pass through the agricultural lands in the selected two hamlets, and therefore, cannot be accessed by the farmers of these hamlets. Apart from these culminating streams, most of the local drainage network lies under farms.

Of the three hamlets in Khalari we surveyed two hamlets — Kumar para and Bhalu para, which fell within our watershed area. There were 191 households in all these two places, consisting of 48 *Halwa*, 46 *Nisad*[61], 27 *Gond,* 26 *Kumhar* and 20 *Raut* families, along with a few *Lohar*[62], *Nai*[63], *Mahar, Sahu*[64] and *Gadariya*[65] families. Average land size for all communities was very small. People were therefore were dependant upon land leases in the Tandula submergence area. The main sources of income were from owned holdings, traditional caste-based work and daily wage labour.

The *Gonds* and *Halwas* were the dominant communities, owning a major part of the un-submerged agricultural land. Other communities were almost fully dependent upon their traditional caste-based work, like the *Nisad* community that is fully dependent upon the Tandula Reservoir for fishing. They had formed a fishing co-operative society, through which not only *Nisad* but also other communities were engaged in fishing, in portion leased from the irrigation department. The *Kumhars* and *Rauts* followed their traditional work as well as fishing and cultivating the leased land. The rest of the communities depended on their traditional work or on daily wage labour.

***Table 7.2: Cropping Pattern in Khalari***

| Soil | *Tikri* | *Doli* | *Bharrie* | *Bahara* | Bunds | Tandula submergence |
|---|---|---|---|---|---|---|
| *Kanhar* | Long duration Paddy, *Utera* (Lakdi, Alsi, Lakh, Batra) | | Urad, Kodon, Kutki | Long duration Paddy, *Utera* (Lakdi, Alsi, Lakh, Batra) | Arhar, Tilli, Jirra Bhaaji, Vegetables like beans, tubers, etc. | Wheat and gram, vegetables like brinjal, tomato, ladyfingers, chilli, etc. |
| *Matasi* | Long duration Paddy | Short duration Paddy | | Long duration Paddy, *Utera* | Arhar, Tilli, Jirra Bhaaji, Vegetables like beans, tubers, etc. | Wheat and gram, vegetables like brinjal, tomato, ladyfingers, chilli, etc. |
| *Murrum* | | | Short term | | | |

[61] Fisher-people
[62] Blacksmith
[63] Barber
[64] Traders/oilsmith
[65] Sheep rearers

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | fallow or kodon and kutki | | | |

### 7.1.2 *Mid Gradient Villages*

1. Jamih

While the *patwari* records for Jamih show more than 50 per cent of total land of the village to be under forest cover, in reality about 20 per cent of the total forest land has been encroached upon by the neighboring village, and about 25 per cent stands denuded and degraded without much vegetation. In our biomass survey we found a total of only 5-10 trees in this part of the forest area. The remaining forest area is comparatively dense. We found 35-105 big and small trees with a girth of more than 20 cm in 15 plots spread over 3 different locations. Numerous species like *sagwan*, *bija*, *kusum*, *karra*, *senha*, bamboo, *babul*, *khair*, *palas*, *mahua*, *semal*, *sajha*, etc were found. Vegetation on farm bunds was negligible, with an average tree cover of 3-5 trees on one acre of land. The central and southern parts of the village are characterized by high gradients, undulations and high slopes; but the rest of the land is rolling plains. The soil in the central and southern parts of the village is predominantly *murrum*, while *matasi* occurs along the drainage lines. Soil depth is low to medium, but in the northern and western parts of the village the soil is *kanhar* and the soil depth is high. The terrain is broken in many parts by rocky outcrops. There is dire need for ridge area treatment, to check the quick run off due to the very low vegetative cover. Some hillocks are completely barren. To make matters worse the soil in this area is very loose (*murrum* and rocky outcrops). The high slopes in the upper reaches of the ridge area compound soil erosion.

A major problem in the village is that almost all the natural drainage network has been encroached upon and converted into private lowland paddy fields (*bahara* land). In the Survey of India toposheet we found two 3$^{rd}$ order streams, each with a length of around 200 to 250 meters. The toposheet also marks 10-15 2$^{nd}$ order streams, but in reality these two have become a part of farmland. During our survey farmers complained about water logging problems on their land; during our investigation we found that all those areas where drainage lines have been sunk in farm plots, water logging was an acute problem during heavy rain. The village has two water harvesting structures: an old, private pond and one new community structure built in 1987. Though there is scope for building more water harvesting structures, almost all the ideal locations are under private ownership. The cropping pattern is as shown in table 7.3.

***Table 7.3: Cropping Pattern Of Jamih***

| Soil | *Tikri* | *Doli* | *Bharrie* | *Bahara* | *Bunds* |
|---|---|---|---|---|---|
| *Kanhar* | Long duration Paddy, *Utera* | Long duration Paddy | Long term Fallow, Urad, Kodon, Kutki | Long duration Paddy, *Utera* (Lakdi, Alsi, Lakh, Batra) | Arhar, Tilli, Jirra Bhaaji, Vegetables like beans, tubers, etc. |
| *Matasi* | Long duration Paddy, *Rabi* (wheat, gram, | Short duration Paddy | Urad, Kodo | Long duration Paddy, *Rabi* (wheat and | Arhar, Tilli, Jirra Bhaaji, Vegetables |

| | | | | | |
|---|---|---|---|---|---|
| | paddy with Borewell) | | | gram) | like beans, tubers, etc. |
| *Bhata* | Corn, vegetables if homestead | | Kodo, Urad | | |
| *Murrum* | | | Waste and Fallow | | |

Out of a total of 33 households, there was 1 *Halwa*, 1 *Kumhar*, 1 *Nissad*, 1 *Sahu* household. The remaining 29 households were *Gond*. Except for families all the remaining households had a poor land resource base, and poor income. The average land holding of the village was less than 2 acres. All the 5 female-headed households were very poor. The differentiation in the land holding within the village was not high and the biggest landholder was a female-headed household with no working members, since she was very old. Most of the time the land was left fallow. Migration was a part of the livelihood strategy of almost all the households in the village, and all reported at least one migrant from amongst its working members. However, this is not always a reflection of distress and we must also look more closely at the type of work they find outside and the wages they receive. That will indicate whether the strategy is out of lack of local opportunities ('push') or due to attractive options outside ('pull'). We found that many people had migrated to take up lowly paid daily labour. This was a clear indication that people migrated out of compulsion, due to lack of employment and livelihood security in their village.

2. Dhobani (A) and Kurubhat

As per the *patwari* records Dhobani (A) and Kurubhat had very little area under forestland, of about 25 hectares and 22 hectares respectively. This was quite low in comparison with the other villages. In reality most of this forestland had been encroached upon or was denuded and degraded. The entire forest area of Dhobani (A) was barren, except for a few *palaas* and *babul* trees and some varieties of local cactus. Dhobani (A) also had very sparse vegetation on private farm bunds.

The terrain of the village is rugged and undulating with few small hillocks scattered around the village. *Murrum* is the most dominant soil, covering about 60 per cent of total land followed by *matasi*, which is located in the lowland of the village. Some areas located towards the higher order drainage line were covered with *kanhar*. The main constraint to agricultural development in this village is the poor quality of soil, which neither retains sufficient soil moisture, nor has the required nutrient value to support long duration paddy. The cropping pattern was essentially a mix of short duration paddy and other dry oilseeds, pulses and coarse cereals (Table 7.4).

***Table 7.4: Cropping Pattern of Dhobani and Kurubhat***

| Soil | *Tikri* | *Doli* | *Bharrie* | *Bahara* | *Bunds* |
|---|---|---|---|---|---|
| *Kanhar* | | | | Long duration Paddy | *Arhar, Tilli, Jirra Bhaaji,* Vegetables like beans, tubers, etc. |
| *Kachhar* | | | | | |
| *Matasi* | Short duration paddy | Short duration Paddy | *Arhar, Tilli, Kodo, Urad,* | Long duration Paddy | *Arhar, Tilli, Jirra Bhaaji,* |

| | | | | | |
|---|---|---|---|---|---|
| | | | *Kutki* | | Vegetables like beans, tubers, etc. |
| *Bhata* | | | *Arhar, Tilli, Kodo, Urad, Kutki* | Short duration Paddy | |
| *Murrum* | Short duration paddy | Short duration paddy | Fallow or *Arhar, Tilli* | | |

The ridge area was totally barren without any vegetation. Though one 4th order stream and three to five 2nd order and 1st order streams existed on the maps, most of them were in the plots, except for the first order streams in the ridge area and the main 4th order *nala* that flows towards Kurubhat. There was one water harvesting structure which was used by the villagers for domestic purposes, and sometimes, for protective irrigation on the nearby fields in Dhobani (A). Though a *nala* diversion scheme existed in Kurubhat village along the Tedhagi *nala*, it irrigated land in Adjal whereas the submergence area was in Kurubhat. Other than these, there were two irrigation tanks, of which one had fallen into disuse, while the other was rather ineffective, as it had a very small catchment area and, hence, insufficient water.

In Kurubhat there were 60 households consisting of 3 communities: 30 *Halwa*, 15 *Gond*, and 15 *Mahar*. Of these 3 communities, *Mahars* were the most backward with respect to land holdings as well as living conditions, which was very bad.

In Dhobani (A) there were 85 households comprising 48 *Halwa*, 20 *Gond*, 8 *Mahar*, 3 *Nisad*, 3 *Raut*, 2 *Lohar* and 1 *Sahu*. *Halwa* and *Gond* were the dominant communities as far as land holding was concerned, but most of their land is covered by *murrum* soil, which has very low productive capacity, of 200 kg to 300 kg of paddy/per acre of land or even less. Nevertheless, in normal years the land was adequate enough to ensure subsistence for their families. In contrast, Scheduled Castes and OBCs had very marginal landholding. For their livelihood they pursued their traditional occupations, which was not adequate to meet their basic subsistence needs. Therefore, daily wage labour was a very crucial secondary or even primary work. Unfortunately this source of livelihood was not dependable or plentiful, and these people were unable to find work every day, because the labour force is larger than the required work force. Therefore seasonal migration is an annual occurrence. Not only do the lower caste families migrate. At least one person from each house migrates after harvesting.

### 7.1.3 *High Gradient Villages*

1.Puttarwahi

As per *patwari* records, in Puttarwahi about 35 hectares land is under Protected and Reserved Forests and 8 hectares are under open scrubland. In reality there is little standing cover. When entering the village we see the whole village surrounded by hills and hillocks, but almost all of them are either covered by small plants, typically local cactus, or are totally barren. We were told that in the early nineties almost all the trees were cut down, often by villagers, and sold as firewood in the local market (about 4-5 km away in Dalli Rajhara and Chikhalakasa). In 1994-95 the inhabitants decided to replant the forest area under the 'Narmada Sagar Pariyojana'.

About 15 hectares of land was planted and certain rules formulated to protect this area. According to these rules no household of the village would cut any tree, for domestic or for any other purpose. This entire village of about 130 households was totally dependent upon Tekadhodha, Adjal and Gujra village forests. During our survey we found *sagwan*, *khamar*, *sisam, senha* and *karra* in the plantation areas, whereas in other forest areas we found only *phasa* and *babul* trees scattered about the farm bunds. In Puttarwahi the farm bunds had negligible vegetation.

The terrain is markedly rugged and undulating, and is surrounded by hills and hillocks, and the agricultural land is like terraces on hills rather than plots on plains. Only the northwestern part of the village is relatively plain. A hillock divides the village into two separate hamlets: Puttarwahi main and Kharitola.

The village has very poor and shallow soils - *murrum* and *murrum* mixed soils are the dominant soil types in the village. *Matasi* soil is found in the scattered lowlands in southern, central and northern parts of the village, while *bhata* farms are left unbunded. Some *kanhar* soil is found along the *nala* bed. The cropping pattern is shown in Table 7.5.

Dongaghat and Tedhagi *nalas* start from the Puttarwahi hills. Tedhagi starts from the southern hills of Puttarwahi and flows in the southwestern part of the village and the Dongaghat *nala* starts from the central and northeast hills of the village and flows in the eastern side of the village towards the north. There are three tanks, which are used for domestic purposes. These are essentially filled by the rainwater draining from the village streets rather than any local streams.

***Table 7.5: Cropping Pattern of Puttarwahi***

| Soil | *Tikri* | *Doli* | *Bharrie* | *Bahara* | *Bunds* |
|---|---|---|---|---|---|
| *Kanhar* | | | | Long duration Paddy, *Utera* (*Lakdi, Alsi, Lakh, Batra*) | *Arhar, Tilli, Jirra Bhaaji*, Vegetables like beans, tubers, etc. |
| *Matasi* | Short duration Paddy | Short duration Paddy | *Urad, Kodo, kulthy* and short duration fallow | Long duration Paddy, *Utera* (*Lakdi, Alsi, Lakh, Batra*) | *Arhar, Tilli, Jirra Bhaaji*, Vegetables like beans, tubers, etc. |
| *Bhata* | | | *Urad, Kodo, kulthy* and short duration fallow | | |
| *Murrum* | | | Long duration fallow, *kodo,urad* | | |

The village consists of two separate hamlets of about 129 households. The *Halwas* and *Gonds* dominate not only in numbers, but also where land ownership and living standards are concerned. Both the *Lohar* and *Nai* houses, do not have any land to plough and the *Rauts* are

marginal farmers. Members of all four castes go to the nearby town of Dalli Rajhara for daily wage labour.

2. Tekadhodha

Tekadhodha is one of the few villages in Dondi where almost all the forestland is covered by vegetation, not only in the records, but also on the ground. But the density of vegetation is not even throughout. Species like *Sajha*, *Bija*, *Tendu*, *Salai*, *Monde*, *Sagawan*, *Birah*, *Kusum*, *Mahua*, *Amla*, *Harra*, *Bahara*, *Palas*, *Khair*, etc. were found. During our biomass survey we came across 45-120 trees of all these species over fifteen different plots over an area of 1 sq. km.

Though vegetation was sparse on farm bunds, *bharrie* had dense vegetation, and appeared more like a forest plot rather than private land. Here too the forest faced the problem of over use, because residents of neighbouring villages like Puttarwahi, Dhobani (A), Kurubhat, Adjal and Khalari used it to meet their domestic needs, including that of firewood and wood for house building. In the lean period almost all the families in this village took to selling firewood in Dalli Rajhara market. Many admitted that they dislike this but were compelled by a total lack of other alternatives. This must be seen in light of the abysmally low wages of less than half the statutory minimum wage on the average for agricultural labour.

Unlike Puttarwahi, which has a highly uneven and rugged surface with undulations, Tekadhoda is situated entirely on the steep slope of a hill, and has terraced farms. Near the forest area on the ridge the slopes are high and soil depth is very low with loose *bhata* soil as the dominant soil cover. The depth of soil increases and textures become finer as one moves towards the settlement. Approximately half the total land of the village is under *bhata* soils. *Murrum* is located essentially in the ridge and forest areas. While *matasi* and *kanhar* soil are located in very few places alongside drainages. There were two main 3$^{rd}$ order *nalas*, both joining Dongaghat. Almost all the small local drainage network had been encroached upon and converted into private *bahara* land.

As the dominant soil type is *bhata*, which is shallow on very high slopes, severe soil erosion has occurred despite dense vegetation. During our survey we found a stop dam, made about 5 years back, on Dongaghat *nala* which hadsilt deposition hence the water in the drainage line did not flow into the *nala* but spilt into private agricultural land. Therefore, it was necessary that the entire ridge area as well as the drainage lines along the 1$^{st}$ and 2$^{nd}$ order streams be treated under a watershed approach. The village had two stop dams on the Dongaghat *nala*. Besides these, there was no other water harvesting structures in the village for daily domestic needs. People depended on Dongaghat *nala* during the monsoons and on private wells at other times.

Short duration paddy was among the major crops, and in the unbunded uplands and midlands coarse cereal, *kodo*, *kutki* and *madiya* were cultivated (Table 7.6). Long duration paddy was cultivated only in the small patch of *bahara* land along Dongaghat *nala*, with the help of the *nala* water. Depending on the September and October rainfall in normal rainfall years farmers planted

an *utera* crop. A significant amount of private land lay fallow wherever uplands are covered by *bhata* soils. Almost all the households had homestead land, on which they cultivated maize, vegetables, etc.

***Table 7.6: Cropping Pattern of Tekadhoda***

| Soil | *Tikri* | *Doli* | *Bharrie* | *Bahara* | *Bunds* |
|---|---|---|---|---|---|
| *Kanhar* | | | | Long duration Paddy, *Utera* (*Lakdi*, *Alsi*, *Lakh*, *Batra*) | *Arhar*, *Tilli*, *Jirra Bhaaji*, Vegetables like beans, tubers, etc. |
| *Matasi* | Short duration Paddy | Short duration Paddy | *Urad*, *Kodo*, *kulthy* and short duration fallow | Long duration Paddy, *Utera* (*Lakdi*, *Alsi*, *Lakh*, *Batra*) | *Arhar*, *Tilli*, *Jirra Bhaaji*, Vegetables like beans, tubers, etc. |
| *Bhata* | Short duration Paddy | Short duration Paddy | *Urad*, *Kodo*, *kulthy* and Long duration fallow | Short duration Paddy | |
| *Murrum* | | Short duration Paddy, maize and vegetable | Long duration fallow, *kodo*, *urad* | | |

Tekadhodha village is divided into three hamlets, namely Tekadhodha, Marai and Hathighoda. There were 146 households in all, comprising 76 *Halwa*, 47 *Gond*, 10 *Mahar*, 4 *Raut*, 4 *Marar*, 2 *Lohar*, 1 *Sahu*, 1 *Pandit* and 1 *Gadariya*. Though *Halwas* and *Gonds* were the dominant communities, however, there was not much differentiation in the land holding Apart from 3 to 4 households that had about 10 acres land, the average land holding was less than 3 acres per household and, nearly 50 per cent of land was under *bharrie*, which often lies fallow.

### *7.1.4 Farming Situations*

Land location in terms of gradient and landform, and land preparation, land use and farm location relative to the drainage network together combine in constructing the terminology that has evolved to describe farming situations and land types. All unbunded land or land that has not been converted to paddy fields is called *bharrie*, which is found usually found in the midlands and uplands. For this reason, it is used synonymously with midland. Bunded land is called *tikri* in the upland and *bahara* in the lowlands. A very crucial difference between *tikri* and *bahara* is that, in the absence of irrigation, *tikri* depends fully on self-catchment for its water sources, and lies in the first and second order stream areas where the rain falls first and tends to run off rapidly. On the other hand *bahara* lies in areas where the higher order streams flow at a lower rate. Plots that are partially bunded and partially unbunded are called *doli*. These are found usually on uplands or in poor quality soils elsewhere.

***Table 7.7: Land Use Intensity***

| Village Name | Double Cropped Area | Net Sown Area | Gross Cropped Area | Cropping Intensity | Current Fallow | 2-5 Years Fallow | Fallow >5 Years | Total fallows | Percentage Fallows |
|---|---|---|---|---|---|---|---|---|---|
| Adial | 40.15 | 278.50 | 318.65 | 1.14 | 16.04 | 25.04 | 33.50 | 74.58 | 0.19 |
| Jamih | 14.80 | 81.02 | 95.82 | 1.18 | 18.67 | 10.35 | 25.12 | 54.14 | 0.36 |
| Tekadhada | 29.71 | 257.10 | 286.81 | 1.12 | 20.23 | 25.60 | 22.45 | 68.28 | 0.19 |
| Khalari | 0.35 | 444.40 | 444.75 | 1.00 | 4.54 | 10.80 | 12.15 | 27.49 | 0.06 |
| Gujara | 0.45 | 345.30 | 345.75 | 1.00 | 26.84 | 52.30 | 20.40 | 99.54 | 0.22 |
| Kurubhat | 12.37 | 77.50 | 89.87 | 1.16 | 37.28 | 16.67 | 19.50 | 73.45 | 0.45 |
| Dhobani | 14.60 | 154.02 | 168.62 | 1.09 | 12.75 | 10.40 | 10.06 | 33.21 | 0.16 |
| Puttarwahi | 18.16 | 238.65 | 256.81 | 1.08 | 36.66 | 28.00 | 25.36 | 90.02 | 0.26 |

Note: All data is in hectares
Source: *Patwari* Land use records

As far as soil is concerned, its depth, quality and texture usually follow the landform: in the steeper and more sloping areas, the soils are shallower, coarser and lighter. However, where thick vegetative cover is present in the uplands, heavier soils are sometimes found. In the uplands *kanhar* is very rich and has high humus content due to the proximity to forests. However, *kanhar* in the high gradient uplands it is of little advantage, as the slope and the high rainfall intensity result in high run off, leading, in turn, to low soil-moisture retention. On the other hand, *kanhar* in the lowlands is often very poorly drained. Though the few, but intensive, rainstorms interspersed with long dry spells point to the need to stop rainwater with the help of high dykes or farm bunds, in the clayey lowlands this results in water logging. Even in absence of the dykes the drainage is poor. This is the reason why *dorsa* is considered ideal for paddy, and even *matasi* is preferred. Farmers repeatedly told us that, often, the best soils were left fallow or became wastelands, depending upon the gradient.

It is not always the case that land in the uplands or plots with poorer soils are left fallow. Land is left fallow for a variety of reasons. One is to do with traditional crop rotation and agricultural practices directed towards enhancing the productive capacity of the soil. In such systems land is left fallow once every few years, depending upon soil type, quality and depth. Irrigation has altered this substantially, and land with regular or reliable access to irrigation is rarely left fallow. Another important determinant in leaving land fallow is proximity to the settlement, which determines ease of supervision and management. This is especially applicable in areas where wild animals are known to cause severe crop damage.

### *7.1.5 Cropping Systems*

We found that, broadly the following six cropping systems were prevalent:

a. Monocropping, where short duration paddy is grown in *kharif* and then the land is left fallow.

b. Monocropping, where long duration paddy is grown in *kharif* and then the land is left fallow.
c. Monocropping of rier crops like oilseeds, pulses and coarse grain in *kharif* or *rabi*
d. Traverse intercropping, where long duration paddy is grown in *kharif*, and then the next crop is planted in between the standing *kharif* crop under *utera*
e. Traverse intercropping where short duration paddy is grown in *kharif* and then the next crop is planted in between the standing *kharif* crop under *utera*
f. Double cropping, where long duration paddy is grown in *kharif* and then field preparation, ploughing and resowing for *rabi* are undertaken.

The prevalence of different cropping systems depends upon the length of stable growing period (time of commencement of the sowing rains, interspell period, quantum of rain) September-October rainfall, soil, land location and infrastructure. All farmers obviously prefer the long duration paddy - *utera* and long duration paddy-*rabi* combinations because of higher productivity. The former is what they usually cultivate. These two types of cropping systems are essentially possible in lowlands (*Bahara*) where there is preferably *kanhar* or *matasi* soil, because the second crop needs water in the form of irrigation or soil moisture. As we have discussed earlier on, areas in the low land and soils like *kanhar* and *matasi* can retain moisture for longer durations. In addition there is a higher possibility of pumping water from *nalas* and wells in the lowland. Though rare in the uplands, these are completely absent from the unbunded fields and midlands.

The mono-cropping system of long duration paddy and short duration paddy is cultivated either on high moisture holding soils (*kanhar* and *matasi*) in the uplands, or on soils with low water holding capacity (*bhata* and *murrum*) in the lowlands. The monocropping system of pulses and oilseeds is a feature of the unbunded upland areas with *kanhar*, or of unbunded midland and lowland areas with *bhata* and *murrum* soil. Cropping of coarse cereals is practiced on bunded *bhata* or *murrum* soil.

Often farmer after suffer great loss on account of a long dry spell after sowing, which inhibits germination of the paddy. In such an event, they have to replant by broadcast of short duration paddy due to failure of long duration paddy. The growing period for short duration paddy is 60-90 days and it can be sown even after the failure of rains since the first sowing. However, the limitation is that this variety has lower yields per acre and a higher stock to grain ratio. Long duration paddy requires a growing period of 120 days with adequate soil moisture. When successful, this variety has high yields. The traditional crops of *alsi, tili* and mustard continue to be the oilseeds grown in this area these are grown under unirrigated dry conditions in most places. While mustard and *alsi* are grown as *utera* and *rabi* crops, *tili* is grown on farm bunds or on unbunded land during *kharif*.

The pulses predominantly grown in this area are *urad, arhar, lakdi, lak, mung, battra, chana, kulthy, masoor*. Of these, *urad* is the only crop grown in both *rabi* and *kharif*. Others like *lak, lakdi, battra* are grown as *utera*, and *chana, mung, kulthy* are grown during *rabi*. *Arhar* is grown during *kharif* on farm bunds or unbunded lands. Other coarse cereals that are grown in this area

| *Table 7.8: Land Use Pattern* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Village Name** | **Area** | **Percentage Forest** | **Percentage Culturable Waste Land** | **Gross Cropped Area** | **Gross Irrigated Area** | **Percentage Irrigation** | **Percentage well irrigated** | **Percentage Tank Irrigated** |
| Gujra | 679.74 | 26.94 | 2.00 | 429.48 | 0.00 | 0.00 | | |
| Khalari | 924.53 | 42.98 | 0.78 | 474.15 | 60.00 | 12.65 | | 100.00 |
| Kurubhat | 172.72 | 1.37 | 9.33 | 148.68 | 0.00 | 0.00 | | |
| Dhobani | 222.88 | 0.24 | 16.52 | 176.75 | 0.00 | 0.00 | | |
| Jamih | 285.36 | 26.76 | 0.00 | 133.96 | 1.84 | 1.37 | 100.00 | |
| Adjal | 642.74 | 10.48 | 27.06 | 352.23 | 61.56 | 17.48 | | 100.00 |
| Tekadhoda | 941.73 | 7.98 | 54.72 | 310.32 | 0.74 | 0.24 | 100.00 | |
| Putarwahi | 468.27 | 7.62 | 8.71 | 321.78 | 2.56 | 0.80 | 100.00 | |

are *kodo, kutki, madia* and *makka*, and are all sown during *kharif*. *Kodo, kutki* and *madia* are grown on the unbunded lands, while *makka* is cultivated on the homestead land.

Note: All data is in hectares
Source: Census of India

Mono cropping of the coarse cereals and pulses is a type of cropping system restricted largely to unbunded *kanhar* and *matasi* soils in the uplands and unbunded *bhata* and *murrum* in mid and lowlands. Crops grown under this system during *kharif* and *rabi* require land preparation and ploughing. It is observed that in the absence of assured irrigation the cropping strategy is shaped by all those factors that determine soil moisture retention and length of growing period.

We can make the following two conclusions as far as policy interventions are concerned, both arising from the specific conditions of the tribals and the Scheduled Castes. The first one concerns the land owning tribals who are predominantly small and middle farmers. Under the present backward agricultural production conditions of low productivity they cannot produce enough to sustain themselves. The development of agriculture would be a necessary condition to enforce livelihood security. The second concerns the Scheduled Castes. For those Scheduled Castes who own land, the size of holding is usually marginal. Many amongst them are also landless. People from these communities are more dependent on incomes from their traditional occupations. Therefore, interventions that are designed to enhance the livelihood security for people from this group must have a very strong employment generation and labour absorption component.

### *7.1.6 Workforce Characteristics*

***Table 7.9: Percentage of Workforce Dependent on Different Industrial/Sectoral Categories***

| Village Name | ADP | Forest | Mining | HH_Indy | Non_ HH_ Indy | Manufacturing | Services | Marginal | WPR |
|---|---|---|---|---|---|---|---|---|---|
| Gujra | 78 | 2 | 8 | 2 | 1 | 3 | 10 | 8 | 49 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Khalari | 83 | 4 | 1 | 5 | 1 | 6 | 6 | 1 | 53 |
| Jamih | 79 | 7 | 7 | 4 | 1 | 6 | 1 | 7 | 49 |
| Kurubhat | 88 | 0 | 2 | 0 | 0 | 0 | 11 | 16 | 42 |
| Dhobani | 86 | 1 | 3 | 3 | 1 | 4 | 4 | 14 | 45 |
| Adjal | 93 | 1 | 1 | 0 | 0 | 1 | 4 | 3 | 55 |
| Tekadhoda | 89 | 1 | 5 | 0 | 1 | 1 | 4 | 0 | 49 |
| Putarwahi | 93 | 1 | 2 | 0 | 3 | 3 | 2 | 0 | 57 |

Note: ADP: Agriculture dependent population=cultivators + agricultural labourers; HH_Indy: Household Industry; Non-HH_Indy: Non household Industry; WPR: Workforce Participation Rate

Table 7.9 indicates, that the villages are largely dependent on agriculture. Kurubhat and Dhobani have a large percentage of marginal workers. The nearby iron ore mines in Dalli Rajhara provide a small amount of jobs, supporting a small percentage of the workforce. Villages with a high artisan population also have higher percentage of household industry based workforce. Still, this is a predominantly agriculture dependent workforce.

### 7.1.7 Agricultural Labour

During the survey we came across four different types of agricultural labour systems practiced in this village.

1. **Exchange of collective agricultural labour** among the small and medium farmers. Generally households possessing this type of land holding exchanged their labour, usually, but not always, without kind and cash payments and provided the afternoon meal. However, this is not always the standard labour exchange system. Sometimes payment is made, either in cash or in kind. Specific families of small and middle farmers usually enter into labour exchange arrangements among themselves. This means that there is assured labour at the prevailing wage rate. It should be noted that actual payment of wages in cash and kind usually takes place in such arrangements.

2. **Labour guarantee,** whereby big farmers of these villages often entered into an arrangement with a family, or several families, wherein they are committed to provide agricultural labour for all the standard operations as and when required during the crop cycle. The employer is committed to hiring members from these families before seeking other labourers. The wages are not fixed before hand and are the ones prevalent at the time of work. Although this contract does not entail an annual payment, it does assure labour availability at peak seasons for the employer given the low likelihood of alternatives emerging, the labourers see no choice and, in fact welcome assured employment as they tend to their holdings as well. The bigger farmers entered into an arrangement with members of marginal and landless households to provide agricultural labour at the rates prevailing at the time of hiring. This gives an element of security, both, to employer and employee.

3. The more standard **permanent farm servant system,** although in our sample we found only one such case.

4. Daily wage labour at the prevalent local wage rates

We also found several permanent labour and personalized contracts, which do not involve bondage and indebtedness, made by the poor for the simple reason that this assures employment in an otherwise dismal labour market. This is more so when the possibility of farm employment is very bleak. Therefore, it is our contention that attached labour of this kind is not exploitative.

***Table 7.10: Ethno-Demographic Profile***

| Ethno –Demographic Profile | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Village Name | Popln_ Density | Sex Ratio | Under 6 Sex Ratio | Over 7 Sex Ratio | SC Sex Ratio | ST Sex Ratio | Perc_SC | Perc_ST | Over 7 Literacy _Male | Male Literacy | Over 7 Literacy Female | Female Literacy | Over 7 Literacy | Literacy |
| Gujra | 1.87 | 975 | 969 | 977 | 700 | 991 | 3 | 70 | 75 | 60 | 37 | 30 | 56 | 45 |
| Khalari | 2.06 | 1052 | 950 | 1027 | 867 | 966 | 11 | 30 | 66 | 55 | 27 | 22 | 46 | 38 |
| Jamih | 0.51 | 1028 | 929 | 1052 | | 1016 | 0 | 88 | 59 | 47 | 21 | 18 | 39 | 32 |
| Kurubhat | 1.75 | 1134 | 1121 | 1138 | 1050 | 1116 | 18 | 78 | 70 | 54 | 43 | 33 | 55 | 43 |
| Dhobani | 2.07 | 1044 | 885 | 1092 | 760 | 1103 | 10 | 80 | 72 | 56 | 31 | 25 | 51 | 40 |
| Adjal | 1.42 | 1141 | 971 | 1196 | 625 | 1133 | 1 | 84 | 70 | 53 | 33 | 26 | 50 | 39 |
| Tekadhoda | 0.81 | 1008 | 804 | 1073 | 902 | 1019 | 10 | 85 | 62 | 47 | 27 | 22 | 44 | 34 |
| Putarwahi | 1.48 | 1017 | 790 | 1088 | | 1015 | 0 | 97 | 74 | 56 | 29 | 24 | 50 | 40 |

Notes:

1. Popln_Density: - Population Density in persons/sq km; SC Sex Ratio: - Sex Ratio of Scheduled Caste; ST Sex Ratio: - Sex Ratio of Scheduled Tribes; Perc_SC: Percentage of Scheduled Caste population; Perc_ST: - Percentage Scheduled Tribe population
2. All literacy data is in percentages, all ratios are of 'women per thousand men'

With the exception of Khalari, most villages in the area were overwhelmingly tribal (Table 7.10). The proportion of Scheduled Castes in the total population was highest in Kurubhat, where they constitute a fifth of the population, followed by Khalari, Dhobani and Tekadhoda. It is well documented that historically this tribal areas have had higher gender ratios than non-tribal areas. However, this has undergone reversal in recent decades. The same is evident here. However, the disturbing feature is that the under 6 sex ratio is worse in all villages, and for all social groups. This reflects the poorer health and nutritional status of the girl child, since female foeticide or infanticide was not a factor. Another distressing feature is the systematically lower sex ratio in the Scheduled Caste population.

In Gujra literates as a proportion of total population do not exceed 45 per cent, which is 56 per cent if calculated as a percentage of the population over 7 years of age. Female literacy rates are far below this, almost half of this in most places (Table 7.10). Therefore, although the sex ratio

is higher than in non-tribal areas, the status of the girl child in terms of both survival and education is extremely vulnerable.

### 7.1.8 *Land Distribution*

Table 7.11 gives the pattern of land ownership in the eight villages surveyed:

***Table 7.11: Class Wise Distribution of Landholdings***

| | Household | | Landownership | | Average Size of Holdings |
|---|---|---|---|---|---|
| | Number | Percentage | Amount in acres | Percentage | |
| **Jamih** | | | | | |
| Landless | 3 | 9.68 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 1 | 3.23 | 0.56 | 0.71 | 0.56 |
| Small (1-5 acre) | 24 | 77.42 | 54.07 | 68.62 | 2.25 |
| Middle (5-10 acres) | 3 | 9.68 | 24.17 | 30.67 | 8.06 |
| Large (>10 acres) | 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***Total*** | **31** | | **78.80** | | 2.81 |
| **Gujra** | | | | | |
| Landless | 29 | 11.60 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 16 | 6.40 | 9.63 | 1.23 | 0.60 |
| Small (1-5 acre) | 168 | 67.20 | 431.57 | 55.01 | 2.57 |
| Middle (5-10 acres) | 26 | 10.40 | 175.60 | 22.38 | 6.75 |
| Large (>10 acres) | 11 | 4.40 | 167.80 | 21.39 | 15.25 |
| ***Total*** | **250** | | **784.60** | | 3.55 |
| **Adjal** | | | | | |
| Landless | 13 | 7.26 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 9 | 5.03 | 4.71 | 0.71 | 0.52 |
| Small (1-5 acre) | 120 | 67.04 | 328.11 | 49.24 | 2.73 |
| Middle (5-10 acres) | 31 | 17.32 | 239.55 | 35.95 | 7.73 |
| Large (>10 acres) | 6 | 3.35 | 94.00 | 14.11 | 15.67 |
| ***Total*** | **179** | | **666.37** | | 4.01 |
| **Khalari** | | | | | |
| Landless | 21 | 10.99 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 28 | 14.66 | 15.58 | 4.30 | 0.56 |
| Small (1-5 acre) | 136 | 71.20 | 298.70 | 82.39 | 2.20 |
| Middle (5-10 acres) | 5 | 2.62 | 36.25 | 10.00 | 7.25 |
| Large (>10 acres) | 1 | 0.52 | 12.00 | 3.31 | 12.00 |
| ***Total*** | **191** | | **362.53** | | 2.13 |
| **Kurubhat** | | | | | |
| Landless | 3 | 5.00 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 5 | 8.33 | 3.58 | 1.61 | 0.72 |
| Small (1-5 acre) | 37 | 61.67 | 100.14 | 45.06 | 2.71 |
| Middle (5-10 acres) | 12 | 20.00 | 78.25 | 35.21 | 6.52 |
| Large (>10 acres) | 3 | 5.00 | 40.25 | 18.11 | 13.42 |
| ***Total*** | **60** | | **222.22** | | 3.96 |

| | Household | | Landownership | | Average Size of Holdings |
|---|---|---|---|---|---|
| | Number | Percentage | Amount in acres | Percentage | |
| **Dhobani (A)** | | | | | |
| Landless | 8 | 9.41 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 9 | 10.59 | 6.25 | 2.52 | 0.69 |
| Small (1-5 acre) | 59 | 69.41 | 165.27 | 66.64 | 2.80 |
| Middle (5-10 acres) | 7 | 8.24 | 47.50 | 19.15 | 6.79 |
| Large (>10 acres) | 2 | 2.35 | 29.00 | 11.69 | 14.50 |
| ***Total*** | **85** | | **248.02** | | 3.22 |
| **Tekadhodha** | | | | | |
| Landless | 6 | 4.11 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 7 | 4.79 | 4.50 | 0.78 | 0.64 |
| Small (1-5 acre) | 105 | 71.92 | 303.83 | 52.81 | 2.89 |
| Middle (5-10 acres) | 22 | 15.07 | 171.00 | 29.72 | 7.77 |
| Large (>10 acres) | 6 | 4.11 | 96.00 | 16.69 | 16.00 |
| ***Total*** | **146** | | **575.33** | | 4.11 |
| **Puttarwahi** | | | | | |
| Landless | 13 | 10.08 | 0.00 | 0.00 | 0.00 |
| Marginal (<1acre) | 7 | 5.43 | 4.40 | 0.74 | 0.63 |
| Small (1-5 acre) | 68 | 52.71 | 207.55 | 34.70 | 3.05 |
| Middle (5-10 acres) | 29 | 22.48 | 214.80 | 35.91 | 7.41 |
| Large (>10 acres) | 12 | 9.30 | 171.40 | 28.66 | 14.28 |
| ***Total*** | **129** | | **598.15** | | 5.16 |

Note: Average size of holdings excludes the landless

Small farmers dominate numerically as well as in terms of the land owned by them in all the selected villages except Puttarwahi, where middle farmers own marginally more land. The proportion of landless in the households increases from 4.11 percent in Tekadhodha to 5 per cent in Kurubhat, 7.26 per cent in Adjal, 9.41 per cent in Dhobani (A), 9.68 per cent in Jamih, 10.08 per cent in Puttarwahi, 10.99 per cent in Khalari and 11.60 per cent in Gujra. Large farmers have a significant presence in landholding in Kurubhat, Gujra and Puttarwahi where they constitute 5 per cent, 4.40 per cent and 9.30 per cent of total cultivators respectlively and own over a fifth of the land. Inequality in land distribution is highest in Gujra and Kurubhat.

The average size of holdings is also an important determinant of sustainable and self-sufficient livelihood. The highest average holdings are in Puttarwahi (5.16 acres) while the lowest are in Khalari (2.13 acres). It is important to note that Khalari has the highest number of small and marginal landholdings, whereas in Puttarwahi the middle and large farmers are present in larger numbers and own more of the land.

***Table 7.12: Caste Wise Land Distribution***

| | Household | Household (%) | Landownership | Landownership (%) |
|---|---|---|---|---|
| Jamih | | | | |
| *Gond* | 26 | 83.87 | 60.98 | 77.39 |
| *Halwa* | 2 | 6.45 | 10.82 | 13.73 |
| *Kumhar* | 1 | 3.23 | 3.00 | 3.81 |
| *Nisad* | 1 | 3.23 | 1.00 | 1.27 |
| *Sahu* | 1 | 3.23 | 3.00 | 3.81 |
| *Total* | 31 | | 78.80 | |
| Gujra | | | | |
| *Bairagi* | 3 | 1.20 | 2.48 | 0.32 |
| *Gadriya* | 1 | 0.40 | 5.00 | 0.64 |
| *Ganda* | 4 | 1.60 | 2.50 | 0.32 |
| *Gond* | 33 | 13.20 | 113.82 | 14.51 |
| *Halwa* | 143 | 57.20 | 513.32 | 65.42 |
| *Kumhar* | 1 | 0.40 | 0.00 | 0.00 |
| *Lohar* | 7 | 2.80 | 4.75 | 0.61 |
| *Mahar* | 1 | 0.40 | 2.50 | 0.32 |
| *Muslim* | 8 | 3.20 | 28.55 | 3.64 |
| *Nai* | 1 | 0.40 | 0.00 | 0.00 |
| *Pandit* | 2 | 0.80 | 1.50 | 0.19 |
| *Panika* | 1 | 0.40 | 3.25 | 0.41 |
| *Rajput* | 1 | 0.40 | 4.00 | 0.51 |
| *Raut* | 10 | 4.00 | 23.50 | 3.00 |
| *Sahu* | 29 | 11.60 | 77.53 | 9.88 |
| *Satnami* | 5 | 2.00 | 1.90 | 0.24 |
| *Total* | 250 | | 784.60 | |
| Adjal | | | | |
| *Gond* | 63 | 35.20 | 272.11 | 40.83 |
| *Halwa* | 89 | 49.72 | 329.71 | 49.48 |
| *Lohar* | 1 | 0.56 | 0.00 | 0.00 |
| *Mahar* | 5 | 2.79 | 17.65 | 2.65 |
| *Nai* | 3 | 1.68 | 0.00 | 0.00 |
| *Nisad* | 4 | 2.23 | 3.90 | 0.59 |
| *Raut* | 11 | 6.15 | 39.50 | 5.93 |
| *Sahu* | 3 | 1.68 | 3.50 | 0.53 |
| *Total* | 179 | | 666.37 | |
| Khalari | | | | |
| *Costa* | 3 | 1.57 | 4.75 | 1.31 |
| *Gadariya* | 6 | 3.14 | 9.03 | 2.49 |
| *Ganda* | 7 | 3.66 | 8.50 | 2.34 |
| *Gond* | 27 | 14.14 | 52.30 | 14.43 |
| *Halwa* | 48 | 25.13 | 142.60 | 39.33 |
| *Kumhar* | 26 | 13.61 | 49.45 | 13.64 |
| *Lohar* | 2 | 1.05 | 0.00 | 0.00 |

***Table 7.12: Caste Wise Land Distribution (contd)***

| | Household | Household (%) | Landownership | Landownership (%) |
|---|---|---|---|---|
| *Nai* | 1 | 0.52 | 0.00 | 0.00 |
| *Pandit* | 1 | 0.52 | 0.00 | 0.00 |
| *Nisad* | 46 | 24.08 | 67.20 | 18.54 |
| *Raut* | 20 | 10.47 | 18.30 | 5.05 |
| *Sahu* | 4 | 2.09 | 10.40 | 2.87 |
| *Total* | 191 | | 362.53 | |
| Kurubhat | | | | |
| *Gond* | 15 | 25.00 | 73.55 | 33.10 |
| *Halwa* | 31 | 51.67 | 123.87 | 55.74 |
| *Mahar* | 14 | 23.33 | 24.80 | 11.16 |
| *Total* | 60 | | 222.22 | |
| Dhobani (A) | | | | |
| *Gond* | 20 | 23.53 | 69.48 | 28.01 |
| *Halwa* | 48 | 56.47 | 147.68 | 59.54 |
| *Lohar* | 2 | 2.35 | 3.00 | 1.21 |
| *Mahar* | 8 | 9.41 | 19.01 | 7.66 |
| *Nisad* | 3 | 3.53 | 5.50 | 2.22 |
| *Raut* | 3 | 3.53 | 3.35 | 1.35 |
| *Sahu* | 1 | 1.18 | 0.00 | 0.00 |
| *Total* | 85 | | 248.02 | |
| Tekadhoda | | | | |
| *Gadaria* | 1 | 0.68 | 0.00 | 0.00 |
| *Gond* | 47 | 32.19 | 239.13 | 41.56 |
| *Halwa* | 76 | 52.05 | 256.45 | 44.57 |
| *Lohar* | 2 | 1.37 | 0.00 | 0.00 |
| *Mahar* | 10 | 6.85 | 47.97 | 8.34 |
| *Mangia* | 4 | 2.74 | 19.00 | 3.30 |
| *Pandit* | 1 | 0.68 | 5.00 | 0.87 |
| *Raut* | 4 | 2.74 | 4.40 | 0.76 |
| *Sahu* | 1 | 0.68 | 3.38 | 0.59 |
| *Total* | 146 | | 575.33 | |
| Puttarwahi | | | | |
| *Gond* | 36 | 27.91 | 198.70 | 33.22 |
| *Halwa* | 89 | 68.99 | 395.95 | 66.20 |
| *Lohar* | 1 | 0.78 | 0.00 | 0.00 |
| *Nai* | 1 | 0.78 | 0.00 | 0.00 |
| *Raut* | 2 | 1.55 | 3.50 | 0.59 |
| *Total* | 129 | | 598.15 | |

It is observed that *Halwas* and *Gonds*, both adivasi groups dominate as far as landownership is concerned (Table7.12 and Table 7.13). By and large, their presence in the population corresponds to the percentage of land owned by them. Among the non-adivasi landowning families, those from *Mahar* and *Nisad* castes own small plots. These two castes are considered intermediate and lower in the hierarchy than adivasis, and are Scheduled Castes. *Nisads* in

Jamih constitute 3.23 per cent of the households but own only 1.27 of the land, while in Adjal they constitute 2.23 per cent of the population and own 0.59 per cent of the land. They constitute a far higher proportion of households in Khalari (24 per cent) but own only 18 per cent of the land, while in Kurubhat *Mahars* form 23 per cent of the population and own 11 per cent of the land.

In general, it is seen that Scheduled Castes own smaller plot of land, and account for a far smaller share in landholdings in villages where they are landed. The proportion of Scheduled Castes is higher in the villages in the mid- and lowlands, and here they are either predominantly landless, or are small and marginal farmers. In the same villages, the non-Scheduled Castes (usually adivasis) display a more even distribution of landholding.

*Table 7.13: Caste Composition of Surveyed Villages (Percentage)*

| Caste | Jamih | Gujra | Adjal | Khalari | Kurubhat | Dhobani (A) | Tekadhodha | Puttarwahi |
|---|---|---|---|---|---|---|---|---|
| *Bairagi* | 0 | 0.9 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Costa* | 0 | 0 | 0 | 1.92 | 0 | 0 | 0 | 0 |
| *Gadariya* | 0 | 1.03 | 0 | 2.93 | 0 | 0 | 0.33 | 0 |
| *Ganda* | 0 | 1.1 | 0 | 3.66 | 0 | 0 | 0 | 0 |
| *Gond* | 85.06 | 13.09 | 34.97 | 11.81 | 32.31 | 28.27 | 35.4 | 33.04 |
| *Halwa* | 4.55 | 58.13 | 49.33 | 26.74 | 47.91 | 54.05 | 47.79 | 64.56 |
| *Kumhar* | 2.6 | 0.34 | 0 | 13.46 | 0 | 0 | 0 | 0 |
| *Lohar* | 0 | 2.48 | 0.45 | 0.82 | 0 | 0.83 | 0.77 | 0.51 |
| *Mahar* | 0 | 0.34 | 0.62 | 0 | 19.78 | 8.32 | 9.07 | 0 |
| *Mangia* | 0 | 0 | 0 | 0 | 0 | 0 | 2.54 | 0 |
| *Marar* | 0 | 0 | 2.23 | 0 | 0 | 0 | 0 | 0 |
| *Muslim* | 0 | 3.65 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Nai* | 0 | 0.41 | 1.69 | 0.46 | 0 | 0 | 0 | 0.76 |
| *Nisad* | 3.25 | 0 | 2.14 | 25.82 | 0 | 4.37 | 0 | 0 |
| *Pandit* | 0 | 0.9 | 0 | 0.27 | 0 | 0 | 1 | 0 |
| *Panika* | 0 | 0.34 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Rajput* | 0 | 0.28 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Raut* | 0 | 3.93 | 7.85 | 9.62 | 0 | 3.33 | 2.21 | 1.14 |
| *Sahu* | 4.55 | 11.09 | 0.71 | 2.47 | 0 | 0.83 | 0.88 | 0 |
| *Satnami* | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

The land in these villages appears in upland, midland and lowland situations, and land location is as important (if not more) as landownership (Table 7.14). Ownership of the best located-lands is another issue of considerable importance in determining livelihood security and drought vulnerability. In these case too, it is the *Halwas* and *Gonds* who own most of the land in lowland location. Small plots cut out of the upland farmlands are usually good locations for short duration paddy if the soil has adequate depth and soil moisture retentive capacity. In fact, such bunded uplands are usually characterized by deeper and more clayey and loamy soils. The *Gonds* and Halwas too predominantly own such plots. It is only in Khalari that *Nisads* own land in the lowlands to any significant extent (Table 7.15).

*Table 7.14: Land Type Village Wise*

| Name of the village | Land Ownership (acres) | *Tikri* | | *Bharrie* | | *Doli* | | *Bahara* | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Acres** | **Percentage** | **Acres** | **Percentage** | **Acres** | **Percentage** | **Acres** | **Percentage** |
| **LOW GRADIENT** | | | | | | | | | |
| Gujra | 784.60 | 353.88 | 45.10 | 222.37 | 28.34 | 144.30 | 18.39 | 64.05 | 8.16 |
| Adjal | 666.37 | 154.25 | 23.15 | 255.76 | 38.38 | 168.36 | 25.26 | 92.05 | 13.81 |
| Khalari | 362.53 | 143.40 | 39.56 | 48.75 | 13.45 | 118.13 | 32.58 | 52.00 | 14.34 |
| **MID GRADIENT** | | | | | | | | | |
| Jamih | 78.80 | 23.13 | 29.35 | 23.00 | 29.19 | 16.14 | 20.48 | 15.50 | 19.67 |
| Kurubhat | 222.22 | 43.49 | 19.57 | 76.56 | 34.45 | 83.25 | 37.46 | 18.42 | 8.29 |
| Dhobani (A) | 248.02 | 47.85 | 19.29 | 100.55 | 40.54 | 76.56 | 30.87 | 23.16 | 9.34 |
| **HIGH GRADIENT** | | | | | | | | | |
| Tekadhodha | 575.33 | 95.78 | 16.65 | 193.95 | 33.71 | 150.10 | 26.09 | 135.50 | 23.55 |
| Puttarwahi | 598.15 | 69.00 | 11.54 | 302.75 | 50.61 | 147.15 | 24.60 | 78.70 | 13.16 |

*Table 7. 15: Land Location: Caste Wise*

| Caste | Land Ownership (acres) | Land Ownership Percentage | *Tikri* | | *Bharrie* | | *Doli* | | *Bahara* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Acres** | **Percentage** | **Acres** | **Percentage** | **Acres** | **Percentage** | **Acres** | **Percentage** |
| **Jamih** | | | | | | | | | | |
| *Gond* | 60.98 | 77.39 | 18.56 | 30.44 | 17.50 | 28.70 | 11.14 | 18.27 | 12.75 | 20.91 |
| *Halwa* | 10.82 | 13.73 | 3.07 | 28.37 | 2.50 | 23.11 | 3.50 | 32.35 | 1.75 | 16.17 |
| *Kumhar* | 3.00 | 3.81 | 1.00 | 33.33 | 1.50 | 50.00 | 0.50 | 16.67 | 0.00 | 0.00 |
| *Nisad* | 1.00 | 1.27 | 0.50 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 50.00 |
| *Sahu* | 3.00 | 3.81 | 0.00 | 0.00 | 1.50 | 50.00 | 1.00 | 33.33 | 0.50 | 16.67 |
| ***Total*** | **78.80** | **100.00** | **23.13** | **29.35** | **23.00** | **29.18** | **16.14** | **20.48** | **15.50** | **19.67** |
| **Gujra** | | | | | | | | | | |
| *Bairagi* | 2.48 | 0.32 | 2.48 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Gadriya* | 5.00 | 0.64 | 3.50 | 70.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.50 | 30.00 |
| *Ganda* | 2.50 | 0.32 | 0.00 | 0.00 | 1.50 | 60.00 | 1.00 | 40.00 | 0.00 | 0.00 |
| *Gond* | 113.82 | 14.51 | 54.07 | 47.50 | 33.00 | 28.99 | 17.00 | 14.94 | 9.75 | 8.57 |
| *Halwa* | 513.32 | 65.42 | 225.65 | 43.96 | 150.27 | 29.27 | 100.35 | 19.55 | 37.05 | 7.22 |
| *Kumhar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Lohar* | 4.75 | 0.61 | 4.75 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Mahar* | 2.50 | 0.32 | 0.00 | 0.00 | 1.00 | 40.00 | 1.50 | 60.00 | 0.00 | 0.00 |
| *Muslim* | 28.55 | 3.64 | 16.50 | 57.79 | 6.55 | 22.94 | 2.50 | 8.76 | 3.00 | 10.51 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Pandit* | 1.50 | 0.19 | 0.50 | 33.33 | 1.00 | 66.67 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Panika* | 3.25 | 0.41 | 2.50 | 76.92 | 0.75 | 23.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Rajput* | 4.00 | 0.51 | 1.50 | 37.50 | 2.50 | 62.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Raut* | 23.50 | 3.00 | 11.75 | 50.00 | 9.75 | 41.49 | 2.00 | 8.51 | 0.00 | 0.00 |
| *Sahu* | 77.53 | 9.88 | 30.38 | 39.18 | 16.05 | 20.70 | 18.35 | 23.67 | 12.75 | 16.45 |
| *Satnami* | 1.90 | 0.24 | 0.80 | 42.11 | 0.50 | 26.32 | 0.60 | 31.58 | 0.00 | 0.00 |
| ***Total*** | **784.60** | **100.00** | **354.38** | **45.17** | **222.87** | **28.40** | **143.30** | **18.26** | **64.05** | **8.16** |

***Table 7.15: Land Location: Caste wise (contd.)***

| Caste | Land Ownership (acres) | Land Ownership Percentage | *Tikri* | | *Bharrie* | | *Doli* | | *Bahara* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| **Adjal** | | | | | | | | | | |
| *Gond* | 272.11 | 40.83 | 62.30 | 22.90 | 108.60 | 39.91 | 58.51 | 21.50 | 46.75 | 17.18 |
| *Halwa* | 329.71 | 49.48 | 81.55 | 24.73 | 115.51 | 35.03 | 97.45 | 29.56 | 35.20 | 10.68 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Mahar* | 3.00 | 0.45 | 0.00 | 0.00 | 2.20 | 73.33 | 0.80 | 26.67 | 0.00 | 0.00 |
| *Marar* | 14.65 | 2.20 | 2.15 | 14.68 | 3.50 | 23.89 | 5.50 | 37.54 | 1.50 | 10.24 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nisad* | 3.90 | 0.59 | 0.00 | 0.00 | 3.60 | 92.31 | 0.30 | 7.69 | 0.00 | 0.00 |
| *Raut* | 39.50 | 5.93 | 8.25 | 20.89 | 18.85 | 47.72 | 3.80 | 9.62 | 8.60 | 21.77 |
| *Sahu* | 3.50 | 0.53 | 0.00 | 0.00 | 1.50 | 42.86 | 2.00 | 57.14 | 0.00 | 0.00 |
| ***Total*** | **666.37** | **100.00** | **154.25** | **23.14** | **253.76** | **38.08** | **168.36** | **25.26** | **92.05** | **13.81** |
| **Khalari** | | | | | | | | | | |
| *Costa* | 4.75 | 1.31 | 0.00 | 0.00 | 0.50 | 10.53 | 3.25 | 68.42 | 1.00 | 21.05 |
| *Gadariya* | 9.03 | 2.49 | 6.50 | 71.98 | 0.50 | 5.54 | 2.03 | 22.48 | 0.00 | 0.00 |
| *Ganda* | 8.50 | 2.34 | 7.00 | 82.35 | 1.00 | 11.76 | 0.50 | 5.88 | 0.00 | 0.00 |
| *Gond* | 52.30 | 14.43 | 21.40 | 40.92 | 5.70 | 10.90 | 21.20 | 40.54 | 4.00 | 7.65 |
| *Halwa* | 142.60 | 39.33 | 50.50 | 35.41 | 22.30 | 15.64 | 45.15 | 31.66 | 24.65 | 17.29 |
| *Kumhar* | 49.45 | 13.64 | 27.60 | 55.81 | 2.40 | 4.85 | 10.45 | 21.13 | 9.00 | 18.20 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Pandit* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nisad* | 67.20 | 18.54 | 21.15 | 31.47 | 10.05 | 14.96 | 25.65 | 38.17 | 10.10 | 15.03 |
| *Raut* | 18.30 | 5.05 | 3.00 | 16.39 | 5.30 | 28.96 | 8.00 | 43.72 | 2.00 | 10.93 |
| *Sahu* | 10.40 | 2.87 | 6.25 | 60.10 | 1.00 | 9.62 | 1.90 | 18.27 | 1.25 | 12.02 |
| ***Total*** | **362.53** | **100.00** | **143.40** | **39.55** | **48.75** | **13.44** | **118.13** | **32.58** | **52.00** | **14.34** |
| **Kurubhat** | | | | | | | | | | |
| *Gond* | 73.55 | 33.10 | 11.55 | 15.70 | 29.70 | 40.38 | 23.80 | 32.36 | 8.50 | 11.56 |
| *Halwa* | 123.87 | 55.74 | 25.40 | 20.51 | 39.50 | 31.89 | 49.25 | 39.76 | 9.22 | 7.44 |
| *Mahar* | 24.80 | 11.16 | 6.54 | 26.37 | 7.36 | 29.68 | 10.20 | 41.13 | 0.70 | 2.82 |
| ***Total*** | **222.22** | **100.00** | **43.49** | **19.57** | **76.56** | **34.45** | **83.25** | **37.46** | **18.42** | **8.29** |
| **Dhobani (A)** | | | | | | | | | | |
| *Gond* | 69.48 | 28.01 | 14.70 | 21.16 | 23.37 | 33.64 | 27.56 | 39.67 | 3.85 | 5.54 |
| *Halwa* | 147.68 | 59.54 | 31.25 | 21.16 | 59.73 | 40.45 | 41.60 | 28.17 | 15.20 | 10.29 |
| *Lohar* | 3.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 100.00 | 0.00 | 0.00 |
| *Mahar* | 19.01 | 7.66 | 1.90 | 9.99 | 12.25 | 64.44 | 2.40 | 12.62 | 2.46 | 12.94 |
| *Nisad* | 5.50 | 2.22 | 0.00 | 0.00 | 2.50 | 45.45 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Raut* | 3.35 | 1.35 | 0.00 | 0.00 | 1.00 | 29.85 | 1.35 | 40.30 | 0.65 | 19.40 |
| *Sahu* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***Total*** | **248.02** | **100.00** | **47.85** | **19.29** | **98.85** | **39.85** | **75.91** | **30.60** | **22.16** | **8.93** |
| **Tekadhoda** | | | | | | | | | | |
| *Gadaria* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Gond* | 239.13 | 41.56 | 39.75 | 16.62 | 85.88 | 35.91 | 64.25 | 26.87 | 49.25 | 20.60 |
| *Halwa* | 256.45 | 44.57 | 31.15 | 12.15 | 75.60 | 29.48 | 76.85 | 29.97 | 72.85 | 28.41 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

*Table 7.15: Land Location: Caste wise (contd.)*

| Caste | Land Ownership (acres) | Land Ownership Percentage | *Tikri* | | *Bharrie* | | *Doli* | | *Bahara* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| *Mahar* | 47.97 | 8.34 | 15.00 | 31.27 | 18.97 | 39.55 | 7.50 | 15.63 | 6.50 | 13.55 |
| *Mangia* | 19.00 | 3.30 | 6.50 | 34.21 | 5.00 | 26.32 | 1.50 | 7.89 | 6.00 | 31.58 |
| *Pandit* | 5.00 | 0.87 | 0.00 | 0.00 | 5.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Raut* | 4.40 | 0.76 | 0.00 | 0.00 | 3.50 | 79.55 | 0.00 | 0.00 | 0.90 | 20.45 |
| *Sahu* | 3.38 | 0.59 | 3.38 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***Total*** | **575.33** | **100.00** | **95.78** | **16.64** | **193.95** | **33.71** | **150.10** | **26.08** | **135.50** | **23.55** |
| **Puttarwahi** | | | | | | | | | | |
| *Gond* | 198.70 | 33.22 | 13.75 | 6.92 | 115.70 | 58.23 | 40.85 | 20.56 | 27.85 | 14.02 |
| *Halwa* | 395.95 | 66.20 | 55.25 | 13.95 | 184.55 | 46.61 | 105.30 | 26.59 | 50.85 | 12.84 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Raut* | 3.50 | 0.59 | 0.00 | 0.00 | 2.50 | 71.43 | 1.00 | 28.57 | 0.00 | 0.00 |
| ***Total*** | **598.15** | **100.00** | **69.00** | **11.53** | **302.75** | **50.61** | **147.15** | **24.60** | **78.70** | **13.15** |

*Table 7.16: Land Location: Class Wise*

| Classes | Total Ownership | | *Tikri* | | *Bharrie* | | *Doli* | | *Bahara* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| **Jamih** | | | | | | | | | | |
| Marginal | 0.56 | 0.71 | 0.56 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Small | 54.07 | 68.62 | 19.82 | 36.66 | 16.50 | 30.52 | 11.00 | 20.34 | 6.75 | 12.48 |
| Middle | 24.17 | 30.67 | 2.75 | 11.38 | 6.50 | 26.89 | 5.14 | 21.27 | 8.75 | 36.20 |
| Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***Total*** | **78.8** | **100.00** | **23.13** | **29.35** | **23.00** | **29.18** | **16.14** | **20.48** | **15.50** | **19.67** |
| **Gujra** | | | | | | | | | | |
| Marginal | 9.63 | 1.23 | 6.93 | 71.96 | 0.90 | 9.35 | 1.30 | 13.50 | 0.50 | 5.19 |
| Small | 431.57 | 55.01 | 193.95 | 44.94 | 122.62 | 28.41 | 91.05 | 21.10 | 23.95 | 5.55 |
| Middle | 175.60 | 22.38 | 75.75 | 43.14 | 53.60 | 30.52 | 25.45 | 14.49 | 20.80 | 11.85 |
| Large | 167.80 | 21.39 | 77.25 | 46.04 | 45.25 | 26.97 | 26.50 | 15.79 | 18.80 | 11.20 |
| ***Total*** | **784.60** | **100.00** | **353.88** | **45.10** | **222.37** | **28.34** | **144.30** | **18.39** | **64.05** | **8.16** |
| **Adjal** | | | | | | | | | | |
| Marginal | 4.71 | 0.71 | 1.05 | 22.32 | 0.60 | 12.75 | 2.56 | 54.30 | 0.50 | 10.63 |
| Small | 328.11 | 49.24 | 70.10 | 21.36 | 112.26 | 34.21 | 98.00 | 29.87 | 46.80 | 14.26 |
| Middle | 239.55 | 35.95 | 60.60 | 25.30 | 102.90 | 42.96 | 44.80 | 18.70 | 36.25 | 15.13 |
| Large | 94.00 | 14.11 | 22.50 | 23.94 | 40.00 | 42.55 | 23.00 | 24.47 | 8.50 | 9.04 |
| ***Total*** | **666.37** | **100.00** | **154.25** | **23.14** | **255.76** | **38.38** | **168.36** | **25.26** | **92.05** | **13.81** |
| **Khalari** | | | | | | | | | | |
| Marginal | 15.58 | 4.30 | 4.00 | 25.67 | 0.80 | 5.13 | 9.48 | 60.85 | 1.30 | 8.34 |
| Small | 298.70 | 82.39 | 122.20 | 40.91 | 40.15 | 13.44 | 96.65 | 32.36 | 39.45 | 13.21 |
| Middle | 36.25 | 10.00 | 11.20 | 30.90 | 7.80 | 21.52 | 8.00 | 22.07 | 9.25 | 25.52 |
| Large | 12.00 | 3.31 | 6.00 | 50.00 | 0.00 | 0.00 | 4.00 | 33.33 | 2.00 | 16.67 |
| ***Total*** | **362.53** | **100.00** | **143.40** | **39.55** | **48.75** | **13.45** | **118.13** | **32.58** | **52.00** | **14.34** |

***Table 7.16: Land Location: Class Wise (Contd.)***

| Classes | Total Ownership | | *Tikri* | | *Bharrie* | | *Doli* | | *Bahara* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| **Kurubhat** | | | | | | | | | | |
| Marginal | 3.58 | 1.61 | 2.06 | 57.54 | 0.00 | 0.00 | 0.70 | 19.55 | 0.82 | 22.91 |
| Small | 100.14 | 45.06 | 21.18 | 21.15 | 33.56 | 33.51 | 41.05 | 40.99 | 4.35 | 4.34 |
| Middle | 78.25 | 35.21 | 10.00 | 12.78 | 30.50 | 38.98 | 28.50 | 36.42 | 8.75 | 11.18 |
| Large | 40.25 | 18.11 | 10.25 | 25.47 | 12.50 | 31.06 | 13.00 | 32.30 | 4.50 | 11.18 |
| ***Total*** | **222.22** | **100.00** | **43.49** | **19.57** | **76.56** | **34.45** | **83.25** | **37.46** | **18.42** | **8.28** |
| **Dhobani (A)** | | | | | | | | | | |
| Marginal | 6.25 | 2.52 | 2.90 | 46.40 | 0.47 | 7.52 | 2.73 | 43.68 | 0.15 | 2.40 |
| Small | 165.27 | 66.64 | 28.25 | 17.09 | 60.58 | 36.66 | 62.63 | 37.90 | 13.91 | 8.42 |
| Middle | 47.50 | 19.15 | 11.70 | 24.63 | 22.50 | 47.37 | 7.70 | 16.21 | 5.60 | 11.79 |
| Large | 29.00 | 11.69 | 5.00 | 17.24 | 17.00 | 58.62 | 3.50 | 12.07 | 3.50 | 12.07 |
| ***Total*** | **248.02** | **100.00** | **47.85** | **19.29** | **100.55** | **40.54** | **76.56** | **30.87** | **23.16** | **9.34** |
| **Tekadhodha** | | | | | | | | | | |
| Marginal | 4.50 | 0.78 | 1.20 | 26.67 | 0.60 | 13.33 | 1.00 | 22.22 | 1.70 | 37.78 |
| Small | 303.83 | 52.81 | 55.58 | 18.29 | 90.85 | 29.90 | 91.10 | 29.98 | 66.30 | 21.82 |
| Middle | 171.00 | 29.72 | 26.00 | 15.20 | 59.50 | 34.80 | 32.00 | 18.71 | 53.50 | 31.29 |
| Large | 96.00 | 16.69 | 13.00 | 13.54 | 43.00 | 44.79 | 26.00 | 27.08 | 14.00 | 14.58 |
| ***Total*** | **575.33** | **100.00** | **95.78** | **16.64** | **193.95** | **33.71** | **150.10** | **26.08** | **135.50** | **23.55** |
| **Puttarwahi** | | | | | | | | | | |
| Marginal | 4.40 | 0.74 | 0.75 | 17.05 | 1.25 | 28.41 | 2.40 | 54.55 | 0.00 | 0.00 |
| Small | 207.55 | 34.70 | 16.35 | 7.88 | 99.65 | 48.01 | 73.15 | 35.24 | 17.40 | 8.38 |
| Middle | 214.80 | 35.91 | 29.25 | 13.62 | 105.10 | 48.93 | 49.35 | 22.97 | 31.20 | 14.53 |
| Large | 171.40 | 28.66 | 22.65 | 13.21 | 96.75 | 56.45 | 22.25 | 12.98 | 30.10 | 17.56 |
| ***Total*** | **598.15** | **100.00** | **69.00** | **11.53** | **302.75** | **50.61** | **147.15** | **24.6** | **78.70** | **13.15** |

If we look in greater depth at the distribution of land locations according to size class of cultivators, we find that over 45 per cent of the agricultural land of Jamih and Gujra is owned by small and marginal farmers, and is in the more vulnerable locations (unbunded uplands and midlands). The figures for Khalari (46 per cent) and Dhobani (37 per cent) are comparable (Table 7.16). This is a very important factor in determining food security and drought vulnerability. The unbunded uplands and the midlands are characterized by rapid run off and low soil moisture retention capacity. In the case of the uplands, where soil quality and depth permits, small plots have been bunded and converted to paddy fields for short duration paddy. For the rest of the upland and midland agricultural land, the practice is to grow long duration dry pulses, oilseeds and coarse grain, which are sturdy but have low productivity. When small and marginal farmers own such lands, two things follow. Firstly, it makes the livelihoods of these cultivators who are primarily agriculture-dependent, extremely precarious. Secondly, the resource-starved cultivator (often in poverty) is unable to break out of an ecologically determined, low-productivity agriculture in an infrastructure-deficient area due to the lack of fund for investment this then perpetuates the vicious cycle of low productivity agriculture and poverty due to the precarious economic condition of the majority of cultivators as well as land. This point is further supported by the fact that in all these villages, small and marginal farmers

also own a large percentage of the land. In fact, in the areas with higher unbunded uplands and midlands the land distribution is less skewed.

Villages with a higher percentage of bunded agricultural land (in lowland and upland) are Tekadhara (49.63per cent), Khalari (46.92per cent) and Kurubhat (45.77per cent). It should be noted that even in the villages where well 'located' lands in terms of terrain are high, they do not exceed half the agricultural land. In the worst case of Gujra, they constitute 26.55 per cent of agricultural land only.

### *7.1.9 Land Use*

***Table 7.17: Land Use Pattern***

| Name of the village | Land ownership | Agriculture | | Fallow>3 years | | Waste land | | Bunded fields | |
|---|---|---|---|---|---|---|---|---|---|
| | Acres | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| **LOW GRADIENT** | | | | | | | | | |
| Gujra | 784.60 | 708.25 | 90.27 | 51.70 | 6.59 | 18.45 | 2.35 | 561.73 | 71.59 |
| Adjal | 666.37 | 527.17 | 79.11 | 108.15 | 16.23 | 29.55 | 4.43 | 411.51 | 61.75 |
| Khalari | 362.53 | 348.83 | 96.22 | 13.20 | 3.64 | 0.50 | 0.14 | 316.73 | 87.37 |
| **MID GRADIENT** | | | | | | | | | |
| Jamih | 78.80 | 75.77 | 96.15 | 2.00 | 2.54 | 1.00 | 1.27 | 54.21 | 68.79 |
| Kurubhat | 222.22 | 188.66 | 84.90 | 33.06 | 14.88 | 0.00 | 0.00 | 143.66 | 64.65 |
| Dhobani (A) | 248.02 | 217.52 | 87.70 | 28.50 | 11.49 | 2.00 | 0.81 | 147.47 | 59.46 |
| **HIGH GRADIENT** | | | | | | | | | |
| Tekadhodha | 575.33 | 458.68 | 79.72 | 88.22 | 15.33 | 28.43 | 4.94 | 381.38 | 66.29 |
| Puttarwahi | 598.15 | 434.40 | 72.62 | 156.15 | 26.11 | 8.00 | 1.34 | 292.40 | 48.88 |

There is a discernible difference in the land use pattern across different types of villages, along more or less expected lines. Higher gradient villages situated at the crest of elevated landforms generally have a lower proportion of bunded fields and higher proportion of fallows than lower gradient and low-lying villages (Table 7.17). This is essentially due to the presence of shallower, lighter soils on steep slopes, with low soil moisture holding capacity and more rapid runoff.

*Table 7.18: Caste Wise Land Use Pattern*

| Caste | Landownership | | Agriculture | | Fallow>3 years | | Waste land | | Bunded fields | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| **Jamih** | | | | | | | | | | |
| *Gond* | 60.98 | 77.39 | 57.95 | 95.03 | 2.00 | 3.28 | 1.00 | 1.64 | 42.45 | 69.61 |
| *Halwa* | 10.82 | 13.73 | 10.82 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.32 | 76.89 |
| *Kumhar* | 3.00 | 3.81 | 3.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.50 | 50.00 |
| *Nisad* | 1.00 | 1.27 | 1.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 100.00 |
| *Sahu* | 3.00 | 3.81 | 3.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.50 | 50.00 |
| ***Total*** | **78.80** | **100.00** | **75.77** | **96.15** | **2.00** | **2.53** | **1.00** | **1.26** | **54.77** | **69.50** |
| **Gujra** | | | | | | | | | | |
| *Bairagi* | 2.48 | 0.32 | 2.48 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.48 | 100.00 |
| *Gadriya* | 5.00 | 0.64 | 5.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 100.00 |
| *Ganda* | 2.50 | 0.32 | 2.50 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 40.00 |
| *Gond* | 113.82 | 14.51 | 98.07 | 86.16 | 13.75 | 12.08 | 2.00 | 1.76 | 80.82 | 71.01 |
| *Halwa* | 513.32 | 65.42 | 465.82 | 90.75 | 28.60 | 5.57 | 15.70 | 3.06 | 362.05 | 70.53 |
| *Kumhar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Lohar* | 4.75 | 0.61 | 4.75 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.75 | 100.00 |
| *Mahar* | 2.50 | 0.32 | 1.50 | 60.00 | 1.00 | 40.00 | 0.00 | 0.00 | 1.50 | 60.00 |
| *Muslim* | 28.55 | 3.64 | 23.50 | 82.31 | 5.05 | 17.69 | 0.00 | 0.00 | 21.50 | 75.31 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Pandit* | 1.50 | 0.19 | 1.00 | 66.67 | 0.00 | 0.00 | 0.50 | 33.33 | 1.00 | 66.67 |
| *Panika* | 3.25 | 0.41 | 3.25 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.50 | 76.92 |
| *Rajput* | 4.00 | 0.51 | 3.00 | 75.00 | 1.00 | 25.00 | 0.00 | 0.00 | 1.50 | 37.50 |
| *Raut* | 23.50 | 3.00 | 19.25 | 81.91 | 1.00 | 4.26 | 0.25 | 1.06 | 13.75 | 58.51 |
| *Sahu* | 77.53 | 9.88 | 76.23 | 98.32 | 1.30 | 1.68 | 0.00 | 0.00 | 62.48 | 80.59 |
| *Satnami* | 1.90 | 0.24 | 1.90 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.40 | 73.68 |
| ***Total*** | **784.6** | **100.00** | **708.25** | **90.26** | **51.70** | **6.58** | **18.45** | **2.35** | **561.73** | **71.59** |
| **Adjal** | | | | | | | | | | |
| *Gond* | 272.11 | 40.83 | 197.56 | 72.60 | 55.10 | 20.25 | 18.95 | 6.96 | 162.41 | 59.68 |
| *Halwa* | 329.71 | 49.48 | 284.56 | 86.31 | 41.75 | 12.66 | 2.40 | 0.73 | 216.20 | 65.57 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Mahar* | 3.00 | 0.45 | 1.80 | 60.00 | 1.20 | 40.00 | 0.00 | 0.00 | 0.80 | 26.67 |
| *Marar* | 14.65 | 2.20 | 9.15 | 62.46 | 4.30 | 29.35 | 1.20 | 8.19 | 9.15 | 62.46 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nisad* | 3.90 | 0.59 | 0.30 | 7.69 | 0.60 | 15.38 | 3.00 | 76.92 | 0.30 | 7.69 |
| *Raut* | 39.50 | 5.93 | 31.30 | 79.24 | 4.20 | 10.63 | 4.00 | 10.13 | 20.65 | 52.28 |
| *Sahu* | 3.50 | 0.53 | 2.50 | 71.43 | 1.00 | 28.57 | 0.00 | 0.00 | 2.00 | 57.14 |
| ***Total*** | **666.37** | **100.00** | **527.17** | **79.11** | **108.15** | **16.23** | **29.55** | **4.43** | **411.51** | **61.75** |
| **Khalari** | | | | | | | | | | |
| *Costa* | 4.75 | 1.31 | 4.75 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.25 | 89.47 |
| *Gadariya* | 9.03 | 2.49 | 8.53 | 94.46 | 0.50 | 5.54 | 0.00 | 0.00 | 8.53 | 94.46 |
| *Ganda* | 8.50 | 2.34 | 8.50 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.00 | 94.12 |
| *Gond* | 52.30 | 14.43 | 51.30 | 98.09 | 1.00 | 1.91 | 0.00 | 0.00 | 47.55 | 90.92 |

*Table 7.18: Caste Wise Land Use Pattern (contd.)*

| Caste | Landownership | | Agriculture | | Fallow>3 years | | Waste land | | Bunded fields | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| *Halwa* | 142.60 | 39.33 | 135.55 | 95.06 | 6.55 | 4.59 | 0.50 | 0.35 | 121.30 | 85.06 |
| *Kumhar* | 49.45 | 13.64 | 47.55 | 96.16 | 1.90 | 3.84 | 0.00 | 0.00 | 47.05 | 95.15 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Pandit* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nisad* | 67.20 | 18.54 | 65.20 | 97.02 | 2.00 | 2.98 | 0.00 | 0.00 | 57.65 | 85.79 |
| *Sahu* | 10.40 | 2.87 | 10.40 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.40 | 90.38 |
| ***Total*** | **362.53** | **100.00** | **348.83** | **96.22** | **13.20** | **3.64** | **0.50** | **0.13** | **316.73** | **87.36** |
| **Kurubhat** | | | | | | | | | | |
| *Gond* | 73.55 | 33.10 | 60.05 | 81.65 | 13.50 | 18.35 | 0.00 | 0.00 | 14.07 | 19.13 |
| *Halwa* | 123.87 | 55.74 | 106.37 | 85.87 | 17.00 | 13.72 | 0.00 | 0.00 | 31.98 | 25.82 |
| *Mahar* | 24.80 | 11.16 | 22.24 | 89.68 | 2.56 | 10.32 | 0.00 | 0.00 | 20.94 | 84.43 |
| ***Total*** | **222.22** | **100.00** | **188.66** | **84.89** | **33.06** | **14.87** | **0.00** | **0.00** | **66.99** | **30.14** |
| **Dhobani (A)** | | | | | | | | | | |
| *Gond* | 69.48 | 28.01 | 59.48 | 85.61 | 9.00 | 12.95 | 1.00 | 1.44 | 46.11 | 66.36 |
| *Halwa* | 147.68 | 59.54 | 132.18 | 89.50 | 15.50 | 10.50 | 0.00 | 0.00 | 87.95 | 59.55 |
| *Lohar* | 3.00 | 1.21 | 3.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 100.00 |
| *Mahar* | 19.01 | 7.66 | 14.01 | 73.70 | 4.00 | 21.04 | 1.00 | 5.26 | 6.76 | 35.56 |
| *Nisad* | 5.50 | 2.22 | 2.50 | 45.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Raut* | 3.35 | 1.35 | 3.00 | 89.55 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 59.70 |
| *Sahu* | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***Total*** | **248.02** | **100.00** | **214.17** | **86.35** | **28.50** | **11.49** | **2.00** | **0.80** | **145.82** | **58.79** |
| **Tekadhoda** | | | | | | | | | | |
| *Gadaria* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Gond* | 239.13 | 41.56 | 187.75 | 78.51 | 42.50 | 17.77 | 8.88 | 3.71 | 153.25 | 64.09 |
| *Halwa* | 256.45 | 44.57 | 216.65 | 84.48 | 28.75 | 11.21 | 11.05 | 4.31 | 180.85 | 70.52 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Mahar* | 47.97 | 8.34 | 32.50 | 67.75 | 9.47 | 19.74 | 6.00 | 12.51 | 29.00 | 60.45 |
| *Mangia* | 19.00 | 3.30 | 17.50 | 92.11 | 1.00 | 5.26 | 0.50 | 2.63 | 14.00 | 73.68 |
| *Pandit* | 5.00 | 0.87 | 2.00 | 40.00 | 3.00 | 60.00 | 0.00 | 0.00 | 2.00 | 40.00 |
| *Raut* | 4.40 | 0.76 | 0.90 | 20.45 | 3.50 | 79.55 | 0.00 | 0.00 | 0.90 | 20.45 |
| *Sahu* | 3.38 | 0.59 | 3.38 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.38 | 100.00 |
| ***Total*** | **575.33** | **100.00** | **460.68** | **80.07** | **88.22** | **15.33** | **26.43** | **4.59** | **383.38** | **66.63** |
| **Puttarwahi** | | | | | | | | | | |
| *Gond* | 198.70 | 33.22 | 143.20 | 72.07 | 55.90 | 28.13 | 0.00 | 0.00 | 82.00 | 41.27 |
| *Halwa* | 395.95 | 66.20 | 287.70 | 72.66 | 100.25 | 25.32 | 8.00 | 2.02 | 209.40 | 52.89 |
| *Lohar* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Nai* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Raut* | 3.50 | 0.59 | 3.50 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 28.57 |
| ***Total*** | **598.15** | **100.00** | **434.40** | **72.62** | **156.15** | **26.10** | **8.00** | **1.33** | **292.40** | **48.88** |

There is no systematic trend discernible as far as caste-wise land use is concerned, except that in lower gradient villages fallows are lower across the board and in higher gradient villages they are higher, with bunding displaying a trend opposite to this (Table 7.18).

***Table 7.19: Class Wise Land Use Pattern***

| | Landownership | | Agriculture | | Fallow>3 years | | Waste land | | Bunded fields | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage | Acres | Percentage |
| **Jamih** | | | | | | | | | | |
| Marginal (<1acre) | 0.56 | 0.71 | 0.56 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Small (1-5acres) | 54.07 | 68.62 | 52.57 | 97.23 | 0.50 | 0.92 | 1.00 | 1.85 | 37.57 | 69.48 |
| Middle (5-10 acres) | 24.17 | 30.67 | 22.64 | 93.67 | 1.50 | 6.21 | 0.00 | 0.00 | 16.64 | 68.85 |
| Large (>10acres) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***Total*** | **78.80** | **100.00** | **75.77** | **96.15** | **2.00** | **2.53** | **1.00** | **1.26** | **54.21** | **68.79** |
| **Gujra** | | | | | | | | | | |
| Marginal (<1acre) | 9.63 | 1.23 | 8.23 | 85.46 | 0.90 | 9.35 | 0.50 | 5.19 | 8.23 | 85.46 |
| Small (1-5acres) | 431.57 | 55.01 | 387.37 | 89.76 | 29.55 | 6.85 | 11.45 | 2.65 | 308.95 | 71.59 |
| Middle (5-10 acres) | 175.60 | 22.38 | 160.10 | 91.17 | 7.00 | 3.99 | 5.50 | 3.13 | 121.00 | 68.91 |
| Large (>10acres) | 167.80 | 21.39 | 152.55 | 90.91 | 14.25 | 8.49 | 1.00 | 0.60 | 123.55 | 73.63 |
| ***Total*** | **784.60** | **100.00** | **708.25** | **90.26** | **51.70** | **6.58** | **18.45** | **2.35** | **561.73** | **71.59** |
| **Adjal** | | | | | | | | | | |
| Marginal (<1acre) | 4.71 | 0.71 | 4.46 | 94.69 | 0.00 | 0.00 | 0.25 | 5.31 | 4.11 | 87.25 |
| Small (1-5acres) | 328.11 | 49.24 | 273.56 | 83.37 | 37.75 | 11.51 | 11.30 | 3.44 | 211.75 | 64.54 |
| Middle (5-10 acres) | 239.55 | 35.95 | 184.15 | 76.87 | 53.40 | 22.29 | 7.00 | 2.92 | 141.65 | 59.13 |
| Large (>10acres) | 94.00 | 14.11 | 65.00 | 69.15 | 17.00 | 18.09 | 11.00 | 11.70 | 54.00 | 57.45 |
| ***Total*** | **666.37** | **100.00** | **527.17** | **79.11** | **108.15** | **16.22** | **29.55** | **4.43** | **411.51** | **61.75** |
| **Khalari** | | | | | | | | | | |
| Marginal (<1acre) | 15.58 | 4.30 | 15.58 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.78 | 94.87 |
| Small (1-5acres) | 298.70 | 82.39 | 290.30 | 97.19 | 7.90 | 2.64 | 0.50 | 0.17 | 261.50 | 87.55 |
| Middle (5-10 acres) | 36.25 | 10.00 | 30.95 | 85.38 | 5.30 | 14.62 | 0.00 | 0.00 | 28.45 | 78.48 |
| Large (>10acres) | 12.00 | 3.31 | 12.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 100.00 |
| ***Total*** | **362.53** | **100.00** | **348.83** | **96.22** | **13.20** | **3.64** | **0.50** | **0.13** | **316.73** | **87.36** |
| **Kurubhat** | | | | | | | | | | |
| Marginal (<1acre) | 3.58 | 1.61 | 3.58 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.58 | 100.00 |
| Small (1-5acres) | 100.14 | 45.06 | 93.58 | 93.45 | 6.56 | 6.55 | 0.00 | 0.00 | 66.58 | 66.49 |
| Middle (5-10 acres) | 78.25 | 35.21 | 59.25 | 75.72 | 18.50 | 23.64 | 0.00 | 0.00 | 45.75 | 58.47 |
| Large (>10acres) | 40.25 | 18.11 | 32.25 | 80.12 | 8.00 | 19.88 | 0.00 | 0.00 | 27.75 | 68.94 |
| ***Total*** | **222.22** | **100.00** | **188.66** | **84.89** | **33.06** | **14.87** | **0.00** | **0.00** | **143.66** | **64.64** |
| **Dhobani (A)** | | | | | | | | | | |
| Marginal (<1acre) | 6.25 | 2.52 | 6.25 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.78 | 92.48 |
| Small (1-5acres) | 165.27 | 66.64 | 156.27 | 94.55 | 9.00 | 5.45 | 0.00 | 0.00 | 104.69 | 63.34 |
| Middle (5-10 acres) | 47.50 | 19.15 | 39.00 | 82.11 | 7.50 | 15.79 | 1.00 | 2.11 | 25.00 | 52.63 |
| Large (>10acres) | 29.00 | 11.69 | 16.00 | 55.17 | 12.00 | 41.38 | 1.00 | 3.45 | 12.00 | 41.38 |
| ***Total*** | **248.02** | **100.00** | **217.52** | **87.70** | **28.50** | **11.49** | **2.00** | **0.80** | **147.47** | **59.45** |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tekadhodha** | | | | | | | | | | |
| Marginal (<1acre) | 4.50 | 0.78 | 4.20 | 93.33 | 0.00 | 0.00 | 0.30 | 6.67 | 3.90 | 86.67 |
| Small (1-5acres) | 303.83 | 52.81 | 254.98 | 83.92 | 35.22 | 11.59 | 13.63 | 4.49 | 212.98 | 70.10 |
| Middle (5-10 acres) | 171.00 | 29.72 | 136.00 | 79.53 | 32.00 | 18.71 | 3.00 | 1.75 | 111.50 | 65.20 |
| Large (>10acres) | 96.00 | 16.69 | 63.50 | 66.15 | 21.00 | 21.88 | 11.50 | 11.98 | 53.00 | 55.21 |
| ***Total*** | **575.33** | **100.00** | **458.68** | **79.72** | **88.22** | **15.33** | **28.43** | **4.94** | **381.38** | **66.28** |
| **Puttarwahi** | | | | | | | | | | |
| Marginal (<1acre) | 4.40 | 0.74 | 4.15 | 94.32 | 0.25 | 5.68 | 0.00 | 0.00 | 3.15 | 71.59 |
| Small (1-5acres) | 207.55 | 34.70 | 171.55 | 82.65 | 36.00 | 17.35 | 0.00 | 0.00 | 106.40 | 51.26 |
| Middle (5-10 acres) | 214.80 | 35.91 | 151.80 | 70.67 | 63.00 | 29.33 | 0.00 | 0.00 | 108.20 | 50.37 |
| Large (>10acres) | 171.40 | 28.66 | 106.90 | 62.37 | 56.90 | 33.20 | 8.00 | 4.67 | 74.65 | 43.55 |
| ***Total*** | **598.15** | **100.00** | **434.40** | **72.62** | **156.15** | **26.10** | **8.00** | **1.33** | **292.40** | **48.88** |

However, this is not so for size holding of farmers. Smaller and marginal farmers have a systematically higher proportion of bunded land, though this declines with increasing elevation and slope (Table 7.19). This tends to confirm the fact that, in the absence of alternative sources of income and low monetization of agricultural investment, farmers use family labour more intensively.

### *7.1.10 Productivity*

***Table 7.20: Yield of Long Duration Paddy (Kg/Hectare)***

| | ***Doli*** | ***Tikri*** | ***Bahara*** |
|---|---|---|---|
| **Kanhar** | | 1000 | 1400 |
| **Dorsa** | | | |
| ***Matasi*** | | 900 | 1100 |
| **Bhata** | | | 800 |
| ***Murrum*** | | | 800 |
| ***Kachhar*** | | | 1350 |

As can be seen from Tables 7.20 and 7.21, the yields of both, short duration and long duration paddy, vary with soil type and land location. Therefore, livelihood security depends a lot on the 'farming situation'.

***Table 7.21: Yield Of Short Duration Paddy (Kg/Hectare)***

| | ***Tikri*** | ***Doli*** | ***Bharrie*** | ***Bahara*** |
|---|---|---|---|---|
| **Kanhar** | 1000 | 950 | 600 | |
| **Dorsa** | | | | |
| ***Matasi*** | 1050 | 800 | | |
| ***Bharrie*** | | | | |
| ***Murrum*** | | | | |
| ***Kachhar*** | | | | |

In general, *dorsa* is considered the ideal soil for paddy, essentially from the point of view of drainage and soil moisture retention. *Kanhar* in the uplands does not retain enough moisture because the water runs off before the moisture can percolate through the fine particles that are sticky adhere strongly to each other after the dry season, forming or thick crust. The water has to stand long enough to permeate this. In the lowlands, the *kanhar* soils are often water logged because they are poorly drained. These soils also tend to crack up after long inter-spell gaps.

### *7.1.11 Water*

1.Irrigation

Most villages have a very low percentage of area that is irrigated (Table 7.22). Moreover, the fluctuation in irrigation over the years is very large.

***Table 7.22: Percentage GCA Irrigated, Avg. 2001-02***

| | |
|---|---|
| Dhobani | 9.08 |
| Adjal | 21.54 |
| Jamih | 0.00 |
| Tekadhada | 11.75 |
| Khalari | 11.90 |
| Gujra | 0.73 |
| Kurubhat | 0.00 |
| Puttarwahi | 0.00 |

Even if we adopt a cautious approach to groundwater and save it for drinking purposes only in this hard rock area, rainwater in the worst years also can actually support a far greater area under paddy too, if proper water management techniques and strategies are adopted. The following simple calculations illustrate this most dramatically. The area under paddy is the average for the last three years. Although most farmers adopt shorter duration varieties, we have assumed a 100-day variety, and used 400mm as the rainfall over these weeks, which is the actual rainfall in the worst drought year in the last 5 years. Finally, we have assumed a 50 per cent loss due to evaporation and percolation. Therefore, utilizable rainwater is 50 per cent of precipitation in the months of June – September. We have not included groundwater or surface drainages. Despite all these limiting assumptions that would result in severe underestimation of the utilizable water resources, the surpluses are high (Table 7.23).

***Table 7.23: Utilisable Rainwater and Net Irrigation Requirement of Paddy***

| Village | Village area in h.a. | Area under paddy (h.a.) | Weekly water requirement | | 100 day requirement | Availability ha-m | Utilisable rainwater ha-m | Surplus ha-m |
|---|---|---|---|---|---|---|---|---|
| | | | mm | Total paddy crop ha-m | | | | |
| Khalari | 924.53 | 406.80 | 50.00 | 20.34 | 290.86 | 416.04 | 208.02 | 125.18 |
| Gujra | 679.74 | 318.15 | 50.00 | 15.91 | 227.48 | 305.88 | 152.94 | 78.41 |
| Kurubhat | 172.72 | 41.40 | 50.00 | 2.07 | 29.60 | 77.72 | 38.86 | 48.12 |
| Dhobani | 222.88 | 98.44 | 50.00 | 4.92 | 70.38 | 100.30 | 50.15 | 29.91 |
| Puttarvahi | 468.27 | 140.94 | 50.00 | 7.05 | 100.77 | 210.72 | 105.36 | 109.95 |
| Adjal | 642.74 | 222.50 | 50.00 | 11.13 | 159.09 | 289.23 | 144.62 | 130.15 |
| Jamih | 285.36 | 70.20 | 50.00 | 3.51 | 50.19 | 128.41 | 64.21 | 78.22 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Tekadhoda | 941.73 | 228.15 | 50.00 | 11.41 | 163.13 | 423.78 | 211.89 | 260.65 |
| Total | 4337.97 | 520.85 | 50.00 | 26.04 | 372.41 | 1952.09 | 976.04 | 1579.68 |

2. Drinking Water

It is now well accepted that groundwater is the safest and best source for drinking purposes. However, there are several issues regarding the availability and quality of groundwater in hard rock and high elevation villages. Groundwater must be saved and replenished to the extent possible for drinking purposes: drinking must be the first charge on groundwater resources in such hard rock, rain dependent and drought prone areas.

The problems relating to drinking water differ, depending upon the elevation. In the villages at a high elevation, the hand pumps require very deep boring and are often not successful. In the low elevation villages access to quality sources of water is a major issue. In most villages the farmers recalled that the depth of boring to access groundwater was showing an alarming increase (Table 7.24).

***Table 7.24: Depth and Seasonal Reliability of Drinking Water From Handpumps***

| Name of revenue village | Age | Depth (ft) | Recent | Depth (ft) | Quality | Availability |
|---|---|---|---|---|---|---|
| Gujra | 40 years old | 70 | 2001 | 180 | o.k. | 12 months |
| Khalari | 1980 | 60 | 2001 | 125 | o.k. | |
| Jamih | 1980 | 180 | 1995 | 250 | o.k. | 12 months, some problem in summer. |
| Kurubhat | 1977-78 | 200 | 1984-85 | 300 | o.k. | 12 month |
| Dhobani | 1984-97 | 30 | | 10 | o.k. | 3 working and 3 out of |
| Adjal | 1970-75 | 90 | 1998-99 | 140 | o.k. | 12 months |
| Tekadhoda | 1980 | 150 | 2000 | 250 | o.k. | Great difficulty from April to July |
| Puttarwahi | 1985 | 140 | 1998 | 200 | o.k. | |

The problems are inadequate spread of hand pumps within the villages (Table 7.25), and their drying up in summer. While the former requires new installation, the latter requires better groundwater management. The quality of water in the wells on which the people have to rely in the summers is far from satisfactory, and inhabitants report widespread stomach disorders.

***Table 7.25: Drinking Water Infrastructure***

| Name of the village | No. of private sources | | No. of government sources | | |
|---|---|---|---|---|---|
| | Wells | Handpumps | Wells | Handpumps | Borewells |
| Jamih | 0 | 0 | 0 | 3 | 0 |
| Gujra | 19 | 11 | 3 | 10 | 1 |
| Adjal | 17 | 17 | 2 | 5 | 1 |
| Khalari | 4 | 4 | 3 | 7 | 1 |
| Kurubhat | 6 | 6 | 2 | 2 | 0 |
| Dhobani | 1 | 1 | 2 | 3 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| Tekadhodha | 16 | 1 | 2 | 8 | 1 |
| Puttarwahi | 10 | 1 | 4 | 5 | 0 |

In the high elevation villages, a significant section of the population still drinks water from open dug wells, which dry up after April. In the lower gradient areas, hand pumps are more reliable but begin to cause trouble around June. Further, several hamlets do not have serviceable hand pumps, resulting in long treks for the women in search of water.

3. Bathing and Livestock

For bathing purposes as well as for livestock, most people rely on the several tanks that are spread across the area (Table 7.26). Unfortunately these tanks have been neglected, both, in terms of the upkeep of the structures (desiltation and well repair), as well as with regard to preservation and enhancement of catchment. Many of the previous drainage lines have been converted to paddy fields, and deforestation and loss of vegetative cover have resulted in massive soil erosion and loss of storage space. Traditional community-based systems have died out, and have not been replaced by a new system of management.

*Table 7.26: Irrigation/Bathing Structures*

| **Village Name** | **Sources** | **No. of sources** | **Remarks on Reliability** |
|---|---|---|---|
| Jamih | Well (govt.) | 5 | 8 months Availability, Dry after March |
| | Well (Pvt.) | 6 | 8 months Availability, Dry after March |
| | Tank bathing | 2 | 8 months |
| Gujra | Well (pvt) | 3 | |
| | Dams | 1 | |
| | Tank bathing | 4 | 8 months Availability, Dry after March |
| Adjal | Tank irrigation | 2 | 8 months Availability, Dry after March |
| | Tank bathing | 4 | New tank water storage only 2 months |
| | Dabris | 3 | 6 months Availability, Dry after January |
| | Well (Pvt.) | 60 | 8-12 months |
| | Dams | 1 | o.k. |
| | Others | 1 | |
| Kurubhat | Dabris | 3 | 6 months Availability, Dry after January |
| | Tank bathing | 3 | 8 months Availability, Dry after March |
| | Dams | 1 | |
| | Well (pvt) | 15 | |
| | Other | 1 | |
| Puttarwahi | Tank bathing | 5 | 1 for 12 months; 2 for 6 months & 2 for 8 months |
| | Dabris | 4 | 6 months Availability, Dry after January |
| | Well (pvt) | 8 | 12 months |

Note: Govt. –government
Pvt. - private

### *7.1.12 Fodder*

All the grazing land in this area is open and not fenced, and grazing practices that have evolved over the years serve the dual purpose of crop protection and livestock management. Typically, the homesteads and settlements are surrounded by agricultural land, with the grazing land usually at some distance from the settlements. Three strategies are adopted for livestock management, depending upon time of the year. During the *kharif* season the village *Raut* collects all the livestock of the village and takes them for grazing safely out of reach of the farmland. For this the *Raut* is given paddy for each head of livestock as follows: 16 kg for one cow/bullock, 20kg for buffaloes, 8kg for a calf and 4kg for a goat.

The second strategy is that the villagers hold a meeting and a person from the *Marar* or *Ganda* community, or anyone else, in case these communities are absent or disinterested, or a person belonging to these communities from a neighbouring village, is hired as a day and night guard locally known as *itahis mudkaaha*, to protect against livestock grazing in the agricultural lands where there is standing crop. The payment is 4 kg of paddy to guard one acre of land. After the harvest, the livestock is allowed open grazing in the fields.

The third strategy is that of the owners themselves collecting fodder, both green and dry, and feeding their animals every night. When the animals return home, the owners themselves provide water and fodder. The *Raut* does not provide bathing and all other livestock management services. Usually green fodder is collected from the agricultural bunds during monsoon till the *kharif* crops are harvested. Dry fodder consists of agricultural residues and some of the local grass collected from the *bharrie*/fallow and pastures.

As far as the availability and consumption of dry fodder is concerned, there is a deficiency across all size classes of cultivators (Table 7.27). Except in Kurubhat and Dhobani, this gap reduces as the size class of farmers increases. This is to be expected, because, by and large more family labour by small and marginal farmers does not translate into higher productivity, since they are toiling on the marginal uplands and midlands. Total availability of dry fodder is a function of agricultural production and hence, is related to size of landholding and productivity. Productivity itself is a function of land location, which is an important determinant of land use. The ability of the farmer to invest in agricultural inputs, as well as the availability of infrastructure to complement private investment on farms is important too. These are lacking in the areas with a higher proportion of uplands and midlands.

The inverse relationship between size of landholding and extent of shortfall of dry fodder is not broken by higher productivity of smaller holdings. This is so because the more intensive application of family labour does not always translate into higher productivity on smaller plots of smaller cultivators, due to the offsetting influence or impact of poor location in terms of terrain, and the related factor of poorer soils.

***Table7.27: Availability of Dry Fodder and Shortfall From Actual Consumption***

| Village | Big animal | | | | | Small animal | Dry fodder avail. | Act dry fodder consumption | Gap | Gap% |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cow | Bullock | Buffalo | Pig | Total | Goat | | | | |
| **Jamih** | | | | | | | | | | |
| **Landless** | 1 | 0 | 0 | 0 | 1 | 0 | 7.20 | 362.99 | -355.79 | -98.02 |
| **Marginal** | 4 | 0 | 0 | 0 | 4 | 0 | 142.95 | 1451.97 | -1309.02 | -90.15 |
| **Small** | 36 | 34 | 2 | 0 | 72 | 3 | 8898.69 | 26135.46 | -17236.77 | -65.95 |
| **Medium** | 7 | 12 | 2 | 0 | 21 | 0 | 4372.61 | 7622.84 | -3250.23 | -42.64 |
| **Large** | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Gujra** | | | | | | | | | | |
| **Landless** | 25 | 4 | 0 | 0 | 29 | 13 | 18.31 | 25076.92 | -25058.62 | -99.93 |
| **Marginal** | 16 | 4 | 0 | 0 | 20 | 11 | 2592.80 | 17294.43 | -14701.63 | -85.01 |
| **Small** | 264 | 244 | 36 | 0 | 544 | 146 | 110587.16 | 470408.50 | -359821.33 | -76.49 |
| **Medium** | 49 | 52 | 10 | 0 | 111 | 4 | 37176.90 | 95984.09 | -58807.19 | -61.27 |
| **Large** | 34 | 48 | 32 | 0 | 114 | 28 | 36062.86 | 98578.25 | -62515.39 | -63.42 |
| **Adjal** | | | | | | | | | | |
| **Landless** | 10 | 0 | 0 | 0 | 10 | 3 | 0.00 | 9669.95 | -9669.95 | -100.00 |
| **Marginal** | 3 | 7 | 0 | 0 | 10 | 0 | 1135.28 | 9669.95 | -8534.67 | -88.26 |
| **Small** | 112 | 172 | 27 | 0 | 311 | 69 | 65068.87 | 300735.29 | -235666.42 | -78.36 |
| **Medium** | 47 | 75 | 15 | 13 | 150 | 15 | 38869.52 | 145049.18 | -106179.65 | -73.20 |
| **Large** | 22 | 20 | 6 | 0 | 48 | 29 | 16370.29 | 46415.74 | -30045.45 | -64.73 |
| **Khalari** | | | | | | | | | | |
| **Landless** | 6 | 3.5 | 0 | 0 | 9.5 | 29 | 717.96 | 10567.55 | -9849.60 | -93.21 |
| **Marginal** | 24 | 25 | 2 | 0 | 51 | 0 | 4737.54 | 56731.07 | -51993.53 | -91.65 |
| **Small** | 182 | 187 | 43 | 0 | 412 | 56 | 85510.36 | 458298.09 | -372787.73 | -81.34 |
| **Medium** | 14 | 12 | 4 | 0 | 30 | 0 | 9034.48 | 33371.22 | -24336.74 | -72.93 |
| **Large** | 2 | 2 | 0 | | 4 | 0 | 4559.48 | 4449.50 | 109.99 | 2.47 |
| **Kurubhat** | | | | | | | | | | |
| **Landless** | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Marginal** | 2 | 2 | 0 | 0 | 4 | 0 | 824.03 | 2348.99 | -1524.96 | -64.92 |
| **Small** | 65 | 67 | 6 | 0 | 138 | 79 | 17526.17 | 81040.29 | -63514.12 | -78.37 |
| **Medium** | 27 | 25 | 7 | 0 | 59 | 34 | 12975.39 | 34647.66 | -21672.27 | -62.55 |
| **Large** | 17 | 9 | 5 | 0 | 31 | 14 | 5042.69 | 18204.70 | -13162.01 | -72.30 |
| **Dhobani (A)** | | | | | | | | | | |
| **Landless** | 4 | 1 | 0 | 0 | 5 | 0 | 0.00 | 3273.14 | -3273.14 | -100.00 |
| **Marginal** | 4 | 13 | 0 | 0 | 17 | 3 | 1212.73 | 11128.67 | -9915.94 | -89.10 |
| **Small** | 91 | 107 | 9 | 0 | 207 | 91 | 19901.68 | 135507.89 | -115606.21 | -85.31 |
| **Medium** | 24 | 24 | 3 | 0 | 51 | 19 | 5916.67 | 33386.00 | -27469.33 | -82.28 |
| **Large** | 4 | 6 | 5 | 0 | 15 | 6 | 1860.94 | 9819.41 | -7958.47 | -81.05 |
| **Tekadhodha** | | | | | | | | | | |
| **Landless** | 11.5 | 9 | 3 | 0 | 23.5 | 7 | 983.45 | 34417.22 | -33433.77 | -97.14 |
| **Marginal** | 1 | 12 | 0 | 0 | 13 | 2 | 1927.46 | 19039.31 | -17111.85 | -89.88 |
| **Small** | 139.5 | 177 | 39 | 11 | 367 | 53 | 56652.76 | 536762.16 | -480109.39 | -89.45 |
| **Medium** | 72.5 | 67 | 5 | 0 | 145 | 57 | 25211.30 | 211629.28 | -186417.99 | -88.09 |
| **Large** | 14 | 18 | 5 | 0 | 37 | 11 | 12036.60 | 54188.81 | -42152.21 | -77.79 |

| Puttarwahi | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Landless** | 2 | 4 | 1 | 0 | 7 | 0 | 324.25 | 4438.29 | -4114.04 | -92.69 |
| **Marginal** | 4 | 7 | 3 | 0 | 14 | 0 | 804.99 | 8876.58 | -8071.59 | -90.93 |
| **Small** | 108 | 120 | 30 | 0 | 258 | 49 | 25648.75 | 163582.71 | -137933.96 | -84.32 |
| **Medium** | 20 | 63 | 33 | 0 | 116 | 9 | 25700.47 | 73548.81 | -47848.34 | -65.06 |
| **Large** | 37 | 38 | 4 | 0 | 79 | 13 | 19531.24 | 50089.28 | -30558.04 | -61.01 |

On an average, the dry fodder gap hovers around 70-75 per cent, and livestock owners have to purchase the rest. As far as green fodder is concerned, the pattern is similar to that of dry fodder (Table 7.28). All livestock owners reported deficits, but the size of the deficit is smaller for the larger landowners. It is only in Khalari village that the large landowners reported a surplus of dry and green fodder. The average deficiency of green fodder is less than that for dry fodder, hovering around 50 to 60 per cent.

Thus, land use planning to increase the fodder availability, especially in the lean season, is very important. Often, pastoral systems on the midlands and other areas with poor soils are promoted as the only system, which is not desirable in the absence of a never-fail public distribution system, which is not the present situation, especially in the rainy sowing and pre-sowing season, when family foodstock is pretty low, as large parts are cut off. However, after ensuring minimal family food security, pastoral farming is very important on the fallows and very poor quality soils or high gradients.

*Table 7.28: Green Fodder (Shortfall from Actual Consumption)*

| Village | Big animal | | | | | Small animal | Green fodder available | Actual green fodder consumption | Gap | Gap% |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cow | Bullock | Buffalo | Pig | Total | Goat | | | | |
| **Jamih** | | | | | | | | | | |
| **Landless** | 1 | 0 | 0 | | 1 | 0 | 0.00 | 1286.48 | -1286.48 | -100.00 |
| **Marginal** | 4 | 0 | 0 | | 4 | 0 | 795.03 | 5145.92 | -4350.89 | -84.55 |
| **Small** | 36 | 34 | 2 | | 72 | 3 | 53337.87 | 92626.49 | -39288.61 | -42.42 |
| **Medium** | 7 | 12 | 2 | | 21 | 0 | 23623.70 | 27016.06 | -3392.36 | -12.56 |
| **Large** | | | | | | | | | | |
| **Gujra** | | | | | | | | | | |
| **Landless** | 25 | 4 | 0 | | 29 | 13 | 0.00 | 53479.65 | -53479.65 | -100.00 |
| **Marginal** | 16 | 4 | 0 | | 20 | 11 | 11684.08 | 36882.52 | -25198.44 | -68.32 |
| **Small** | 264 | 244 | 36 | | 544 | 146 | 448552.07 | 1003204.54 | -554652.47 | -55.29 |
| **Medium** | 49 | 52 | 10 | | 111 | 4 | 161845.03 | 204697.99 | -42852.96 | -20.93 |
| **Large** | 34 | 48 | 32 | | 114 | 28 | 175403.10 | 210230.36 | -34827.27 | -16.57 |
| **Adjal** | | | | | | | | | | |
| **Landless** | 10 | 0 | 0 | 0 | 10 | 3 | 0.00 | 24494.79 | -24494.79 | -100.00 |
| **Marginal** | 3 | 7 | 0 | 0 | 10 | 0 | 4905.04 | 24494.79 | -19589.74 | -79.98 |
| **Small** | 112 | 172 | 27 | 0 | 311 | 69 | 301542.84 | 761787.81 | -460244.97 | -60.42 |
| **Medium** | 47 | 75 | 15 | 13 | 150 | 15 | 201099.54 | 367421.78 | -166322.23 | -45.27 |
| **Large** | 22 | 20 | 6 | 0 | 48 | 29 | 76663.43 | 117574.97 | -40911.53 | -34.80 |
| **Khalari** | | | | | | | | | | |
| **Landless** | 6 | 3.5 | 0 | 0 | 9.5 | 29 | 2839.39 | 18284.47 | -15445.09 | -84.47 |
| **Marginal** | 24 | 25 | 2 | 0 | 51 | 0 | 20273.22 | 98158.76 | -77885.54 | -79.35 |
| **Small** | 182 | 187 | 43 | 0 | 412 | 56 | 375082.95 | 792968.78 | -417885.83 | -52.70 |
| **Medium** | 14 | 12 | 4 | 0 | 30 | 0 | 34427.56 | 57740.45 | -23312.88 | -40.38 |
| **Large** | 2 | 2 | 0 | | 4 | 0 | 17036.32 | 7698.73 | 9337.59 | 121.29 |
| **Kurubhat** | | | | | | | | | | |
| **Landless** | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Marginal** | 2 | 2 | 0 | 0 | 4 | 0 | 5082.50 | 8851.98 | -3769.48 | -42.58 |
| **Small** | 65 | 67 | 6 | 0 | 138 | 79 | 94523.17 | 305393.31 | -210870.14 | -69.05 |
| **Medium** | 27 | 25 | 7 | 0 | 59 | 34 | 64950.96 | 130566.71 | -65615.74 | -50.25 |
| **Large** | 17 | 9 | 5 | 0 | 31 | 14 | 39396.49 | 68602.85 | -29206.36 | -42.57 |

*Table 7.28: Green Fodder (Shortfall From Actual Consumption) (Contd.)*

| Village | Big animal | | Small animal | | Green fodder available | | | Actual green fodder consumption | Gap | Gap% |
|---|---|---|---|---|---|---|---|---|---|---|
| **Dhobani *(A)*** | | | | | | | | | | |
| **Landless** | 4 | 1 | 0 | 0 | 5 | 0 | 0.00 | 11957.58 | -11957.58 | -100 |
| **Marginal** | 4 | 13 | 0 | 0 | 17 | 3 | 9086.04 | 40655.78 | -31569.74 | -77.65 |
| **Small** | 91 | 107 | 9 | 0 | 207 | 91 | 147747.47 | 495043.92 | -347296.4 | -70.15 |
| **Medium** | 24 | 24 | 3 | 0 | 51 | 19 | 35492.33 | 121967.34 | -86475.01 | -70.9 |
| **Large** | 4 | 6 | 5 | 0 | 15 | 6 | 17036.32 | 35872.75 | -18836.43 | -52.51 |
| **Tekadhodha** | | | | | | | | | | |
| **Landless** | 11.5 | 9 | 3 | 0 | 23.5 | 7 | 4968.93 | 47897.62 | -42928.69 | -89.63 |
| **Marginal** | 1 | 12 | 0 | 0 | 13 | 2 | 5536.80 | 26496.55 | -20959.75 | -79.10 |
| **Small** | 139.5 | 177 | 39 | 11 | 367 | 53 | 293848.10 | 746999.02 | -453150.92 | -60.66 |
| **Medium** | 72.5 | 67 | 5 | 0 | 145 | 57 | 161845.03 | 294519.39 | -132674.37 | -45.05 |
| **Large** | 14 | 18 | 5 | 0 | 37 | 11 | 75243.74 | 75413.27 | -169.53 | -0.22 |
| **Puttarwahi** | | | | | | | | | | |
| **Landless** | 2 | 4 | 1 | 0 | 7 | 0 | 2129.54 | 12761.71 | -10632.17 | -83.31 |
| **Marginal** | 4 | 7 | 3 | 0 | 14 | 0 | 3549.23 | 25523.43 | -21974.19 | -86.09 |
| **Small** | 108 | 120 | 30 | 0 | 258 | 49 | 148925.82 | 470360.32 | -321434.50 | -68.34 |
| **Medium** | 20 | 63 | 33 | 0 | 116 | 9 | 154533.61 | 211479.83 | -56946.23 | -26.93 |
| **Large** | 37 | 38 | 4 | 0 | 79 | 13 | 105980.10 | 144025.06 | -38044.96 | -26.42 |

### *7.1.13 Fuel-wood*

Fuel wood is collected from forests and farm bunds or dry animal dung is used. Agricultural residues are almost never used as fuel. In our survey, we did a stratified random sampling exercise and selected 20 per cent from each landholding size-class.

*Table 7.29: Final Fuel Wood Gap on the Basis of Annual Fuel Wood Consumption*

| Village | Annual fuel wood consumption of 20% | Total no. of villagers from 20% | Total population in villages | Per person annual fuelwood consumption | Annual fuel wood consumption of the village in kg | Annual fuel wood consumption of the village in tons | Availability of fuel wood in tons | Gap of fuel wood in tons |
|---|---|---|---|---|---|---|---|---|
| **Jamih** | 23647.36 | 44 | 154 | 537.44 | 82765.76 | 82.77 | 103.47 | 20.70 |
| **Gujra** | 163343.19 | 351 | 1452 | 465.37 | 675710.29 | 675.71 | 260.79 | -414.92 |
| **Adjal** | 115358.68 | 225 | 1121 | 512.71 | 574742.58 | 574.74 | 111.77 | -462.97 |
| **Khalari** | 141819.86 | 276 | 1092 | 513.84 | 561113.36 | 561.11 | 141.75 | -419.36 |
| **Kurubhat** | 41685.79 | 102 | 359 | 408.68 | 146717.63 | 146.72 | | -146.72 |
| **Dhobani (A)** | 51933.24 | 100 | 481 | 519.33 | 249798.88 | 249.80 | | -249.80 |
| **Tekadhodha** | 123103.97 | 231 | 904 | 532.92 | 481757.53 | 481.76 | 92.91 | -388.85 |
| **Puttarwahi** | 69384.47 | 165 | 790 | 420.51 | 332204.43 | 332.20 | 8.54 | -323.66 |

*Table 7.29: Final Fuelwood Gap On The Basis Of Annual Fuelwood Collection (Contd)*

| Village | Annual fuelwood collection of 20% | Total no. of villagers from 20% | Total population in villages | Per person annual fuelwood collection | Annal fuelwood collection of the village in kg | Annual Fuelwood Consumption of the village in tons | Availability of fuelwood in tons | Gap of fuel wood in tons |
|---|---|---|---|---|---|---|---|---|
| *Jamih* | 22360 | 44 | 154 | 508.18 | 78260.00 | 78.26 | 103.47 | 25.21 |
| *Gujra* | 188560 | 351 | 1452 | 537.21 | 780025.98 | 780.03 | 260.79 | -519.24 |
| *Adjal* | 87070 | 225 | 1121 | 386.98 | 433802.09 | 433.80 | 111.77 | -322.03 |
| *Khalari* | 100965 | 276 | 1092 | 365.82 | 399470.22 | 399.47 | 141.75 | -257.72 |
| *Kurubhat* | 56390 | 102 | 359 | 552.84 | 198470.69 | 198.47 | | -198.47 |
| *Dhobani (A)* | 46580 | 100 | 481 | 465.80 | 224049.80 | 224.05 | | -224.05 |
| *Tekadhodha* | 78265 | 231 | 904 | 338.81 | 306283.81 | 306.28 | 92.91 | -213.37 |
| *Puttarwahi* | 32365 | 165 | 790 | 196.15 | 154959.70 | 154.96 | 8.54 | -146.42 |

Table 7.29 is based on our biomass survey and addresses the question of whether the present cover can support the existing needs if the collection is to remain at sustainable levels and permit regenerative extraction. It estimates the gap on the basis of actual collections. As is evident from the two tables, if the ecologically viable rate of replenishment is taken as the yardstick, the deficits are large and depend on the extent of forest cover.

### *7.1.14 Food Insecurity*

Food is usually cooked twice a day and comprises a meal of rice and thin *dal* or vegetable cooked with large amounts of chillies, which is eaten more as chutney than a vegetable. Extra rice is cooked at night, and the leftover is soaked in water and eaten with salt or chillies and onions as breakfast. Of course this is in the good months. In April and May, when the hands and fields are devoid of work, the stomach too has to bear the brunt of leanness. Unfortunately, human metabolism has not evolved to the necessary adaptability that such shortfalls demand, so eat we must. Those who do not migrate make do with a meal of coarse cereals and *madiya*.

Table 7.32 below is too bald a representation of malnourishment, hunger and the fragility of food security that stalks these villages, and explains more eloquently than anything else the underlying cause and expression of drought vulnerability.

The survey was conducted in two parts, a census and a sample survey. The researchers tried to collect data at comparable times of the agricultural cycle and work cycle in different villages.

Everywhere, the survey was completed between August and December; the better part of the year as far as food availability and purchasing power is concerned. The following three questions were asked of the selected families:

1. How much of each item was consumed in the preceding week?
2. How much of each item was consumed on the preceding day?
3. How much of each item was consumed in the preceding month?
4. Was this lower or more than 'normal' consumption over the year or in previous years for the same timing?

We found that, systematically, people either ate vegetables or pulses with cereals, with pickle or chutney, rarely both. We made an upward revision of 2002 consumption data by averaging the 'normal' intake and drought year intake, wherever differences were reported.

The comparison between consumption in the normal year and in 2002 for each village on the basis of what the respondents told us indicates that, by and large, the situation is one where it is not total consumption that declines, but the composition of the food basket that changes. A lot more of non-cultivated foods, coarse cereals and brews are consumed. Pulses, fine cereals and cultivated vegetables show a decline of the order of 25 to 50 per cent in a drought year (Table 7.30).

| Village | ***Table 7.30: Drought Year Consumption As Percentage Of Normal Year*** |
|---|---|
| Jamih | 75 |
| Gujra | 75 |
| Adjal | 60 |
| Khalari | 75 |
| Kurubhat | 75 |
| Dhobani (A) | 75 |
| Tekadhodha | 75 |
| Puttarwahi | 70 |

The second issue is of seasonality in the availability of foodstocks with small cultivators and purchasing power, through work, with buyers of foodgrains. However, Dhobani and Tekadhodha were surveyed after the harvest, which might partly, explain the higher consumption levels in these two villages. Food intake is strongly related to the availability of work and retained output. Both decline towards summer resulting in acute distress in the areas that, in any case, have low per capita availability of food and work (Table 7.31). Non-cultivated foods become the mainstay of a diet of watery, coarse cereal brews, accompanied by tubers, etc. Sowing brings some relief by providing employment, and after the rains weeds and forest products abound, resulting in higher labour absorption and supplementary income, and food. This is seasonality that extends well beyond weeding, until harvest. However, in drought years, even the harvest does not bring succor to an already low productivity, high cultivator, and agriculture-dependent population.

***Table 7.31: Seasonal Availability of Foodstocks***

| Season | Foodstocks | Employment | Forest produce | Livelihood Shortage |
|---|---|---|---|---|
| *Chait* | Low | Moderate | *Mahua* | High |
| *Baisakha* | Low | Very Low | *Tendu* leaves | High |
| *Jetha* | Moderate | Moderate | | |
| *Asad* | Low | Reasonable | | |
| *Sawan* | Low | Very high | | |
| *Bhando* | Low | Very high | | |
| *Kuwar* | Very Low | Harvesting | | Extremely high |
| *Kartik* | Good | Good | | |
| *Aghan* | Moderate | Moderate | | |
| *Paush* | Moderate | Moderate | | |
| *Magha* | Good | Very low | | High |
| *Phagun* | Good | Very low | *Tendu/chaar* | High |

'Cultivators in hunger' and widespread malnourishment are, therefore, typical of the region. Table 7.32 is based on the recommended intake by ICMR for each consumption unit, which is a weighted average of the age and load profile of the population (**Nutritive Value of Indian Foods** (2001) by *National Institute of Nutrition, Indian Council of Medical Research*, Hyderabad). The norm for cereals and millets is 450 grams per day, for pulses it is 40 grams per day, oil it is 22 grams per day and vegetables is 125 grams per day.

The situation is clearly appalling. As expected, the landless are the worst off, followed by marginal and small farmers. However, the most significant fact that emerges from this table is the widespread hunger, with most people on the average consuming half the pulses they should be (which is the best and, perhaps only, source of protein in these largely vegetarian diets) and never more than three fourths of the cereals they should be consuming. It bears repetition that there consumption levels are at lower norms than those recommended for heavy workers in 1979 by ICMR.

People consume more vegetables than they do pulses. Much of the vegetables are non-cultivated foods collected from the forest, *imli*, *kusum*, berries, *char*, *tendu*, bamboo shoots, mushrooms, tubers, etc. Vegetables include several green leafy vegetables often cultivated on and found in abundance on farm bunds.

In light of the fact that (i) the survey was conducted at the time of the year that was optimal from the point of view of availability and purchasing power; (ii) the effort made by us to revise consumption upwards to incorporate the abnormally lower levels due to drought, our estimates would, if anything, underestimate hunger and malnutrition.

| ***Table 7.32: Per Capita Per Annum Consumption as a Percentage of ICMR Nutritional Norms, 2002*** | | | | | |
|---|---|---|---|---|---|
| | | Pulses | Cereals | Vegetables | Oil |
| | | *40gms/ day* | *450gms/ day* | *150gms/ day* | *22gms/ day* |
| Jamih | Landless | 35.37 | 59.13 | 38.18 | 17.50 |
| | Marginal | 42.81 | 77.48 | 46.76 | 31.56 |
| | Small | 46.78 | 77.11 | 50.10 | 43.18 |
| | Medium | 50.24 | 99.94 | 51.24 | 56.60 |
| | Large | | | | |
| | | 39.38 | 76.61 | 49.81 | 34.63 |
| Gujra | Landless | 39.38 | 51.89 | 59.54 | 34.74 |
| | Marginal | 42.23 | 52.04 | 63.47 | 31.56 |
| | Small | 44.45 | 62.00 | 53.72 | 25.15 |
| | Medium | 27.33 | 75.00 | 56.58 | 25.32 |
| | Large | 36.13 | 83.44 | 67.43 | 32.27 |
| | | 42.81 | 58.71 | 59.81 | 27.45 |
| Adjal | Landless | 47.19 | 42.58 | 44.31 | 17.60 |
| | Marginal | 69.28 | 57.69 | 61.11 | 17.60 |
| | Small | 57.47 | 64.14 | 70.55 | 30.68 |
| | Medium | 50.58 | 70.80 | 79.87 | 46.03 |
| | Large | 53.63 | 82.89 | 98.87 | 43.89 |
| | | 53.66 | 63.51 | 75.82 | 31.62 |
| Khalari | Landless | 33.12 | 50.57 | 60.04 | 15.40 |
| | Marginal | 37.60 | 60.84 | 57.74 | 18.90 |
| | Small | 50.55 | 69.25 | 65.33 | 23.18 |
| | Medium | 58.15 | 68.05 | 70.83 | 25.86 |
| | Large | 54.32 | 87.81 | 78.41 | 29.81 |
| | | 50.24 | 65.19 | 66.13 | 15.40 |
| Kurubhat | Landless | 54.35 | 60.42 | 56.22 | 13.42 |
| | Marginal | 53.97 | 63.84 | 52.42 | 11.12 |
| | Small | 46.03 | 60.05 | 58.75 | 18.52 |
| | Medium | 42.33 | 78.27 | 73.73 | 21.59 |
| | Large | 77.57 | 83.29 | 68.78 | 25.81 |
| | | 42.98 | 65.80 | 67.25 | 21.81 |
| Dhobani (A) | Landless | 57.47 | 64.29 | 45.65 | 20.38 |
| | Marginal | 47.12 | 70.43 | 46.93 | 23.34 |
| | Small | 72.67 | 85.42 | 61.73 | 30.41 |
| | Medium | 84.79 | 95.75 | 56.84 | 27.51 |
| | Large | 108.08 | 102.44 | 72.19 | 43.89 |
| | | 73.22 | 81.82 | 60.05 | 28.77 |
| Tekadhodha | Landless | 34.25 | 50.09 | 57.63 | 16.60 |
| | Marginal | 71.92 | 62.49 | 67.80 | 19.84 |
| | Small | 53.66 | 68.49 | 68.66 | 23.12 |
| | Medium | 48.29 | 81.54 | 53.97 | 21.48 |
| | Large | 65.07 | 82.79 | 72.96 | 26.08 |
| | | 50.58 | 79.48 | 67.93 | 21.97 |

| *Table 7.32: Per Capita Per Annum Consumption as a Percentage of ICMR Nutritional Norms, 2002 (Contd.)* | | | | | |
|---|---|---|---|---|---|
| Puttarwahi | Landless | 26.64 | 56.36 | 58.84 | 16.24 |
| | Marginal | 30.48 | 58.39 | 50.09 | 20.71 |
| | Small | 39.45 | 57.85 | 52.12 | 23.40 |
| | Medium | 47.74 | 59.63 | 58.87 | 18.14 |
| | Large | 49.93 | 63.41 | 56.96 | 23.12 |
| | | 38.42 | 58.16 | 55.16 | 22.25 |

### *7.1.15 Livelihood*

We calculated the livelihood deficit by calculating actual income from all sources, requirements for all minimum needs, and converting the gap into labour days on the basis of the official wage rate. The first point about the livelihood deficit is that it is based on the sample survey for each stratum covering 20 per cent of each village. The estimates are based on this and may be generalized for the entire village. After estimating for each household the total requirement of basic needs for sustainable livelihood and the total availability of income from all sources, we estimated the shortfall. The surplus households were weeded out, as their surpluses do not get redistributed and, therefore, make little difference to the rest of the village immediately (Although, these can translate themselves into higher labour absorption through investment, provided such surpluses exist in the first place, and secondly, the enabling environment and concomitants for private on-farm investment exist).

Three important observations can be made. First and foremost, livelihood security for most farmers and landless families is precarious, except in the case of large and middle farmers in a few villages. In other words, the backwardness of the region translates into a more generalized experience of food and livelihood insecurity. Villages with more unequally distributed land in low gradient areas do exhibit a difference, but by and large, the experience of poverty and income deficiency is more universal in the more difficult terrains.

Secondly, the employment deficit for all the villages taken together, at minimum wages, is 2,08,941.07 days, which implies a bill of Rs. 1,09,69,406.07 or Rs. 13,71,175.76 per village. This is an average of two months of employment generation for the workforce (Table 7.33). This can go a long way in building rural infrastructure and productive assets, which will increase agricultural production and yields by bringing more fallows under cultivation, by increasing double cropping and protecting soil moisture. Reduced distress out-migration will finally help small farmers gain from the one factor that they own in abundance: more intensive application of family labour. Increased incomes and infrastructure will also support higher complementary on-farm investment. Eventually, the surplus labour so mobilized will translate into higher productivity and lower dependence on this kind of wage employment. However, if the government does not meet this gap through programmes based on minimum wages, the prevailing local wage rate of Rs 25 per day will have to generate far greater employment. In the context of very low productivity and growth in agriculture, the absorption of hired labour too is low.

Thirdly, the shortfall in livelihoods is greater in the higher gradient villages, which are crying out for attention. Higher gradient and crest villages generally have a lower proportion of bunded fields and higher proportion of fallows than lower gradient and low-lying villages. Small and marginal farmers have a systematically higher proportion of bunded land, though this declines with increasing elevation and slope. These are also the areas of lower productivity and higher fallows. The fragility of the ecology is under severe test as deforestation and neglect coexist. This also compels farmers to migrate to areas outside the village in search of work, to local catchment areas where wheat and gram are cropped during *rabi*, or outside.

***Table 7.33: Employment Requirement in Person Days of Employment Per Annum to Meet Livelihood Gap, 2002***

| Size class | Average per family employment required | Average Per Worker employment required at minimum wages | Total employment required | Total expenditure at Rs 52.50 daily wages |
|---|---|---|---|---|
| Gujra | | | | |
| Landless | 360.00 | 130.91 | 10440.00 | |
| Marginal farmers | 120.05 | 43.65 | 1920.79 | |
| Small farmers | 143.33 | 52.12 | 24079.01 | |
| Middle farmers | 60.70 | 22.07 | 1578.10 | |
| Total village | 159.07 | 52.44 | 38017.90 | 1995939.63 |
| Khalari | | | | |
| Landless | 290.00 | 105.45 | 6090.00 | |
| Marginal farmers | 179.88 | 65.41 | 5036.72 | |
| Small farmers | 150.86 | 54.86 | 20517.63 | |
| Middle farmers | 120.63 | 43.87 | 603.17 | |
| Total village | 169.72 | 61.72 | 32247.53 | 1692995.12 |
| Jamih | | | | |
| Landless | 178.57 | 64.94 | 535.71 | |
| Marginal farmers | 160.00 | 58.18 | 160.00 | |
| Small farmers | 175.19 | 63.71 | 4204.65 | |
| Middle farmers | 95.25 | 34.64 | 285.76 | |
| Large farmers | | | | |
| Total village | 167.29 | 63.25 | 5186.12 | 272271.31 |
| Kurubhat | | | | |
| Landless | 242.88 | 88.32 | 728.65 | |
| Marginal farmers | 180.54 | 65.65 | 902.71 | |
| Small farmers | 190.00 | 69.09 | 7030.00 | |
| Middle farmers | 185.00 | 67.27 | 2220.00 | |
| Total village | 190.90 | 69.42 | 10881.36 | 571271.61 |
| Dhobani (A) | | | | |
| Landless | 340.56 | 123.84 | 2724.48 | |
| Marginal farmers | 310.69 | 112.98 | 2796.22 | |
| Small farmers | 290.81 | 105.75 | 17157.97 | |
| Middle farmers | 63.62 | 23.14 | 445.35 | |
| Large farmers | | | | |
| Total village | 272.33 | 64.98 | 23124.02 | 1214011.22 |

***Table 7.33: Employment Requirement in Person Days of Employment Per Annum to Meet Livelihood Gap, 2002(Contd.)***

| Size class | Average per family employment required | Average Per Worker employment required at minimum wages | Total employment required | Total expenditure at Rs 52.50 daily wages |
|---|---|---|---|---|
| Adjal | | | | |
| Landless | 287.77 | 104.64 | 3741.02 | |
| Marginal farmers | 199.23 | 72.45 | 1793.08 | |
| Small farmers | 162.38 | 59.05 | 19485.42 | |
| Middle farmers | 104.94 | 38.16 | 3253.08 | |
| Large farmers | 100.00 | 36.36 | 600.00 | |
| Total village | 161.30 | 58.65 | 28872.61 | 1515811.83 |
| Tekadhodha | | | | |
| Landless | 258.97 | 94.17 | 1553.84 | |
| Marginal farmers | 248.02 | 90.19 | 1736.11 | |
| Small farmers | 282.59 | 102.76 | 29671.59 | |
| Middle farmers | 282.73 | 102.81 | 6220.11 | |
| Large farmers | 125.00 | 45.45 | 750.00 | |
| Total village | 273.50 | 99.46 | 39931.64 | 2096411.27 |
| Puttarwahi | | | | |
| Landless | 289.73 | 105.36 | 3766.48 | |
| Marginal farmers | 256.85 | 93.40 | 1587.94 | |
| Small farmers | 277.42 | 100.88 | 18864.23 | |
| Middle farmers | 235.12 | 85.50 | 5658.56 | |
| Large farmers | 205.89 | 74.87 | 802.68 | |
| Total village | 261.38 | 85.05 | 30679.89 | 1610694.08 |

The percentage of families below the poverty line is shown in Table 7.34.

***Table 7.34: Percentage of Below Poverty Line Families***

| **Name of the village** | **Percentage BPL** |
|---|---|
| Jamih | 51.85 |
| Gujra | 60.10 |
| Adjal | 27.34 |
| Khalari | 37.10 |
| Kurubhat | 38.00 |
| Dhobani (A) | 40.00 |
| Tekadhodha | 32.50 |
| Puttarwahi | 26.13 |

This clearly does not capture hunger and malnutrition that we have captured through our survey. However this is the subject matter of an important, but separate, discussion.

## 7.2 Drought Vulnerability, Money-Lending And Land Alienation: Findings Of Field Survey In Kondagaon And Marwahi Blocks

These two blocks, selected to look into drought vulnerability, money-lending and land alienation, fall in transitional agro-climatic zones, as per the all-India regionalization by NBSSLUP and the Planning Commission. While Kondagaon is almost the first block after crossing the picturesque Keshkaal valley from the Kanker basin into the Bastar Plateau, Marwahi is in the upper reaches of Bilaspur district and shares characteristics with the Northern Hills region.

The loss of operational control and/or ownership of land by the poor and indebted Scheduled Caste and adivasi landowners in satellite hamlets, against paltry debt, to upper caste and better-off farmers in the main village or Marwaris in the nearby towns is reported to be growing at an alarming rate, both in Marwahi and in Kondagaon. In village after village this story repeated itself. Over the years, they were pushed into occupying forest and other government land for a combination of reasons: indebtedness, low productivity, low employment and wages and land alienation. The reasons remain, but the access to the forestland has gone, with the new thrust to hi-tech commercial and fenced plantation and the ousting of these farmers. In the last two years this has combined with low productivity and poor infrastructure to place survival itself under severe threat.

The crises of both, malnourishment and low incomes, results from this interaction between **state apathy** towards economic and infrastructure development; anti-Adivasi **eviction policies** of the Forest department; **land alienation** on account of **usury**; and **low productivity**. These socio-economic circumstances, production conditions, and ethno-demographic conditions very quickly translate themselves into extreme drought vulnerability under adverse ecological conditions.

### 7.2.1 *Ethno-Demographic Profile*

***Table 7.35: Ethno Demographic Profile in Selected Villages, Kondagaon Block***

| Name of village | Population | | Population density | Gender Ratio | | | | | Literacy Rates | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Total | | | Total | | Male | | Female | |
| | SC (%) | ST (%) | | SC | ST | overall | under6 | over7 | overall | over7 | overall | over7 | overall | over7 |
| Neota | 2.09 | 51.9 | 1.08 | 1000 | 929 | 981 | 983 | 981 | 10 | 12.59 | 8 | 10.15 | 2 | 2.44 |
| Palari | 9.79 | 76.38 | 0.27 | 1217 | 1158 | 1127 | 1176 | 1111 | 17 | 22.42 | 13 | 17.35 | 4 | 5.07 |
| Chikhalputi | 0 | 87.16 | 1.88 | | 1048 | 947 | 1111 | 897 | 22 | 30 | 16 | 21.82 | 6 | 8.18 |
| Chichpolang | 0 | 94.04 | 1.37 | | 1232 | 1238 | 914 | 1400 | 7 | 10.12 | 7 | 9.52 | 0 | 0.6 |
| Dudhgaon | 0 | 100 | 1.64 | | 955 | 955 | 1154 | 873 | 4 | 5.93 | 4 | 5.93 | 0 | 0 |
| Farasgaon | 0 | 100 | 2.19 | | 1254 | 1254 | 1000 | 1356 | 1 | 1.89 | 1 | 1.89 | 0 | 0 |

Apart from Palari and Neota, the villages in Kondagaon are entirely tribal. Neota has a high percentage of OBC population (Table 7.35 and 7.37).

***Table 7.36: Castewise Percentage Distribution of Holdings, Kondagaon***

| | Neota | | Palari | | Chikhalputi | | Chichpolang | | Dudhgaon | | Farasgaon | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Owned | Operated | Owned | Operated | Owned | Operated | Owned | Operated | Owned | Operated | Owned | Operated |
| Muriya | 56 | 51 | 70 | 60 | 36 | 15 | 70 | 60 | 74 | 61 | 80 | 65 |
| Bhatra | | | | | | | | | | | | |
| Halba | | | | | 40 | 17 | 12 | 5 | | | | |
| Devangan | 25 | 36 | 15 | 12 | | | | | | | | |
| Thakur | 6 | 6 | | | | | | | | | | |
| Marwari | | | 10 | 23 | 10 | 55 | 15 | 32 | 15 | 29 | 20 | 35 |
| Satnami | 1 | 0 | | | 9 | 5 | | | | | | |
| Kalaar | 11 | 7 | 2 | 2 | | | 3 | 3 | 1 | 0 | | |
| Ganda | 1 | 0 | 3 | 3 | | | | | | | | |
| Gond | | | | | | | | | 6 | 6 | | |
| Brahman | | | | | 5 | 8 | | | | | | |
| Christians | | | | | | | | | 4 | 4 | | |

There is a huge loss of operational holdings by Scheduled Castes and primitive tribes (Table 7.36 and 7.38). In the case of the former the loss is of owned holdings as well. In Marwahi, most of the primitive tribes own little or no land, and have even lost control over the product of their very fertile *baadis*.

***Table 7.37: Ethno Demographic Profile in Selected Villages, Marwahi Block***

| Name of the village | Population | | | Pop_ density | Gender Ratio | | | | | Literacy Rates | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Total Pop | | | Total | | Male | | Female | |
| | Total | SC (%) | ST (%) | | SC | ST | overall | under6 | over7 | overall | over7 | overall | over7 | overall | over7 |
| Dhummatola | 710 | 1.83 | 86.34 | 0.80 | 1167 | 984 | 1017 | 1167 | 990 | 21 | 25.13 | 16 | 19.39 | 5 | 5.73 |
| Usarh | 2803 | 8.06 | 80.63 | 0.90 | 1132 | 965 | 971 | 1231 | 915 | 22 | 27.55 | 16 | 19.88 | 6 | 7.67 |
| Beljhiriya | 1705 | 0.82 | 94.02 | 1.19 | 1000 | 979 | 985 | 1809 | 823 | 21 | 27.88 | 17 | 22.15 | 4 | 5.73 |
| Katra | 2101 | 3.05 | 88.86 | 2.02 | 882 | 978 | 991 | 1125 | 962 | 17 | 21.68 | 13 | 15.59 | 5 | 6.08 |
| Semardarri | 2685 | 2.42 | 84.92 | 1.43 | 1031 | 977 | 963 | 834 | 1006 | 13 | 17.53 | 10 | 13.63 | 3 | 3.89 |
| Naka | 1158 | 0.00 | 97.24 | 1.81 | 0 | 1066 | 1064 | 974 | 1088 | 15 | 18.12 | 11 | 14.35 | 3 | 3.78 |

The loss of operational holdings is far greater, increasingly in proportion to backwardness and under development.

***Table 7.38: Caste Wise Percentage Distribution of Holdings, Marwahi***

| | Dhummatola | | Usarh | | Beljhiriya | | Katra | | Semardarri | | Naka | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Owned | Operated | Owned | Operated | Owned | Operated | Owned | Operated | Owned | Operated | Owned | Operated |
| *Marwari* | 3.4 | 4.4 | | 15.5 | | 18.5 | 8 | 25 | 6.5 | 41.77 | 5.45 | 26.67 |
| *Behena* | | | 15.62 | 12.92 | 15.42 | 6.87 | 2.21 | 1 | 14.3 | 2.5 | | |
| *Thakur* | | | | | | | 2.65 | 3.11 | | | | |
| *Gond* | 94 | 93 | 53.55 | 55.26 | 66.78 | 68.65 | 45.7 | 41.2 | 41.7 | 37.53 | 76.21 | 63.34 |
| *Panika* | | | | | 1.76 | 0 | 1.35 | 1.2 | 12.9 | 9.67 | 1 | 1 |
| *Yadav* | 2.6 | 2.6 | 5.61 | 5.54 | 2.5 | 1.89 | 12.75 | 10.58 | 3.3 | 3.3 | | |
| *Chamar* | | | | | | | 1.5 | 0 | | | | |
| *Brahman* | | | 5 | 6.36 | | | | | | | | |
| *Scheduled Caste* | | | 2.56 | 0 | | | | | | | | |
| *Baiga* | | | | | | | | | 13 | 3 | | |
| *Dhanihar* | | | | | | | 2.54 | 0 | | | 13.78 | 6.33 |
| *Pando* | | | | | | | | | 9 | 2.14 | | |
| *Pao* | | | 16.82 | 4.32 | 13.22 | 3.55 | 23.4 | 17 | | | 3.12 | 1 |

The caste/tribe based inequality in land distribution and land alienation becomes clearest when one looks at the number of households belonging to different backward castes and primitive tribes. In Usarh for instance there are over a hundred *Baiga*, *Khairwar* and Scheduled Caste households who are completely landless. In Semardarri, the number of *Pao*, *Panika* and *Pando* households that are almost landless is 180 (Table 7.38).

***Table 7.39: Households Belonging to Different Castes, Marwahi***

| | Dhummatola | Usarh | Beljhiriya | Katra | Semardarri | Naka |
|---|---|---|---|---|---|---|
| *Marwari* | | | 2(non-resident) | | 25 | 5 |
| *Behena* | | 200 | 49 | 5 | 100 | |
| *Satnami* | | | | | | |
| *Kalaar* | | | | | | |
| *Ganda* | | | | | | |
| *Gond* | 120 | 120 | 205 | 156 | 400 | 245 |
| *Thakur* | | | | 2 | | |
| *Dhobi* | | | | | | |
| *Raut* | | | | | | |
| *Panika* | 1 | | 9 | 8 | 50 | |
| *Namdev* | | | | | | |
| *Yadav* | 1 | 15 | 4 | 70 | 27 | |
| *Lohar* | 1 | | | | | |
| *Chamar* | | | 6 | 17 | | |
| *Ahir* | | | | | | |
| *Dhobi* | | 2 | | | | |
| *Brahman* | | 12 | | | | |
| *Scheduled Caste* | | 23 | | | 37 | |
| *Kewat* | | 2 | | | | |
| *Khairwar* | | 50 | 85 | | | |
| *Baiga* | | 20 | | | 21 | 34 |
| *Dhanihar* | | | | 50 | | 45 |
| *Pando* | | | | | 56 | 12 |
| *Pao* | | 172 | 38 | 121 | 70 | 29 |
| *Agariya(Vishwakarma)* | | | 4 | | | |

### 7.2.2 *Occupational Structure Of Workforce*

In Marwahi the workforce participation rates (WPR) are high in areas of greater landlessness and there is large prevalence of agricultural labour in the agriculture dependent population (Table 7.40). Marginal workers as well as women workers are higher too. In Kondagaon, the WPR is generally lower and marginal workers higher (Table 7.41). Female workforce participation as as main workers is generally far lower. From the discussions it is clear that the burden of earning supplementary income and ensuring nutrition, through gathering forest produce for sale and consumption, fell on women.

***Table 7.40: Workforce in Percentage in Selected Villages, Marwahi Block***

| Name of Village | Total Pop | WPR | Marginal Workers | Male Workers | Female Workers | Cult | Agriculture Labourers | Mining | Manuf | Other_ Services | Agr Dep Pop |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dhummatola | 710 | 51 | 0 | 66 | 34 | 63 | 28 | 5 | 1 | 1 | 91.44 |
| Usarh | 2803 | 48 | 7 | 66 | 34 | 73 | 19 | 0 | 3 | 4 | 92.81 |
| Beljhiriya | 1705 | 35 | 20 | 86 | 14 | 77 | 21 | 0 | 1 | 1 | 97.80 |
| Katra | 2101 | 52 | 7 | 57 | 43 | 85 | 12 | 0 | 1 | 1 | 97.51 |
| Semardarri | 2685 | 49 | 14 | 67 | 33 | 87 | 9 | 0 | 0 | 3 | 95.89 |
| Naka | 1158 | 36 | 0 | 84 | 16 | 62 | 31 | 0 | 5 | 1 | 93.54 |

Abbreviations:

Total Pop: Total Population;WPR: Worker Participation Ratio;Cult: Cultivators;Manuf: Manufacturing;

Agr Dep Pop: Agriculture Dependent Population

Land attachment is generally high in the tribal villages, with the more developed villages showing a lower share of cultivators in their agriculture dependent workforce.

***Table 7.41: Workforce in Percentage in Selected Villages, Kondagaon Block***

| Name of Village | Worker Participation Rate | Marginal Worker | Male Worker | Female Worker | Cultivators | Agriculture Dependent Population |
|---|---|---|---|---|---|---|
| Neota | 27 | 25 | 95 | 5 | 86 | 96.5 |
| Palari | 31 | 13 | 80 | 20 | 86 | 87.85 |
| Chikhalputi | 39 | 24 | 84 | 16 | 72 | 94.83 |
| Chichpolang | 27 | 30 | 94 | 6 | 100 | 100 |
| Dudhgaon | 43 | 16 | 68 | 32 | 92 | 100 |
| Farasgaon | 38 | 32 | 72 | 28 | 76 | 100 |

### 7.2.3 *Increasing Indebtedness And Land Alienation*

Land alienation takes on three forms in this area. The first is the outright sale of lands owned by the Scheduled Caste peasantry to the Marwaris and Seths in nearby towns or within the village itself. Everywhere we went the Scheduled Caste groups reported huge land alienation, particularly of their lowlands and *gabhar* land. Often, these may be deals that do not conform to the land ceiling acts. However, the law does not offer the same protection against land alienation to the Scheduled Caste peasantry as does section 70 B of the Land Alienation Act to the tribals, (despite the well-documented weaknesses in law and implementation). The second is the sale of tribal land by the marginal and small peasantry to members of a tiny section of upwardly mobile and influential Adivasi elite.

In terms of legality, the third route is far more serious. Against very small loans, sometimes no more than Rs. 500 taken ten years ago, tribal landowners are forced to allow the moneylenders to till their land (which is treated as the interest repayment) till the complete re-payment of the principal amount. This means that sometimes landowners are reduced to bonded labor on their own land. The labor and the land belongs to the adivasi peasant in debt, costs are shared equally between the debtor and the moneylender, as is the output. (The adivasi farmers pointed out that

this was completely unlike the traditional *batai* or sharecropping arrangements in the area, under which the sharecropper provided the labour, the land belonged to the owner, and the costs and output were shared equally). Alternatively, the moneylender hires labor on this land that has been given to him as collateral against the loan, leaving the landowner without any share of the output or access. Inevitably, those who had lost ownership or control over their lands in this way were the poorest in the village, belonging to the most vulnerable adivasi communities: *baiga*, *dhanihar*, *pando* and other backward adivasi groups. The loss of access/ownership of land did not fundamentally threaten livelihood since expansion encroachment was possible and was largely ignored by the authorities. Despite the huge amount of labour and effort that this required (clearing, leveling and bunding), it afforded a cushion and even resulted in a certain degree of complacency and carelessness amongst the Adivasis.

The locational dynamics of this process of land alienation are interesting. The villages are structured such that, people belonging to the backward castes and tribes live in settlements far from the main village, at a distance from whatever infrastructure and amenities that do exist. In some villages in Marwahi, the hamlets were at a distance of 5 to 10 kilometers. The land that is cultivated by them has far more humus and inherent productivity, as it is located closer to the forests. The soil is very good for homestead cultivation of vegetables and maize. The terrain is highly undulating, and settlements are usually at the highest point (an important reason why handpumps are often not very successful). In fact, drinking water is an acute problem in these hamlets on two counts. Handpumps often do not exist, either because the population density is very low and the PHED finds it unviable, or because the granite-gneiss strata offer very few accessible aquifers at these greater heights (the block has in fact been declared dry by the Central Groundwater Board). People are forced to rely on seasonal streams and *nalas*, and very shallow structures call *thodi*s, where water gets collected. Some of these were lined with bricks and made pucca two years ago, but the water has never been tested for its quality. In any case, these dry up by Holi, in the month of March.

For its part, the PHED argued that they were trying, but due to the dispersal of settlements and the underlying hard rock strata, the task was often very difficult. They even tried to argue that the *baigas* were very suspicious of any interventions and were known to abandon settlements if a handpump was installed. However, we spoke to several members of the *baiga* community and repeatedly heard them ask for handpumps. They were not silent or distant, only suspicious (maybe with good reason). Perhaps the PHED officials were relating stories of the past, which have now become a part of the settlers' folklore.

Traditionally, these tribes were hunters-gatherers and practiced 'cut and burn' broadcast agriculture. At present, with a great deal of effort, homesteads or *badis* have been prepared by leveling, digging and fencing. Around these *badis*, the land is unbunded *tikra* or *marhan* uplands from where the rainwater quickly runs off in numerous first order streams and undulating mal midlands. The *gabhar* paddy fields, where they exist, are small parcels in the lowlands with deep soils. The adivasis have practiced settled cultivation on these fields for decades, earlier for themselves and now for the moneylenders. Known as 'primitive' tribes, the contemptuous and the romantics alike believe that these adivasi groups choose isolation over development, which is available to them. 'Laziness' and 'carelessness' as well as an irrational attachment to 'primitives' practices are cited as the main causes of low productivity and indebtedness. In fact if the non-

adivasis are to be believed, the *baigas* and others have no interest either in development or in any government program and would like nothing better but to be left alone to enjoy a life of drunkenness and cock fights. There can be no bigger travesty of the truth than this, nor greater irony. The biggest beneficiaries of the non-acquisitive and happy-go-lucky attitude of the adivasis were these very same settlers who exploited and duped them of their lands. They came as saviours, and instead destroyed the foundation of adivasi life. Without an alternative development policy, poverty, disease and hunger were inevitable.

The largest incidence of land loss, both operational control as well as ownership, is suffered by the most backward tribes and castes. The full extent of this is not evident unless one also takes into account the loss of 'encroached' holdings. *Khairwars* and *Baigas*, as well as *Pandos* and *Paos* often hold no *pattas*, and practiced shifting cultivation using cut and burn techniques on forest or other government land. This was not out of 'preference' but due to lack of options, since they had been excluded from the several rounds of land settlements, largely because of their political voicelessness and lack of organization. The story repeated itself in the present context of antyodaya cards, despite clear instructions that all primitive tribes must be included in the list. This was due to reasons ranging from the mundane (lack of information and therefore absence from the *gram sabha* meeting) to the bizarre (fear of facing the village community because of suspicion of theft of lack, etc.). The gainers have been the usual suspects, with a chillingly repetitive pattern. The biggest gainers were the newly emergent class of gentlemen farmers with homes in the nearby towns, often, but not always, *Marwaris*, a generic term for settlers from outside who were moneylenders, members of the business community and traders. They came with heavy political clout too, and we were told in village after village that those cornering land were politically well connected. The lands of the primitive tribes or the Scheduled Castes do not satiate the freshly fuelled land hunger of the elite. Encroachments of government land too are common.

This signals greater concentration and centralization of the land for the elite and immiserisation and dispossession for the poorer farmers. The backwardness of tribal agriculture was already a burden on the tribal peasantry. Low productivity now combines with land alienation to doubly burden the tribal and Scheduled Caste peasantry.

### 7.2.4 *Encroachment As Survival Strategy*

The dispossessed were left with little option but to eke out a living from agricultural labor and encroachment upon revenue and forest land, where ever this was possible. For several years this has been the so-called 'survival strategy' of the poor. Encroachers have often tilled the same plots for several decades. In the past the forest department as well as the revenue officials usually turned a blind eye to this. However, in the last two years, the forest department has aggressively started re-claiming its land, fencing it and then undertaking hi-tech commercial plantation. In all cases this has led to simmering discontent and conflicts.

To fully comprehend the significance of the loss of this land, few other, related issues must be considered. The first is increasing land alienation, both operational access and even ownership, as discussed above. The second is the low availability of employment, the third is the constraints imposed by the ecological setting and the fourth is backward agriculture.

*Before examining these issues we must clarify that we are not making a case in favour of encroachments, but simply suggesting that the old encroachments must be regularized; agriculture be made more productive and land use be more intensive through double cropping and better utilization of fallows and bunds, through infrastructure development and extension services, for which there is a felt need and is an explicit demand by the farmers.*

### *7.2.5 Soil, Landform And Farming Situations*

Our field survey clearly brings out the following aspects of Chhattisgarh's soil-slope-drainage regime and its impact on farming situations.

1. Considerable soil variability. In the plains soils vary from lateritic type to heavy clayey soils through sandy-loam and clay-loam types, while in Bastar, they vary from sloping *marhan* to heavy soils, under lowlying *gabhar* conditions.

2. Variations in most soil properties are closely related to their position on the landscape. Soil properties gradually change with the slope, indicating that drainage conditions, differential transport of eroded material and translocation and deposition of mobile soil constituents play a major role in the development of these soils. As one Moves down the slope there is an increase in soil depth and in water holding capacity, gradual change in colour from red to dark gray brown, in texture from sandy loam to clayey, and in consistency from non-sticky to very sticky, etc.

3. The topographical variations have a marked influence on regulating hydrological conditions, and thereby, on processes responsible for morphological features, as well as physical and chemical properties of the soils.

4. Apart from the effect of landform and terrain, geological strata and structure too have a marked influence on the water retention and percolation potential of soils. The parent material influences the inherent productivity and particle size of soil. This influences the groundwater potential and soil moisture regime, under different rainfall conditions.

Thus, soils widely differ in their production potential and management requirements. Other reports confirm this finding[66].

[66] Status Report (2000), Indira Gandhi Krishi Vishwavidyalaya, Raipur, M.P. 492012, pp 11-15)

*Kondagaon (Bastar Plateau)*

In Bastar plateau the land is undulating and hence the soils vary considerably from top of the hillock to the valley (Table 7.42). The kinds of soils found in Bastar plateau are as follows:

a) *Entisols*: *Entisols* of Bastar are coarse textured, well-drained and eroded soils with low water holding capacity. The farmers' choice for using this soil for cultivation is obviously related to its occurrence in favourable moisture regime and ease of management with limited animal draught power due to its lighter texture. The soil has high to medium productivity potential.

b) *Inceptisols*: Inceptisols of Bastar, are light textured, shallow and have poor water holding capacity. These soils are under forest and natural vegetative cover. They are agriculturally less important soils. Small millets like *kodo-kutki* are grown in patches.

c) *Alfisols*: *Alfisols* are the most abundant soils in Bastar accounting for 45 per cent of geographical area. More than 80 per cent of these soils are sound in the potentially productive lands. *Alfisols* account for about 50 per cent of the potentially productive land area suitable for rice, wheat, gram, vegetables and sugarcane.

d) *Vertisols*: *Vertisols* are next in abundance to *Alfisols*. These soils have good production potential due to high water holding capacity, ample depth, high clay content, good fertility and response to fertilizer use. Most of these soils have a high production potential for rice, wheat, gram, vegetables and sugarcane. They are spread over about 25 per cent of geographic area. They constitute about 40 per cent of potentially productive land area in Bastar. At present most of them are under deciduous forest with patches under cultivation.

e) *Mollisols*: Mollisols of Bastar typically have coloured horizons due to high organic matter content. These soils have been formed under a thick vegetative cover in the forests, as a result of underground decomposition of organic residues on base-rich parent material. They have a thick, dark-coloured and well structured surface horizon. The soils occur on wide-ranging landforms, from plateau, gently sloping subdued plateau, upper piedmont to valley bottoms, covering about 17 per cent of total geographical area of Bastar. Most of the soils are not under major crops. They are either under forest or grass cover, or remain fallow.

| *Table 7.42: Area Under Different Land Locations in Hectares, Bastar* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Block name | *Marhan/ Dand* | | *Tikri, Chanwar* | | *Bharri/ Maal/ chanwar* | | *Bahara/ Gabhar* | |
| | Upland | | Midland 1 | | Midland 2 | | Low Land | |
| | Area | Percentage | Area | Percentage | Area | Percentage | Area | Percentage |
| Jagdalpur | 6122 | 26.75 | 4269 | 18.66 | 5773 | 25.23 | 6719 | 29.36 |
| Lohanandeguda | 11982 | 46.93 | 5872 | 23.00 | 3161 | 12.38 | 4517 | 17.69 |
| Darma | 12884 | 48.20 | 7620 | 28.51 | 4100 | 15.34 | 2128 | 7.96 |
| Tokapal | 7186 | 36.38 | 4858 | 24.60 | 4080 | 20.66 | 3626 | 18.36 |
| Bastanar | 19592 | 74.53 | 2893 | 11.00 | 837 | 3.18 | 2967 | 11.29 |
| Bastar | 13918 | 36.77 | 9065 | 23.95 | 9207 | 24.32 | 5660 | 14.95 |
| Bakaband | 9347 | 27.83 | 8733 | 26.00 | 8136 | 24.22 | 7376 | 21.96 |
| Kondagaon | 17600 | 41.05 | 9945 | 23.19 | 8703 | 20.30 | 6630 | 15.46 |
| Pharasgaon | 10405 | 39.41 | 6293 | 23.84 | 5507 | 20.86 | 4195 | 15.89 |
| Keshkal | 11410 | 42.43 | 6092 | 22.65 | 5330 | 19.82 | 4061 | 15.10 |
| Bederajpur | 8961 | 41.87 | 4895 | 22.87 | 4283 | 20.01 | 3264 | 15.25 |
| Narayanpur | 14754 | 43.15 | 7648 | 22.37 | 6692 | 19.57 | 5100 | 14.91 |
| Makri | 8583 | 40.79 | 4902 | 23.30 | 4290 | 20.39 | 3268 | 15.53 |

*Marwahi (Northern Hills area)*

The soils of the Northern Hills are identified with the existing farming situations, which gives some idea about their production potential. The soils, described and identified locally, based on their occurrence, management and use are as follows:

a) Eroded hilly soils: About 10 per cent of the region is under this category of soils, on highly undulating land with steep slopes. They are coarse textured, stony to sandy, red and yellow coloured and highly eroded. Most of the area covered by these soils is under forest, but some arable crops like *kodo-kutki*, *niger*, *toria*, etc. are also grown.

b) *Goda Tikra* soils: These soils are light textured (gravelly and sandy), have poor moisture retention and suffer from soil erosion. The undulating and sloping topography causes sheet and gully erosion. They cover about 30 per cent of the area and under upland, unbunded cultivation, and early varieties of paddy, *urid*, *kutki*, *niger*, *arhar* and maize are grown. During *rabi*, only *toria* is grown in homesteads after maize. Soil fertility is poor and there is severe soil erosion.

c) *Goda Chawar* soils: These soils cover about 25 per cent of the total cultivated area in the upland bunded areas. Bunding of upland fields is done for checking soil erosion and to conserve rainwater. Early varieties of rice, groundnut, soyabean, maize, vegetable and fruit crops are commonly grown in this situation. Improper bunding of fields, poor utilization of land due to lack of irrigation, frequent occurrence of drought, poor soil fertility and low moisture retention capacity are the major problems limiting the production potential of these soils.

d) *Chawar* soils: These heavy soils occur on gentle slopes and in lowland, bunded areas, covering about 15 per cent of the cultivated area. Rice-wheat/mustard (irrigated) and rice-gram/linseed/lentil (rainfed) are the most common crop rotations.

e) *Bahara* soils: These soils occur in extremely low land situations, and *bahara* literally translates into flowing water in the local dialect. These soils occur on valleys covering 10 per cent of the cultivated area. Silty loamy in texture, these soils have been formed on transported alluvium deposits. Baharas retain water till November in the slightly upper reaches and semi-tall (140 days) rice varieties are grown. But in lower *Bahara*, water flows till Sakrant-Holi (February) and late maturing, tall varieties of rice are grown. Mono-cropping of rice is generally followed in unirrigated conditions.

f) Soils of large bunded fields: Fields that are bound by large bunds to conserve water during rainy season are used for growing rainfed wheat in the lower part of the field and gram and linseed in *rabi* in the upper part after draining out water stored during the rains. The soils are deep, clay loam in texture with high moisture retention.

### 7.2.6 *Low Irrigation, Land Use Intensity And Productivity*

Farmers largely operate on the extensive rather than the intensive margin of cultivation, due to a variety of reasons. Such as low population density and abundant availability of 'open' spaces by way of village commons, revenue land, forest land; poverty of the cultivators; low availability of infrastructure and extension services; open grazing after *kharif* and destruction of crops by wild animals; etc. Productivity and yields are very low and variable. The cause of the low productivity lies in the low resource base of the cultivators on account of widespread poverty, resulting in the well know vicious cycle between low productivity leading to low surpluses, resulting in low investment and poverty. Accompanying this socio-economic condition of the adivasi peasantry is the low level of the technology of agricultural production, which has not been able to break the constraints imposed by the ecological setting and the niggardly level of state investment in infrastructure and extension services. Irrigation is extremely low in most selected villages.

### 7.2.7 *Biasi*

Broadcast *biasi* is the principal method of rice cultivation. As discussed in Chapter 5, in this system, the sowing is done by broadcasting of seed rather than transplantation of saplings. When the crop is 4-6 weeks old, the fields are ploughed, an operation that requires 10-15 cm of stagnant water. This is called *biasi*, after which weeding and fertilizer application follow. Though this gives lower returns, farmers are more inclined to accept lower but assured returns rather than higher yields with higher uncertainty[67]. Even very small irrigation structures that can tide over the dry spells through protective irrigation can help overcome this constraint.

[67] This operation adversely effects the plant population which is a constraint in improving productivity. However, *biasi* is essential in order to remove weeds that can otherwise overrun the rice plant itself, plentiful due to the dry broadcast method of sowing. Farmers therefore improve the plant population in *biasi* by sowing extra seedlings in a small area and use these for filling the gap after *biasi*. The *biasi* method requires 10-15 cm of standing water.

### *7.2.8 Rice Bunds*

Although in Chhattisgarh about ten per cent of the total rice area is under bunds, this is far lower in the case of both Marwahi and Kondagaon, since a significant part of cultivated lands are unbunded in the uplands. Often, the older bunds are left fallow or used for grass for green fodder and forage. Crops are grown usually on new bunds, but there is a huge potential to increase the production of *kharif* pulses and oilseeds by utilizing the vast area under these bunds. *Arhar* (Pigeonpea) is the most popular, and leafy vegetables and tubers are also grown, besides moong, urid, rice bean, sesame, niger, etc.

The area under forests is very large. Huge areas are left fallow, and a large part of cultivation is on unbunded fields through broadcast sowing. This not only implies a low soil-moisture retention ability of such plots but also a far greater spread of weeds, especially. in the case of paddy. By and large, sturdy crops that are more able to withstand greater soil-moisture stress (coarse cereals, pulses and oilseeds) but with the low productivity are grown. Sometimes, even short duration paddy is grown under these circumstances, with no *biasi* and weeding.

### 7.2.9 *Land Use And Cropping Pattern*

#### *Kondagaon (Bastar)*

Kondagaon is a mono-cropped area, with little or no *utera*. The high bunds of Dondi are not visible on most of the land. A large part of the *gabhar* or uplands are unbunded, where coarse cereals and pulses are cultivated (Table 7.43). Lowland is almost entirely bunded. One important reason for leaving the plots unbunded is poor soil quality or uneven topography. The second reason, no less significant, is the high degree of cultivation on encroached revenue or forestland.

***Table 7.43: Land Use, Kondagaon Block, 2002-03***

| Name of village | Cropping Intensity | Percentage Forest (Census) | Percentage Fallows | Percentage Unculturable Wasteland |
|---|---|---|---|---|
| Palari | 1.01 | 3.43 | 3.30 | 0.02 |
| Farasgaon | 1.08 | 63.55 | 4.70 | 0.00 |
| Neota | 1.10 | 51.67 | 0.82 | 0.00 |
| Dudhgaon | 1.00 | 68.63 | 6.33 | 0.00 |
| Chikhalputi | 1.03 | 27.52 | 36.01 | 0.00 |
| Chichpolang | 1.01 | 59.83 | 0.88 | 0.00 |

Rice is the most important crop, grown on more than two-third of the total cropped area during *kharif*. Small millets are next in importance covering about 20 per cent. Maize is also very important and is mainly grown in homesteads (protected area around dwelling). Irrigation

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Chhattisgarh's rainfall pattern has a high occurrence of long interspell durations or dry spells, and the break in monsoon (dry spell) results in delayed *biasi*. Mechanical weeding is not possible in dry sowing, resulting in excessive weed competition. This also results in delayed application of fertilizers. Since high yielding medium duration varieties do not have a vegetative lag phase, their yields decline to unacceptably low levels due to delayed *biasi*. Therefore, farmers opt for the late local varieties, which may have lower yields under ideal conditions, but are capable of withstanding the adverse effect of delayed *biasi* and therefore yield a more dependable output.

intensity in most of these villages is even below that for the block as a whole, which is very low at 7 per cent (Table7.44).

***Table 7.44: Land Use And Irrigation, Kondagaon***

| Name of village | Forest area as per cent of total area | Cultivable wasteland as per cent of total area | Net Sown Area (NSA) | Net Irrigated Area (NIA) | NIA as a per cent of NSA | Share of different sources in NIA | | | | NSA as per cent of total area |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Wells | Canals | Rivers | Others | |
| Neota | 51.19 | 5.56 | 328 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 28.95 |
| Palari | 2.16 | 2.70 | 340 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 91.89 |
| Chikhalputi | 52.16 | 12.23 | 87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.29 |
| Chichpolang | 57.01 | 8.10 | 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.40 |
| Dudhgaon | 71.93 | 7.37 | 61 | 9.00 | 14.75 | 0.00 | 0.00 | 0.00 | 9.00 | 21.40 |
| Farasgaon | 69.77 | 2.25 | 87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 27.97 |

Bastar region is believed to be a center of origin of rice and has a vast and rich genetic diversity, which is threatened by replacement by improved uniform varieties. It is grown in a range of biophysical settings, ranging from very shallow uplands (*marhan* and *tikra*) to lowlands (*gabhar*). Based on the soil type, moisture availability and stable rainfall period, farmers traditionally adopted different varieties of rice with differing durations.

***Table 7.45: Cropping Pattern, Kondagaon Block in Percentages – 2002-03***

| | ***Kharif*** **Crops** | | | | | | ***Rabi*** **Crops** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of Villages | Paddy | Coarse Cereals & Millets | Pulses | Oilseeds | Veg. & Fruits | Total Crop | Paddy | Cereals | Pulses | Oilseeds | Veg. & Fruits | Irrigated Crop | Un Irrigated Crop | Total Crop |
| Palari | 90.6 | 0.4 | 6.62 | 0.9 | 0.8 | 99.32 | 0 | 0.16 | 0.36 | 0.02 | 0.09 | 0.27 | 0.41 | 0.68 |
| Farasgaon | 79.68 | 4.85 | 5.15 | 1.4 | 0.11 | 91.19 | 0 | 0.38 | 0 | 0 | 0 | 8.81 | 0 | 8.81 |
| Neota | 76.9 | 3.62 | 6.53 | 3.26 | 0.5 | 90.81 | 2.01 | 5.38 | 0.35 | 0.31 | 1.21 | 8.82 | 0.37 | 9.19 |
| Dudhgaon | 80.81 | 10.93 | 20.74 | 2.99 | 6.94 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chikhalputi | 79.84 | 1.89 | 7.8 | 1.23 | 4.66 | 95.35 | 0 | 1.78 | 0 | 1.42 | 0 | 3.21 | 1.45 | 4.65 |
| Chichpolang | 89.38 | 3.21 | 5.04 | 1.04 | 1.67 | 98.97 | 0 | 0.49 | 0 | 0.25 | 1.5 | 0.79 | 0.25 | 1.03 |

After rice, small millets like *kodon*, *kutki*, *madiya*, *sawan*, *chikma*, are the important crops cultivated and are also the staple food of the tribals. There is immense genetic diversity of these crops too in the region. Maize cultivation is extremely crucial in livelihood support through homestead farming (kitchen gardening or *badi* cultivation). It is also a source of food supplement, wherein green cobs serve as a source of food during scarcity period like the rainy season, when other crops are yet to be harvested. Maize-toria is the most common crop cycle in homesteads. *Urad* and pigeonpea are other important crops. Among mid-*kharif* season crops, *kulthi* an important pulses is useful due to its potential to withstand the adversities of sloping eroded soils with very low fertility. Niger (*Ramtil*) is the predominant oilseed crop in mid *kharif* season. So is Rapeseed (*Toria*), an important oilseed crop of this region, which plays a vital role

in double cropping after maize in homesteads. Wheat, gram and linseed are not important in the region.

Tuber crops are an important component in the diet of tribals. Different types of tubers are grown in the homestead, and wide genetic variation exists among tuber crops in the region. Cassavas, sweet potato, greater yam (Nagar Kanda), white yam, colocassia are amongst the commonly grown tubers. Vegetables are another important component of homestead cultivation. Big farmers are taking up vegetable cultivation in a major way, especially near urban areas. These include tomato, brinjal, table pea, okra (*bhindi*), potato, cow pea, etc. Spices are grown extensively in Bastar. The important spice crops are onion, ginger, turmeric, chillies and coriander. Fruits include mango, guava, papaya, *jamun*, banana, pineapple, tamarind, etc. These are grown in very low density conditions. Plantation crops like coconut are grown as a solitary tree behind the house. Although a non-traditional crop, farmers of the region fancy growing at least one coconut plant in their *bari*. Slowly, the settlers and traders are acquiring/encroaching/leasing land for larger plantations. Orchards are also coming up.

*Marhan* (top upland) soils, found over a wide area of Bastar plateau, are generally degraded. In such areas, cultivation of cashew is generally recommended. One of the major constraints limiting expansion or the area under grafted cashew plants is the non-availability of planting material. Karonda has been recognized an ideal plant for bio fencing and inter-plantation in cashew orchard based cropping systems under wasteland situations.

Agricultural practices play an important role in enhancing crop yields under a given set of soil and climatic conditions. There is some scope for raising productivity, through improved agricultural practices. There include maintenance of proper plant population by adopting appropriate seed rate, optimum time and method of sowing, proper weed control and adoption of inter-cropping to minimize risk under adverse conditions, etc. Bastar Plateau is mainly a monocropped area with little *utera* or intercropping. This entails a risk of complete crop failure under adverse conditions. Furthermore, monetary returns to the farmer are not commensurate with the efforts put in by them. To increase land use efficiency and economic gain, various types of suitable intercropping regimes may be encouraged. These require supportive irrigation, which is not a problem in the existing ecological regime. Bastar receives 1400-1600 mm rainfall. The topography is undulating and water accumulates in many places, which offers good scope for water harvesting and fisheries. However, fish productivity is quite low, mainly because the cultivation practices are very poor and extension services have had a limited outreach, concentrating on the better off farmers in villages closer to the town and main roads. Further on, investment in minor and micro-irrigation works, as well as *in situ* measures by the state have remained low, though these did gain some momentum during drought relief works in the last drought .

Another point that repeatedly came up was the increasingly impossible *utera* cultivation, which depended on *hatiya* or September rains. These rains have reduced and have proved far more unreliable in the past half a decade.

The tribal farmers apply organic manures in their *bari* fields making these fields rich in organic matter. Consequently, balanced nutrition in *bari* cultivation is generally achieved resulting in

higher economic returns. This also makes the homestead most coveted. Away from the *bari*, however, the nutritional status of soils is very poor. Most of the Bastar plateau soils are acidic in nature.

Wild mushrooms are found in abundance in the forests of Bastar Plateau during the rainy season. Edible wild mushrooms are collected and sold by the tribals. This provides extra income during off-season the good quality protein, Enriches their diet as well. Paddy-cum-fish culture in unleveled low-lying fields or aquaculture on waterlogged fields provides additional income to many of the more enterprising farmers who have adopted these, and there is no reason why the other farmers cannot do so. Similarly, in view of the fact that farmers in this region have low income and are seasonally under employed, the introduction of dairy animals, goats, pigs, poultry, ducks, fish and other subsidiaries on their farm increases the opportunity for employment and adds to their income.

Since the feeding of green fodder to animals under severe scarcity conditions is out of question, the animals have to be fed only on coarse roughage like rice straw. The nutritive value of paddy straw is very low since it has low nitrogen and mineral contents, and high silica and lignin content. Therefore, the promotion of pastoral crops/grass/plants in the uplands and midlands as well as on farm bunds is a vital necessity for drought mitigation.

***Marwahi (Bilaspur)***

***Table 7.46: Land Use and Irrigation (Marwahi)***

| Name of village | Forest area as per cent of total area (Total) | Cultivable wasteland as per cent of total area | Net Sown Area (NSA) | Net Irrigated Area (NIA) | NIA as a per cent of NSA | Share of different sources in NIA | | | | NSA as per cent of total area |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Wells | Canals | Rivers | Others | |
| Dhummatola | 16.77 | 3.99 | 430 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 76.08 |
| Usarh | 55.58 | 7.67 | 887 | 8.53 | 0.96 | 100.00 | 0.00 | 0.00 | 0.00 | 35.12 |
| Beljhiriya | 68.45 | 7.19 | 476 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 23.38 |
| Katra | 76.53 | 2.50 | 706 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 16.63 |
| Semardarri | 49.11 | 7.36 | 1130 | 0.40 | 0.04 | 100.00 | 0.00 | 0.00 | 0.00 | 29.43 |
| Naka | 76.52 | 0.27 | 415 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19.85 |

The percentage area irrigated in these villages is well below the block average of 8 per cent. The cropping intensity too is extremely low Tables 7.46 and 7.47).

***Table 7.47: Landuse and Irrigation, Marwahi Block, 2002-03***

| Name of village | Cropping Intensity | Percent Irrigation | Proportion Fallows | Proportion of common | Percentage Forest Area (Revenue) | Percentage Scrublands | Percentage Water Bodies | Percentage Mountain |
|---|---|---|---|---|---|---|---|---|
| Semardarri | 1.02 | 0.61 | 14.16 | 0.70 | 6.89 | 72.87 | 1.60 | 17.58 |
| Dhummatola | 1.02 | 0.92 | 12.01 | 0.24 | 13.27 | 75.58 | 2.00 | 0.00 |
| Usarh | 1.01 | 1.34 | 11.80 | 0.74 | 6.01 | 92.56 | 0.96 | 0.00 |
| Katra | 1.00 | 0.04 | 6.21 | 0.83 | 1.88 | 93.11 | 1.14 | 3.39 |
| Beljhriya | 1.01 | 0.65 | 18.19 | 0.76 | 8.41 | 90.71 | 0.59 | 0.00 |
| Naka | 1.02 | 1.84 | 14.17 | 0.27 | 0.35 | 98.17 | 0.40 | 0.06 |

There is mono-cropping of rice in the selected villages, which covers about 70 per cent of the net cultivated area. Irrigation is negligible, and that is why most of the gross cropped area is cultivated during *kharif*. This is only 4 per cent. About 65 per cent of the rice is grown in uplands, which are characterized by very shallow eroded land and acidic soils and have poor fertility and water holding capacity. Small millets and maize are other important *kharif* crops. Among pulses, horsegram (*kulthi*), black gram (*urid*) and pigeonpea (*arhar*) are important. Niger is the important oilseed crop (Table 7.48). Groundnut and *til* are also grown, although both these crops account for less than 4.5 per cent of the cultivated area. In *rabi*, wheat and mustard are important crops. The climate of the zone is suitable for wheat cultivation. Mustard is largely grown in homesteads after early maize. Gram does not do well in the acidic soils of this area. However, its cultivation is limited to the better soils.

***Table 7.48: Cropping Pattern of Villages in Marwahi Block in Percentages***

| Name of Villages | Unirrigated Paddy Crop | | | | ***Kharif* Crops** | | | | | | ***Rabi* Crops** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Traditional | | HYV | | Un Irrigated Paddy | Coarse Cereals & Millets | Pulses | Oilseeds | Veg. & Fruits | Un Irrigated Crop | Cereals | Pulses | Oilseeds | Veg. & Fruits | Irrigated Crop | Un Irrigated Crop | Total Crops |
| | Transplant | Broadcast | Transplant | Broadcast | | | | | | | | | | | | | |
| Semardarri | 3.93 | 74.18 | 1.27 | 20.62 | 63.48 | 15.95 | 5.30 | 6.13 | 3.75 | 94.62 | 0.71 | 0.71 | 4.06 | 0.55 | 0.61 | 4.78 | 5.38 |
| Dhummatola | 0.00 | 97.71 | 1.52 | 1.83 | 72.01 | 12.24 | 6.93 | 2.64 | 0.00 | 93.82 | 0.46 | 0.56 | 3.82 | 1.91 | 1.66 | 4.52 | 6.18 |
| Usarh | 22.68 | 45.41 | 24.73 | 7.18 | 57.96 | 26.98 | 4.19 | 0.63 | 0.00 | 90.99 | 0.56 | 0.90 | 3.38 | 5.07 | 5.10 | 3.91 | 9.01 |
| Katra | 4.63 | 93.03 | 1.66 | 0.68 | 78.72 | 8.14 | 5.25 | 1.51 | 0.03 | 93.65 | 0.10 | 3.22 | 5.89 | 0.36 | 0.36 | 5.99 | 6.35 |
| Beljhriya | 2.45 | 96.03 | 1.35 | 0.13 | 78.19 | 11.65 | 3.40 | 2.74 | 0.33 | 96.08 | 0.10 | 1.74 | 3.19 | 0.63 | 0.63 | 3.29 | 3.92 |
| Naka | 5.13 | 88.20 | 4.87 | 1.81 | 67.40 | 19.22 | 4.18 | 5.34 | 0.36 | 96.50 | 0.90 | 0.27 | 1.96 | 0.64 | 1.81 | 1.69 | 3.50 |

Rice is grown in a whole range of farming situations: from unbunded upland sloping fields to leveled water logged bahara (low lying) fields. Farmers try and select rice varieties suitable for different growing situations and permissible length of growing period as per the soil-slope-rain situation, with shorter duration and even less labour-intensive methods (without *biasi* and weeding) in the unbunded uplands. There is usually a trade off between length of growing period and productivity, on the one hand and reliability and location, on the other. The unbunded uplands are often not ploughed or weeded.

Rice is mostly sown by the traditional broadcasting method and dry sowing. The poor, resource-constrained farmers in the region, belonging to tribal and other weaker sections of society, have small holdings and are unable to use monetary inputs like fertilizers. Very little chemicals are used for controlling pests and diseases, like gall midge among rice pests and blast among diseases. Millets are next in importance to rice, especially for tribal farmers and are their staple food. The farmers do not use any inputs in these crops. Every farmer we spoke to complained of the poor availability of quality seeds of improved varieties. Farmers often prefer intercropping of small millets with black gram, which is also more remunerative. Maize is grown mostly in homesteads and consumed as green cobs, during the lean pre-harvest months of August/September when foodstocks with the family are very low. *Kulthi* is an important pulse and is grown on hill slopes as a mid-season crop in August-September. The growing conditions are extremely poor. The soils are highly eroded, very poor in organic matter and nutrients. Niger is an important cash crop of the tribal farmers and is grown almost in a situation similar to that of horse gram. Very little wheat is grown, both, under irrigated and unirrigated conditions.

Rape-seed is a vital crop in the maize-toria cycle in homesteads. Besides these, a large number of crops are grown in the area, including *urad*, groundnut, soyabean, pigeonpea, gram, field pea, linseed, barley, etc. In the past six to seven years, urid has not been too popular because it 'turned yellow' and was affected by blight. Similarly, the area under mustard has reduced due to the failure of the ever important September-October *hatiya* rains.

### 7.2.10 *Livestock Maintenance Practices*

A number of the well-endowed farmers, typically the traders who have now taken to farming and are rapidly boring tubewells, complained about the traditional practice of open grazing after harvesting rice, a practice consistent with monocropping, given the abundance of crop residue and grass for grazing uptil December, or longer. However, this spells doom for those who wish to go in for a *rabi* crop, and many villages have witnessed intense conflicts and even violence after angry farmers killed the hapless animal that strayed into their fields of wheat and gram. Irate animal owners and adivasi farmers and residents retaliated by destroying the crop and police intervention (always to the detriment of the tribal residents) has ensued. In the absence of more widespread irrigation and other complementary facilities for *rabi*, that make it an option for a large number of cultivators and not just a few rich farmers or outsider traders, and of dry and green fodder for livestock, this will most likely remain a thorny and contentious issue. There is also no effort to seriously promote agro-forestry and fodder crops, which is traditionally absent in this mono-cropped area. An additional factor is that livestock rearing has never been an income-oriented activity. On the other hand, the trader-farmers everywhere demanded saplings of remunerative plants.

### 7.2.11 *Productivity*

Crop-yields are incredibly low, and vary with soil and land location. The yields are well below the state average, and this holds true even in the best setting, in terms of slopes and soil. Table 7.49 shows the averages across all villages and size classes.

***Table 7.49: Yield of Selected Crops in Kgs Per Hectare, Marwahi***

| | | | *Kanhar* | *Matasi* | *Dorsa* | *Kachhar* | *Murrum* |
|---|---|---|---|---|---|---|---|
| | | *Marhan*(upland) | 807 | 937 | 910 | | |
| | | *Mal* (midland) | | | | | |
| | Paddy | *Gabhar* (lowland) | 1252 | 1321 | 1022 | | |
| | | *Marhan*(upland) | 120 | 248 | 250 | | 100 |
| | | *Mal* (midland) | 145 | 280 | 261 | | 167 |
| | Kodo-kutki | *Gabhar* (lowland) | | | | | |
| | Maize | *Baari*(upland) | 1016 | 1044 | 1478 | | 765 |
| | | *Marhan*(upland) | 1083 | 1392 | 1498 | | 861 |
| | | *Mal* (midland) | 821.5 | 984 | 921 | | 720 |
| *Kharif* | Pigeonpea | *Gabhar* (lowland) | | | | | |
| | | *Marhan*(upland) | | | | | |
| | | *Mal* (midland) | | | | | |
| | Wheat | *Gabhar* (lowland) | 1293 | 1003 | 772 | | |
| | | *Marhan*(upland) | | | | | |
| | | *Mal* (midland) | | | | | |
| *Rabi* | Gram | *Gabhar* (lowland) | 592 | 394 | 405 | | |

As we have discussed earlier, the biggest constraints to increasing yield are irrigation facilities, infrastructure and wherewithal with the adivasi farmers. Upgradation of traditional practices is essential too. In the upland conditions, the absence of farm ponds makes even *biasi* very difficult and farmers often just grow paddy or coarse cereals and millets on unbunded fields. In fact, the trend was that the only bunded land in the backward interior villages was the lowland *gabhar*, while in the advanced or more developed villages the only unbunded land was the land encroached by the marginalized backward tribes and castes. We must remember that the lower application of productivity enhancing labour in labour intensive practices is because state intervention has been unable to help agriculture overcome constraints imposed by terrain and soil, to retain rainwater. It has little to do with the anthropologists' view of tribal farmers as 'laid back', and being more interested in drink and cockfights than serious work.

***Table 7.50: Yield of Selected Crops in Kgs Per Hectare, Kondagaon***

| | | | *Kanhar* | *Matasi* | *Dorsa* | *Kachhar* | *Murrum* |
|---|---|---|---|---|---|---|---|
| | | Marhan(upland) | 850 | 1020 | 975 | | |
| | | Mal (midland) | | | | | |
| | Paddy | Gabhar (lowland) | 1350 | 1365 | 1150 | | |
| | | Marhan(upland) | 142 | 267 | 295 | | 164 |
| | | Mal (midland) | 155 | 290 | 315 | | 180 |
| | Kodo-kutki | Gabhar (lowland) | | | | | |
| | Maize | Baari(upland) | 1200 | 1190 | 1290 | | 840 |
| | | Marhan(upland) | 1100 | 1410 | 1470 | | 720 |
| | | Mal (midland) | 798 | 910 | 884 | | 750 |
| *Kharif* | Pigeonpea | Gabhar (lowland) | | | | | |
| | | Marhan(upland) | | | | | |
| | | Mal (midland) | | | | | |
| | Wheat | Gabhar (lowland) | 1100 | 1050 | 745 | | |
| | | Marhan(upland) | | | | | |
| | | Mal (midland) | | | | | |
| Rabi | Gram | Gabhar (lowland) | 650 | 410 | 375 | | |

However, the gap between yield in the field survey sample average and the maximum national yields is phenomenal. (Table 7.51)

***Table 7.51: Slack in Yield and Shortfall in Adivasi Farmer Incomes on Account of Paddy***

| | Paddy Yield in kgs per hectare | MSP for Paddy 2002-03, Rs. Per kg | Value of gross output per hectare in Rs. | Deficit of the farmers on account of the slack (Rs) |
|---|---|---|---|---|
| State Average Yield | 1800.00 | 5.30 | 9540.00 | -4770.00 |
| National Maximum Yield | 4344.00 | 5.30 | 23023.20 | -18253.20 |
| Actual Yield as per Field Survey | 900.00 | 5.30 | 4770.00 | 0.00 |

The major constraint to developing irrigation is the expansion of rural power infrastructure. Although there are some perennial or seasonal streams that retain flow till February/March, they are in gorges or low-lying narrow valleys while agricultural lands lie above the streams and rivers, at an average of 100 to 150 meters. For instance, in Neota an earthen dam is severely underutilized since the village and its agricultural land are at a higher elevation and there is no provision of power to lift the water. This results in the paradoxical situation of scarcity amidst plenty: abundant or, at least, adequate water availability, but the lack of complementary and essential infrastructure backing to utilize it. In the absence of power to lift water, a large number of small on-farm *in situ* measures to retain soil moisture at the place where the rain falls first is required. In fact, in most of the villages in Kondagaon, the streams had water till March or April, and existing structures retained water till May in years of normal rainfall. The recent attempt by the state government to construct a large number of farm ponds on private land through the drought relief works is commendable. However, it is not an unqualified success as it required the landowner to deposit his/her title deed or *patta* with the government (in general, the guidelines of

employment programmes do not permit asset creation on private land, which is why this was made mandatory). This was met with great suspicion and resistance on the part of small farmers and those who belonged to backward castes, and wielded little influence or power.

The farmers' low ability to make investments on their farms is not mitigated by credit, because the cultivators cannot avail of it. This is for four reasons: distance from the Banks and co-operative societies, high interest charges, corruption and unpleasant experiences during loan recovery.

### 7.2.12 *Food Consumption*

There exists an underlying hunger and malnourishment amongst the peasantry and labourers as is clearly demonstrated in the tables below (Tables 7.52 and 7.53).

***Table 7.52: Per Capita Consumption in Villages of Marwahi Block as a Percentage of ICMR Nutritional Norms, 2003***

| | | Pulses | Cereals/Millets | Vegetables |
|---|---|---|---|---|
| | | *40gms/day* | *450gms/day* | *150gms/day* |
| Semardarri | Landless | 55 | 138 | 31 |
| | Marginal | 79 | 185 | 38 |
| | Small | 83 | 140 | 45 |
| | Medium | 99 | 138 | 78 |
| | Large | 120 | 120 | 110 |
| | Primitive tribes | 37 | 82 | 41 |
| Dhummatola | Landless | 48 | 115 | 37 |
| | Marginal | 82 | 148 | 43 |
| | Small | 79 | 169 | 72 |
| | Medium | 91 | 110 | 87 |
| | Large | 110 | 126 | 158 |
| | Primitive tribes | 41 | 89 | 33 |
| Usarh | Landless | 45 | 178 | 75 |
| | Marginal | 58 | 188 | 65 |
| | Small | 67 | 136 | 81 |
| | Medium | 82 | 118 | 115 |
| | Large | 105 | 105 | 128 |
| | Primitive tribes | 48 | 83 | 51 |
| Katra | Landless | 49 | 169 | 39 |
| | Marginal | 56 | 187 | 41 |
| | Small | 72 | 215 | 46 |
| | Medium | 89 | 105 | 62 |
| | Large | 117 | 110 | 127 |
| | Primitive tribes | 28 | 62 | 37 |
| Beljhiriya | Landless | 79 | 144 | 56 |
| | Marginal | 92 | 154 | 42 |
| | Small | 47 | 139 | 78 |
| | Medium | 78 | 122 | 93 |
| | Large | 120 | 112 | 102 |
| | Primitive tribes | 31 | 88 | 69 |
| Naka | Landless | 59 | 173 | 39 |
| | Marginal | 66 | 201 | 56 |
| | Small | 79 | 189 | 82 |
| | Medium | 81 | 155 | 104 |
| | Large | 138 | 110 | 152 |
| | Primitive tribes | 38 | 91 | 58 |

| ***Table 7.53: Per Capita per Annum Consumption of Villages of Kondagaon Block as a Percentage of ICMR Nutritional Norms, 2003*** | | | | |
|---|---|---|---|---|
| | | Pulses | Cereals/Millets | Vegetables |
| | | *40gms/day* | *450gms/day* | *150gms/day* |
| Palari | Landless | 43 | 143 | 38 |
| | Marginal | 41 | 153 | 41 |
| | Small | 69 | 109 | 62 |
| | Medium | 81 | 129 | 77 |
| | Large | 106 | 104 | 128 |
| | | | | |
| Farasgaon | Landless | 39 | 165 | 45 |
| | Marginal | 41 | 201 | 51 |
| | Small | 78 | 134 | 72 |
| | Medium | 91 | 144 | 51 |
| | Large | 119 | 116 | 146 |
| | | | | |
| Neota | Landless | 54 | 171 | 33 |
| | Marginal | 59 | 178 | 56 |
| | Small | 42 | 154 | 61 |
| | Medium | 89 | 132 | 89 |
| | Large | 92 | 128 | 136 |
| | | | | |
| Dudhgaon | Landless | 40 | 149 | 39 |
| | Marginal | 41 | 172 | 32 |
| | Small | 57 | 182 | 61 |
| | Medium | 91 | 149 | 82 |
| | Large | 127 | 119 | 93 |
| | | | | |
| Chikhalputi | Landless | 33 | 143 | 51 |
| | Marginal | 39 | 165 | 47 |
| | Small | 91 | 133 | 72 |
| | Medium | 103 | 121 | 89 |
| | Large | 115 | 138 | 151 |
| | | | | |
| Chichpolang | Landless | 63 | 162 | 48 |
| | Marginal | 51 | 171 | 54 |
| | Small | 45 | 126 | 74 |
| | Medium | 91 | 101 | 72 |
| | Large | 121 | 106 | 172 |
| | | | | |

While interpreting the data we must remember that the figures are actual consumption as a percentage of the norm. Therefore, figures below 100 per cent reflect the shortfall from the norm.

The tables speak for themselves, and the broad conclusions that can be made are the following:

- The shortfall in pulse and vegetable consumption is spread over all sections t except the larger farmers. This is most severe in the case of the *Baigas*, P*andos*, *Panikas, Paos* and other primitive tribes, who have taken to settled cultivation very recently and a large part of their sustenance comes from fishing, hunting and gathering.

- The high per capita consumption of cereals is usually in the form of coarse cereals and millets, which are dry-land crops acquired either from own holdings or received as wages.

- Such high and suppressed hunger is bound to result in a very fragile health status and chronic malnourishment. This in turn means that under drought conditions, starvation hangs on their heads like the proverbial sword of Damocles, unless the public distribution system and food for work programmes are adequate and quick to respond.

### 7.2.13 *Significance Of Forest Produce*

The forest has always been bountiful for the tribal and Scheduled Caste population living in and around the forests. It has offered tremendous supplementary livelihood and food security, in many instances providing for cash needs or goods for barter at the local *haat*. The non-timber forest produce that is available in both places includes mango, *jamun*, *munga*, *laakh*, *saal*, *tendu* leaves, *chaar*, *harad*, *mahua*, etc. Though all these command a good price in the towns and cities, and earn the traders and middlemen good margins, the collector may receive as little as 20 per cent of the final price! In the case of the nationalized products like *tendu* leaves, the trouble is that the societies do not pick up the entire collection.

### 7.2.14 *Wages, Employment And Poverty*

Both, employment and wages are very low in the region, largely due to the low intensity of farming and the lack of alternative off-farm rural employment. Here too Marwahi lags behind Kondagaon, which is not saying very much considering that the wages in Kondagaon are an average of Rs 25 for men and 20 for women. In fact, a number of people migrate to Raipur in search of work. In Dudhgaon, farmers reported that peak agricultural wages were Rs 15 for women and Rs 20 for men. In most of Marwahi, the wages were usually in kind, but never added up to more than Rs 15. The employers themselves were a trifle embarrassed when we heard this, and started explaining it in terms of the following: ‘we also give lunch…” ‘The tribals come at 12 and leave by 5…” etc.

| *Table 7.54: Below Poverty Line and Antyodaya Households as Proportion of Total Households* | |
|---|---|
| **Kondagaon Block** | |
| Palari | 67 |
| Farasgaon | 68 |
| Neota | 73 |
| Dudhgaon | 61 |
| Chikhalputi | 79 |
| Chichpolang | 61 |
| **Marwahi Block** | |
| Semardarri | 62 |
| Dhummatola | 71 |
| Usarh | 78 |
| Katra | 71 |
| Beljhiriya | 67 |
| Naka | 79 |

Therefore, we find that poverty, low productivity, indebtedness, land alienation and extremely stark exploitation of the Scheduled Caste and poor adivasi peasantry and agricultural labour is commonplace in these areas, resulting in poverty and hunger. This makes the area and its people, extremely vulnerable to a lot of distress in times of drought. However, the problem lay not so much in the lack of feasible solutions, but in the inattention in mainstream policy to the specificities and requirements of these forgotten people, a mainstream that in the pursuit of its own development and interests has of course never hesitated in exacting a very heavy price from these very same people. We now turn attention to policy issues.