

Draft report of a Study on watershed development in
Sunari watershed (semi-ravine area) of Datia district
of Madhya Pradesh

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1. Study design

1.1 Background

Society for Promotion of Wastelands Development (SPWD) and SAMBHAV¹, Gwalior had initiated a watershed project in Pali hamlet of Sunari watershed starting January 2003. One of the major problems of the ravinous stretch along the Sindh river (a tributary of Chambal) is of land degradation because of ingress of flood water in the agricultural lands leading to progression of ravines. The project developed by SPWD and Sambhav was developed with the idea of checking further land degradation and for that the approach used for treatment was on a watershed basis. The expected outputs of the project developed by SPWD and Sambhav are -

- (1) Prevention of further development of ravines through watershed treatment activities in semi-ravinous areas,
- (2) Demonstration of the technology in the area
- (3) Improvement of livelihood in the project area.

The project area falls in Sunari watershed, which cuts across the Seondha and Datia tehsils of Datia district.

1.2 Rationale of the study

An in-house study was initiated in the watershed with the following objectives -

- To study the natural resource endowment/ access and its management with an emphasis on ravines.
- Livelihood systems of the area.

The study is descriptive in nature; it takes an integrated view of the agrarian order in the watershed: access to land, access to water, access to other common property resources, access to credit and other capital assets. Livelihoods systems was also studied because the problem of production from land (whether private or common property) could not be viewed in isolation from the issue of livelihoods. An attempt was made to comprehend the local self-governance institutions and their role in NRM.

1.3 Methodology

As a first step for the study a baseline of the villages was undertaken. Both secondary and primary level data were collected based on individual interviews of key persons and focussed group discussions, departmental data, Participatory Rural Appraisals (PRAs) and ocular observations. The policies (particularly) related to NRM for the state of Madhya Pradesh which have impact on resources and institutions and their interplay were also considered. A checklist

¹ SAMBHAV a Gwalior based NGO is a part of Ekta Parishad's network, which is a radical political initiative in the state on land, and forest related issues. It works in the issues related to displacement and rehabilitation and to pattern of development in the area.

was used for collecting village level information which was analysed along the following lines- land distribution; access to water; access to forest; access to livestock; agricultural activities; trend in agriculture; migration; village institutions; Panchayati Raj Institutions (PRIs); government programmes; credit; public distribution system (PDS); livelihood systems.

2. Sunari Watershed

2.1 Technical aspects of the watershed

Sunari is a microwatershed with an area of around 3290 ha. The watershed is around 50 kms from Gwalior city and is located just across the river Sindh on the NH-75. There are a total of five villages in the watershed - Goraghat in Datia tehsil; Sunari, Bharsula, Tilaitha and Uchad in Seondha tehsil. For practical purposes the portion of Goraghat (hamlet of rawat community) which falls on the other side of the road too has been included in the watershed. The watershed delineation was in conformity to the one developed under the Natural Resource Information Systems (NRIS) under a pilot project implemented in two districts of Madhya Pradesh by National Informatics Centre (NIC), Madhya Pradesh. The land is relatively flat in the watershed and the difference in altitude is not more than 20m throughout the watershed. The initial idea was to choose a stretch of the river given that the problem of ravines is related to ingress of water from the river and not the usual soil erosion due to runoff. However from the onset it was clear that the selection would be done on a watershed basis. Studies on ravines by VIKSAT and other institutions too advocate the practice of treating ravine land on watershed basis. In case of Sunari microwatershed the river on one side and manmade boundaries like road on the other sides formed the ridgeline. In this case there was a culvert in the road the outflow from that needs to be considered while calculating runoff from the watershed. There are a number of structures in the watershed (mostly drainage outlets) which have been constructed by the department of soil and water conservation under a World Bank programme on ravine reclamation.

2.2 Socio-economic data -Sunari watershed

Demography

<i>Details</i>	<i>Goraghat</i>	<i>Uchad</i>	<i>Bharsula</i>	<i>Tilaitha</i>	<i>Sunari</i>	<i>Total watershed</i>
Total households	180	215	142	103	173	813
Total population	1194	1306	1137	679	1342	5658
Total male	649	713	611	371	745	3089
Total female	545	593	526	308	597	2569
Literate	98	335	255	159	299	1146

Source: NIC, Datia

Amenities and Infrastructure

<i>Amenities</i>	<i>Goraghat</i>	<i>Uchad</i>	<i>Bharsula</i>	<i>Tilaitha</i>	<i>Sunari</i>	<i>Total watershed</i>
Educational - Primary school	1	1	1	1	1	5
Middle school	X	1	X	X	X	1
Medical	Nearest at Goraghat	Primary health centre at Uchad	Within kms	5	More than 10 kms	Within 5 - 10 kms
						Around 5 - 10 kms

Drinking water - potable	Well; Handpump (Five; four functional)	Wells; Handpump - 34 (9 govt, 25 private)	Wells; handpump - one	Wells, handpump - one	Wells, handpump - one	Wells; handpumps	42
Post and Telegraph	Nearest less than 5 kms	Post office	Post office	Less than 5 kms	Within 5 kms	2 post offices at Uchad and Bharsula	
Days of market / haat	Nearest within 5 kms	More than 10 kms	More than 10 kms	More than 10 kms	More than 10 kms	Between 5-15 kms	
Communication (bus-stop); railway station; waterway	Bus stand	Bus stop	Bus stop	Bus stop within 5 kms	Bus stop	4 bus stops	
ICDS centre	None	None		None	None		
Approach to village	Kutcha road	Pucca road	Pucca road	Kutcha road	Pucca road	Pucca road in three villages; kutcha in two	
Electricity for agriculture	√	√	√	√	√	In all villages	
Electricity for domestic purposes	X	√	√	√	X	In three villages	
Staple food: Wheat and jowar							
Nearest town and distance: Dabra within 5-18 kms							
PDS Accessibility (Fair Price Shop at Sunari factory area)							
Bank - PNB at Sunari factory area, SBI at Uchad village							
River adjoining the village - Sindh (tributary of Chambal)							
Nearest market: Sunari factory area and at Uchad village							
Distance from Gwalior 50 kms							
Distance from Datia 22 kms							
Distance from main road: Goraghat is situated at intersection of Indergarh road and SH- 37; all the other four villages are situated adjacent to or at the most 3 kms away from the Indergarh road.							

Primary education centre is there in all villages but lacks building and resources.

Worker composition

<i>Details</i>	<i>Goraghat</i>	<i>Uchad</i>	<i>Bharsula</i>	<i>Tilaitha</i>	<i>Sunari</i>	<i>Total watershed</i>
Total main workers	114	389	276	234	311	1317
Cultivators	87	321	227	216	345	1196
Agricultural labourers	8	29	26	None	32	95
Household industry	None	1	7	7	11	26
Other workers	19	none	16	16	23	74
Marginal workers	36	5	52	None	157	250
Non workers	296	912	809	445	774	3236

NIC, Datia

2.3 Livelihood systems

There are no significant industries in and around the watershed. As a result local wage opportunities are largely confined to agriculture and its related infrastructure. There were three industries in the watershed- Gwalior synthetics limited, Sunari; Kishori Pujari Granite private limited, Goraghat and Sonal straw product private limited, Kotra-Goraghat. All of these have been closed during the last five to ten years. The textile factory (Sunari factory) went out of production a decade back. Formerly there were many families from the village as well as adjacent villages who had got employment here. Dependence of workers on the farm has increased after the closure of Sunari factory. Sunari factory used to provide employment to around 250 people from the watershed and contractual work to another 100. There are other factories in the industrial area of Datia as well as Dabra/ Gwalior industrial area. There is some amount of dependence on the Dabra/ Gwalior industrial area largely for unskilled labor. Very few people have over the years graduated to the category of skilled labor (mostly *mistry* in construction industry).

Rural and peri-urban infrastructure is the main employer of unskilled labor. Both Dabra and Indergarh are burgeoning towns and attract labor from the watershed. Apart from that the periurban centers like Goraghat village and Uchad village also provides opportunities. Broadly speaking the poor within the watershed depend on a mix of the three to four livelihood options- on farms, canal (Rajghat project presently), roads (NH 75 which was developed a decade back) and buildings as worksites.

In our study we have not been able to set out the trends in supply (quantity) and terms (quality) of labor opportunities in agriculture and off-farm works. This can be a further area of research. The extent of livelihood dependence on the non-farm sector could be figured out through a sample survey at household level. This research could be taken up under this year's (2004-05) MoU. We can then present the types of labor contract in use at present, and who among the different laboring communities is working in each. This could be done through historical interviews, which could review the origins and likely future of these contractual arrangements.

The chief sources of livelihood sources available within the watershed are therefore agriculture² and wage labor (agricultural, sand mining). Women usually go for agricultural labor whereas men are engaged in sand mining in the river Sindh. Migration from the area to distant places is not common; seasonal migration to villages within the watershed (like Uchad an agriculturally more developed village) or nearby areas for agricultural labor is common though. For certain castes like jatavs and dhimars the other sources of livelihood are sale of fish and vegetables. Catching of fish from the river Sindh is illegal and therefore the sale is done at the local *haat* (weekly market) in a covert way. Some households are involved in animal husbandry (goats and buffaloes in particular). As far as sand mining from the river Sindh is concerned, the villagers get the work on a seasonal basis for loading of trucks. The lease is taken by big farmers of Uchad village and till now no one from other villages in the watershed has ventured into this due to lack of capital.

The area has seen heavy investments (not public investments though) in irrigation and other inputs during the late eighties which kickstarted intensive agriculture in the area. The area is a heavy tubewell irrigated area. Intensive cultivation is done in the watershed; therefore common lands are of marginal importance. However, the productivity of the agricultural lands is not very high like in Western Uttar Pradesh.

² Seondha tehsil where four out of five villages of our watershed are located has the largest number of villages having their working population classified as cultivators.

The populist process of land distribution took place during the seventies. It has to be studied whether all this has shifted the terms and requirements of labor on the farm. Around twenty-five percent of the households are landless in village Sunari itself; they rely on wages to fulfil basic grain needs.

Earlier farmers were compelled to meet the workload and seasonal rhythm of the newly cleared and watered farms. The coming of tractors/ harvesters and hiring of these has adversely affected the labor requirement. This is evident in the case of sandmining in which too large-scale use of machinery is displacing labor.

Another trend has been the bringing in of migrants for wage labor work in the area for the first time. For the work on the Rajghat Left Bank canal, which passes through the watershed, workers have been brought in from as far as Jhabua. This is a mobile workforce and has moved on along the course of canal construction. This too reduced the opportunities for labour during the canal construction. Though people are given government rates here, only a few farmers get work and that too when there is excess work.

A further trend which we observed in land relations was that there has been a shift from attached labor extending over generations to untied and fixed term piece rate contract as also from daily labor to migrant labor from neighbouring districts. Feudal land relations are uncommon in the watershed. There are quarries and farms in adjoining districts where these exist.

Almost all-arable lands have been cleared for cultivation (leave apart the ravinous lands). Also, the average farm size is decreasing fast. The period of eighties saw a sudden increase in the land value in the area. But inspite of the premium value farmers do not sell land. They hold onto land for prestige and land security in uncertain times. In this context the unskilled labourers here are facing an uncertain future. Both local on-farm options and on-farm demand is declining in the area and the conditions, which give them minimum wages, are no longer in place.

There is no growth in the private sector during the last decade here beyond construction and petty trade. Public investments are declining, and whatever investments are there are depending more and more on migrant labor. All this is leading to a crisis in the area. The government of MP had heavily subsidised electrical power for the farmer using upto 5 H.P. motors for pumping water. This had led to installation of large numbers of pumping sets on each river bank lifting of the precious water for wheat rice combination affecting the perennial flow of these rivers. Removal of power subsidies is leading to a crisis in agriculture.

When we look at the district as a whole mining and quarrying of stones for building materials are common. Bundelkhand granite is mined here and stone-gravel's made of granite are popular for RCC work. Stone cutting and quarrying is under the total control of contractors who exploit the wage labourers. The sand of the rivers provides valuable material for masonry and RCC work. Feudal relations in the form of bonded labor are very common in the field of quarrying in the region. Discussions brought out that access to formal credit by rural agricultural and non-farm producers is reducing. Wage rate prevalent in the area averaged around Rs. 40 for women to Rs. 60 for men.

Below mentioned are a number of cases related to livelihoods of the people of the area. They cover livelihoods of particular caste groups (like sahariyas) in the watershed, dependence on options like sandmining, gur production, the prevalent system of sharecropping to crisis in sugarcane in the area.

2.3.1 Case of Sahariyas settled at Goraghat

The sahariyas of Goraghat (twelve families) do not have pattas and are not eligible for institutional credit or government schemes as a result. A primary school teacher (at Goraghat) an ex-employee of Sambhav had tried to introduce a resolution in the Gram sabha to include these families in the voters' list but the village seems to be divided on this. These sahariyas are originally from Guna, Morena and Shivpuri district of the state and are twice displaced the second time from Sarnagath village on the right bank of Sindh river. Their traditional occupation is of working in the forest and of living on forest produce. Most of them are not settled agriculturists to this day and are into either agricultural labor or more frequently into the 'general labourer' category. The sahariyas of Goraghat get agricultural labor work at either Goraghat itself or bigger villages like Sunari, Mehnora, Pachokra, Sarnagath (all villages) or at towns like Dabra and Morena. Construction work or loading/unloading work on a daily basis at Dabra fetches them the prevalent wage rate of Rs. 50. Trucks usually come to the village for taking labourers to the site on a daily basis. Both men and women go for wage labor.

The practice³ of hali-batholi and hali-banta is no longer common among the sahariyas of the watershed. In the district however most of the sahariyas do not have formal possession of land even thirty years after it was allotted to them. They work as bonded labourers on their own land. Many adivasis are attached to others' farms for a payment of a meagre Rs. 2000-5000 per year. In the local dialect this is known as "hali". This system of bonded labourer is widely prevalent in these parts. The starvation deaths of Sahariyas in nearby Shivpuri during the year 2002's drought had become a political issue and the government has been forced to implement Food For Work (FFW) programmes for them. During our visit the Sahariyas of Goraghat were doing work on road (panchayat programme). They also work on sand mining (Sindh River) on a lumpsum basis (Rs. 250 - Rs. 300 per trolley).

The Sarpanch's claim that the Sahariya's cannot be given land under the charnoi land distribution scheme because of absence of charnoi land in the village is not true however. According to the data however culturable waste (including gauchar and groves) constituted 46.72 ha in the village.

2.3.2 Case of sandmining at Goraghat

Unlike the nearby district of Shivpuri, which is mineral rich and is famous for illegal mining/quarrying from reserved forest areas, Datia is not important from mineral point of view. Only minor minerals like sand, building stones, road metal and murrum are being extracted. Sand mining from Sindh riverbed is common during summer months.

The mining department has issued guidelines for leasing minor mineral mines:

³ In the former they are given an agreed amount of remuneration in lump sum at the time when they are employed. Some food is also given according to need and for all this a very high interest is charged. The Sahariya goes on working and his/ her wages go towards part payment of the amount paid to him (her) and thus he/she becomes a slave for life. Under hali-banta cash is not given instead he/she gets some grain in lieu of the daily wage and one-fifth to one-sixth share in produce earned by him/her yearly. Under this system the dependence on the creditor continues.

- Mines having a gross income of upto Rs. 2.5 lakhs shall be transferred to the gram panchayats.
- Gross income of Rs. 2.5 to 5 lakhs to Janpad panchayats.
- Gross income of Rs. 5-10 lakhs to zilla panchayats.

The sarpanch of Goraghat took advantage of his contacts with political higher ups to get the royalty from sand mining in Sindh river for the Gram panchayat. He claims to have drawn the attention of Chief Minister Digvijay Singh on this issue. Previously this used to go the Janpad panchayat. For a work of Rs. 10 lakh, which is ongoing now, the Gram panchayat of Goraghat has got Rs. 2.5 lakh. The sarpanch of Uchad too expects some income from sandmining in Uchad village (Rs. 1 lakh; income 20-25 percent) this year.

Given the extent of sandmining in the area the chances of this leading to adverse effects like the problem of endangering the river course and aggravating the dangers of floods is high. Sandbanks are inducers of infiltration, water purification and help maintain underground flows of water. Their removal is a danger to both the quality and quantity of water, but sandmining is on the rise because of high demand of Bundelkhand sands that are fine, stony sands, clayless and without impurities.

2.3.3 Case of sharecropping⁴ at Uchad village

Choubey's two sons are service holders and do not stay at Uchad village. Choubey gives his land on batai; presently it's with a kumhar who has the adjacent land. The terms of batai are - the cost share is equally borne by the landowner and the sharecropper; the crop is shared in kind. Thus two-third goes to the landowner and one-third to the sharecropper. Choubey has a tubewell but is not able to operate it in the absence of electric line, which is yet to reach, where his field is. The same is the case of the sharecropper (kumhar) and as a result rainfed urad is grown. Choubey shuffles his tenants every year to avoid them from acquiring bhumiswami status (occupancy and ownership rights). Choubey is politically well connected (formerly a member of the District Congress Committee) and is waiting for the MPED to provide a connection to his field. He refuses to expend the Rs. 40,000 to Rs. 50,000, which the department wants him to do for getting the electric poles to his field.

The tenants who he gives his land on batai to are usually medium/ semi-medium farmers from adjacent fields. The patwari has not entered the tenant's name in the village revenue records. The few jatav landless families in the village meet their subsistence requirements from wage labor and not sharecropping. The crop share in this case works out to be very adverse for the sharecropper. Generally the norm in the watershed is of equal sharing of cost and produce between the tenant and the landowner. Also, sharecropping is these days being replaced by the system of lease (on a fixed rate basis) in the area. In this case there is no sharing in kind.

Section 168 of the MP land revenue code, 1959 provides that no bhumiswami shall lease any land comprised in his holding for more than one year during any consecutive period of three years. Section 169 confers rights of occupancy tenant or a tenant to whom the bhumiswami has tenanted land in contravention of the provisions of section 168. This provision ensures that people who give land for cultivation on contract basis are always apprehensive of losing the land. The practice followed in the village is to rent the land for a particular amount to be paid in cash or kind (in case of Choubey) at the time of harvesting of crop, but in revenue records the tenant is

⁴ Sharecropping is these days being replaced by the system of lease (on a fixed rate basis) in the area.

not shown as in possession. These contracts are tenured for a one-year period. Because of mistrust of others Choubey gives his lands to members of only the kumhar community. As mentioned earlier this deprives the ones who are landless and have land hunger the opportunity to till the land even as tenants. In this particular village the jatavs who are landless go for wage labor instead of batai. It was very difficult to ascertain the extent of tenancy in the area given the fact that much of it is concealed tenancy. The tenants here (in Uchad village) hire tractors for ploughing, sowing and harvesting. Tenants in the village are not pure tenants; there are only part owners and part tenants.

2.3.4 Gur production at Tilaitha

Gur is one of the areas the rural resource rich and the urban non-cultivating class have invested in. Gur production is illegal here, the first charge on cane being the mills in the district. However production of gur continues in practice inspite of the ban. Any resistance from the Dabra sugar mill is ignored and the authorities (Dabra mill) are instead asked to bring a stay order from the court. The localites here do not have the requisite skills for production of gur. It is a common practice to draw in the traditional gur producers from Farrookabad and Muzzafarnagar district of Uttar Pradesh who bring the labor too from there. So a typical arrangement which is prevalent in the area is one where the localite gets into a partnership with the gur producers from UP. The case of Patel of Tilaitha village was studied; Patel sets up the unit of gur every year. The cost share and profit share is decided in advance. Usually the profit is shared in the proportion of their investment; the rent of the land on which the unit (crushers, labour etc) is set up is also included in the cost share and the local partner compensated accordingly. The labor (which is usually brought from UP) is paid on a lumpsum basis and is employed in three shifts of eight hours each. Gur is a bad bargain however and fetches barely Rs. 50 to 60 per qtl.

2.3.5 Crisis ridden sugarcane producing areas

The cane growers of the country are facing a number of problems ranging from lack of remunerative prices to reduction in offtake in the wake of deregulation in the sugar industry. Some of these problems have been dealt with here in the particular context of sugarcane producing areas of Gwalior, Shivpuri and Datia districts of Madhya Pradesh (MP).

2.3.5.1 Price question

Remunerative prices for produce is a question of interest for the peasantry in the cane producing districts of MP. The MP government has not declared the State Advised Price (SAP) for the sugarcane season as yet. In the absence of sugarcane being lifted from the field the farmers are not being able to prepare it for rabi sowing. Every year after the central government declares the Statutory Minimum Price (SMP) the states declare the State Advised Price (SAP). This was necessary as the central government kept the SMP at an extremely low level. This was largely because of an incorrect calculation of the input prices, which have been on the increase in the last few years. Because the central government had to pay to the sugar mills for the levy sugar it used to purchase for PDS and for buffer stocks, so it kept the SMP deliberately low. The SAP as a convention was kept at a third of the SMP to offset the cost increase and to take care of the local condition.

Sugar mills are refusing to pay SAP to the farmers now. The SAP for last year in both MP and UP was Rs. 74/ qtl. Unlike in UP where the SAP had shown a sharply increasing trend over the last few years going up to as much as Rs. 105/ qtl a few years back and having come down sharply of late, MP had shown a more or less constant figure over the years. As against Uttar Pradesh where the farmer lobby is strong, in Madhya Pradesh there were no agitations for remunerative prices of sugarcane. Huge arrears were pending with sugar mills. In UP, on the other hand assistance under soft development loan schemes to the private sugar mills for payment of arrears to the cane growers is common.

2.3.5.2 Non payment of arrears: case of Dabra sugar mill

The farmers in our study area in Seondha tehsil of Datia district supply the cane to the Dabra sugar mill in Gwalior district. Around four thousand metric tonnes of sugarcane is produced from Datia district, most of which is from the Seondha tehsil. The mill is beset with problems and has held back the arrears till now and has given only Rs. 60 per qtl till now. Thus most of the farmers in this area have a huge amount stuck with the mill, the figures going upto as much as Rs. 50,000 per farmer.

The Dabra sugar mill is under losses and blames the former Digvijay Singh government of a partisan attitude towards the Guna sugar mill which was bailed out of a crisis recently through a government grant of rupees six crores. The owner of Dabra sugar mill is known to have political leanings towards the Scindia family, the declining influence of which has led to the current problems. Both the mill owners as well as the farmers feel that the state government is not committed to safeguarding the interest of farmers. Not many efforts are underway to ensure that the mills pay the farmers a price, which is atleast equal to that of the previous year. Besides not much has been done to secure that prompt payment of the produce is done to the farmers. There is an act of 1968 for sugarcane and sugar, for payment of arrears but has rarely been used for helping the cane growers. In the absence of sugarcane being lifted from the field the farmers are not being able to prepare it for rabi sowing.

2.3.5.3 Hike in SMP

The central governments decision (Dec 2002) of having hiked the SMP (Statutory Minimum Price) of sugar to Rs. 69.50 per quintal too has not been received with much enthusiasm here. This is the price for a recovery rate of 8.5 percent and is higher for greater recovery. This increase of Rs. 5 may bring some relief to the cane-growers and may avert the experience of 1978 and 1994-95, though it cannot hold for long given the deregulation in the industry. The procurement cost is nowhere able to take care of the rise in cost of inputs.

2.3.5.4 Unrestricted import of sugar

Dismantling of the Public Distribution System (PDS) and the buffer stocks has led to lesser offtake by the government. Buffer stock of around 20 lakh tonnes used to be maintained earlier. Unrestricted import of sugar continues despite the fact that domestic production is well above the domestic consumption. The total closing stock (National level figures, Aug 2002) a month before the beginning of the sugar crushing season was 156.95 lakh tonnes. The offtake for internal consumption, both levy and free market was of the order of 131.12 lakh tonnes. Thus 7.06 lakh tonnes were available for export. Despite this import continues unrestricted. The situation has

come to a passe and the mill owners are refusing to pay SAP to cane growers. In May (2003) end the SDM had to intervene after protests and demonstrations in the Seondha; quick action has been assured but till now nothing has been done. Chief Minister however says that the ball is in the mill owners court now that the government has given two crores to the Dabra mill owner. Most of the farmers from the watershed area are now supplying cane to the Guna sugar factory and not Dabra.

2.3.5.5 Case study- Tribal land alienation in the sugarcane producing areas of Dabra

Dabra is a block in Gwalior district and is about 50 kms from Gwalior town. The area has a population of around three lakhs and is dominated by *gujars*, the other communities being *rawats* and *sahariyas* (tribals). Construction of canals and deep tube wells has led to a continued increase in the irrigated area. Rice and sugarcane are grown in the command area of Harshai dam of Sindh river (a tributary of Chambal). The climate and soil conditions are suited to the growth of sugarcane. The sugar produce from the area goes to Guna, Morena and Jhansi after catering to the Dabra Sugar mill. Changes in physical infrastructure like construction of road network has made regular and adequate supply of cane to the mills possible.

Around 5000 acres of lands were under a sugar factory (Dabra Sugar mill) since 1937 in Dabra town. Under the MP Ceiling on Agricultural holdings act, 1960 certain categories of land like those being operated by joint farming societies/ trusts etc were given relaxation's in their ceiling limits. Until the 1970's, lands under sugarcane were exempt under the ceiling laws. The Sahariya tribals, who had been brought in from neighbouring districts of Guna and Shivpuri, were tilling the land around Dabra. In the wake of the Green Revolution there was a huge rush of big farmers into the area originally inhabited by adivasis as it provided cheap labor and land. There was a huge influx in the heavily forested areas of western Madhya Pradesh like Shivpuri and Datia (Utsa Patnaik). There were many punjabi's who settled in the present sugarcane areas of Shivpuri and Gwalior during late 60's. The *sahariya* adivasis of the area unaware of the monetised markets and the real market value of their lands sold them at a pittance. There was a shift to cash crops (sugarcane) and its expansion continued unabated. Big farmers bought tribal lands and made the adivasis work on in the very same lands that they sold at throwaway prices.

The *Sahariya* tribals hold only 130 acres as of today inspite of the tenancy reforms. Wherever they were given tenancy rights they have been evicted by the landed *gujars*. The lease period for these lands was thirty years and the government cancelled the lease in 1967. However, the lands have not been returned to the *sahariyas* who were the tillers. Instead an agricultural sugar cooperative society was set up in the 70s and most of the land continues to be held by *gujars*. The cane in the members' fields is however cut by the adivasis. Big traders from in and around Gwalior continue to hold lands through *benami* transfers/ trusts (and in this case Cooperative). Thousands of acres of lands thus continue to remain with people who do not cultivate them.

The claim that the urban non-cultivating class has disposed of the lands and instead invested them in other areas like trade/ industry/ transport etc., in the cities does not seem to hold here. There are numerous factories instead on the agricultural lands near Dabra town. Gur is one of the areas the rural resource rich and the urban non-cultivating class has invested in (Case of gur production mentioned earlier). Gur production is illegal here, the first charge on cane being the mills in the districts. However production of gur continues in practice inspite of the ban. Any resistance from the Dabra sugar mill is ignored and the authorities (Dabra mill) are instead asked to bring a stay order from the court.

The case brings out the means used to evade land reforms and the increasing alienation of tribals from the lands. The rawats and the adivasis (who are the share tenants in the Dabra area) are struggling against this. The matter is doing the rounds of the courts right now. The tribals in the area are fighting against the Dabra sugar mill and are being supported by the Janadhar advocacy center of Sambhav.

2.3.6 Coverage of rural population under PDS

Problems related to coverage of people under PDS were common in the watershed. Wrong parameters were applied to determine BPL and APL people, resulting in excluding overwhelming majority of poor and marginal farmers. Malpractice was common and there were many people in the watershed who said that villagers with tractors too had been enumerated as BPL cardholders whereas the needy have been left out. This was observed in Tilaitha village in particular. List for BPL is prepared by government officials and not sarpanch. It seems that the criteria for selection of members in the BPL list by the sarpanch contradicts those stated under the PRI system.

2.3.7 Anganwadi worker

There were complaints against anganwadi worker and mid day meal scheme (dalia) of village school at Tilaitha. The gram sabha has the powers to withhold salaries, accept leave applications and inspect the work of the government employees working in its jurisdiction under the 2001 Gram Sabha amendment. Nothing has been done inspite of several complaints. The confusion in the line of authority is very evident in the case of anganwadi worker as she has to work under panchayats, but is accountable to the department creating a peculiar situation where panchayats cannot get work done in spite of people's mandate and government approval. This is nothing but an institutional weakness within the PRI where various authoritative powers are shared in utter confusion at different times. The powers to identify beneficiaries lie with Gram Panchayat (GP). The Janpad Panchayat (JP) sanctions the list however. The ones who implement (anganwadi workers) are not accountable to the panchayat system. On the other hand, the anganwadi workers feel dissatisfied because the executing responsibility is with them whereas the powers and authority are vested with the ZP and JP.

2.4 Project area: Pali hamlet of Sunari village

The first year's intervention in the SPWD-SAMBHAV project is in the Pali hamlet of Sunari village. The Pali hamlet was inhabited in the post independence period. The dominant community in Pali mauja of Sunari village is of *kewats (majhis)* who are professional fishermen. The kewats were the original inhabitants of Chandpur village of Gwalior, which is just across the river Sindh. During the British raj Chandpur used to be a big zamindari area. Many of the tenants there were kewats. They set up habitations in the villages like Bharsula, Gora, Sunari and over a period of time they received land from the district administration (one to one and a half acre). The community used to depend upon wells, ponds, rivers etc. These people who were originally fishermen and water carrier caste have become agriculturists and agricultural labourers now. After Independence some of the families migrated to this area along the Sindh river. They are also known as *dhimar's* because they used to inhabit the ravines (which were locally known as *dhi's* meaning mounds) alongside the rivers. There is a long-standing demand from the *kewat*

community that it be accorded the status of ST from its current status of OBC given its poor socio-economic status.

Demography of Pali village

<i>Details</i>	<i>Number</i>
Total families	32
Scheduled caste families	7
Kewat(mallah- fisherman caste)	25
Landless families	2
Number of BPL families	19
Population of hamlet - Pali	297
Male	153
Female	144

The main *kharif* crops grown in the village (Pali) are *bajra*, *urad*, *arhar*, and to some extent groundnut and in *rabi* are *chana*, *sarson*. Wheat is also grown to a lesser extent wherever irrigation is available. The irrigated area available under *rabi* is around 12-13 hectares. This is mainly under well irrigation; only two waterings can be provided from the dugwells. It can be concluded that around 80-85 percent of the land is unirrigated. Some households are also involved in cultivation of vegetables in/ adjacent to the river bed and near the wells. The vegetables grown include *lauki*, *turai*, *kaddu*, *tamatar*, *bhindi* etc., and provide additional income to the households. Discussions with villagers (of both Sunari and Pali mauja) suggested that fishing is illegal in the river and therefore the catch is sold in a clandestine manner in the local haat. The reason was not very clear however. The distribution of landholdings in Pali hamlet is -

<i>Area in hectare</i>	<i>Number of households</i>
Landless	2
Less than 1 ha	16
1-2 ha	8
2-3 ha	5
3-5 ha	1
Total number of households	32

Source: Sambhav report, 2004

In Pali it was noticed that the actual land held was not conforming to that in the khasra map. The cultivator as a result was not eligible for benefits from government programmes/ schemes. They could not get loans from banks without being legal owners over their land. The land, which the kewats had received, from the government is now with the Baghels of Sunari village (main village) and the former have been reduced to the status of tenants.

2.4 Land, water and soil in the area

Nearly three-fourth of the area of the district is covered by alluvium. Along the Sindh river section the thickness of the alluvium often exceeds 15m. The nallahs and ravines are often thickly

covered with *kankar* (calcareous concretions), a material used locally for lime burning. About half of the soils of the district are of poor quality and among many types recognised by the cultivators, *mar* and *kabar* the black soils are the best covering 15 % and 43 % of the total land area respectively. The soil in the watershed is sandy *domat*. The watershed is located in the midst of semi to deep ravines; the topography is highly undulated as a result. Most of the farmers have leveled of the land themselves. The district has a sizeable area (give figures) under cultivable wastes. There has been no particular organised effort to cultivate these wastes, but sporadic individual action to bring such lands under the plough have been there. Huge tracts of land have been cleared through individual initiative and are under encroachments. Some of these have been allotted/ redistributed to landless persons under the tenancy acts. The state has not undertaken reclamation of the ravines in the area through use of tractors except in 1953-54 when a forty hectare piece of land was reclaimed for establishment of a state mechanised farm at Datia.

The lands which lay in the inferior *rankar* soil regions, in general present little difficulty in the way of their recovery and utilisation for agricultural purposes and are in fact being reclaimed through conventional methods. The area, which has been left out of cultivation, is generally used for grazing purposes. The latest policy of the state government on leasing of non-forest wastelands to private companies could adversely affect the grazing need of the communities. The watershed has a high incidence of erosion particularly in agricultural fields. There are seven nallahs of different sizes in the agricultural lands and they are expanding every year. Some big farmers who have resources have tried to prevent further erosion by constructing or strengthening bunds. Due to unavailability of resources this has been done to a limited extent and not at the level of community.

2.4.1 Land use data

Land use - Area (ha)	Goraghat	Uchad	Bharsula	Tilaittha	Sunari	Total watershed area	% age distribution of land
Total area of the village	382.41	515.24	641.60	759.55	991.69	3290.49 ha	100 %
Total agricultural area	180.75	364.07	427.58	208.32	554.23	1734.95 ha	52.73 %
Irrigated by source	127.4 (W)	43.70 (W)	218.55 (W)	71.94 (W)	282.84 (W)	744.43 ha (W)	42.91 %
Unirrigated	53.35	320.37	209.03	136.38	271.39	990.52 ha	57.09 %
Forest	106.23	48.90	128.21	255.94	246.28	785.56 ha	23.87 %
Culturable waste (including gauchar and groves)	46.72	43.57	20.45	221.12	117.41	449.27 ha	13.65 %
Area not available for cultivation	48.87	58.70	65.36	74.17	73.82	320.92 ha	9.75 %
Area under ravines (estimates)	Rough estimate suggests that around 1/ 5 th of the total area of the watershed is under ravines.						

Source: NIC, Datia, 2001

2.4.2 Extent of ravines in Sunari watershed

An exact idea regarding the extent of ravines was not available from the government data. To get rough estimates of the area under ravines revenue maps can be used and villagers could be asked to trace them on the revenue map (this could be taken up this year). Pankaj Chaturvedi of the National Book Trust, New Delhi mentions in a paper in 'Problems and potentials of Bundelkhand with special reference to water resource base' the extent of ravines in the villages along the Sindh river. The villagewise distribution of ravines according to it is -

<i>Goraghat</i>	45 ravines till one and a half m height, 46 ravines between the height of one and a half to 5m and 36 ravines over 5m height
<i>Bharsula</i>	total of 322 ravines here; 46 of which are over 5m height
<i>Uchad</i>	52 deep ravines
<i>Tilaittha</i>	Total of 300 ravines

All these villages are fast losing land to ravines.

2.4.3 Allotment of agricultural ravine land

The Government of MP had in April 2003 (pre-election period) came up with a scheme for allotment of agricultural ravine land. Under this scheme, up to two meter deep ravines were to be allotted to villagers. The people belonging to scheduled castes, scheduled tribes and other backward classes, who were already occupying up to two-meter deep ravines and have been cultivating it for last three years, were to be issued pattas on these lands. The land was to be allotted free of cost to people of scheduled castes and scheduled tribes while members of other sections were to be given allotments at twenty percent cost of the land. Ravines with two to five meter depths would be allotted through open auction. The ascending order of priority for allotment to people was be people of village, block and district. The cabinet had directed that the ravine allotments were to be made by June end 2003. The allottees of this land were to be able to pledge it to obtain loan from banks or government or recognised institutions. District Collectors were responsible for allotment of ravine land. In this watershed there were widespread irregularities in allotments of ravine lands. For Sunari village itself seventy application forms had been received and allotments made to the powerful landed rawat community. The collector had to intervene following protests by baghels and other SCs. Till now only six pattas have been allotted (the rate being Rs. 2000 for six bighas).

2.5 Agriculture

The crops grown in the area include sugarcane mixed with wheat or with chana. Small farmers are into kharif crops like urad (other pulses). Apart from that certain sections also grow vegetables. According to our estimates the farmers could make Rs. 2500 per bigha from oilseeds/ wheat etc. In the case of sugarcane the profit margin is around Rs. 3000. Apart from this the tops from sugarcane are very useful as fodder. Disaggregated view would show that only certain sections are into sugarcane; the rest are into labor.

Economics of sugarcane in the watershed

<i>Cost of inputs per bigha</i>	
10 qtl seed	Rs. 700
Urea (superphosphate)	Rs. 375
Water (7 waterings)	Rs. 700
Harvesting labor	Rs. 200
Pesticide (decaron/ indosulphan)	Rs. 250
Sowing labor	Rs. 200
Throwing/ cleaning/ transportation to centre	Rs. 500
Total input cost	Rs. 2825/ bigha
<i>Income from sugarcane</i>	
Production is 80 qtl/ bigha (50 tons per ha); rate is Rs 70 per qtl (Dabra sugar mill)	Rs. 5600/ bigha
Profit per bigha	Rs. 2800 per bigha (approx)

(2.5 bigha is one acre)

The yield from sugarcane does not compare well with that in other states like Maharashtra, Uttar Pradesh. In Maharashtra the productivity is around 100 tons per ha in Kolhapur area. In Sunari area the productivity is around 50 tons per ha.

2.6 Irrigation scheme

The Rajghat Canal Irrigation Project of Madhya Pradesh passes through our watershed area. The project⁵ had been intensified in the year 2002-03 with the loan assistance received from the J.B.I.C., Japan. According to the Chief Engineer of Rajghat Canal Project, Shri P.K. Tiwari, in near future one lakh 21 thousand 450 hectare agricultural land would start getting irrigation in Guna, Shivpuri, Datia, Shivpuri, Tikamgarh and Bhind districts. Under the canal project renewal of left bank canal, Datia carrier canal, Anguri barrage and Datia irrigation canal and Bhandar canal system is being renovated. Since the work on Rajghat canal has covered parts of our watershed there is a need to understand the policy level changes related to operation and maintenance of the canal systems at the state level and the performance of these in the area. Some of these issues can also be studied in the area on the Right Bank of the river Sindh that is the command area of a number of canals of the Sindh and Mahuar nadi. These are the sugarcane producing areas of the Gwalior district. Moreover, the exact dependence on the canal as well as the relocation because of the project needs to be worked out in details (can be taken up this year).

⁵ Irrigation has already been started in 32 thousand-hectare area in five districts. The inter-state project is being constructed on Betwa River on Madhya Pradesh-Uttar Pradesh border. Work on this project, designed to irrigate 1.21 lakh hectare through a network of canals, was going on very slow in 1997. It is now near completion following the Japanese assistance. Madhya Pradesh shares 22 lakh meter water of the 44 lakh hectare meter water for utilisation through 255 km long canals, barrage and distribution system.

2.7 Caste class interrelationship

An analysis of the percentage distribution of households by size class of holdings and the castes was done under the study. The data for land was available from the Land Commissioner's office at Gwalior. Analysis was done for irrigated/ unirrigated and total lands. Data for other assets like borewells/ tractors/ threshers/ kutti machines/ harvesters/ pumpsets/ bullock carts/ livestock etc were not available on a castewise basis for all the villages. But FGDs in most villages revealed that the ownership pattern was more or less along the same pattern as land. The land ownership was skewed in favour of intermediate castes like rawats and yadavs. The brahmins, banias and kayasthas have over the years sold land and shifted to other occupations or service. Among the SCs certain castes like baghels are relatively more landed as compared to the jatavs (SC), dhimars (OBC) or sahariyas (ST). However, it can be safely said from the analysis that economic and social statuses are mutually reinforced and that caste and class are interrelated.

Caste politics⁶ in the area

John Harriss in an essay on comparison of political regimes across Indian states notes that the political regime in Madhya Pradesh is primarily upper caste/ class dominated Congress regime. The northern part of MP where our project is located has seen a resurgence of dalit parties in the last few years; this is reflected in the panchayati raj institutions too. The caste politics of the district was studied. This would be precursor to studying the political dominance of the emergent OBC castes and SC castes and the contradictions therein in the panchayati raj institutions. The political configuration of the area of district is being studied. It is necessary to also study the nearby constituencies of palace dominated areas which influence the politics of the district.

Caste polarisation is very high in the area. Claims that though caste continues to be a means of social identity but it no longer serves, as a means of political mobilisation does not hold true for the area. The area, which was dominated by palace politics, has seen the assertion of dalits and the middle castes like rawats, yadavs and lodhis in the Post Mandal era.

Castes like rajputs (thakurs), kayasthas, brahmins, jains and banias are at the top of the social hierarchy. Their control over landholdings to trade and business was near total and even now continues to be significant. The major OBC and SC castes in northern MP are -

OBCs dhimars, nai, dhobi, gadaria, bunkar, jogi, chipri, raikwar, manjhi, kewat, lodhi, yadav, bhoi, teli, lohar, barhai and bedia

SCs ahirwar, basorh, mehtar, sondhia, chadar, banskar, kumhar, kori, jatav, kalar and khatik.

The scheduled caste population is considerable in Bundelkhand region (northern MP). It exceeds the state and national average in each of these districts. Datia has the highest percentage of SC population in the state namely 24.67 % of the district's population. Among the major tribes only sahariyas are present in Datia. Even their percentage is very low (1.71 %).

The major power blocks in the area were traditionally the Congress and BJP with the socialists (samajwadis) having lost ground since the 70's. Both the Congress and Jansangh/ BJP have

⁶ This was studied before the 2003 Vidhan Sabha elections and has not taken into account the clean sweep in the area by the BJP.

traditionally fielded upper caste candidates. Both the BSP and the SP has been trying to consolidate their hold in the northern districts of the state during the nineties. BSP in particular had emerged as the third power centre in the area. The local power relations are well reflected in the outcomes of the vidhan sabha elections.

Datia falls in the parliamentary constituency of Bhind for Loksabha elections. For the Vidhan sabha elections there are three constituencies in Datia namely Datia, Bhandar and Seondha. Seondha is a reserved constituency for SCs. The previous Home Minister of Madhya Pradesh Shri. Mahendra Boddha of the Congress belongs to the Seondha constituency in which our study area (Sunari watershed) is situated. The influence of BSP in the area was on the increase till last elections when it was fully routed from here. It had bagged one constituency in the 1998 elections. Shri. Phool Singh Baraiyya who was the state head of BSP was elected from the Bhandar constituency of Datia. The scheduled castes are increasingly getting organised under the Bahujan Samaj Party. SP too had a constituency in the district; the OBCs too are politically very powerful in the area. Caste of the candidate and money and muscle power is the key to win elections in this highly criminalised belt of the state.

The change in caste dynamics reflects in the intergang (dacoit) rivalries nowadays. Caste feuds, which had been the bane of banditry in the Chambal valley and Bundelkhand region, had earlier been a backward consolidation against upper castes. This seems to be no more the case with infighting among the OBC gangs being strong. The gangwars between rawat led and gaderia led gangs as also between yadav led and kurmi led gangs is common nowadays. According to K.N. Sharma a sociologist the spurt in gangwars among the OBC dacoits reflects the changing social equilibrium at the grassroots level. This indicates that the upper caste vs. OBC contradiction is being submerged and the inner contradictions among the various OBC castes are resurfacing (Yogesh Vajpayee).

Caste related clashes are very common in the area. According to Ekta Parishad an organisation working on land issues, instances of fleeing of SCs and saharias in particular from their village because of oppression by gujars (a middle caste) is very common in the area. Grabbing of land of the saharias (by the gujars) when they migrate to the cities for seasonal employment too is rampant. Thakur -brahmin clashes, SC-OBC clashes and inter OBC clashes (off late) are very common in the area.

Castewise breakup in the watershed

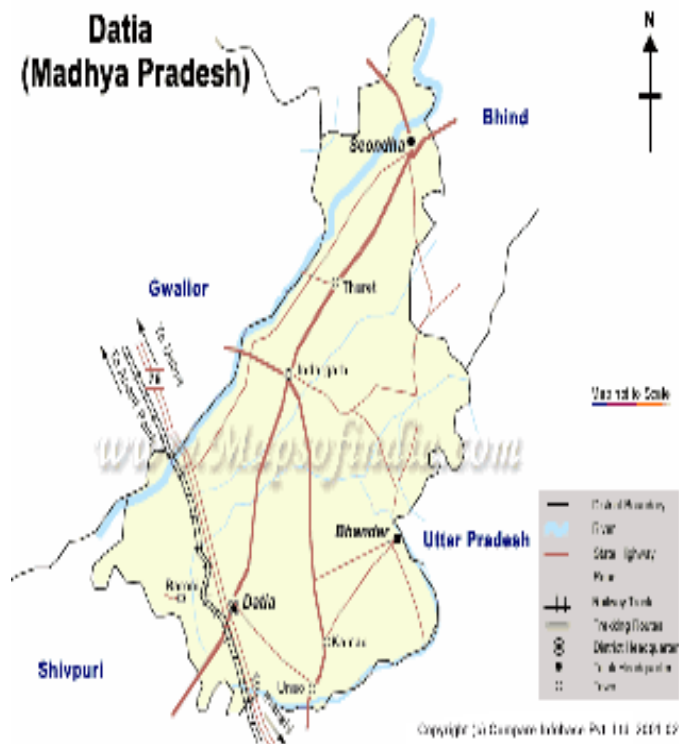
<i>Goraghat</i>	<i>Uchad</i>	<i>Bharsula</i>	<i>Tilaiitha</i>	<i>Sunari</i>
Rawat 70; Jatav 30; Brahmin 3; Shrivastava 8; Adivasi (sahariya) 10; Nai 1	Brahmin 30, Baghel 15, Musalman 25, Yadav 30, Rajput (Thakur) 10, Nai 5, Lohar 5, Harijan 50, Kumhar 4, Teli 8, Kewat 10, Kayastha 10, Chaurasia 10, Dhobi 5, Jatavs 30	NA	Rawat -90, Jatav -10, Baretha - 9, Parihar -9, Namdev -2, Darji -2, Baghel - 14, Brahmin-1, Adivasi - 5	NA

All the figures are in terms of number of households and are approximate (based on FGDs)

3. Situational analysis of district Datia

Datia district falls in Gwalior division of Madhya Pradesh and is the only district of this division, which is considered to be a part of Bundelkhand⁷ because of geophysical reasons. Bhind and Gwalior bound the district in the north, Shivpuri and Jhansi in the south, Gwalior (main block) and Shivpuri in the west and Bhind and Gwalior district in the east. The Bhandar tehsil of Gwalior district has been shifted to Datia in a recent re-organisation of the districts. The total area of Datia which used to be the smallest district of Madhya Pradesh is now 2692 sq. km (earlier the area was 2038 sq. km.). The district is located on the margins of the Ganga valley and the Vindhyan plateau. The main body of the district extends between 25° 33' north to 26° 18' north latitude and 78° 13' to 78° 51' east longitude. The district is divided into three tehsils Datia, Seondha and Bhandar.

District Map



In the northwestern part of Seondha and on the left bank of the Sindh, a low range of sandstone hill overlooks the river and extends upto the northeastern bend in the district.

⁷ The Bundelkhand cultural region straddles several districts of southern UP and northern MP. In the pre-independence period the UP districts formed British Bundelkhand while the MP districts comprised the native states (Ravindra K. Jain).

3.1 Physical features

3.1.1 Topography

The whole district is uniformly sloping towards the northeast but the mounds and hillocks of otherwise concealed granite are also marked intermittently on the plains. The general level of the country is about 198 metres but the variation ranges from about 152 to 335 m above Mean Sea Level (MSL). The district has the following two distinct physiographic divisions

3.1.1.1 The Lower Bundelkhand Plateau

The southern part around Datia town lies in the granitic area and forms a somewhat barren and rocky tract. The tract lies above 213 m and the prominent hills lie to the south east and west of Datia. The hill near Gharwa is 308 m high, Udnu-ki-Toria and Baroni hill are 317 m high. The southern enclaves lie at about 305 m above MSL; and the highest peak of Burdwan is 337 m high in the Basai block. The hills show steep rise on their sides and a few rise to over 91 m from their immediate neighborhood. The tract is covered by alluvium and the hard masses reappear only across the Sindh on its northwestern side. North west of Seondha as well as on the left bank of Sindh, a low range of sandstone hills overlooks the river and extends upto its northeastern bend in the district. The height of the scarp on its southeastern face is 30 to 91 m. These hills join the Gwalior range in the west and slope towards the north, where the rocks beneath the alluvium disappear. Among these hills there are three peaks, which rise above 244 m the highest, being 263 m in the south. Seondha hill on the northern bank of the Sindh, is over 183 m. The plateau region is either bare or stony on steep slopes or is covered with reddish soil or black cotton soil.

3.1.1.2 The Gangetic plain

Most of the central and northern parts of the district lie in the Sindh-Pahuj doab, which form the southern margin of the Gangetic valley. The central part of the district is about 183 to 213 m above MSL, whereas the northern part of the area south-east of Maithana (Bhander tehsil) lies below 183 m. Although dotted with hillocks and low mounds of granite the valley is flat, uniformly and gently sloping towards the north-east, and formed mostly of river alluvium.

The alluvial tract is marked by gullies and ravines caused by water action on the loose soil along the major rivers as well as their tributary streams. Rill erosion an early stage of gully formation along with ravine development to some extent is a natural process but is accelerated because of the removal of the natural flora, uncontrolled grazing, careless ploughing and unplanned management of field drainage. Gullies and ravines have developed in the alluvium all along the Sindh, Mahuar and Parron river.

3.1.2 Soil

The soils of Datia are representative of the soils of Bundelkhand. They are locally known as mar, kabar, parua, rankar and also kachhar at various places. Mar is a very fertile soil and is black coloured with fine mixture of calcareous stones and shell. It has good water retention capacity. The soil causes fissures during summer season. Mar is usually found in pockets where the

intrusive dykes of trap have disintegrated. Going to a depth of 0.3 m to 0.6 m from the surface it needs little manure and yields crops without artificial irrigation. Mar and kabar are highly water retaining and fertile soils and with them the problem of excess water was known to create problems. Kabar is also a black coloured soil lighter than mar. It is stiffer in character and does not possess calcareous stones or shells. The soil cracks during summer and does not need artificial irrigation normally during cultivation. Padua soil is brown or yellowish in appearance and is less fertile than the above two types. Rakar soil is an inferior soil found in the hilly region. It consists of mostly stones and less of soils and goes to a depth of 0.15 m to 0.30 m from the surface. The kachhar soil is normally found in the vicinity of villages, along the banks of the rivers or streams and the bed of tanks. This is the most fertile soil with fine texture.

Deeper alluvium deposits occur along the major rivers and streams of the district. The alluvial soil is loamy and fertile. Admixtures of sand, in varying proportions and of various sizes of grains produce a number of soil types. Due to locational factors also, some sub-types are added. The soil in low-lying flat lands with poor drainage is usually saline. It is generally brown in colour. The alkaline soil is grey, sticky on wetting and hard in drying, acquiring a cloddy structure. Growth of crops or flora is difficult at places where undulating kankar layer often comes up on the surface in any soil region. Due to alternate leaching and capillary rise of moisture the subordinate layer of calcium carbonate is also unsuitable for agriculture.

3.1.3 Climate

The district has a dry climate except during the monsoons. The year is divided into four seasons - cold (December to February), summer (March to May), monsoon (June to September) and post-monsoon (October to November). The average annual rainfall of the district is 760.4 mm. About ninety-one percent of the annual rainfall in the district is received during the monsoon months - June to September, the rainiest months being July and August. On an average there are 35 rainy days in a year in the district.

3.2 Demographic characteristics of the district

Datia is the smallest district of the state and is smallest in population size too. Its population comprises of 0.59 % of the total population of the state.

Comparison of basic demographic indicators of district Datia with Madhya Pradesh and India (Yr. 1991)

S.N.	Indicators	Datia 1991	Madhya Pradesh 1991	India 1991
1.	Population	396,317	66,181,170	846,302,688
2.	Percent population increase (previous decade)	27.07	26.8	23.9
3.	Density (population/ sq km)	194	149	273
4.	Percent urban	22.45	23.2	26.1
5.	Sex ratio	847	931	927
6.	Percent 0-14 yrs old	41.36	38.1	36.3
7.	Percent 65 + yrs old	3.30	3.8	3.8
8.	Percent SC	24.67	14.5	16.48
9.	Percent ST	1.71	23.3	8.08

10.	Percent literate	34.91	44.2	52.2
11.	Percent literacy - male	48.54	58.4	64.1
12.	Percent literacy - female	18.82	28.8	39.3
13.	Exponential growth rate	NA	2.38	2.14
14.	Total fertility rate	5.8	4.6	3.6
15.	Infant mortality rate	156	104	79
16.	Couple protection rate	59.38	38.8	43.5

Source: The MP Human Development Report, 1995

Interblock comparison of basic demographic indicators of district Datia (Yr. 1991)

S.N.	Indicators	Datia	Block Seondha	Block Datia
1.	Total Population	396,317	145,268	162,084
2.	Total area	2034 sq km	926 sq km	1108 sq km
3.	Population male	214,529	79,262	87,770
4.	Population female	181,788	66,066	74,314
5.	%age increase from 1981 to 1991	27.07	18.98	25.83
6.	Density	194	183	204
7.	Sex ratio	847	831	860
8.	%age Scheduled Castes	24.67	25.11	24.35
9.	%age Scheduled tribe	1.71	0.24	2.81
10.	Total literacy rate	34.91	30.75	29.93
11.	Literacy rate -male	48.54	45.67	44.42
12.	Literacy rate -female	18.82	12.62	12.82
13.	Couple protection rate (1996)	59.38	64.80	58.27

Source: The MP Human Development Report, 1995

The district has three towns the biggest being Datia itself and the smallest being Indergarh. The two rural blocks, Seondha and Datia are the two tehsils of the same names. The percentage population increase during 1981 to 1991 has been lower for these two rural blocks as compared to the district average. Population density of block Seondha is lesser than that of block Datia. Datia has a better sex ratio. Datia has the highest percentage of SCs amongst all the districts of Madhya Pradesh. The percentage of scheduled caste population is more or less same for both the blocks. However the percentage of scheduled tribes (mostly Sahariyas) is higher for Datia as compared to Seondha.

Profile of district

Total population	Total male population	Total female population	Sex ratio	Total SC population
515360	279041	236319	847	128001
Total ST population	Urban population	Rural population	Total literacy	
7605	105365	409995		

Source: The MP Human Development Report, 1995

Families living below poverty line (BPL)

	Rural populati	Total no. of	Poverty rate	No of rural families below poverty line (income groups)	Average BPL
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	on(1991)	rural families BPL		0-4000	4001-6000	6001-8500	8501-11000	income
Datia	307751	27424	49.0%	7413	8080	6067	5864	5703
Madhya Pradesh	5078781	5550757	60.1%	2226195	1806366	983580	534616	4653

Source: The MP Human Development Report, 1995

Classification of families (Nos.) living below poverty line (for eighth plan 1992-07)

	<i>Small farmers</i>	<i>Marginal farmers</i>	<i>Agricultural labor</i>	<i>Non artisan</i>	<i>Rural</i>	<i>Others</i>	<i>Total agricultural labour</i>
Datia	7858	8903	3820	3733	1097	2013	27424
Madhya Pradesh	1200558	1435235	1791974	821081	197340	194569	5550757

Source: The MP Human Development Report, 1995

3.3 Natural resources and livelihood systems

3.3.1 Land

3.3.1.1 Land use and agriculture: Datia

<i>Land use and agriculture</i>	<i>1991</i>
Cereals per capita (kg)	233.9
Pulses per capita (kg)	106.0
Oilseeds per capita (kg)	18.2
Average landholding (ha)	2.8
Irrigated area ('000 ha)	42.2
Unirrigated area ('000 ha)	91.2
Fertiliser consumption per ha (kg)	32.5
Cropping intensity	106
Per capita forest area (in sq kms)	0.070

Source: The MP Human Development Report, 1995

3.3.1.2 Land distribution in Datia

According to the Human Development Report of Madhya Pradesh the Gini Coefficient of operational holdings in Datia was 0.517.

Number, area and average (size of operational holdings): Datia and M.P.

<i>Size</i>	<i>Number Datia</i>	<i>Number Madhya Pradesh</i>	<i>Area (ha) Datia</i>	<i>Area (ha) Madhya Pradesh</i>
Marginal (below 1 ha)	18355 (33%)	3877798 (40.05%)	9853 (7.09%)	1795380 (8.20%)
Small (1-2 ha)	14469 (26%)	2311647 (23.87%)	21037 (15.14%)	3335672 (15.24%)

Semi medium (2-4 ha)	12931 (23.23%)	1918751 (19.82%)	35876 (25.82%)	5289081 (24.16%)
Medium (4-10 ha)	8394 (15.07%)	1239853 (12.80%)	50021 (35.99%)	7363548 (33.64%)
Large (10 ha and above)	1503 (2.7%)	255351 (3.46%)	22175 (15.96%)	4106654 (18.76%)
Total holdings	55652	9682592	138962	21890335

Source: Agricultural census 1995-96

The average size of landholding in Madhya Pradesh is 2.3 ha and in Datia it is 2.5 ha. The figures in the table above suggest that the trends in land distribution for the district are more or less the same as that of the state. 33 percent of the landholders in the category of marginal farmers (below 1 ha) hold not more than 7.09 percent of the land in Datia. The small (1-2 ha) and semi-medium (2-4 ha) peasants who constitute the largest chunk of 49.23 percent hold 40.96 percent of the land. The medium peasants (4-10 ha) who constitute 15.07 percent of the landowners hold 35.99 percent of the land. Finally, 2.7 % of farmers who belong to the large farmer category (above 10 ha) own 15.96 percent of the land. These figures do not include the vast number of landless in the district, which too have land hunger. The skewed ownership of land holdings would have been more evident in that case.

3.3.1.3 Land utilisation in Datia

Category	Area in ha	Percent
Revenue forest	101	0.041%
Land under non-agriculture usage	13649	5.61%
Barren and unculturable land	11488	4.72%
Permanent pastures and other grazing land	7921	3.256%
Land under misc. tree crops and groves (not included in net sown area)	126	0.52%
Culturable wasteland	11789	4.845%
Old fallows	4006	1.646%
Current fallows	3534	1.452%
Net area sown	190614	78.35%
Geographical area (ha) by village paper	243288	

Source: (Agricultural census 1998-99)

The figures for net sown area suggest that more than seventy eight percent of the area in the district under the village papers is under this category. The figures for wastelands in the district comes to 12.663% if the current and old fallows, culturable wastelands and barren and unculturable land are taken into account. This is very different from the data regarding wastelands from the Wastelands atlas, NRSA, Hyderabad.

3.3.1.4 Land redistribution: state of land reforms in the state

In the Bundelkhand area the system of land revenue which was prevalent in the pre-independence period was of the 'bhaichara' system wherein every farmer paid the same rates and there were no subordinate tenants. In Madhya Pradesh (like in Bihar) the amendment in 1974 to the land-ceiling

act of 1961⁸ recognised transfers even after the law came into force. Thus all the transfers and divisions to evade ceiling provisions by the landlords before 1971 were given a clean chit in a single stroke. The status of redistribution of ceiling surplus land in the district of Datia since the year 1972 is as follows -

<i>Category</i>	<i>Land allotted</i>	<i>Land possession</i>	<i>Land distributed</i>
Datia - district	647.178 ha	528.085 ha	227.457 ha
Seondha tehsil	54.838 ha	54.838 ha	54.838 ha
Datia -tehsil	452.321 ha	372.087 ha	136.843 ha
Bhander tehsil	140.019 ha	101.170 ha	35.785 ha

As far as charnoi land distribution⁹ is concerned the total land to be distributed in Datia according to the Land Settlement Department, Datia was around 2392.08 ha out of which 2164.77 ha has been distributed. The MP government had launched a Land Allotment Campaign by drastically reducing the land available for grazing to three percent. The land was to be distributed to landless SC/STs. The much-hyped 'Bhopal declaration- Dalit agenda' (of 2001) too talked of further reducing the grazing lands¹⁰. There was a scheme meant specifically for allotment of agricultural ravine land (see 2.4.3 for details). The land was to be distributed to landless persons belonging to the Scheduled Caste and Schedule Tribe communities. This was viewed in political circles there as a major populist initiative that came close to the Assembly elections of November, 2003. In a similar move before the previous Assembly elections, the State Government had granted settlement rights to all encroachers in cities belonging to the weaker sections on an as-is-where-is basis.

The land allotment procedure¹¹ has been simplified to benefit the landless. The provision of getting mandatory requirement of the resolution of the Gram Sabhas for changing the land status of available land has been done away with. The State Government has asked all District

⁸ The MP ceiling on Agricultural land act, 1960 provides that any transfer or division of land attempted to render ineffective the provisions of the act could be declared as 'null and void'; this included transfer and division of land after the publication of this act and prior to its enforcement. But by the amendment of 1974 these dates were changed to 1974 onwards and thus all transfers and divisions to evade ceiling provisions undertaken by the landlords before 1971 were given a clean chit in a single stroke.

⁹ The work was accorded top priority and every landless person belonging to the Scheduled Castes and Tribes was to get the allotment order, loan book, copy of khasra map and other relevant documents along with on-the-spot possession of land with proper demarcation. On actual ground this did not take place and instead there was widespread caste polarisation between dalits and caste Hindus with the later not vacating the land, which had been distributed on paper.

¹⁰ The decision to drastically reduce the area of grazing land and allot land to the landless has come under sharp criticism from a section of forestry experts. They are unanimous in their view that those forests already facing the problem of grazing would be further threatened once the grazing area gets systematically reduced all over the State. According to many this was just another case of indifference of public policy towards Common Property Resources (CPRs). Further curtailment of CPR areas even when they are done under programmes like land reform, adversely affect CPRs.

¹¹ Under the revised definition, only the SC, ST farmers or farm labourers residing in the State for the last twelve years and not owning any land either individually or jointly would be considered landless. Besides, those having barren land measuring upto one hectare or half-hectare non-irrigated land would fall in the second category of landless persons. Under the norms fixed for land allotment, the first priority would be given to those who do not possess any land in a village. Those in the second category from the same village would be allotted land only if extra land is available. If more land would be available in a village after allotment to those belonging to the first two categories, the landless persons from adjoining villages would get the next priority. The Government has decided to allot at least one hectare of irrigated or two hectares of non-irrigated land to the landless belonging to the weaker sections.

Collectors to finalize preparations for allotment of land during the Land Allotment Campaign beginning April 14. They have been asked to ensure that the notice boards at the offices of Gram Panchayats carry all necessary information like follow-up of pending court cases, estimate of arable land, change in land status, village-wise list of land-less and land available after removing encroachment.

There were widespread irregularities in the programme and on an average the allottees have got not more than one-acre land (personal communication, SAMBHAV/ EKLAVYA). In fact the creation of small private holdings will only lead to further indebtedness of these people since their lands have low productivity and they are not able to meet their basic needs. Thus giving them ownership rights over land will only be meaningful if the productivity of these lands is increased. Cases of landless getting pattas of Gramsamaj land but not being able to get the possession of the land, which is still with the landlord who has got duplicate patta of the land is very common in the area. Getting duplicate pattas during chakbandi by paying the official is common here.

2.3.4 Forest

The forests of the district fall into major types (1) Group 5-Tropical Dry Deciduous forest - subdivision 5 E I Kardhai (*Anogeissus pendula*) forests and (2) Group 6 B - Northern tropical Thorn forests - subdivision C 2 Ravine Thorn forests. The predominant species in the whole of Datia district are kardhai and khair. By occurrence ghont, makor and babul are next to the above species. These forests provide a very small quantity of timber, which is generally of kardhai, dhaora, seja, tendu etc. Minor forest produce like fuelwood, charcoal, tendu leaves, grasses, mahua-flowers, honey, wax, gum and fruits are extracted. Apart from local consumption they are sent to markets in Jhansi and Gwalior.

Due to the formation of a large number of gullies and ravines and the presence of kankar pan layers in the soil along the banks of the river Sind, the Mahuar and the Parron the forest blocks in the region of Uchad are dominated by the xerophytic trees and shrubs. Large portions of ravine thorn forests are under-stocked or blank. Good trees are rare and the growth is generally poor. Regeneration of reunjha or khair is occasionally marked. Soil conservation measures have been taken in most of these blocks and after a degree of restoration is achieved, a better forest stock is expected.

According to the district gazetteer the forest department had conducted soil conservation works in Goraghat in 1953 and extended to Uchad and Tiletha. Apart from contouring and gully plugging, babool (*Acacia arabica*) was planted in all these blocks. In the ravine thorn forests the main prescriptions under the working plan were limited to soil conservation and afforestation. Dense forest cover has increased substantially during 1995-97 in Datia, Satna, Gwalior and Morena districts.

2.3.4 Wastelands

Gullied and ravinous land accounts for 20.55 lakh ha equivalent to 0.65 % of the total geographical area of the country. Out of 475 districts of the country 221 are in this category. The districts around the Chambal river have more gullied and ravinous lands than other parts of the

country. One district each of Madhya Pradesh and Rajasthan - Bhind and Dholpur have more than 20 percent of their land under ravines. The extent of the area affected by ravines in the state of Madhya Pradesh is mostly along the banks of Chambal, Sindh and her tributaries. Ravine erosion is critical in Shivpuri, Morena, Bhind, Gwalior, Ujjain and Mandsaur district. The total ravine infested area in the state according to the Wastelands Atlas of India, 2000 is estimated to be 20553.35 sq kms. This comes to an estimated 0.65 percent of total area of the country. The figures for Madhya Pradesh are 7569.11-sq. km. The following table gives the extent of wastelands in Datia -

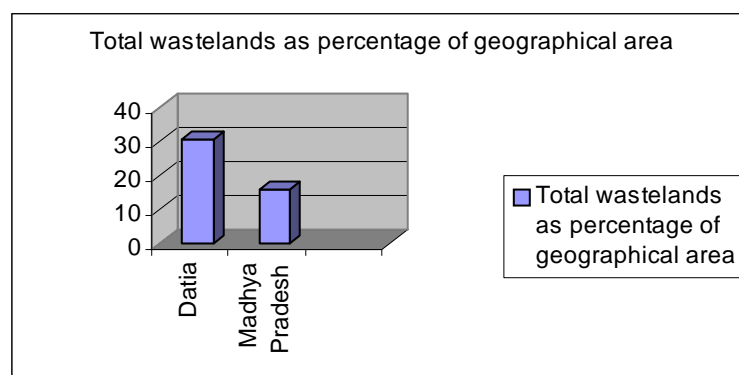
Category	Datia		Madhya Pradesh	
	Area in sq km	% area	Area in sq km	% area
Total geographical area	2038.00		443446.00	
Total wastelands	623.62	30.60	69713.75	15.72
Details of wastelands	Area under wastelands in the district sq km	% age breakup of wastelands	Area under wastelands in the state - sq km	% age breakup of wastelands
Gullied and ravinous lands	252.02	40.41	7569.11	10.86
Land with/ without scrubs	203.69	32.66	36977.87	53.04
Degraded notified forest lands	95.26	15.27	20437.77	29.32
Saline/ alkaline area	40.50	6.49	162.81	0.23
Barren rocky area	27.53	4.41	2950.97	4.23
Others	4.62	0.74	1615.22	2317

Source: Wastelands Atlas of India, NRSA, Hyderabad

Datia has around 30.60 % of its area under wastelands, which is very much higher than that of the state average of 15.72 %. A major part of these wastelands is under gullied and ravinous lands - 40.41 % followed by land with or without scrubs - 32.66 %. This is mainly along the banks of river Sindh (a tributary of Chambal) which crosses the district in the extreme north and forms the north east boundary beyond Seondha. The river flows along the boundary for about 106-km. Apart from that it has a tributary Mahuar that flows in the western part of Datia tehsil and joins the river Sindh within the district on its Right Bank.

Extent of wastelands in the district is very high and is around twice that of the state average. Half of this can be ascribed to gullied/ ravinous lands and another half to land with/ without scrubs. Another striking feature is the presence of tubewell irrigation for production in the area, which is a rich oilseed/ sugarcane producing areas alongside the ravines. There is a limited presence of *sahariya*¹² tribals who are originally the residents of Guna, Morena and Shivpuri district of the state and they are mostly dependent on wage labor. The ravine areas in particular are the home to the *gujars/ yadavs* and *jatavs* apart from a limited presence of *brahmins* and *kayasthas*.

¹² About five lakhs Sahariya Adivasis live in the Chambal - Gwalior division of Madhya Pradesh.



2.3.4 Water resources

2.3.4.1 Irrigation water

Wells, canals and tanks are the main sources of irrigation in the district in that order. Artesian flows (*jharnas*) are common in the district.

Source of irrigation: percentage wise distribution

Category	Datia	% age- wise distribution	Madhya Pradesh	% age- wise distribution
Dugwells- number	13009		1070200	
Irrigated area under dugwells-ha	30970	99.2%	2020734	63.08%
No of shallow tubewells in use	nil		119243	
Irrigated area under shallow tubewells	nil		497535	15.53%
Deep tubewells - number	nil		23 014	
Irrigated area under deep tubewells	nil		82790	2.584%
Number of surface flow irrigation schemes in use	51		188875	
Irrigated area under surface flow irrigation	50	0.8%	602011	18.806%

Area in hectare; figures are for year 1993-94

According to figures for 1993-94 almost the entire area under irrigation is under dugwells. There is no acreage under either deep/ shallow tubewells. The official figures are not true as Sunari watershed is predominantly irrigated by tubewells. According to 1993-94 figures net irrigated area in Datia is 81391 ha. The breakup is 25130 ha (government canals), wells (53024 ha), other sources 3237 ha. Net irrigated area under tanks and private canals is nil. The percentage of irrigated area to net area sown in Datia is 42.7 %. Area irrigated more than once is 4117 ha. Therefore the gross area sown is 85508 ha. The percentage of irrigated area to gross area sown in the district is 40.8%.

The two important rivers, viz, the Sindh and the Pahuj, drain the main body of the district. The Sindh flows along the western boundary for a considerable distance, whereas the Pahuj touches the eastern boundary only for about a kilometer and a half. Thus drainage of the district is divided into these two rivers. The water parting line runs through the district from southwest to northeast. East of the water parting line the tributary streams flow towards the northeast while those in the west flow in a northwesterly direction and join the Sindh. Beyond the district boundary in the north, Pahuj, the eastern river, joins the Sindh which itself joins the Yamuna. Thus water from the district falls into the Gangetic drainage system. Except the four rivers viz., the Betwa, Sindh, Pahuj and Mahuar none of the streams are perennial. Sindh basin has three distinct regions medium lands, plains and deep ravines. Soils low in organic matter content but fairly rich in nutrient status. In the lower reaches it passes through undulating ravines with gradual slope.

The canals, which are a recent innovation in the irrigation system of the district, are likely to come into prominence with completion of the Sindh river project and Bhandar canal under the Matatila¹³ project. The district is deficient in underground water resources. The level of groundwater is very low - between 60-70 ft and that too till March only. The level is as low as 120 ft in the area along the river Sindh. On the alluvium water table is lowered down to a great extent in the summers and sometimes the base rocks are struck in the bottom of the wells. Infertile digging of wells is common in the watershed.

The character of the rivers is seasonal. Most of the streams and the span of the riverbeds dry up in the winter and summer seasons. The runoff during rainy season is very high. Baroni, Agora and Ramsagar are the important tanks of the district. A canal from Ramsagar irrigates the lower fields upto a distance of five and a half kilometers.

The second phase of Rajghat¹⁴ project would benefit Datia most and Uchad village in our watershed will be covered under this scheme.

2.3.4.2 Drinking water

Masonry wells have formed a major resource of drinking water since antiquity. All the villages in the district have been provided at least one handpump each which have to be maintained by the gram panchayats; with a provision of Rs. 500 per hand pump per annum. The cost of one hand pump bored to a depth of 60-75 m here costs Rs. 40,000 nearly. This is a meagre sum; also without proper training it makes little sense. High cost India Mark II pumps on deep borings have been installed; people complain that the handpumps have been installed at shallower depth than that shown on paper. The system of repair and maintenance of these setups could have been kept simpler, decentralised and village based. Uchad is the only village in the watershed that has piped water supply.

¹³ The Matatila dam across the Betwa river has led to an increase in the irrigation potential in the district. The 131km Bhandar canal of the Matatila irrigation scheme caters to around 9580 ha land in around 105 villages of Datia district.

¹⁴ The Rajghat dam on Betwa river in Lalitpur district is supposed to provide water for irrigation to Guna, Shivpuri and Basai enclave of Datia (3442.5 ha). The project is estimated to provide water to 7.56 lakh cubic meter of water to the state in all. A canal dug from the left bank of the Dhkuwan reservoir is to feed water to Anguri river. Barrage constructed on the Bhatan nala of Chirula village as well as Anguri river will generate around 6.5 MW of electricity for the region.

Tendency of exploiting groundwater through deep tubewells is high in the watershed. Some problems related to water in the watershed which came up during the discussions were - general scarcity of water, irregular power supply, high cost of power/ diesel, insufficient rains, lack of adequate number of wells and ponds and the problem of their drying up during summer months, ground water table going further down, depletion of the forests, wastage of water, leakage from dam-connected canals and reservoirs, non functional handpumps etc.

2.4 Livelihoods

The district has a markedly agricultural basis in the occupational pattern, Datia being the only town in the district.

2.4.1 Mining, quarrying and industries

The northern districts of Madhya Pradesh (Bundelkhand) are rich in production of certain minerals such as limestone (chuna pathar), diasphore and piarophilyte. Clay is available in Datia. Lead in the form of galena is found in the hills of Seondha and Datia. Mining and quarrying of stones for building materials is common in the district. Bundelkhand granite is mined here and stone-gravels made of granite are popular for RCC work. Stone cutting and quarrying is under the total control of contractors who exploit the wage labourers. The sand of the rivers provide valuable material for masonry and RCC work. Feudal relations in the form of bonded labor are very common in the field of quarrying in the region. Large scale and organised industries are few and far between. In Datia town and Sunari some industries of Vanaspati oil, cotton processing and graphite cutting are established. Datia has mines for kharia mitti and quartz. Institutional support for establishing cottage and village industries is there but it is estimated that during 1995-96 the district industry centre and khadi gramodyog department could help only 101 persons to set up cottage/ small scale industry.

<i>EMPLOYMENT (year 1991)</i>	
Worker participation rate	
All	36.8 %
Rural	40.0 %
Urban	27.0 %
Share of primary sector (%)	77.1 %
Share of secondary sector (%)	6.4 %
Share of tertiary sector (%)	16.5 %
Employment rate of growth (1981 to 1991)	2.74 %
Total employment in farm sector (%)	77.0 %
Rural employment in non-farm sector(%)	10.5 %
Agriculture labor (%)	13.0 %
Precarious employment	18.8 %

2.4.2 Agriculture

Cropping pattern

Area under crops in hectares

<i>Khariif (Siyari)</i>	<i>Area covered</i>	<i>Yield (kg/ ha)</i>	<i>Rabi (Unhari)</i>	<i>Area covered</i>	<i>Yield (kg/ ha)</i>
Paddy	980	1540	Wheat	56200	2475
Jowar	2090	740	Barley	5050	1800
Maize	410	1000	Gram	60680	960
Arhar	1020	800	Pea	8670	610
Moong	810	800	Lentil	16850	570
Urad	2320	380	Mustard	8350	610
Groundnut	7290	1200	Linseed	680	550
Til	800	570			
Soyabean	60	400			
Khariif total	16550		Rabi total	168160	
Sugarcane	3200				

Figures of kharif are for year 2002 and rabi for year 2003; Source: Agriculture Department, Datia

The cropping intensity is 109 % for Datia district. As far as the trend in agriculture goes there has been a shift towards moong and masoor in the district and for the watershed there has been a shift from food crops to sugarcane.

2.4.3 Livestock

Trends in livestock units in the district

<i>Livestock</i>	<i>1961</i>	<i>Per capita</i>	<i>1972-73</i>	<i>Per capita</i>	<i>1998-99</i>	<i>Per capita</i>
Cattle	135514	0.676	131561		159000	
Buffalo	46501	0.232	46562		114564	
Total bovine population	182015	0.908	178123		273564	
Goat	56187	0.28	46299			
Sheep	28206	0.14	20864			
Poultry	6848	0.034	7063		21660	

Pop 61 200467

Pop 72-73 255267

Pop 98-99

Earlier this area was home to the anna tradition under which the cattle were let free for four summer months mid March to mid July.

2.5 Programmes at district level

Government schemes

A number of programmes aimed at rural development and generating self employment are there in the district launched by the state government, bilateral aid and loans from World Bank and other financial institutions. Some of these programmes are Drought Prone Area Programme,

Training of Rural Youth for Self Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Indira Awas Yojana, Integrated Rural Development Programme (IRDP) and Jawahar Rojgar Yojana.

Rajiv Gandhi watershed Mission

Under the Rajiv Gandhi Watershed Mission Programme eighteen microwatersheds are being implemented under the Employment Assurance Scheme in the three tehsils of Bhandar, Seondha and Datia of Datia district. Twenty-six villages are being covered under the programme and a total area of 10651.83 ha is to be treated under the programme. Key informant interviews of the department officials were conducted to get an idea of the implementation. In MP the watershed management responsibilities have been transferred from District Rural Development Agency (DRDA) to Zilla Panchayat (ZP) as per the 1995 guidelines. DRDA is the nodal agency at the district level with the zilla panchayat chairperson as the patron. The District Collector is the Mission Leader. The District Watershed Advisory Committee (DWAC) is chaired by the Zilla Panchayat Chairperson in the state whereas in other states it is the Chief Executive Officer (CEO) who is the chairperson. In operational terms the CEO remains the Executive head of the programme. The merger of ZP with DRDA has led to several ambiguities. This committee has line department representatives and public representatives who are primarily responsible for the oversight of the programme process. The members of the District Watershed Technical Committee (DWTC) comprise of the line department representatives. While the accounts of DRDA and ZP have been merged for all state funding, the DRDA continues to have a separate bank account for central funding. The DRDA continues with its previous style of functioning.

According to the respondent (Mr. Shailendra Saxena, DRDA, Datia) the ZP Chairperson has some influence on the functioning of Watershed Development Programme. There has been a shortfall in transfer of central scheme funds to the districts and this affects the projects on the ground. Village Watershed Committee (VWC) is registered with DRDA and not under societies act. Earlier (before merger of DRDA and ZP) DRDA itself was registered under the societies act. Meetings of VWC are invalid without the representation from the PIA. The direction of accountability at the village level is therefore outwards - to the PIA and thereon to the ZP/ DRDA. Departmental problems faced by the DRDA - parent department does not support, transport/ TA (honorarium), lack of motivation and additional task for Project Officer and Watershed Development Team members. The decision as to which department should be the Programme Implementation Agency (PIA) is not taken at the district level. In fact it the department which shows interest in becoming a PIA. It puts up an application and so it is not correct to say that the department is saddled with additional responsibilities unless it is interested. The site selection for the structures is done by the VWC in consultation with the PIA. The contribution used to be 25 % earlier; now it is 10 %. According to the respondent in Datia the user groups are formed first before formation of VWC.

Forest department

Respondents: DFO (Ashok Barouniya)/ SDM/ Ranger

Datia became a territorial forest division in 1998. The district has 52.777 sq km area under reserved forests and 215.449 sq km under protected forests. Thus the total area under forests in the district is 268.216 sq km. Recently 35 villages of Karera tehsil of Shivpuri have been included in the Datia tehsil of the district. The forest mostly has kardhai and prosopis apart from khair, palas, tendu and a few other thorny species. The entire forest area is degraded with the density of forests below 0.4 and the quality of forests being 4 B. There are three forest range offices: Goraghat, Seondha and Datia. The quantity of Tendu, which was collected in 2002, was 583.640 std bags. There are a total 45 VFCs in the district; they are protecting 2282 ha of forestland has been transferred from Bhandar tehsil of Gwalior district once the tehsil was merged with Datia. The increase in net forest area or forest cover in the district can be attributed to this.

3. Problem of ravine erosion

3.1 Background

Ravine erosion is one of the major types of soil erosion. The word ravine denotes gullied land containing systems of gullies running more or less parallel to each other and entering a nearby river flowing much lower than the surrounding tablelands. It is not associated with an isolated gully. Sharma (1968) has defined ravines as a channel of ephemeral flow, denuded and guided essentially by the process of rejuvenated streams, and having steep sides and head scarps with a width and depth always greater than a gully. The wastelands atlas states that ravine is an associated network of gullies generally in deep alluvium and entering nearby river, flowing much lower than the surrounding tablelands. The ravines then, are an extensive system of gullies developed along river courses.

In order to study the morphology of ravines and to identify suitable methods of erosion control, various attempts have been made by geographers and soil conservationists. Tejwani and Ahuja (1956) have classified ravine lands into four classes on the basis of their form, head characteristics, length and width.

Particulars of ravine	G1	G2	G3	G4
1. Depth in meters	0-1	1-3	3-9	>9
2. Bed width in meters	0-18	Not < 18	18	Varies
3. Side slope in %	Varies	Varies	6-12	Steep > 12

All India Soil and Land Use Survey (AISLUS) has also proposed to classify gullies into three grades for mapping purposes. The grades are:

- G1 - Narrow gullies with 0.3 m to 1.5 m width.
- G2 - Medium gullies with 1.5 m to 3 m width.
- G3 - Wide gullies with over 3 m width.

3.2 Origin of ravines (Mechanism of ravine growth)

The ravines follow a simple pattern of development which is characteristic of all such areas in India. Almost invariably, they are marked by vertical headcuts and banks, which give them a typical rectangular cross section. Once established, the head cut advances and the channels widen by shaping and undercutting the banks. Abrasion by flowing water, either at the falls or above, is a relatively minor cause of enlargement. The depth of ravine cutting and the gradient of the downstream channel vary widely, depending, on the function of the flow, the character of the eroding sediments and the slope of the valley floor. The depth of ravines and gullies, in all ravine infested areas ranges from a few meters to 80 meters.

3.3 Technological options for ravine reclamation

Some of the technological options (Tejwani et al, 1985 and H.S. Sharma, 1980) which, are suggested for regeneration of land of this area and for erosion control are contour farming, strip cropping and terracing.

Contour farming	It involves planting rows of crops and using farm machinery along the contours of the lands. It is most effective on medium slopes and deep permeable soils. Though it has its dangers for if soil ridges are breached, water may be concentrated in the breaches giving rise to large gullies and ravines.
Strip cropping	Strip cropping consists of creating alternative strips of crops and grass parallel to the contours. This device serves to trap sediment carried from crop strips, filter runoff from upslopes and reduce its velocity. It increases infiltration rate and protects the soil from raindrop impact.
Terracing	It normally requires the creation by earth moving equipment of an embankment parallel to the contours. Most terraces reduce slope gradient, break the original slope up into shorter units, conserve soil moisture and remove runoff in a controlled fashion.

3.4 Restoration of gullied lands

The removal of runoff from terraces requires the construction of waterways and if these are inappropriately designed, they can easily become ravines and gullies. Natural waterways can also become gullies by increased runoff from areas of poor land-use practices. In both the cases measures are required to remove the gullies and to restore the drainage channels. There should be five methods for practice:

1. The most commonly used method is to cover the waterways with grasses or to encourage natural vegetation.
2. To convert the gully and ravine into a stable artificial channel with dimensions appropriate for the discharge of water.
3. To reduce water supply by conservation practices in the tributary lands.
4. To eliminate flow from gully by diverting it into an artificial channel.
5. To reduce erosive flow velocities in gullies by building structures such as spillways and weirs, which dissipate the flow energy and by creating stable channel section between the structures.

Crop management practices: The following crop management practices should be adopted in an integrated watershed planning for ravine lands:

The use of legume or grass crop in rotation at least one year in five, for instance, often gives a high degree of protection from raindrop erosion. At the same time it bestows additional advantages by providing for a period of soil recuperation, improving soil structure and increasing soil content. Similarly the judicious implication of the fertilizers and measures may not only help to improve crop yields but may also encourage soil conditions that decrease detachability and increased infiltration capacity. Further cover crops should also be grown when the main crops have been harvested in areas where the growing season is long enough to sustain them. Such crops serve to protect the soil at times when they would be exposed to rainfall erosion. In addition, they may be ploughed in, to provide a beneficial green manure.

5. Minutes of the workshop on ravine reclamation held at CSWCRTI, Datia

An interactive session on the said topic was held between the scientists/ researchers, NGO workers and villagers at the Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Datia on 1st July, 03. The meeting drew in ten villagers from the SPWD-SAMBHAV project village Sunari and its hamlet Pali, representatives from NGOs: SPWD- New Delhi, SAMBHAV- Gwalior and AFPRO-Gwalior, researchers from CSWCRTI, Datia and Jiwaji University, Gwalior. The points discussed centered around the following categories -

- (1) SPWD-SAMBHAV's project intervention on watershed basis at ravine afflicted village Pali of Sunari watershed,
- (2) Technological options for ravine reclamation,
- (3) Possibility of CSWRTCI's inputs in the project and
- (4) Other related issues on NRM and allied issues such as pricing of produce of farmers (like sugarcane).

5.1 Technical aspects

SAMBHAV explained that mere land bunding is not sufficient and land leveling needs to be done, as the area is very undulated. According to the Dr. Katiyar, Director of CSWCRTI the area chosen (ravine) has the worst case of erosion given that rill and sheet erosion are milder forms of soil erosion. Land leveling and land bunding in itself are of no use. The technology needed for reclaiming ravines was costly and would be upwards of Rs. 30,000 per hectare. This would entail construction of masonry structures (outlets), changes in laying of the field -say a 7m field to be divided into three parts and vegetative barriers be made. Vegetative bunding would be a low cost technology and grasses (like heteropogon and *cenchrus ciliarus*) can be grown on bunds. According to a farmer big dams and embankments are required in the area to tackle the problem of ravines. According to the scientists there are disadvantages of land leveling also. It turns the soil and upper soil goes down and the less fertile soil comes up. This reduces the productivity of soil drastically. Proper technical advice is therefore required before dividing the farm into parts or leveling it. The example of Rishikesh area of Uttar Pradesh was cited wherein the farmers have very narrow fields and are yet taking crops. Dividing the field into parts would increase the productivity, which would far offset the loss of area of the farm, the scientists stated. CSWRTCI works in different parts of the country and gives locale specific advice and was willing to give advice to the villagers.

Mr. Agrawal, SPWD stated that the present agriculture was not productive and hence there was a need to diversify into other crops. The other options were of medicinal herbs, aromatic herbs, better varieties of aonla, aam (Dusheri - case of Malihabad in U.P.) etc., to improve livelihoods. The case of the project with Tarun Sanskar Jabalpur was cited wherein farmers are growing crops like Ashwagandha etc., and thereby augmenting their incomes. Farmers here could try some other crop, which are suited to the area and have markets. A scientist from CSWCRTI said that since the villagers of Pali are already growing ber they could do budding over desi ber. CSWCRTI in its 450-acre farm (which has all types of soil from red to black) had tried budding on ber and can help the farmers in this. Aonla too was suited to the area and could be grown. Whenever plantation is done certain points needed to be taken care of - the size of the trench should be 3ft

X 3ft X 3ft. Water and manure needs to be put properly. Trees need to be grown in lines. Agriculture could be done in between since trees have a higher gestation period. Another suggestion was of digging trenches in April/ May so that insects die and pesticides can be avoided. Planting of trees after June was preferable. While growing urad and moong the farmers should go for better varieties which would reduce the pests. CSWCRTI had better varieties and was ready to provide that to farmers. Good varieties need to be conserved. Also farms should not be kept fallow during kharif. Sun or *deuncha* could be grown; the government provides them on subsidy basis. They reduce erosion and improve nitrogen content. This would improve the productivity of rabi season.

There was a discussion on vermicomposting and Mr. Agrawal from SPWD explained the technique. Better organic content of the field would improve productivity according to him. A scientist from CSWCRTI said that there was provision for training at the institute. There was a need to opt for better variety of worms, which do not go below ten metres and decomposes fast. In urban areas they fetch about Rs. 6-8 per kg. According to another scientist from the same institute vermicomposting is not as easy as often thought; it is workable only when there is enough gobar. There were other raw materials for the technique however like straw of dal/ wheat/ sarson etc; these materials are readily available. Fodder cutting machine should be used for making small pieces. The trench could be of the size 10 ft x 3 ft X 3 ft; 50-kg soil needs to be used per layer. The slurry of gobar and water (after having filtered the slurry) needs to be applied to the layers. Ten to twelve layers are to be made and holes need to be made for better aeration. This can act as very good manure.

There was also a talk on biogas and the subsidy therein. According to a farmer gobar gas plants had been tried throughout the district but had been unsuccessful in the area; there was defect in the unit itself. To this Dr. Katiyar replied that this was mainly because of lack of maintenance. This could be avoided by welding the unit properly, painting it and checking the pipes for leakage. The government gives subsidy on biogas but people do not shift to that since electricity is available. An advantage of biogas was that it has a bye-product (manure). NADEP technology was also suggested.

Mr. Mishra from AFPRO cited the case of a village in Khandwa where a group of 10-12 families had come together and built a biogas plant; even latrines are connected there. As a result the village does not use any urea today. They have used fast growing worms for vermiculture and from an investment of Rs. 4000 were able to reap Rs. 12,000 in just three months time. Prof. Avinash Tiwari of Jiwaji University explained the concept of biocomposting.

5.2 Institutional and policy aspects

In response to the farmer's demand for an integrated programme Dr. Singh, SAMBHAV responded that a lot of resource is required for that. It is not possible for NGOs to do that for long. The panchayat raj institutions get a lot of funding. If the sarpanch is active and the panchayat makes a resolution wanting to work on land and water then the state programmes would definitely reach there. NRM is a responsibility of the state and there a number of programmes earmarked for that. There is a gap between government programmes and the villages; the necessity is of community organisation to bridge that gap. SAMBHAV's main focus is on community mobilisation and training. The idea is to seek convergence of the various government programmes in the area. The idea is to politicise the issue of development. The number of government schemes available is too many to be counted. To this a farmer responded that the producers are not getting a fair price for their produce. The arrears of last years cane are due but

the factory owner who has political patronage refuses to pay them. The system is so corrupt that the farmers inspite of their mobilisation cannot get the price what to speak of convergence of programmes. Nobody listens to the farmers these days; the CM passes on the buck to the mill owner by stating that a grant of two and a half crores has been given to them and its the mill-owners responsibility now.

Dr. Singh responded to this by saying that the understanding of the social situation is very correct but an optimistic stand is of fighting it; court and media could be used to fight this. The struggle is on paper. He cited the case of SAMBHAVs work with the sahariya tribals and the people's institutions that have come up like Saharia Adivasi Sanghatan etc. Wherever work of this kind has been done the gram sabha meetings are held regularly, village level worker visits the village and schools are functional.

According to the farmers the flat rate of Rs. 1200 per month per pumpset (until 1983-84 the rate was Rs. 30 per month per pumpset) is a problem and the rise in prices of electricity reduces the returns from agriculture. The price of produce has not increased at the same pace; the price of wheat has increased from Rs. 100 per qtl to Rs. 600 per qtl during the same period. The costs of inputs have increased substantially though. When farmers (some twelve thousand of them) protested against this in Bhopal many were put behind bars. According to another villager there was a lack of government programmes in the village. A suggestion which came from SAMBHAV was to find out about the programmes on ravine reclamation implemented till now in the district by World Bank/ Govt./ NGOs etc., and their focus and impact. The meeting concluded with a vote of thanks. A team from CSWCRTI visited our project village on 5th, July, 2003.

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