

*planning
the
environment*

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*based on research conducted in
shahdol district, madhya pradesh*

PLANNING THE ENVIRONMENT

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The Walrus and the Carpenter
Were walking close at hand;
They wept like anything to see
Such quantities of sand:

“If this were only cleared away,
“They said, “It would be grand!”
“If seven maids with seven mops
Swept it for half a year”

“Do you suppose,” the walrus said,
“That they could get it clear?”
“I doubt it,” said the Carpenter
And shed a bitter tear.

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Vidushak Karkhana,

Anuppur,

District Shahdol,

Madhya Pradesh.

November, 1982

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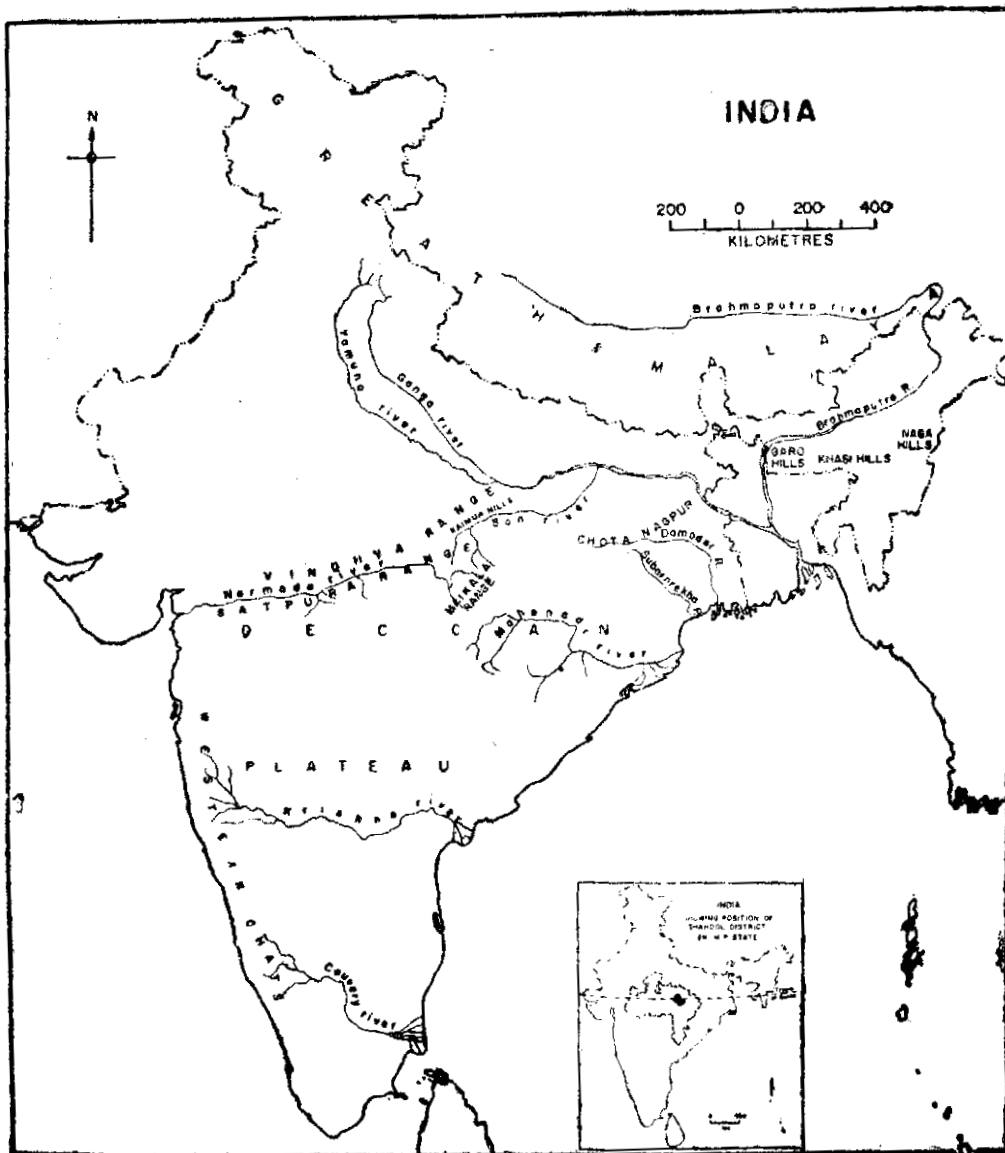
A. Gupta

CHAPTER I
SHAHDOL - THROUGH THE LOOKING GLASS

“The time has come,” the Walrus said,
“To talk of many things:
Of shoes - and ships - and sealing - wax -
Of cabbages - and kings
And why the sea is boiling hot -
And whether pigs have wings.”

Chapter I

1.1 Journey into the heartland



Like a great, primeval slash the valley cuts across India dividing the country neatly into North and South. This is the valley of the Narbada, carrying the waters and silt of Central India into the Gulf of Khambhat, daughter of the Arabian Sea. If you trace the course of the Narbada, down from the salty flats of Gujarat; eastwards through the last spurs of the Western Ghats; up into the rich, loamy, black cotton soil heralding the end of the Deccan trap; walled in by the hills of the Vindhya range to the North and the hills of the Satpura to the South; travel 600 km further east and you will gently rise into the sal forests of the Maikal range, the link between the Vindhyas and the Satpuras; and finally to Amarkantak, the source. Go further east, over the watershed, and you descend into the valley of the Mahanadi which flows on into the Bay of Bengal, 500 km away. You have just traversed the heartland of the tribes of Central India and seen the valley floors which brought them to this last refuge of theirs. Move northwards from Amarkantak and you will abruptly drop into the valley of the Son, flowing west and then describing its great curve through the last of the Vindhyas to join the Ganga at Danapur near Patna. What you see before you, in the valley of the Son, is the district of Shahdol, the Sohagpur pargana of the erstwhile princely State of Rewa, also known as Baghelkhand.

1.2 Four thousand years of history

The earliest settlers in the Son valley and its hilly tracts are the Baiga tribesmen. Nobody knows where they came from but they certainly pre-date the wave of Aryan immigration. Even today they are known to live in close symbiosis with the forests and are reluctant to take up cultivation with the plough.

Of equally pre-historic origin are the Agaria tribes folk. They are aboriginal iron-smelters, quite distinct from the Lohars, the iron workers of the Hindu areas, with whom they have no connection. What happened to the iron they smelted? Why did this skill not raise their social and economic status? Where did they come from? The answers have yet to be recovered from the records buried by Nature deep in her soil.

The Aryans came to India in the Second half of the second millennium B. C, Cattle-breeders who had learnt to tame the horse, and they swept down the Indo-Gangetic plains, conquering, ruling, and imparting a new culture and new mythology. They absorbed the phallic totem of the aborigines into their trinity and called him Shiva, with unbounded power over life and death. At some stage they must have come to the Baghelkand region for the Baigas and Agarias speak Aryan languages. Near Sohagpur, in Shahdol, lie the ruins of Viratnagari, Is this the Viratnagari of Mahabharat fame? Is the Uanganga related to the water that Arjun is said to have brought forth by shooting his arrow into the ground to slake the thirst of a parched and dying Bhishma? Who knows? Certainly not us. But they weave interesting stories around muddy pools, crumbling ruins, and man's minds, for the Aryans did not leave behind a record apart from these.

In the eighth century B. C., the first Munda tribes came over the Naga Hills into the Brahmaputra valley. Primitive cultivators, they travelled down the river valley seeking safety from the floods and food for their tribe. Wherever they went, they settled the land. In Assam they called themselves the Khasis. Sweeping further west and up into the Subarnarekha, Damodar, and Mahanadi

basins, they called themselves the Hos, the Santhals, and many other names besides. From the Mahanadi valley they climbed over the Maikal hills and settled in the upper Son and Narbada valleys as the Kols and then migrated down the Narbada valley and up into the Satpura highlands to call themselves the Korku. In Shahdol they encountered the Baigas and Agarias and reduced them to a lower social order.

Three hundred years later, in the fifth century B.C. the Dravidian tribes migrated northwards from their homes in Karnataka and Andhra. The Gonds came from Karnataka down the Krishna valley, then northwards up the valley of the Godavari over the Maikal range and into Central India in doing so they effectively cut off the Kokru from their Mundari-speaking brothers in the East. The Oraons followed a more easterly route from their homes in Andhra into the Mahanadi basin and then up to the Chhota Nagpur plateau. The Oraons have reached Shahdol only in the second half of this century but the Gonds came much earlier, well over 2000 years ago, and they subjugated the Kols. They also brought with them the plough, a new concept in cultivation. So from shifting cultivation the pattern changed to settled cultivation, although the land remained communal or tribal property. Imagine, if you can, the dark green-blue of the forest canopy changing into the scintillating green-yellow of paddy and the plough biting deep into the undisturbed brown earth.

Next to come were the Maurya and Gupta Kings from Pataliputra, ancient Patna. They travelled up the Son valley in the first century B.C. and brought with them new conceptions of royalty. Land rights were divided between the kings, the village communities, and the individual cultivators. A share of the produce was demanded from the cultivators who gave it to the community, which owned the land, and who, in turn, gave tributes to the monarch. In another 500 years, by the fourth century A.D., some of the Gond chiefs had learnt sufficiently of the ways of royalty and they set themselves up as petty Rajas, thereby calling themselves Raj-Gonds. Being unversed in matters of administration they called in Brahmin priests and court officials from the Ganges basin in the North and freely made gifts of land to them.

In the sixth century A.D. the Kings of Malwa, 300 kms away, began extending their dominions and travelled up the Narbada valley to claim their share of the cultivated produce from the Gond rajas and the tribal communities. The Malwa Empire disintegrated in 300 years but their feudatory princes divided up the possessions amongst themselves. The Kalchuri Rajputs of Mandla, Panna and Banda in the upper reaches of the Narbada valley claimed the western part of Shahdol for their own and built the fort of Bandhogarh. Through military campaigns they extended eastwards into the Son valley and usurped proprietary rights over all the land and largely dispossessed the Kol and Gond community land. The tribals became tenants on their own land.

Agriculture recorded further advances as the new rulers settled other immigrants to make the virgin territory more productive. Kurmis and Patels, expert farmers, took over the cultivation of chunks of the best land and Telis arrived to process the oilseeds to make oil. The monarch and his feudatory princes demanded increasingly larger shares of the produce as tribute.

In the thirteenth century Baghel Rajputs from Gujarat married into the Kalchuri clans and received the fort of Bandhogarh as dowry. By the end of the century the Baghels fled from

Gujarat before the advance of the Khilji rulers and travelled up the Narbada valley to their new dominions to which they gave their name-Baghelkhand. The Baghels extended their possessions to the North along the Son valley and beyond the Kaimur Hills. In the sixteenth century the Mughals, now firmly entrenched in the Gangetic plains, extended their sway over Baghelkhand and under their tutelage the Baghels introduced the zamindari and jagirdari systems by which a new class of landlords emerged, all cultivators being reduced to the status of tenants. The Baghels were extraordinarily poor record-keepers and it is only from this period that we have the Mughal historians to tell us what happened. One of the classical prices paid for this bit of education was the transfer of the musician Tansen from the Baghel palace to the Mughal durbar and the spread of the enormous fame of this gifted singer. Up to the nineteenth century the administration of the State, though it lay nominally with the chief, was almost entirely in the hands of the Kayasth Khaskalams (writers). Land fell into two classes: Kothar, or land directly owned by the State; and Pawaiya, or land alienated in jagirs and other grants. The Pawaidars, Ilaqedars, and Subedars claimed the revenue from the land while the Jagirdars turned over the major portion of the revenue to the State. Some land was still with the tribal communities. In the eighteenth century the Bhonsle Marathas invaded Baghelkhand and occupied most of what is now Shahdol district. They continued the forms of exploitation which they found prevalent under the Baghels. However, this was only for a short time. Early in the nineteenth century the British concluded a series of treaties with the Baghel rulers. In 1857 Shahdol was restored to the Baghels for their services during the Mutiny. However, every time a treaty was broken the British levied heavy penalties. In 1873, the Baghels despatched an armed force which plundered one house and murdered an inmate. For this "offence", the Maharaja was fined Rs. 10,000 and the Sardars who had aided him were fined Rs. 1,000 each. The burden of replenishing the royal and feudal treasuries was passed on to the tenants. Even then, the profligacy of the State was so high that by 1875 the Maharaja had become bankrupt and the administration passed into the hands of the British, with the understanding that the rights granted by the British and their system of administration would be maintained and protected after the British withdrew. Subsequently the British Tenancy Act took away all the communally owned land which still remained with the tribals and gave, sold or auctioned it off to landlords. Under the British, forest management also began, coal mines were opened up in Shahdol at Umaria in 1885, and in 1883 the first railway line was constructed in this section from Katni to Bilaspur passing through Umaria. Thus the foundations were laid for the industrialisation of the area which further alienated land and imposed ever higher levies on the people. An idea of the nature of collection and distribution of wealth can be had from the following figures (for the whole of Rewa State):

In Rupees thousands	Average for 1880-90	Average for 1890-1900	1900-1	1902-3
Land Revenue	6,70	7,87	9,13	13,54
Total Revenue*	11,46	14,13	22,73	29,08

*This excludes Jagirs and religious grants which, in 1902-3, probably absorbed about 15 lakhs.

In 1902-3, of the total revenue, the Umaria colliery contributed 7 lakhs, forests 4.1 lakhs, customs 2.5 lakhs, and excise Rs. 78,000, apart from the 13.54 lakhs obtained from land. The chief heads of expenditure were; Maharaja's establishment, 3.7 lakhs : army, 4.3 lakhs : public works, 3 lakhs : collection of land revenue, 1,4 lakhs : forests, 1 lakhs : and colliery, 3.7 lakhs. Progress had finally come to Baghelkhand and, in particular, to Shahdol!

1.3 The story after independence

The district of Shahdol was constituted as an administrative unit in the State of Vindhya Pradesh after 1947. Vindhya Pradesh later was amalgamated into Madhya Pradesh in 1956.

The Government of Independent India by and large took over the same administrative apparatus of British India. In 1950 State planning for development was taken up in right earnest and the entire administration in the District of Shahdol was geared to developmental goals, from the Department of Tribal Welfare to the Department of Industry. What has happened in the last 30 years and what continues to happen may perhaps best be told in a series of case studies which we have collected during the course of this study.

1.3.1 Land conflict

The Oraons are migrant labourers originating from Sarguja and Raigarh districts, adjacent to Shahdol district. While the causes of their migration are land pressure and unemployment, land hunger was a major factor. About fifteen years back, 1965, a group of 15 to 20 families settled on a hundred acres of land close to village Jamudi in Jaithari Block of Shahdol district. Their village was named Taradand.

Neither the migration nor the location of the settlement was accidental. One of the biggest absentee landlords of Jamudi, owning close to a thousand acres of land, densely forested, wanted his land cleared and developed. The Oraons are expert land levellers and developers, a skill lacking in the local adivasis. The verbal promise of the landlord guaranteeing a hundred acres of land to them was sufficient incentive for the move. The nearness and richness of the forest was an aid to survival, one which was lacking in their home province. Further, the undulating characteristic of the land assured them employment in the future, as land levellers.

Word of favourable conditions for settlement filtered back to the home province and in a period of five years, by 1970, about 50 families moved into the area adjacent to the village of Taradand. The clearing of the land provided wood for building houses, fire-wood and the sale of wood supplied money for other consumption needs, providing sustenance until such time as the land was not ready to be put to agricultural use.

The first party of settlers was led by D., who used his authority as a group negotiator to ensure that his own farm was fully developed. When the second party, led by B., appeared on the scene, they settled on, ostensibly, government owned land. D., by now well established, would collect money from the new comers for the purpose of getting pattas made to record ownership of land. With the passage of time and money, however, D.'s story wore thin as no

pattas were awarded to any of the settlers. This led to serious differences between the two groups of settlers, leading almost to armed confrontation over the issues of boundary demarcation. At this stage the patwari of Jamudi appeared in the picture - he took Rs. 50 - Rs. 100 per settler for the purpose of awarding patta to end the dispute - but the pattas were not awarded and the disputes continued. Since by now the forests had been cleared, the stumps uprooted, the land levelled, embankments between fields constructed etc. local interests wanting to acquire the land had also entered the fray. Jamudi's biggest landlord, with holdings of about 1700 acres, laid claim to the land as forming part of his holdings. Pre-dated pattas can be had - for a price, of course. On the other hand villagers of Dulhara, about five kilometres from Taradand, also laid claim to the land on the basis that they had cattle-grazing rights which they had been exercising on these lands for hundreds of years. Whereas the landlord preferred the use of legal processes to strengthen his claims, the villagers of Dulhara resorted to confrontation. For two monsoons, they ganged up against the Oraons and forcibly ploughed, sowed and reaped the land. The third monsoons, the Oraons retaliated by ganging up and flashing bows and arrows to intimidate the opposition. A few heads were broken when the Dulhara villagers tried to graze their cattle in the standing crops of the Oraon. The landlord got some of the Oraon leaders arrested on charges of trespass, and the Dulhara villagers added their complaint that the Oraons stole and ate their cows.

There are other factors to complicate the situation. According to reliable sources, the last land survey was conducted in 1925 by the British. The land maps do not clearly indicate the landmarks they used to demarcate holdings. Even today, patwaris rely on visual rather than instrumental techniques to determine holdings. Secondly, a majority of the Oraons are Christian converts and receive developmental aid from missionary sources. This goes towards community welfare projects such as wells, a school (and school teacher) and an earthen dam. They are also preferentially employed in Church sponsored programmes, mostly as construction workers. These activities give rise to conjectures regarding the role of the missionaries in the increasing militancy of the Oraons. The other major land owner, who settled the first group of Oraons is also in the process of trying to evict them. Legal proceedings are pending in the court of the sub-Divisional Magistrate.

1.3.2 Model Farms

N is a former social worker turned farmer, whose interest was to set up a model farm in a backward area to accelerate the process of agricultural development. His objective was two fold: (a) to provide sustenance for himself and his family: (b) to understand and tackle problems, operating under the same constraints that any other middle farmer in the region was subjected to. To this end, he purchased five acres of land a little removed from any major township, between an important coal mining town 20 kms. by road and a railway junction town 9 kms. away. The land was uneven though the soil was of good quality. Land close to the village and the road, though uneven, was more expensive than equally fertile flat land in the interior. In addition the cost of developing the land by levelling would place an additional economic burden on N. In spite of this, N decided to opt for the former alternative. A direct consequence of the

decision was that since the land was close to the village, it already was deforested.

As a result, the economic benefit from the use and sale of wood was not available though the stumps of felled trees had to be dug out of the land.

Next was the problem of fencing the land to keep stray cattle out. The normal practice was to either have an arrangement with the local forest guard or to illegally fell wood from the adjoining forests. As the land was not developed, N had a little bit of time to spare before his crop started growing, so he planted a thorny hedge all along the boundary. This was reinforced with 'besharam' - a pernicious weed, available in plenty. Land development was a long process, which had to be phased out, since a portion of the returns from the first crop had to be invested in the development of the remainder of the land. Further, money had to be conserved and this could be done by calculating precisely which land had to be cut by what amount to fill out the shallows and depressions in other portions of the land. The Oraons, migrant labourers from adjoining districts, were skilled at this job and quick workers in the bargain. A slightly higher wage rate was offered as an enticement, the additional expenditure being covered by a quicker return on investment. A portion of the land was planted with cereals and irrigated at intervals by hiring a diesel pump. Up to this stage, the work had been proceeding satisfactorily. Then the problems started.

The next phase involved digging a well and installing a pump. For this, N approached the local office of the Lead bank for financing. N had decided that an electric pump was best suited for his site, but the Agriculture Extension Officer (AEO) thought otherwise. Hearsay has it that the AEO received a commission from the selling agent of diesel pump sets for every set purchased by the fanner through the bank. This was two months before the onslaught of the monsoons. Work on the well had already begun, N having employed the remainder of his capital for this purpose with the plan that the money from the bank would replenish his capital. The AEO, however, refused to budge. The monsoons came, and N was fortunate that his half completed well did not collapse. With the passage of the monsoons, N resumed his efforts to obtain finance. Getting no response from the AEO, he approached the local agent of the concerned bank but to no avail.' The next step was to approach the main office in Shahdol, yet no action was forthcoming. Finally, N wrote to the branch office in Bhopal with a copy to the head office in Bombay, protesting at the tardy treatment meted out at the local level and the indifference at the district level. Copies of this letter were sent to the local and district levels. The local copy came back in a sealed envelope, torn to pieces, with the derogatory comment 'From your father' written on the back of the envelope. It was only when this second incident was reported to the level of Bhopal that a quick investigation was carried out and the finances hurried through. Having secured the finances, the next step was to get an electrical connection at the site. N approached the electricity board local office, armed with the necessary documents. It had been a normal precedent for farmers to pay Rs. 50 to local employees to get an immediate connection. N refused to get blackmailed. Whereas the rules of the Electricity Board stipulate that farmers should get a connection within one week of completion-of all formalities, the matter dragged on for four months. So N declared and went on a hunger strike, with a demand that an enquiry be instigated into the matter. Sufficient prior notice had been given to the Collector, various authorities

within the Electricity Board and the Chief Minister of the state. The manoeuvre created ripples locally. An electric connection was given 24 hours before the deadline of the start of the hunger strike. With, the start of the hunger strike various police functionaries, officials etc. enjoined upon N to call off the hunger strike since a connection had already been served, N however, pointed out that his demand was not installation of service connection but an inquiry into the delay. An enquiry committee of two was then constituted to look into the matter. N's misfortunes did not end here. The well financed by the bank did not yield enough water for vegetable cultivation as planned by N. He approached the bank again but was informed that it was contrary to the rules of the bank to finance a second well before the debt for the first had been cleared. Now N had to fight for his survival. He borrowed, scrounged and squeezed out the last of his capital and made a well next to the nala bordering his northern boundary. This well proved adequate for the Rabi and Kharif cultivation and N managed to recover a measure of economic stability.

B is a big farmer near Anuppur. He decided to go into farming two years ago and purchased 22 acres from a local thakur who had excess land. The rate was Rs. 500 an acre and the entire amount came from the family savings of B and one of his brothers. The family does a flourishing business in Anuppur town with a flour mill and godown. B's brother manages the town business and B the farms. B has sown a variety of crops: Kodo, Arhar, dhan, moong, urad, corn, til and groundnuts. Kodo he sows for his labourers payments thereby saving on cash. Arhar and dhan he cultivates for family use. The rest of the cropping is for commercial purposes. He has sown a second crop of tomatoes and also planted chillies. He has been experimenting with this wide variety of crops. B has a loan of Rs. 4,000/- from the Anuppur bank for a well and pumps set. The well is presently 20ft deep and he intends to deepen it to 30 feet. It appeared certain that he had bribed the bank official for the loan. Land levelling is in progress, and some of the land has been left for a forest area to supply the firewood and implement wood requirements. On the remaining land he wishes to build a bund to form a pond and to start a fishery. By doing this he will also occupy adjoining government land. Until recently B got one crop a year due to lack of water; his well will enable him now to take at least two harvests from his land. His interests lie in quick turnover and so he is concentrating on fast maturing crops like tomatoes. B employs two labourers on the monthly wage of Rs. 100-paid both in cash and Kodo. For fertilizer, mainly gobar and weed compost is used, which minimises the use of chemical fertilizer. He practices crop rotation an example: 1st season-Kjodo, arhar; 2nd season-til; 3rd season-kodo, arhar; and so on. B has a sound financial base and has the business acumen to make out good future plans.

Both N and B are non-tribals. As for the tribals.....

T owns 4 acres. All that he grows is for his family's consumption. He sows kodo, arhar and dhan. He is the only working member of his family that includes his parents-his children are too young and he is separated from his brothers. His land is not irrigated and thus he can harvest only one crop a year of about 20-30 khandi (16 quintals). This land is not level and he is not interested in levelling it. Before the monsoons in '78 he was suffering from malaria. Being the only working member he was still trying to work so that he could sow his lands in time. He was

trying to borrow money for medicines. T cannot meet his annual commitments from his land alone. He hires in land giving 25-50 % of the subsequent produce from the land to the owner, the exact proportion of share depends upon the quality of land. In off season he works as a labourer with work hours of 7.00 a.m. to 2. 00 p. m., following which he bathes, lunches and does various chores until evening. T had attended an agricultural exhibition sometime earlier in Jabalpur. He could remember the fair very clearly and related the inapplicability of the technology he saw there. He had seen, for example, that light soil was good for crops; his own land had dense soil. He cannot use better strains of rice, etc., because of the non-availability of seeds and the increased cash investment involved in fertilizers, irrigation, etc. He thinks he has no means to get this investment and, more importantly, does not want to take this risk.

T is disillusioned by the government loan schemes and other help provided. He has asked for a loan of Rs. 200/- for poultry feed directly and through his father. The loan was refused and T is not clear about the reasons for refusal. He has applied for another loan for Rs. 1000 - for bullocks but does not place much confidence in obtaining it. He uses Gobar and weed compost for fertilizer, and doesn't know much about chemical fertilizers. His crops are often pest-infested,

K and J are relatively large scale farmers. K. has 50 acres and J about 15 acres. Most of their land is level and good quality. K farms only about 25 acres and rents out the rest. Both have wells and pumps from loans obtained two years ago from banks. In another two years they will manage to return the loans with interest. Both cultivate a variety of crops like B but cultivation is mainly for home consumption. They do not use modern fertilizers or pesticides and are uneducated as well. Their cash income comes from hired out land and a limited vegetable cultivation. They do not have much saving. J was not interested in new agricultural practices and trends; K was experimenting with new crops after observing changes in the village brought by farmers from U. P. towns. Both disfavoured sending their boys to school. They pay their labourers from their Kodo crop.

A is a labourer. His family owns some land but A labours in other's fields. The other members of his family tend to the land. Their land is un-irrigated. They cultivate Kodo mainly once a year. A had joined a village co-operative trade bank which failed when the accounts disappeared. A now distrusts all connected with the trade bank. He seeks to be educated and wishes to go to a city for this.

1.3.3 Marketing

In April 1975, an educational experiment conducted by a student volunteer resulted in a preliminary discussion amongst some villagers on the economic uses of Mahua seed and flower. Mahua flower is used both for food as well as for distress sales. It is collected, consumed, and sold in the period between major agricultural food crops; hence it is an important forest produce for small peasants and the landless. Traditionally it has been purchased from the collectors by middlemen for 35 paise per kilo and then sold back to the same tribals at three to four times the price. The economic structure of the trade in Mahua flower had been surveyed earlier by

student volunteers and it certainly was a part of the consciousness of the villager. The problem was, however, that that perception of the dealings in the flower was not organised in an overall world view and hence the situation was accepted and no effort made to find a way out of the clutches of the middlemen and the traders. A number of experiments to build up an organised perception in the minds of the peasants through talks, discussions, and offered solutions all led to failures. Finally a volunteer set down the whole process of the sale and subsequent repurchase of the mahua flower in a series of 24 illustrated cards (visuals) much in the manner of a comic book. The illustrations are very simple, the figures crudely drawn, and vivid colours are used. They caught the imagination of the tribals at a meeting and they grasped the whole sequence very rapidly. The last card had been left blank and a good deal of discussion evolved over how to fill it in. The cards eventually were taken by a villager to another village and then to another. The discussion resulted in the formation of a kind of trade bank in June 1975 with the encouragement of another volunteer. In due course of time the Vyapaar Kothi (trade bank) not only helped villagers in dealing with Mahua flower but also with other food grains and credit. However, by September the pitiful capital available to members of the Kothi had been locked up in credit and discussions began on how to revive the bank and find additional capital. Finally the accounts disappeared and the Kothi collapsed.

1.3.4 Wheat Marketing

Cultivation of wheat in the Rabi season has increased in the region over the last 7-8 years. However, till the summer of 1979, no Government procurement centre had been setup for purchase of wheat from the farmers. The purchase price of local traders ranged between Rs. 75- 90 per quintal whereas the rate declared by the Govt. had been Rs. 113-Rs. 115 depending on the quality of wheat.

In response to the cultivators growing awareness of the pricing discrepancy, a local two-village Kisan Samiti demanded that the government set up procurement centres at Anuppur and Rajendragram for purchase of wheat grown in the hinterland areas of Sohagpur and Bandhogadh tehsils. Verbal assurances were made but no action taken until such time that the Kisan Samiti raised the spectre of a 'Kisan Andolan'. The delay enabled private village level procuring agents, called Fadiyas, to purchase part of the yield. When the procurement centre was finally set up, a number of artificial barriers were created to discourage farmers from selling directly to the Govt. marketing machinery. A sample package containing good quality pure wheat was touted as the requisite quality of wheat against which the produce offered by farmers would be judged and priced; whereas the specifications laid down allow percentages of other grain, grit, moisture etc. Secondly, inordinate delays occurred in weighing in and payment for the wheat: explanations offered ranged from 'money has not come' to 'weighing scales are misplaced'. Thirdly, many villagers were asked to clean their grain on the spot before it could be purchased, but no sieve was made available though such a provision comes within the purview of the procurement agency. Therefore, many cultivators, after conveying their grain to the market, sold it to the local traders who by evening sold it to the Govt. agency, earning Rs. 15 to Rs. 30 per quintal per day.

Further, many Fadiyas sold their grain to the agency which purchased without any check whatsoever. A significant aspect of the situation was that many farmers, even though realizing what was happening, permitted the Fadiyas to sell as they were apprehensive that the agency would otherwise declare that procurement had been insufficient to warrant opening of a procurement centre, and there would be no procurement centre in the following year.

1.3.5 Relief Works

After the drought months in the region caused by the failed monsoon of 1979, relief works were opened in several places in the district. At one stage the local administration claimed to have given employment to over 1 lakh people. In many regions there was a feeling of dissatisfaction with the delays in starting the work, and with the inefficient way the officials were giving the information. For example, the Forest Guard would mention that a relief work had begun to a person who had come to see him on some other work and ask him to pass on the word.

The relief work near Anuppur was being arranged by the Forest Department. It involved the construction of a road from Sajahan to Kekarpani about 13 kms long. It was claimed that the work started in Sajahan would provide employment to about 400-500 labourers for a period of about 2 months. The admission and payment to the scheme was on a weekly basis. The pay rates were advertised as Rs. 3/20 for men and Rs. 3/00 for women for 8 hours of work per day. Contradictory to this was the statement that the payment would be done by the "Khanti", i. e. depending upon the amount of work done, but the workers would have fixed working hours as well as attendance rolls. It was also said that "galla" would be paid along with the cash payments. The concept of grain payments arises from the traditional practice followed by rich farmers in the region. However no one expected to actually receive the grain payments. One of the labourers estimated that three-quarters of the village needed to engage in such relief works. Of the 10 villages in the region surrounding the site of the relief work, with an average population of 500 per village, there are between 3,000 and 3,500 persons who are in need of employment; of these only 400-500 could be provided for by the government scheme, and for only 2 months.

Alternative work for 100 labourers was available at a neighbouring stone quarry leased out to a contractor. The rates of payment to labour there was Rs. 25 -per 100 stones. On an average a worker cuts 50 stones making his daily income Rs. 12.50. The labourer is semi-skilled and it takes up to 2 months to learn by observation to cut well and not hurt oneself with the flying stone chips. One labourer had picked up the skill 14 years ago when the Orient Paper Mill needed such stones; the wages then were Rs.2/50 per day. The labourer owned about 34 acres of land and had a family of 8, with 4 children under 12 years of age. His land itself was rough and undulating.

This village had a population of 500 including 150 children, in about 300 households. Of these about 50 households can survive on only farming activity. 15-20 households have surplus harvests of rai, ramtila, til and alsii, all marketable oilseeds. Collection and sale of edible forest produce, beedi leaves and mahulain leaves, and firewood, is also adopted.

Those of the local farmers who could continue farming operations inspite of the drought were those who had installed pumps. “Women labourers earned Rs. 2/50 per day of 8 hours, whereas men earned Rs. 4/day.

In Khichkiri, at the Relief work on a talaab, there was an old woman of 70 who could barely stand, lifting broken earth into the basket. Payments had not been given for two weeks. The wages paid were Re, 1.50 per day and if there was even a deficit of half an inch in the earth dug, as much as half the wages were cut. None of the labourers had any idea of the actual wage rates.

In Kauna Bahera the Relief work comprised of another talaab. Here too payments had been delayed. In a week they received 7 to 8 kg. of rice. Harassment by the officials was common in totalling the muster roll, calculating the earthwork and employing the labourers. So most of the villagers preferred to go to the forest to pick tendu leaves. Would they go to the collector to complain? “What for? He will only instruct his staff ‘Pay them quickly’, and we will all come home with empty hands. May as well go home early!”

The story was repeated at relief work after relief work.

1.3.6. Short haul transport

A is a businessman of Jaithari, located on the rail line between Anuppur and Pendra Road. While Jaithari is connected by kuchcha road to both Anuppur and Pendra, hardly a handful of vehicles would daily be disturbing its peace. It is a town of diminishing importance since the railways have chosen to focus their attentions on the towns flanking it on either side. Jaithari is a trading centre dealing in grain from the hinterland and sale of petty consumer items such as dais, masalas, soaps, oils, sugar, cloth, rough hardware. It does not as yet boast of an eating house where a full meal is available; oil expellers and atta chakkis of Punjab make are its concessions to modern technology. No workshops cater to its machines and repairs may be made as far away as Jabalpur. (200 kms) or Shahdol (60 kms.) It is, however, a block headquarters and therefore enjoys the presence of a Primary Health Centre, Police Thana, Morgue and an office of the Electricity Board.

A’s family owns about 40 acres of land, trades in grain and has an atta chakki. A is an engineering graduate with some work experience in the Neapanagar Paper Mill. Four years ago, he took Rs. 50,000 from the Central Bank of India to set up an Agro Service Centre under a prevailing scheme. The sale and maintenance of agricultural equipment soon flopped as there was no business in Jaithari to sustain it. The next venture was a tractor, which could not attract a clientele for cultivation; the tractor charges Rs 30 - Rs.40 per hour of tilling, below which it is not viable. Small farmers prefer to till their land themselves, cutting down the external costs, whereas large farmers prefer hiring labourers for the job since they normally have their own bullocks, wages are low (Rs.4 per day), and the size of the plots as well as the terrain is more easily cultivated using traditional methods.

Faced with this situation, A collected some more money and purchased a trolley for transportation of materials. The trolley was made in Satna from parts salvaged from broken down vehicles - a box mounted on two wheels. The wheels were small and of a non standard

size, so that the trolley was incapable of carrying heavy loads and replacement tyres were not easily available. So A decided to replace the existing tyres with larger, standard tyres, requiring a modification of the trolley, all of which entailed further expenditure and excess downtime. Bad materials and poor workmanship in the manufacture of the trolley, coupled with the state of the roads, necessitated frequent repairs on the tractor-trailer.

In an effort to earn enough to repay the bank, A decided to take up contract work for the Public Works Department. Since he was not a registered contractor, he could only take up sub-contracts. The award of the contract entailed money changing hands and after the contract was completed, the contractor collected payment for it, leaving the sub-contractor A in the lurch. Since A does not pull the political weight necessary for getting public works contracts, he has abandoned the field.

As Jaithari does not have a fuelling station, repair and maintenance facility or sufficient transportation business, A has shifted his field of operations to Burhar, 44 kms away from Jaithari. He is now involved in transporting bricks, sand and other construction materials, grain and lumber. Due to his inability to repay the original borrowings from the bank, as also repeatedly having to borrow additional amounts for emergencies, he now is in debt to the tune of Rs. 60,000. Both the tractor and the trolley have seen considerable wear, diesel supply is a perennial problem, service charges in Burhar are murderously high whereas servicing in Shahdol, 22 kms. away from Burhar, increases *he down-time costs. The future is not rosy.

1 3.7 Hand pumps

A man locked in a cell to die, would most probably die of thirst, rather than hunger. Gandhi was able to last that long on his forays into “Fasts unto Death”, because he had not stopped drinking water. In normal circumstances, most villagers get their supplies of drinking water and water for house hold and other purposes from wells, nistaar talabs, or running streams. The wells are not cleaned and chlorinated for years, and the talabs, what with cattle swimming and women washing clothes are breeding grounds of disease germs. The Government does recognise the need for safe drinking water, but doesn't do much to ameliorate it.

So it went on for years The Government even formed a body named the Public Health Engineering Department (P.H.E D.) to make drinking water available to the rural populace. Not much happened. Every year the dried talaabs, wells, streams were replenished by the generous monsoons; and men, women, children kept drinking water, playing host to bacteria and germs, and falling ill and dying in the process. But that was another matter. Dirty or safe, there was water available. And that was enough for the Administration.

Last year, however, there was a severe drought. Streams, nallas, talabs, wells all dried up. Farmers couldn't even get the seed back from the land. It all dried up. Bony cattle became more skeletal. Even people did not have water to drink. It is always easier to contain hungry stomachs. But a parched throat makes a lot of hoarse sound. And a lot of parched throats make a kind of cacophony which is quite unnerving for those who hold office.

It would be wrong to say that the Government stepped in. It has always been there. The PHED too has long been around to implement the World Bank Scheme to provide safe drinking water to India's millions. But given the inertia and corruption at all levels, it plodded on tardily. Whom to give the contract for boring? Which contractor gives the highest cuts? Which supplier gives the biggest commission? Material questions in a material world are of significance. However, they do slow the pace. The contractors, their hangers-on, do make a lot of money with appropriate cuts to their decision making brethren.

The drought, however, forced the pace of operations. The P.H.E.D. became more streamlined. Survey teams fanned out to identify the problem, all anew. They culled out 'problem' villages, where either water was available at much lower depths, or not at all. Or else, the water was brackish, unfit for human consumption.

Something on Nature's water scheme; the soil, which we can lift by our hand, doesn't go in very deep. That is why it is called as topsoil. Below this topsoil, however, is hard rock, or other tough strata. In the Shahdol region one finds layers of coal and sedimentary rocks interspersed beneath the topsoil. In most of the Artesian wells, water, which is trapped between pores in the soil particles, gets collected through seepage. It is this seepage which raises the level of water in the wells. After the monsoons, however, there is also water available in pockets in the sedimentary rocks. This is the second aquifer. This water is clean and germfree, provided we can get it out of the earth, from a depth of 150 to 200 ft.

The job of boring to a depth of 150 to 200 ft, until one strikes the aquifer, is given to big contractors from Jabalpur, Raipur and Shahdol. The boring alone cost Rs.6000-Rs. 8000 depending on the depth. There are contractors with up to 20 boring rigs. With a five horse power diesel engine powered rig it normally takes 10-15 days to do the boring. The casing pipe, which is normally longer than the depth of top soil, is given to prevent caving in of the loose soil column. Once you reach hard rocky strata there is obviously no need for casing pipe. The hand pump - the design of which has been standardised and tested by the World Bank costs another Rs. 1500. In all, the total cost of installing a pump including the boring, casing pipe and pump, comes to over Rx. 10,000.

The P.H.E.D. estimated that one hand pump would cater to the needs of 150 people. So, a village with a population of 500, should have 3 hand pumps installed.

We went over to a village Pahnchua, 2 Kms. from Kotma on the Kotma-Manendragadh Road, where boring was under progress. The contractor had installed his rig and his men were working on it.

A few villagers including tribals and Harijans came over and saw what was happening.

We asked them, 'Did you people give in an application for a handpump?'

'No' they said.

'Do you need a pump over here? Does this site suit you?'

'No, we don't need a hand pump here. The talaab is just nearby.'

Further enquiry revealed that the P. H. E. D. engineer who had come over for site selection,

had tea at the Patels (big landowners) house. So, the location of the hand pump was automatically decided. It was just opposite the Patel's house.

Similar experiences were cited by other survey teams.

A few months later we again went to see the condition of the installed pumps. Somewhere the nut of the fulcrum bolt had loosened and fallen apart. So someone pinched the handle to use as a crowbar. At other places the washer had worn off* and no one had come over for replacement for over two months.

1.3.8 Stone Quarry

The quarry is located about 9 kms. from Anuppur. It is about 200 metres off the Anuppur-Amarkantak road, surrounded by forests. The owner of the quarry belongs to a business family of Anuppur which operates diverse activities. These are goods transportation, taxi service, cloth shop, cement dealership (now wound up), atta chakki, oil expeller, sweetmeat shop and Anuppur's first permanent movie theatre.

The output of the quarry is about 10-12 truckloads daily in the summers and winters. In the monsoons, the quarry gets flooded and construction work is at low ebb, hence output drops to 2-3 truckloads daily. The stone is carted by the owner's trucks. Most of the quarry workers come from the surrounding villages and in the peak season over a hundred workers are employed in the quarry. No drilling or blasting techniques are used to quarry the stone. The tools employed are 8-10 kg, hammer with a wedge on one head, a crow bar and a spade for shovelling Large sandstone boulders are broken by heating; the workers have developed an ingenious system whereby the boulder is first broken in two and then, by heating crosswise, is further broken into four pieces. The wood for the heating operation is hacked from the surrounding forest.

The contractor owner provides no facilities at the work place: no drinking water or shacks or any other facilities. Even the hammer is purchased by the contractor and its cost Rs. 70-80 is gradually deducted from the labourer's wages.

Four grades of stones are quarried with the following economics:

Grade	Wages	Profit per truckload
Sized Blocks	25p. per block	Rs. 67.50
Katran	(by- product of sized blocks)	Rs. 20.00
Badi Gitti	Rs. 2-3 per day	Rs. 125.00
Choti Gitti	Rs. 2-3 per day	Rs. 240.00

The contractor/owner's profits increases with the labour content of the work. The work of loading and unloading the truck is contracted to a composite team of men and women, belonging to the surrounding villages. In practice, the rates for loading and unloading vary between Rs 15 to Rs. 20 per truckload. Trucking operations start at the crack of dawn and continue upto dusk, with no interruption, constituting up to 12 hours of work. If the truck breaks down, or else, diesel is not available, the labourers are not paid a paisa. It also ensures that the labourers cooperate in maximising the daily number of trips.

1.3.9 Workshop

To exist you should be able to earn. To earn you should be able to sell. To sell there must be a buyer - a market. To thrive there must be a well developed market. This is a story of a small mechanical repair workshop trying to subsist in an ill developed market.

A workshop with (the humblest repair gear: a two metre Bataala Lathe, a welding machine, a portable drilling machine. A basic machine shop by all standards. There were more elaborate hand tools-bearing pullers, a set of socket, ring and open ended spanners, alien keys, and the usual chisels, hammers and screwdrivers. The workshop was perched slightly out of a township of about 10,000 but on the main highway-on which some 300 trucks plied to and fro everyday.

A backward area. Undulating terrain. Skewed land ownership pattern. Hardly 2% of the total uncultivated area under irrigation. A single crop economy. The bread and butter for the workshop was repair / overhauling of diesel pump sets. There weren't very many electric pumps. Even the diesel pumps remained totally non-operational for 4 months during the monsoons.

The other jobs were few and infrequent. Atta chakki shafts, 3-inch galvanised pipe threading, bullock cart axles, minor steel fabrication jobs, tractor trailer repairs did come. But with only 8 atta chakkis and two tractors in the entire development block the quantum of work was insufficient. Specialisation was out of the question. Odd things turned up. Cookers, cycles, torches and other things mechanical. The workshop took these but could not make much money.

A feudal set up. The Daroga-Tehsildar clique would get repairs done and never pay. Farmers promised to pay for pump repairs after harvesting their crop. And the landless labourer who came to get his spade blade welded, never had much money anyway.

The township boasts of two hardware shops where the closest machine shop items available would be inch sized nut bolts, that is, if you discount hemp rope. For even the smallest tooling and spares, one would have to go over to Shahdol (55 kms.) or else Bilaspur (150 kms.) away.

Trucks do not stop here. Unless, of course, there is a major breakdown. Automobile repairs require a host of support activities like; battery and armature works, radiator work, leaf spring work, gas welding facility for body work, large sized lathes for rear axle tube machining, which are totally non existent. There are no shops who stock any truck spare parts.

The region is endowed with mineral wealth- 14 coal mines, 2 bauxite mines, 300 MW power station, a 250 tonne per day paper Mill. But these industrial undertakings have their own local and central workshops catering to their needs. And even if one went in for manufacturing of small items, the raw material - mild steel bar stock - would have to be got from as far as Raipur or Jabalpur. And the manufacturers in these big towns would always have an edge over you. The large industries in this area prefer big fish instead of the small fry, for thereby larger cuts are assured. It might not be possible to get cast-iron welding electrodes in Shahdol, for none of the dealers stock them. But one could easily get them from the welding operations of the Amarkantak Thermal power Station at Chachai for half the actual price. There is mass scale pilferage of electrodes from the power plant by operators.

Diesel is at a premium because of the short supply. Farmers have been switching over to electricity wherever power poles have been rigged. For electric pumps, apart from the easy maintenance, cost only one sixth as compared to diesel pumps in running costs. But landholdings are fragmented. One plot here, another plot there. Electric pumps cannot be carted from place to place. Diesel pumps, on the other hand, are mobile. And so, despite high running costs, people still use them. The diesel scarcity notwithstanding, quite large quantities can be bought at control rates from the truck drivers of the Electricity Board and the Irrigation Departments. An Industrial Training Institute in Shahdol formally trains boys for the large industries and informally provides tool bits and machine parts to the private workshops. Skills are low, for the economy presently has no ways of supporting the skilled.

One of the avowed objectives of the workshop was to train potential adivasis in workshop skills. But experience showed the ‘skills’ have no meaning unless there is a resilient market to absorb them. Given the trends of development, it will be a few more years before such a market develops, if at all.

1.3.10. Employment

In 1979, a number of unemployed youth from Jhagrakhand, walked a distance of 1,160 kms. to Delhi to press their demand for employment. In Agra, a documentary was made on the boys, but the media played the news down. On the return journey the 60 boys took a train back. Since nothing came of the march, demoralisation set in as the boys became the laughing stock of the people. There seem to be more than 100 educated unemployed youth in Jhagrakhand alone.

K, a supervisor in the Irrigation Department, had promised to get R a job. When he kept making petty excuses, R realised he was being fooled. Then H, a friend, told R that there would be a recruitment of gangmen for the local Electricity Board the next day. R went to the Board Office the next morning and met the assistant Engineer, Mr. J.

“How long have you worked?” asked Mr. J.

“For one year in ’78,” R lied.

“In whose gang?”

“Baraga’s”, R continued the lie.

The linesman in charge, G, approached and told R and the other applicants to get lost. Later R invited G over to his village in the evening. He arranged for a bottle of mahua and a live chicken. G asked R to deliver the murga at his place, and report next morning with Rs. 100. R gave Rs. 50 and promised to pay the rest on getting his first salary. R now works with the line Erection gang.

They camp at the job site. Eight men are engaged to transport poles to the work spot, and fifteen men dig the pits—3 pits each per day. Three men are a little educated while the rest are illiterates. The daily wages are Rs. 5.50 and may rise to Rs. 8.00. Everyone is dependent on the patronage of G the lineman. If he likes, he can terminate any one of the gang’s services on

charges of theft of wire or cement. The working hours are from 9 a. m. to 4 p. m. But R is pleased that he has a job.

1.3.11. Bansagar Hydel project

Barondha is one of the 243 villages that will be affected by submergence due to the reservoir created by the Bansagar Dam Project at Deolond on the river Son. The number of persons who will be displaced is estimated at 1, 27,000. The project is a multipurpose one proposed to be completed by 1984 at the cost of Rs. 320 crores, involving the states of M. P., U. P. and Bihar. Both the date of completion and the cost of the project however, will be pushed up, judging from the rate of progress of work. The proposed annual irrigation is 2.488 lakh hectares over a total area of 1.548 hectares, of which 13.5% is uncultivable and 66.6% is cultivable. The remaining percentage is of forest land.

Exploration for a dam site in this region that would utilize the waters of the Son first began in 1950. The geological survey of 1952 showed fault zones in the original site region, and later surveys in 1973 led to selection of the present site at Kusrna. This site has as many as 3 gorges formed by the Kymore Range. The project needs a 91 meter high concrete gravity dam at Kusma. It is proposed to impound 6377.2 million cu-metres of water, which will be taken through an open channel into Bihar, and a 4 kms, long tunnel across the Kymore Range, to be delivered by a barrage near Chachai falls. This water will be fed into a 10 kms. long channel leading to a power house on the bank of river Tons, about 15 kms. upstream of Komi village. This power house will use the total drop of 180 metres to generate 200 MW of power. The command area within the | state lies in Rewa, Satna, Sidhi and Shahdol, the bulk of the area being on the northern side of the Kymore Range i.e. in Rewa and Satna. There was a certain pride expressed by engineers at the dam site that Bansagar was the first project that would tap a major river well within the state of M.P. The two tehsils of Shahdol district that will be affected by the submergence are Beohari and Bandogarh. In Beohari 67 villages over an area of 34,109 hectares will be affected with over 50% of this area being submerged. The affected population is estimated as 16,808. In Bandogarh, the figures are 12,118 hectares being affected of which 38% will be submerged; the affected population is 2,589. These figures are all on the basis of the 1961 census.

The road to Barondha is a National Highway and has four State Transport buses running on it. The saying is that Pandit Ram Kishore, MLA, is behind the nationalisation of the road; in reality the road is a dirt track with no bridges or culverts and is not motor able for the whole of the monsoons. The buses raise immense clouds of dust. In the village a lot of people were not convinced that the Bansagar Dam would submerge the region. The Electricity Board had been putting up poles and stringing wires for supply of power to the pumps on the village lands. There had been no definite statement from the Administration, and the Collector on his visit 20 days earlier had said that he had no news in writing that the site would be submerged. Some of the villagers had been making arrangements for their families elsewhere, but these were the rich ones.

Among the directives issued for rehabilitation of the oustees of the Bansagar project there is the proposal to construct 10 model town ships on the fringes of the reservoir. These will have facilities of hospital, park, school, community centres, roads, electricity etc. Patches of land are to be made available in blocks of 5-25 acres within 5 km distances from the reservoir. The oustees are to be rehabilitated in the command area of 7 minor irrigation tanks near the fringe of the reservoir in the Amarpatan and Beohari tehsils. Resettlement grants calculated on the basis of simple formulae are to be paid in addition to the compensation. The guidelines are obtained from the Narbada Tribunal Award, a detailed document that tries to establish the conditions for the acquisition of property in land, for State Govt. purposes applicable to large irrigation projects. However, among those responsible for the execution of these plans there is severe doubt as to the capacity, resources and will available to the state to achieve even a fraction of the ideals expressed in the Award. Already the closest village has been bulldozed away without even the sites for the townships being finalised. The budgetary allocations are hopelessly inadequate and the officer-in-charge has no staff for his job. The document of guidelines seems far more important at the Project Committee levels than the possibility of realizing the guidelines.

At a far more modest scale is the experience of 6 families at Chirapatpar on the foothills of the Maikal Range of Hills a few miles away from Jarnudi. Sometime in the 1950's a minor dam was constructed at Sakra in the same locality, which brought their hinds under submergence. Subsequently, a construction fault made the dam develop a crack and become non-operational, but this did not help the oustees. No lands were given as compensation, but a sum of Rs.400 was given to each family. A minister who had come to inaugurate the dam had told them to occupy forest land- At the present location there is a nala which could easily be used to irrigate the land that these families have begun to cultivate, but these people do not have the necessary resources to install a pump. Nor can they take loans from the banks as they do not possess the 'pattas' till today. Under the circumstances, they are barely able to cultivate 'kodo' a coarse millet, that requires little irrigation. The compensation money was all used up in the struggle for survival during the hard days of clearing the forests and building their huts. Since the administration classifies the land as forested, they have now been offered land in a different place. Also some of them have been involved in court cases for over 3 years during which they were not allowed to cultivate. No compensation was forthcoming upon winning the case. Instead a pan of the land had to be sold to bear the expenses.

1.3.12 Orient Paper Mill

Shahdol and its surrounding districts are rich in forest wealth. Bamboo and various kinds of hardwood are abundant in the region. Coal is being mined, a thermal power station was built at Chachai and the Son flows through Shahdol district. These were all conditions that seemed perfect for setting up a paper and pulp industry in the district. Apart from the proximity of feedstock, power etc. many concessions were given by the state government for setting up a plant in an underdeveloped area. A developed network of rail and road transport connects the region with external markets. It was, therefore, suitable to locate even the associated chemicals manufacturing industry beside the paper plant. Between 1962 and 1965 the paper manufacturing

complex at Amlai on the banks of the Son was constructed and became operational.

Initially the Orient Paper Mills had signed a bamboo lease contract with the M.P. State at the rate of 37 paise per ton on a 20 year lease. This was at a time when the other paper mills (in Bengal) were buying bamboo at the rate of Rs. 100 - 150 per ton. Only last year have the rates of bamboo increased to Rs.102/- ton for the Orient Paper Mill. The industry is highly profitable and according to estimates the profit margin on ordinary paper is over 100%; production costs are Rs. 2.50/kg. whereas the selling price of paper is Rs. 5/kg. The company manufactures over 200 tonnes of paper a day. The declared profits are around Rs. 8 crores per annum, whereas some estimate the profitability to be twice this. Orient Paper and Industries have commenced construction of a cement project in Andhra Pradesh, the government of which has executed the necessary mining lease in favour of the company. Quite obviously the accumulated wealth from making paper for 15 years in Shahdol district has found a new district where the process can repeat itself in its essentials.

Meanwhile in Shahdol district bamboo stocks are exhausted. Special plantations of Eucalyptus are being tried by the forest department as an alternative source for pulp. The homogeneous plantations of Eucalyptus are objectionable on grounds of (a) lowering the water table in their vicinity since the tree has a tremendously high transpiration rate, and (b) having nothing to offer the local rural population by way of intercultural and other benefits that an emphasis on heterogeneous plantations would offer them.

Orient Paper Mills has been interacting with the local environment in two other significant ways. The potential effects of effluents discharged into the Son had been highlighted before the Mill had begun operations, and through the 1950's various committees had tried to prescribe solutions. In 1973, a statistical survey revealed the enormously debilitating effect (ascribed to pollution due to the effluent) which had resulted for the villages downstream. However, OPM has been quite successful in absolving itself of the responsibility for dealing effectively with this assault upon the lives of the rural population.

It has given a contract to the National Environmental Engineering Research Institute at Nagpur to advise it on how to control pollutant levels in the effluents, and it has asked the Jawaharlal Nehru Krishi Vishwavidyalaya to conduct research on how the effluents may be used for agricultural purposes. Neither research project has yielded any significant results as far as the fish and cattle dying downstream of the river are concerned. In 1978, the management of the Mill published a collection of bhajans and distributed them at Re. 1 per copy for the "cultural, economic and social development" of the local population.

When the Mills opened in 1962 the agreement with the State Government stipulated that 80% of the labour force should be recruited from the local populace. At the moment, only about 20% of the workers can claim to be from Vindhyaal.

The organisation of the workforce at Amlai is as permanent and casual labourers. OPM has about 1600-1700 permanent workers on its rolls. The minimum salary of an unskilled permanent workers is Rs.485 per month i.e. Rs. 18 per day. Casual workers placed through the time office are of two categories. Those working inside the factory premises get Rs. 11 per day, and those

working on construction of quarters, road mending, dam building get Rs.7 per day. Casual workers number about 1,000 in these two categories. Apart from these the number of casual workers under the contractors engaged in operations like the lime kiln working, saw mills for splitting logs, the temporary dam construction that is done annually on the Sone, etc., total more than 1,500. It is this last category of casual workers, drawn mainly from the surrounding villages, which demonstrate the nature of work available through OPM for the local environment.

The lime kiln is owned by OPM and has an average daily production of 20 tons which is less than one third of OPM's requirement. The total labour requirement inclusive of Munshi chowkidar, operator and labourers is 70 per day. The entire operation is on contract. The labour contractor gets Rs.18 per ton of finished lime, i.e. about Rs.400 per day. The present contractor, originally from Muzaffarpur in U.P., has now built a bungalow near a neighbouring colliery town. The contractor in turn subcontracts the work. An enclosure of 10 ft. x 10 ft. x 5 ft. containing 20 tonnes of limestone and 4 tonnes of coal is subcontracted for unloading into the bucket elevator at Rs. 45/-. It would normally take 10 labourers 8 hours to do this job. The other subcontracts are accordingly worked out; the sole guide to costs being that hard manual labour is worth Rs. 4 to Rs. 4.50 per day. There is a side business in the lime fines. Contractors in Katni purchase the fines to pulverise and sell for construction purposes. Except for the work on the paper making OPM employs similar contractual methods to run its operations. Recently, a demand for abolishing the use of contracted labour to do the jobs of permanent workers resulted in a strike since the management had been attempting to avoid overtime payments to permanent workers.

Most of the permanent workers are from Bihar, U.P. or Rajasthan. Depending upon the conditions in the regions of their origins, these immigrant workers are subject to varying degrees of economic oppression. For example R had been in OPM since 1963 and during the construction had worked with a contractor. He had been working as a mechanic in the pulp plant for the last fifteen years. His home salary was still Rs 500 per month. His younger brother had opened up a paan shop in Amlai and earned about Rs.300 per month. Together they made Rs.800 per month to support a family of 12 members, living in a two room quarter. During the three month strike in 1979, he had been indebted to the sum of Rs.3,500/-.

The strike in 1979 was the longest in OPM's history. Among the many demands were those including revised pay scales, regularisation of casual workers, re-instatement of some discharged persons who had tried to form a legal staff union, and nationalisation of the mill. OPM is the only large industry in the region that is under private management. The closest neighbouring private sector company is the ACC factory at Kymore.

1.3.13 District Level Science Exhibition

Venue: Raghuraj Higher Secondary School, Budhar Chowraha, Shahdol.

Event: District Level Science Exhibition. Time 5.30 P.M. Every one waiting tensely for the young dynamic engineer Collector of Shahdol to arrive for the inaugural ceremony. The *Cassia siamia* tree under which the Jeep would stop was festooned with twinkling red bulbs Triangular

paper cuttings with red and yellow alternating were stuck on a hemp string and strung horizontally to form a canopy.

No visitors were allowed to enter the rooms which housed the exhibits before the Collector took an inspection round. Seven Class rooms had been vacated and allocated to students coming from schools of Chachai (which has a 300MW Thermal Power station); Amlai (a paper mill with an installed capacity of 250 tons of paper a day); Dhanpuri (a colliery township); Budhar, Beohari and Shahdol.

About 30 per cent of all the projects on display consisted of various versions and variations of 'water level indicators'. The principle is simple. A wood block goes over a pulley, and ends up in a movable contact. At a predetermined 'danger' level the movable contact touches a fixed contact, thereby completing the circuit. Or simply, just switching on another circuit. The switch once closed, rings an 'alarm bell'. Others lighted a bulb light. Others still lighted both a tube light and rang a danger bell, to warn of the impending calamity. Such were the variations, and their accompanying claims to originality and ingenuity.

What probably was more difficult to explain was the social need for a device or a gadget like the 'water level indicator'. Shahdol, with an average rainfall of 140 cms. per annum, and with two rivers. Son and the Johilla meandering through its undulating countryside, has in the past rarely experienced floods or breached embankments. With such a low social need, why so much preoccupation with the 'water level indicator'.

More was, however, still in store. A ninth class student, progeny of a mechanic sardarji, had devised a mechanism wherein whenever you pressed the rear brake lever of a bicycle, a red tail light glowed. Once again a moving contact touching a fixed contact, completing the circuit of the red tail light. However, the contacts were cleverly camouflaged, and all the wires shielded from sight within the tubular bicycle frame. With such proper shrouding it was difficult for a layman to understand the underlying principle. Instead of clarifying, it further 'mystified'. A dialogue with the young sardarji would be of interest.

"Would you please explain me the working principle of your mechanism?"

'No'

'Why?'

'Because if I tell you it will become common. Everyone will make it then.'

'What is wrong if everyone else makes it?'

'Then it will not be unique anymore. Hence I will not tell you its working''.

'But in the school the teachers tell you whatever they know. They make their knowledge "common" so that more students like you can learn. So why wouldn't you tell us about your contraption?'

Even to this the student kept mum. He was still not willing to part with his knowledge. More prodding was called for.

'Why did you display this mechanism at all? If you did not want it to become common you could have just designed it and kept it at home, and admired it when there was no one around.'

To show and still not show. To earn appreciation and still not socialise his knowledge. Such was the young sardarji's dilemma

Still evincing no response from him another question was fired.

'No one is a custodian of the entire human intellect. Most of us, probably will not understand your mechanism, but some of us, if we give it a genuine try, might probably succeed in unravelling the principle. And once we find out its working we are going to 'demystify' it, by explaining the principle of the gadget to all and sundry.'

The boy begged us not to tell it to any one else. The boy, obviously, had internalised a deep seated value of keeping knowledge as an exclusive preserve.

Another boy had displayed some herbal remedies for common disorders. Amla, Harra, Bahera etc. Enquiry revealed that he was not interested in the propagation of an indigenous medicinal system, but picked the bottles from home. His grandfather was a Vaid.

Yet another boy had collected together a few medicine bottles, & stethoscope, a thermometer and a couple of tablets and capsules. This was his sole display.

'What do you wish to get across to the people through this display?'

'That people should go to the doctor when they are ill '

'But don't the people already know about it?'

'Yes'

'Then what is the purpose of the display?' No answer was forthcoming.

Things needn't have a purpose at all. Schooling is a means to getting a high school degree. Cut off from real life vicissitudes, Science, like so many other zombies needn't have a meaning. Science is a zombie. There was a queer display. A placard said, 'A magical way of relighting fused tube lights. Any person proving it wrong shall be awarded a prize of Rs. 100.'

Along with it was a burning tube light, which the boy claimed was fused. 'What is the principle underlying your device?'

'There is no principle. I just kept tinkering and experimenting and finally I devised it. No one has ever done it before. It's a novel attempt.'

Sweeping statements were made without any substantiation.

'But there must be some principle at least? How can a device work without obeying certain physical laws? Objective Jaws stand, irrespective of whether we recognize them or not.'

'No, there is no principle. I just did it.'

A student of science, totally negating science. A boy who had probably never ventured beyond a radius of 50 kms. from Shahdol, claiming his design to be the first in the world. Coming from a trading community, where the only criterion for evaluation is the money 'reward' he had priced his invention at Rs. 100. He refused to recognize the laws he himself had applied. By calling his experiment magical, he was imbuing a materially understandable phenomenon with a supernatural awe.

There was no dearth of demonstrations of fossilized thinking.

On the north pole of a pivoted magnetic needle, a boy had glued the photo of a child. He put a photo of a man in the northern direction, and that of a woman in the southern direction. He flicked the needle. It turned several times and ultimately stopped with the child facing the woman. He was, he claimed, demonstrating a principle of psychology. A child is attracted more to the mother than to the father.

A boy from Chachai had demonstrated a model of a wagon tipping mechanism used in the thermal power station for unloading coal from wagons. His father worked in the workshop of the MPEB, Chachai, so he had access to all the machines and materials. Everything, of course, was fabricated in the workshop. Such models, we were told were displayed on all occasions, in all seasons and in all exhibitions. They were permanent fixtures, which kept appearing year after year.

Another lad had borrowed a few herbarium sheets from his sister who was doing her M.Sc. in botany. It showed some ferns. One was ‘Cheliantis’ — the silver fern. The boy had never seen any of them in real life.

‘Do you know the name of the tree which stands in the middle of your college compound?’

‘No’.

‘Do you know the names of the weeds, herbaceous plants growing wild in your college campus?’

‘No’

‘What is the relevance of your herbarium display?’

There was no answer to it.

The girls section was representation of the dreamy world they lived in. Two of them had made a layout of a ‘Model village’ (Aadarsh Gram), wherein they had made out small buildings out of corrugated sheets, representing the Panchyat House, the Primary Health Centre, the Police Thana, their School, Post office etc. Divorced from production and reality, they could only vicariously gallivant in a world of bliss.

Many questions, however, did spring as a result of a dialogue with the students. ‘What was the purpose of the science exhibition?’

If it was for popularising science amongst the people then why so much emphasis was given to the Collector. It appeared as if the whole organisation was for the sole privilege of one man—the Collector.

‘Why was it that the ‘common man’ was not interested in the exhibition?’

Apart from a few school students and the participants themselves, the exhibition didn’t mean a thing to the ‘public’ at large.

The participants were obviously interested, because a team of ‘experts’ would come from the degree college in Shahdol and evaluate their projects. They would pass their verdict on the individual, creative, ingenious potentialities of the boys. They would tell them who is first, who

is second, and who is last. The last boy obviously, should be told that he is a nitwit. Science was not for him. Before he wrecks his career he should switch over to another field. In a competitive society everyone must be graded, allotted a rung on the ladder. The prized exhibits, the first comers would gad their gadgets at a divisional level science exhibition to be held in Satna. And if they are lucky, which means having the right contacts, they might even be allowed to participate in the State Level science fair to be held in Bhopal.

Ana then the engineer Collector finally arrived. Everyone else was shoed out of the exhibition- Along with his retinue he swept through the rooms. He paused before a model of a gobar-gas unit,

“What gas is generated in this?” he asked the nervous young boy behind the display.

“Methane, sir.”

“No, it’s ethane.”

And he stalked off to his waiting jeep.

1.4 A Worm’s Eye-View

So progress chugged into Shahdol with the first steam engine of 1898; where the Sirdars of the Rewa Council had solemnly noted in 1883;

“We, the Sirdars of the Council, came to Satna this day, and the Superintendent of Rewa has informed us that the G.O.I, propose to open up the Umaria, Johilla, and Sohag-pur coalfields, and to construct a railway from Katni to Bilaspur through the above named places.

As to the coal mines of Umaria, Johilla and Sohagpur, a contract is to be given to a company of capitalists for 99 years, and the agreement which may be entered into by Govt., on behalf of Rewa state should be observed by this State... without making a railway, the coal cannot be developed, and the greater the facility of me:-ins for conveying it, the greater will be the extent to which the coal mines will be worked, and the consequent profits to the State. We believe that this line from Katni to Bilaspur will cost above two crores of rupees. ...food grains and timber etc., which are now exported with great difficulty for want of roads and transport, will be easily carried to markets by rail and there sell to advantage: that, in addition, the prosperity of towns and villages will increase, as will also the trade of the State. The rail will secure safety and comfort to the country, and improve the condition and civilisation of the people. In times of famine, food will easily be carried from place to place.....”

Enough! We have laboured the point long enough when,98 years after the “company of capitalists” was born, the people who produce the wealth of a nation have little notion of that wealth, when they eat once a day in the year 1980, and when only 70,000 of them have plucked up enough courage to register their names on the rolls of the employment exchanges while thousands of others toil ignobly in the farms and forests and factories for a pittance - then enough has been said. We have now to examine what underlies this myth of progress.

CHAPTER II THE THEORY OF CENTRAL PLACES

Said the mouse to the cur,
“Such a trial dear Sir,
With no jury or judge,
Would be wasting our breath,”

“I’ll be judge, I’ll be jury,”
Said cunning old Fury.
“I’ll try the whole cause,
And condemn you to death.”

Chapter II

2.1 The Rule of Conquest

What has happened? It would not only be futile to sit back and dream of a forest land peopled by a forest tribe living at peace with nature, it would also be untrue. The search for food and water, warmth and comfort, security and shelter began in remote prehistory and it still continues. Perhaps the search is much nearer its goal now than it was ever before as technology demonstrates its capacity, for the first time, to banish want and fear. But technology, and men using that technology, also make the goal recede even further away by releasing weapons of destruction and hatred and greed beyond men’s imaginations.

Why did it happen? That is what we must seek to answer. Why did each new social class relegate the others to toil and slavery? Why is it that men and women and children still go hungry? Why is it that some live in comfort, many in distress, and all in fear? Why is it that the forests disappear, and the fish perish, and men poison themselves with what they produce? For answers we will again have to go back into history.

When Baiga gave way to Kol, it was because the Baiga was totally dependent on nature. He took what he found in the forests and survived well when the fruits and seeds and flowers were bountiful. But the Kol had studied nature and so he knew when to plant and what to sow. Observation had changed to knowledge to mastery, not only over nature but over other men too. In time, the Kol fell victim to the same technological development when the Gond came with his superior knowledge of the plough. The Gond anticipated what nature could do or not do and so he planned how deep and how often to till the land. But, in the meantime, stronger forces were developing elsewhere and the iron that the tribal Agaria did not find a use for, the Hindu Lohar turned into spears and swords and shields. When the Maurya Kings came the plough could not protect itself against the sword, or the bullock against the horse, and tribute

had to be paid to the new masters. The sword brought more knowledge with it too, for the Kurmi and the Patel came and before their superior farming techniques the Gond could not hold his own. Then for fifteen centuries sword fought against sword as Malwa followed Maurya, to be replaced by a succession of Kalchuri and Baghel, each extracting more tribute than the one before. But the sword had to yield some time and it yielded before the gun-powder of the Mughal. Explosive secrets had been unlocked and the techniques developed to contain them within bronze and steel. But the Mughal cannon remained primitive before British firepower and the East India

Company converted the tiny forest clearing of the Baiga into the massive empire of the Angrez. For 4,000 years men accumulated land and possessions and booty until, by 1947, half the world was a vast colony. Each succeeding power had colonised larger areas and each time resources and wealth flowed towards the centre. The cannon and rifle were supported by the machine now and industry assured a high noon for the British Empire. But all accumulation has to be accompanied by deprivation elsewhere. No wonder then that the toilers and labourers, from whose effort the wealth was created, became more destitute than ever before.

But all this was under slavery, when “democracy” had yet to emerge in which all men are created equal and government is by the people, of the people, for the people. What happened after India became independent? We go back to cast a hopeful eye on the stories we told earlier. What do we find? The Oraon clears the land promised to him for his labour and immediately other covetous eyes turn towards their newly-productive farms. The non-tribal farmer, diverting money from trade and business, is able to get quick returns from his small or big farm, while the small tribal farmer remains locked into his poverty although the bigger tribal farmer can still eke out an adequate living. Both tribal and non-tribal have to face the same reluctant administrative apparatus but the non-tribal is better able to coax or coerce it to work. In some cases, though, they both fail against market forces. The Mahua flower collector is unable to keep his co-operative intact in the face of his pressing need for credit, while the wheat seller is unable to get a higher price for his produce. In both cases the merchant captures the profit. The merchant, in close collaboration with the contractor and the official, is also able to make deep inroads into the funds and grain made available for relief works while the workers have to make do at starvation levels. Forests that once used to supply a variety of produce for a variety of uses are now being converted into homogeneous plantations at the behest of industrialists and businessmen. The contractors maintain their stranglehold over the transport sector, the stone quarries, the installation of hand pumps, siphoning off the funds meant for public benefit into private treasuries. Employees in public sector units also participate in this re-channelling of resources from public sector units into private hands, with large-scale pilferage of steel and coal, electricity and diesel, electrodes and machine tools. All the while the number of unemployed grows. There are 16,000 applicants for a bare 450 posts. Even when the unemployed organise to demand work they meet with little sympathy from an administration that is only too happy to give free benefits to a much more entrenched coterie of the large owners of factories, and farms, trade and transport. A great dam uproots 1,27,000 people and it is planned to rehabilitate them in ten “model” townships but past experience has taught everyone that not only will the

townships remain on paper but that compensation for land lost will also be long delayed and inadequate. The benefits will accrue to those who build the dam and the farmers who will grow rich on rice and wheat and sugar - cane - if they get the water when they need it. A giant paper mill makes enormous profits while its labour force suffers under the contractor's miserly hand. Not only does the centre of industrial enterprise not spark off the development of ancillary industries, on the contrary it plunders the forests, pollutes the air and the water, and rapes the environment. The culture of accumulation and consolidation runs deep. It permeates the educational apparatus so thoroughly that the conception of "science" held in a young student's mind, is to be hoarded and mystified. And all this is only a fraction of the total picture.

So Shahdol after 1947 is part of the continuum that existed before. There have been no significant changes. Wealth is being produced at a far higher rate now but the process of appropriation, of centralisation of power and profit, has not ceased. One could argue that "corruption" is the villain of the piece but to do that would be to ignore the social roots from which corruption, like other social evils, springs. For, after 1950, there has been a process of Planning at work in these last 30 years. *Planning* was meant to develop the nation, to permit the rational use of resources, and to drag the people out of the poverty they found themselves in after 200 years of British domination. In 30 years the resources have certainly been used up but has the condition of the poor changed for the better? Or is the Rs 4 per day that the labourer earns today less than the 4 Rs. he used to earn in 1900? (In 1900, 4 annas would have purchased 3 kg. of rice; today 4 rupees will buy 1.5 kg. of rice.) One could argue that the planners mean well; it is the administrators who distort planned objectives. But this would mean that the planners are not of the same social class as those who accumulate the profits. This is patently untrue. A planner who refuses to recognise that contractors and officials will pocket over 60% of the finances allocated for drought relief is no objective, "neutral" planner. He is a vassal of the exploiters and his theories of planning are modelled to maintain and, wherever possible, increase the levels of exploitation-To understand this we will have to analyse the underlying assumptions and theories of planning. For this we will have to go far beyond the District of Shahdol.

2.2 The Cunning Old Theory

Planning as an instrument of control over the economy is not new. Soviet Russia began State Planning in earnest in 1920 to recover from the ravages of war and to build a strong, modern, and socialist economy. In the 1930s the massive problems of the world-wide recession gave rise to crises in industrial production, employment, transport etc. and resulted in the first debates on regional disparities and government action to control these in a "free" economy. By the 1950s John Maynard Keynes had shown through his general theory how the State not only could but had to act with its enormous fiscal and political powers to control the economy; Communist China had embarked on another experiment in Socialist Planning; and Democratic India had begun its Five Year Plans. While the Socialist States could plan in an *Imperative* fashion i.e. they had total control of the economy, India's planning was *Indicative* i.e. it could only indicate the rate of growth and the directions of change. The Indian Government went

further. It took note of the serious disparities between “developed” areas and “backward” areas (much as the UN today speaks of the “developed” countries and the “developing” countries) and designed plans to overcome these disparities. Thus the Integrated Area Development Plans and the Comprehensive Area Development Plans were born. But what are the assumptions underlying these Plans?

John Galpin discovered in the early part of this century that the zone of influence of grocery stores in rural America had a circular shape. That is, these stores provided services to customers in an area which could roughly be described by a circle with the store at the centre. This is similar to the zone of influence that a merchant in a market town of Shahdol would have, buying grains, oilseeds, and minor forest produce and selling consumer goods in return—and making considerable profits in the bargain just as the American stores did. Von Thünen took this as a starting point and posed the concept of *Ring Models*. He said that at the centre there would be a town and within the circle there would be villages with their agricultural land and the land use patterns would be determined by the services that the town had to offer. This is easy enough to understand in our own context: if the peasants find that they cannot sell wheat profitably enough at the wheat procurement centres they will stop growing wheat. The merchants appreciate this and so permit a small profit to the farmers while collaring the bulk of the surplus in collusion with the procurement-centre officials. Next, Christaller developed his theory of *Central Places*. He said that since a town offers certain services to its surrounding hinterland, if the services are increased then the surrounding area will develop to make use of these services. This, too, falls into a recognisable pattern. When Anuppur is declared a tehsil and the judicial and executive functions move to Anuppur then people who were previously going to Shahdol town to meet the authorities now travel to Anuppur to meet them, and since Anuppur is nearer they travel in larger numbers. As one harassed farmer put it, “Previously we used to waste our time going from one office to the next in Shahdol town, now we waste it in Anuppur. And when nothing happens, we go to Shahdol to waste some more time!” To this theory Loesch added his concept of *Economic Landscape*. In this landscape he included non-service functions and attempted to see how all these functions were related in the geographical area. So he looked at not only marketing and transport but also other socio-economic factors like soil conditions, rainfall, and culture etc. Schumpeter added to this by suggesting that since a service unit influenced an area around it, then an *innovative firm* placed at a central point could exert more influence through its dynamism. All this means that a town or city has a “modernising” influence on the country around it as people come from the villages to the town, pick up new ideas, and thus the villages begin to develop. Parroux, Boudeville, and Hirschman put this all together at successive stages into the *Growth or Development Pole* theory. According to this theory modern, urbanised, and industrialised towns and cities in an area send out “growth impulses” into the hinterland. The assumption was that in such centres human activities must come together to generate lower costs and higher profits. Thus, instead of handlooms scattered all over the rural areas it is better to have a power loom or a textile mill in an urban area so as to produce cheaper cloth. Around this industry other industries will cluster to act as ancillaries and thus development will take place. “Growth” will have occurred. Such centres are, therefore, called “growth points”. In a geographical area the growth point generating the greatest number of growth impulses, i.e. a

large city or a large industrial township, would then become a *Growth Pole* from which all growth would radiate outwards. Thus the Growth Pole affects its entire environment. As we have seen, the points in Shahdol which have large industries or are large towns have colonised and exploited the space around them rather than send out “growth impulses”. The theory of Central Places attempts to correct this by saying that the Growth Pole should be designated as a *Development Pole*. If an area is backward then a Development Pole like a large steel mill or thermal power station or paper plant should be put up there to utilise local resources and labour and to begin developing the area around it. To prevent it from further concentrating and accumulating wealth in the Pole, there should be a deliberate attempt by the Government to decentralise development. This is to be done by linking the Growth Pole to the other growth points in the area and by adding functions at appropriate places to further spread the development process. All this can be computed through mathematical techniques which show how one function is more important than other functions on the basis of how many people use it. Thus one would have a *hierarchy of functions* in order of importance of the functions. And by calculating how many functions, and of what importance, a place offers one can compute the importance of the place itself. Thus one would have a *hierarchy of centre* with the Development Pole at the top. What, in other words, has been called the N-B-M-S model - the Node followed by the Block followed by the Middle village followed by the Small village? Then, with an eye to what travels from where to where, one would plan to build roads from one growth point to another on the basis of the position it occupies in the hierarchy; then install a post-office here, a bank there; increase a police thana, provide for a farmers service centre; make proper arrangements for an industrial estate, draw a design for water supply to the towns first, and then the villages; set up a Development Cell and appoint a Deputy Director of Industries to reply to earnest enquiries that should come from sincere entrepreneurs flocking in by the dozen. This is the theoretical legacy on which the Area Planning programmes are based and they make neat little models. But then things don't quite work out that way for at the end of it all you have something like Shahdol where the process of accumulation continues unabated and the working force grows poorer. Something is wrong somewhere in the theory of Central Places.

Something, indeed, is wrong somewhere. The theory stipulates that functions are hierarchical; that places are hierarchical; but people, too, are hierarchical. All men in a village, leave alone a geographical area, are not equal. They are tied to their environment and to the social forces that lock them into little corners from which there is little or no escape. Profit rules the roost and if one man benefits then many others must be deprived. That much is clear from what we have seen and heard. Man conflicts with nature, certainly, but men also conflict with each other, and therein lies the graveyard of the theory of Central Places.

2.3 Nature's Death

World development today has produced development in one of its parts while producing underdevelopment in the other. To understand that this is inevitable one must look at the nature of development in an advanced nation-state and compare it with the process in a backward one:-

The USA uses over 44×10^8 kcal. of energy per capita in order to give a per capita Gross National Product of over \$ 2800. India consumes under 2×10^8 kcal. per capita (4.5%) to give a per capita GNP under \$ 100. Of the total, the USA uses only 8.16×10^8 Kcal to provide food for an average US resident, of which, further, a mere 18% was used on the farm. If all the world had the same per capita energy bill for the entire food chain, a quantity equal to *two thirds* of the 1970 world commercial energy used would have been consumed for this purpose. This kind of energy consumption is just not possible for universal development.

There is, further, a dynamic relationship between food, energy, production, and money. An underdeveloped nation trying to increase agricultural production by using Green Revolution techniques is dependent upon fertiliser purchases - amongst other things - from the richer nations. A rise in fertiliser import prices will critically affect production on the farm forcing the government to purchase grain abroad, further depleting foreign exchange reserves and thus ability to purchase fertiliser abroad. The exchange between nations thus forces state of dependence and therefore, underdevelopment.

Even within a nation Green Revolution techniques do not remove disparities. Studies have indicated that the nature of land distribution and the “underdevelopment” of most small farmers make it possible only for the richer peasants to use these techniques and increase production - quite often replacing food crops with more profitable cash crops. Even Gobar Gas (methane gas from manure) plants accentuate disparities. It is estimated that the minimum economy-size plant for a family has a 200 cu. ft. capacity, an investment of Rs. 3500, and need 12 cattle to support it. For an underdeveloped nation, with an estimated 50% living below an official “poverty” line, the majority of agricultural families would not be able to afford a Gobar-Gas plant.

Bearing in mind that industrial development depends upon surpluses from agriculture, upon adequate food supplies, and upon mineral resources, let us also look at how many years’ world mineral resources are estimated to last at currently rising rates:

Gold 26	Aluminium 52	Nickel 93
Mercury 38	Lead 61	Cobalt 145
Copper 45	Molybdenum 62	Coal 147
Natural gas 46	Platinum 82	Chromium 151
Petroleum 47	Manganese 91	Iron 170

Shahdol along with the rest of India, trying to catch up with the norms of development, has already had incalculable damage done to its environment. The Son River stinks of paper mill effluents for 22 km, destroying all fish along the way. A dam further along its course will inundate 10,000 hectares of forest land. Forests have already been depleted to 20% of the total area. Firewood continues to take its toll. With the trees gone the rivers carry out more topsoil from the valley. As the coal mines are abandoned land begins to settle over the empty and unsupported galleries. Indiscriminate cattle grazing does further damage to the land and the cattle go further and further away for food. And social tensions continue to grow with ‘development’.

The problems are not limited to Shahdol or lo India. In the US, Ralph Nader wrote in 1971 “The Federal role in water pollution control began in 1948 on a temporary trial basis and became permanent in 1956 ... Beginning with the drafting of the water pollution legislation, the Federal effort grew into a complex charade. The built-in procedural delays exceeded the professional avarice of the most adamant of corporate lawyers. The delegation of initiatory moves to the States insured the availability of a ‘divide-and rule’ tactic by industry vis-à-vis already subservient and under equipped state agencies. A 72 year old Federal law banning the dumping of industrial pollutants into navigable waterways went almost completely unenforced until its 70th birthday when the first of some 30 injunctive actions were brought against a fraction of the approximately 40,000 daily violators. Hundreds of millions of dollars of construction grant subsidies flowed from Washington to local government for waste treatment plants which industry promptly used to dump more waste through. This subsidy to local industry turned into a subsidy to factories that increased water pollution. The Kafkaesque tapestry extends into the mockery of Federal enforcement conferences, the never ending deadline extensions for the weakest of pollution controls, the secured trade secrecy over what lethality’s industries dump into the public’s waterways, the clear evidence of serious and worsening contamination of drinking water, the damage to other people’s property and property rights by industrial, municipal, and agricultural pollution without even any compensation, the loss of livelihoods for thousands of commercial fishermen and the emergence of water so laden with ignitable wastes that rivers such as the Buffalo and the Cuyahoga are declared official fire hazards... Its (the Federal role’s) effectiveness to date can be concisely assessed by the virtual absence of any evidence that the seven laws passed and more than three million dollars spent by the Federal government has reduced the level of pollution in any of our country’s major bodies of water so that they are once again suitable for human use...’

That has a familiar ring to it!

There are, therefore, certain restrictions within the relationships between man and nature, and man and man which make *development*, in the sense in which it has already taken place in the developed nations, a near impossibility. If Shahdol is one of 9 districts, out of a total of 45, which may be called well-developed then the task of removing disparities within an underdeveloped nation alone are staggering. Even if Shahdol provides a model -which it does not - the restrictions on the process of change are clearly evident. Let us take a look at some selected indices of the district: (Data 1976)

The working population is 37.2% of the total population and of this only 7.7% are engaged in mining and manufactures, 83.8% are in agriculture (30% as labour). The land yields over 64% of the domestic product while manufacturing industry, construction, and power yield a little under 14%.

There are 2150 villages and of these, 95 villages and 8 towns are electrified (less than 5%) covering 7608 consumers. 1183 primary schools have 94,941 students; 191 secondary schools have 25,764 students; 36 higher secondary schools with 10,181 students; 3 colleges with 907 students; this means that for every 100 children entering at the primary level only 1 makes it to college. Average literacy level of 14.59% (5.78% for women). There are 1974 km of metalled

roads and 557 km of motorable dirt roads. The local RTO has registered 25 private buses (for passengers); 514 trucks (for goods); 219 private cars; 100 two wheeled vehicles; and 1 taxi.

Such a level of development is incredibly low when compared to that of a developed nation, assuming that the norms set by developed nations are acceptable. In the 1920s environmental issues were mainly raised as a protest against industrialisation and its despoliation of the countryside. In the 1960s it became fashionable to talk of pollution, ecology, and much else. But in 1970s and 80s the preservation of the environment has become a pressing problem for societies everywhere. The theory of Central Places, adequate enough to explain accumulation, has nothing to offer for the problems we now face.

CHAPTER III THE DEMAND MODEL

Tweedledum and Tweedledee
Agreed to have a battle;
For Tweedledum said Tweedledee
Had spoiled his nice new rattle.

Chapter III

3.1 Environment Planning- Another Look

Just as the Growth Centre model was borrowed by Indian planners from work done in the USA and Europe, so the basic work for controlling the environment was done in the rich nations. The Indian government, in the initial stages, adopted the standards and legislation developed over many years in the United Kingdom. Hence, if we wish to examine the history of Environmental planning it would be useful to examine what happened in England. The milestones on the path the English planners trod are simple to record.

1800-1824: Robert Owen, convinced of the “lamentable and permanent evils” of the industrialisation of his time, managed the pioneering but eventually short-lived textile mill at New Lanark.

1844-45: Frederic Engels investigated the slum conditions and wrote “The condition of the Working Class in England” describing the poverty and the terrible physical conditions.

1848: The British Government passed the first Public Health Act regulating the sanitation and sewage arrangements in the newly sprung up industrial townships.

1868: The Artisans and Labourers Dwellings Act were passed to regulate the individual housing of workers.

1875: The Artisans and Labourers Dwellings Improvements Act was passed to further control the development of housing. The Public Health Act was amended to give the municipalities permission to set up separate departments for dealing with sewage and sanitation.

1878- 1890: Different industrialists adopted the “garden town” approach to plan their industrial townships in order to make life more livable for their industrial workers. Cadbury set up Bournville in 1878, Lever set up Port Sunlight in 1887, and Rowntree set up a township in York in 1890.

1909: So far the attempts to control the environment had been mainly in the hands of the industrialists wishing to have a healthier working force or the State in keeping towns free of epidemics and disease. But during the Boer war it was discovered that recruits from working-class areas were very weak- sometimes too weak to even lift a rifle, A committee set up to investigate the reasons for this reported on the appalling living conditions of the working class and recommended the passing of legislation to control these conditions Accordingly in 1909

the government passed the Town Planning Act which gave the State authorities the power, for the first time, to dictate how private property in land was to be used.

1930s: The massive problems of the world-wide recession gave rise to the first debates on regional disparities and government action to control these in a laissez-faire economy.

1947: The first Labour government had come to power and it tried to implement the first steps of State control over planning through nationalisation and the Town and Country Planning Act which extended planning concepts from the city to the village areas.

1950: World War II had by now devastated a large number of towns and these had to be rebuilt from scratch. Thus the Keynesian rationale for State planning was established.

1968: With the complete breakdown of the colonial system and its consequent economic problems the government had to make additional efforts to organise and manage production, housing, transport, food etc. Hence the new Town and Country Planning Act was passed to control the environment.

1970: With the increase in education and political consciousness various sections of the public began to fight both private and public enterprise on environmental issues of location, noise, pollution, etc. and so the State integrated environmental action by setting up the Department of the Environment.

Somewhat similar trends can be seen quite clearly in the Indian case. In the first decades of the British Raj the Government established medical facilities in the Cantonment areas to protect British troops from native diseases. But as the destitution of the Indian people grew and lakhs died of plague and famine the government was forced to take up public health measures. No ruler can extract wealth from a diseased and infirm populace. Provision was made in the Indian Penal Code to permit District Administrators to take punitive action against those found polluting any public water source. As the pace of industrialisation grew some steps had also to be taken to maintain the minimum of hygiene and sanitation in the workers' colonies and some semblance of industrial safety in the work places. Various standards, building codes, Nuisance Acts, and inspection schedules were laid down - all of which were inherited by independent India. In 1956, there was a hepatitis epidemic in Delhi when sewage from the Najafgarh nullah was discharged into the Jamuna River near the Wazirabad water plant. A study of the Ganga near Kanpur in 1966 showed heavy pollution from tannery discharges and in 1968 the Ganga actually caught fire near Monghyr when petroleum wastes from a nearby oil refinery were discharged into it. In 1967, the Rivers Khan and Kshipra near Indore and Ujjain were found to be polluted due to sullage and textile mill wastes. In 1970, it was the turn of the Subarnarekha near Ranchi when it became a sewage drain for the industrial township. In 1971, the Central Public Health Engineering Research Institute at Nagpur reported blithely that of 2,540 cities and towns, only about 1,200 have a modern water supply, less than 200 have underground drainage, and 2 have complete sewage treatment plants. A remarkable record of concern for public health. But by now pressure from urban citizens' groups had begun mounting and in 1974, the Government enacted the Water Pollution Control Act which provided for severe penalties against defaulters. In 1975, three political parties representing fishermen's and farmers' interests were able to get

the Government to order the closure of Zuari Agro-Chemicals for releasing arsenic into the sea and ammonia into the fields. Environmental lobbies had also become active by now and uproars were raised against air pollution in Bombay and Mathura, deforestation in Uttarakhand and Jharkhand, and many other regional issues. The latest is the hue and cry over the planned submergence of the Silent Valley in Kerala, one of the last tropical rain forests. In 1980 the Government enacted the Air Pollution Control Act and in 1981 the Department of the Environment was set up.

What we learn from history then is that the degradation and control of the environment became public issues for governmental action only when they posed economic problems in the course of production for private profit and that governments had to take up increasingly stricter positions with regard to private property and its use so that the social fabric was not destroyed. Even here the State's hand was forced by the groundswell of discontent among the people.

When these underlying issues become clear we can now proceed to define our concepts of Environmental Planning so that these become helpful in understanding our society and the tasks we have to take up in order to correct its ills: "*Environmental Planning* is that political exercise in allocation and management of resources which improves the well-being of those engaged in production, prevents the harmful by-products of industrialisation, and conserves the natural resources."

3.2 People and planning

This is likely to be a tiresome section since we are now moving deeper into an area of theoretical concepts. But it also contains the crux of what we have begun to understand. So please bear with us for a while. We shall try and make it as presentable as we can,

We have analysed the Growth Centre model and shown its limitations. Now we have to try and move towards an alternative model. For this we will have to begin by defining a few terms. Let us start with, *What is a Model?* A "model" here is not a three-dimensional representation, like a "model" aeroplane, nor is it an ideal example, like a "model" child; it is an abstract concept which arranges a number of elements together to explain a phenomenon. Thus, we had a Growth Centre "model"*, a theory that tried to explain how growth takes place from central places.

Now, Planning. Environmental Planning, as we have just seen, is generated as an effort to solve environmental problems. Earlier we had seen that Area Planning emerged to solve the problem of disparity and backwardness. All these problems represent a conflict between what *is* and what is desired *to be*. We can, therefore, say: "ALL PLANNING IS FOR THE RESOLUTION OF CONFLICTS". If you think about that for a bit you will realise that that statement can be generalised over day-to-day activities even, like planning to go shopping or planning to read this report. Go on, think about it a bit. So a planning model will be that model which will show us how to resolve conflicts. If it cannot do so then it is clearly inadequate and a new model has to be constructed. This is exactly what we are now trying to do.

What is Conflict? you might ask at this stage. A conflict is the manifestation of opposing forces. As when Tweedledee and Tweedledum had a “conflict” over the rattle. Or when you swing a bucket full of water around you then there is a conflict between the water trying to remain in the bucket and the water trying to fall out of it. If one tries to understand the conflict further by spotting what are the opposing forces then one defines the *Contradiction* underlying it. The contradiction is an abstraction. It comprises of the centripetal and centrifugal forces acting on the water in the bucket in opposition to each other. These forces are also abstractions. So, we can state: “All conflicts are *manifestations* of underlying contradictions and a single contradiction may manifest itself in different conflicts under different conditions. The very fact that we don’t fall off the earth is, for example, a manifestation of the same centripetal and centrifugal forces that keep the water in the swinging bucket. The conflict becomes manifest when we try jumping as high as we can. Conflicts, as we have seen in the discussion on planning, can be of two kinds: one, the conflicts between *Man and Nature*, and the other, the conflicts between *Man and Man*. We could also perhaps define a conflict within Man himself, as in the case of whether you wish to read this section while your spouse does the cooking, but that can be related to the other two conflicts for the purposes of our planning exercise, i. e. you will read this along with your spouse if you want to poke holes in our argument, or you won’t read this if it’s a bright, sunny winter day and you want to do the cooking yourself. A conflict can take shape as opposed needs or as opposed demands. The distinction between a *Need* and a *Demand* was summed up aptly by a worker who put it as the difference between,, “Please give it, brother” and “Are you going to give it or not?” A demand expresses the conflict sharply. It is the call for action, an indication of the desire and will to change a particular situation. Hence, it is the critical element of planning. Without a demand a plan is nothing but a figment of the imagination.

Since conflicts are of two kinds-Man-Nature and Man-Man - we can theoretically, say the planning can be of three kinds:

- i) That which tries to resolve the first,
- ii) That which tries to resolve the second-hand
- iii) That which tries to resolve both.

These would be akin to saying, respectively;

- i) Let’s put up a Bank here because a Bank benefits everyone.
- ii) Let’s chase all the moneylenders away from here because they exploit the poor; and
- iii) Let’s chase the moneylenders away because they exploit us and let’s design and control another source of credit to meet our needs.

You will notice that the first statement is made by a “neutral” planner, the second is made by one who speaks on behalf of the poor, while, in the third, it is the poor who speak for themselves. Consequently, planning models can be of different kinds depending upon whose point of view is being adopted. We call these three models:

- i) Harmony Model ... Man - Nature
- ii) Conflict Model ... Man - Man
- iii) Demand Model ... Both

Why do we call them these? Because the *Harmony Model* assumes that the relations between men are harmonious (which is why the Bank will benefit “everyone”) and then plans for how Men can overcome their conflicts with nature. The Growth Centre model is a *good* example of this kind of planning. The *Conflict Model*, on the other hand, assumes that the relations between men are in conflict (which is why the moneylenders should be prevented from exploiting the poor) and then shows how these conflicts can be tackled. Different groups of men form associations and unions, federations and chambers, lobbies and parties, on the basis of this model. They choose to ignore the man-nature conflicts. The *Demand Model* begins from the demands made by people around both kinds of conflicts and then tries to interlink all the conflicts. It attempts, theoretically, to resolve *all* conflicts that can be identified. Since this model attempts to link one conflict with others it also tries to unearth the contradictions underlying the conflicts. Just as by studying the lives of hundreds of living creatures and then linking them together, Darwin arrived at the central contradiction underlying the Theory of Evolution - that the opposition between the forces of extinction and the forces of survival controls the evolution of all species. He extended the contradiction underlying the human body (the birth and death of human cells) to all life and all time. By trying to resolve the contradictions underlying all conflicts the Demand Model proposes that the essence of planning is “Survival of human organisation”. The *growth* of the Growth Centre model and the survival of the Demand model are, you will agree, two very different concepts. Man, you see, is a part of Nature and responsible for Nature’s destruction. So if he tries to resolve the man-nature conflicts alone he destroys himself, and if he tries to resolve man - man conflicts alone he destroys nature and, therefore, himself. Which is what environmental degradation is all about. The environment *contains* man. By degrading it he degrades himself: What is the resolution of this contradiction? Obviously, man has to bring about harmony both with other men as well as with nature. This is the task of the Demand Model and of Environmental Planning, as we see it.

Now for the last bit. How are the conflicts to be interlinked? Quite simply - as in a tree. The last leaf is connected to a stem which, in turn, is supported by a minor branch. The minor branch sprouts from a main branch which eventually joins the main trunk. So one is dependent on the other which is dependent on the third and so on. This is the *hierarchical* linkage. Cut off the trunk and the whole tree falls down; cut off a branch and only those leaves dependent on it will fall down. But if we look closely into the life of the tree we will find that there is interdependence too. If it were not for the leaves the tree would not be able to respire and the trunk would die; if it were not for the roots the tree would not be able to draw nourishment and the leaves would die. It is all one big interlinked system. This is the *network* linkage. Conflicts may be linked in both these fashions. They may be grouped hierarchically, first around the surface issues - what is the bone of contention; and then they may be linked in a network fashion by examining the forces at work - who is opposed to whom. Thus a model of the entire system is built up.

What next? Since it is the task of the Demand Model to show how all conflicts may be resolved, we will have to analyse the interlinked conflicts and contradictions to see how they may be resolved. Resolution of the central contradiction-the opposing forces right in the centre, responsible for all the disparities, the problems, the tensions - is the final objective of such a plan. And it is those who plan who will have to decide which of the opposing forces will finally resolve the contradictions. Who, in the Demand Model, are the planners? The model begins with *Demands*. It is, therefore, from amongst those who demand that the planners will emerge. Thus planning and action will find a nexus, a meeting-point. The Demand model now provides a method. Beginning from the explicit conflict at the outermost leaf how can one proceed towards the implicit conflicts within the branches and then the trunk, and finally, to the contradictions in the entire system.

To sum up: what does the Demand model do?

- i) It identifies all the conflicts in a region.
- ii) It interlinks these conflicts to discover the underlying contradictions,
- iii) It shows how the contradictions may be resolved.
- iv) Finally it provides a method of learning how to travel from the outermost conflicts to the innermost contradictions.

So much for abstract theory. We have ranged far beyond Shahdol in space and in time, seeking the interlink ages between all manner of conflicts. From the ancient animism of the Baiga we have travelled to the modern anxiety of the Department of the Environment. From the burning Ganga we have also seen the burning Cuyahoga. And from the inadequacy of Harmony we have gone to the immediacy of Demand and back to the imperative for Harmony. This is the method of the Demand Model at work. But it is now time to return to Shahdol. To see how theory fits what we see and feel and hear. And to make explicit the method of resolution of all conflicts.

CHAPTER IV THE DATA BASE

Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogoves.
And the raome raths outgrabe.

Chapter IV

Collection and Presentation of Data

The data for the planning exercise has been collected, for the greater part, through surveys. The surveys were carried out by teams of student volunteers. These volunteers came from colleges and institutions all over the country and for many of them, the interaction with “villagers” proved a valuable learning experience.

Guidance was provided by experts and professionals through check lists and occasionally, personal supervision. The data has been collected through interviews and discussions with people involved in the local economy and cross checked by our own involvement in the economy of the region. Government records proved disappointing in this respect; they were meagre or non-existent, often faulty and outdated. Government Departments were also reluctant to part with their information. The primary data base is far more comprehensive than the amount presented; it has been used for identifying important trends and presented in a collated fashion. Since our understanding of the Demand Model evolved parallel to the data gathering activity, a measure of selectivity in presenting the data was called for. At the outset, the various sectors of the economy to be studied were classified as:

- (i) Primary production - agriculture, forestry and mining,
- (ii) Secondary manufacturing and processing - large and small industry;
- (iii) Tertiary infrastructure - marketing, credit, health, education, transport, irrigation and welfare activities.

Conflicts identified from the data are numbered for reference. Man-Man conflicts are designated by M and Man—Nature conflicts by N. Whereas *all* Man - Man conflicts can be located in the data, the Man-Nature conflicts have been selectively abstracted. For instance, with less than 2% of the land being irrigated, many Man-Nature conflicts due to developed irrigation will not otherwise come into the picture, although experience in other regions may indicate the potentiality of these conflicts.

The most representative Man-Nature conflicts have been listed in Chapter V. The data is presented sectorally under the following heads;

4.01 Location, Geography and Climate

4.02 History and Culture

- 4.03 Minerals
- 4.04 Agriculture
- 4.05 Irrigation
- 4.06 Forestry
- 4.07 Industries
- 4.08 Services - Education and Training, Transport, Welfare
- 4.09 Credit
- 4.10 Marketing
- 4.11 Ecology
- 4.12 Health
- 4.13 Employment

4.01 LOCATION, GEOGRAPHY AND CLIMATE

4.01.1 Location

Shahdol District lies in the north-eastern part of Madhya Pradesh. It is situated between the Vindhyachal Mountain range on the north and Satpura range on the south. It lies enclosed in latitudes of 22° 45'N and 24° 15'N, and longitudes of 80° 30' E and 82° 10' E. The line marking the Tropic of Cancer passes through the district.

Most of the area of the district was in the Riyasat of Sohagpur, part of the old Rewa State. The region it lies in is called Baghelkhand. The district has an area of 14029.1 Sq. kms and is divided into 4 tehsils and 12 blocks for administrative purposes.

4.01.2 Geography and Topography

<i>Tehsil</i>	<i>Location</i>	<i>Area (Sq.Kms)</i>
Bandhogarh	West	3632.2
Beohari	North	2720.9
Pushparajgarh	South	1770.8
Sohagpur	East	5905.2

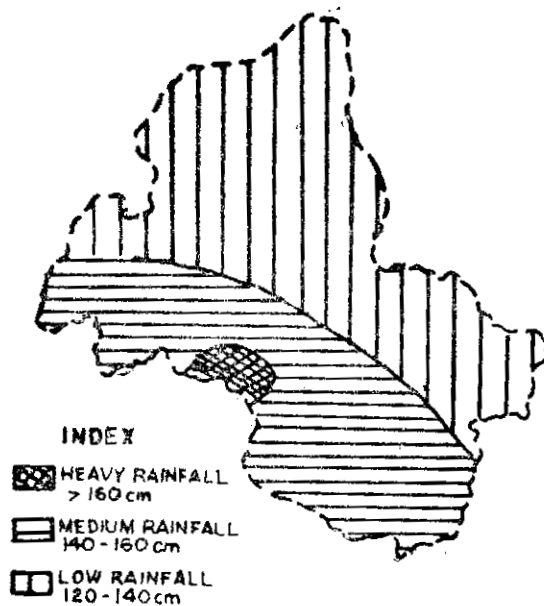
The larger towns and railhead settlements in these tehsils are respectively Chandia, Umaria, Basnia and Amarkantak, Shahdol, Budhar, Anuppur, Jaithari and Kotma. The district lies south of the Kaimur ridge, almost the whole of its northern boundary being made by river Son (flowing more or less parallel to the main Kaimur scarp) except for a small portion in the extreme north-west which is bounded by the Mahanadi, a tributary of Son. Main physical features of the northern part of the district (all tehsils excluding Pushparajgarh) are the hills, which run east to west in parallel ranges, enclosing open valleys, sometimes of considerable stretch. The chief range in the district is the Maikal which is the connecting link between the great hill systems of Vindhyachal and the Satpura, which form the northern and southern walls of the Narmada

valley. Amarkantak, the source of Narmada, is in the south-east corner of the district at the point where the boundaries of Mandla and Bilaspur districts converge. The plateau of Maikal runs from the south-east to north-west. The general slope of the country in the district is also the same.

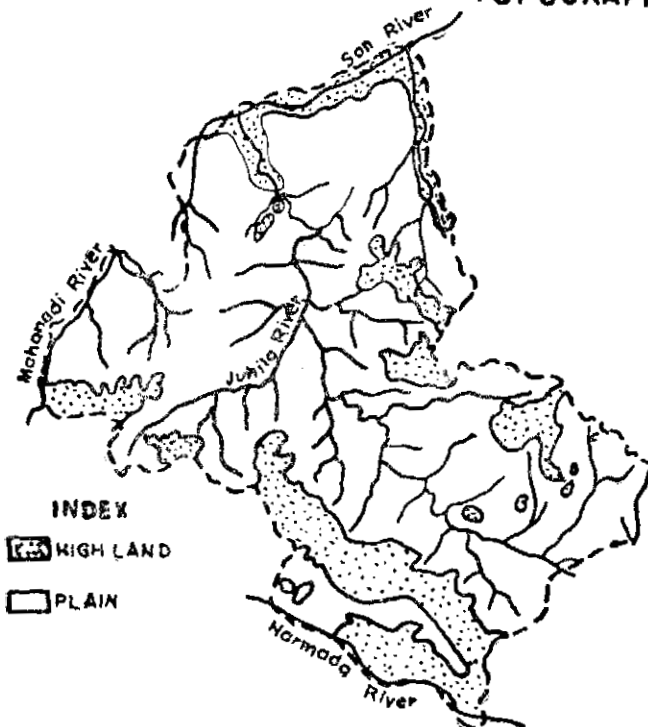
4.01.3 Geology

The eastern portion of the Satpuras - the Maikal being the main range forms part of the Deccan trap: hard black rock of volcanic origin; on weathering, decomposition to laterite, or lateritic bauxite which is found in Amarkantak. Black cotton soil is found in the valleys; reddish soil on slopes is suitable for tree growth because of its greater retention of moisture. Decomposition and degradation gives pale yellow sandy soil supporting best quality sal forests.

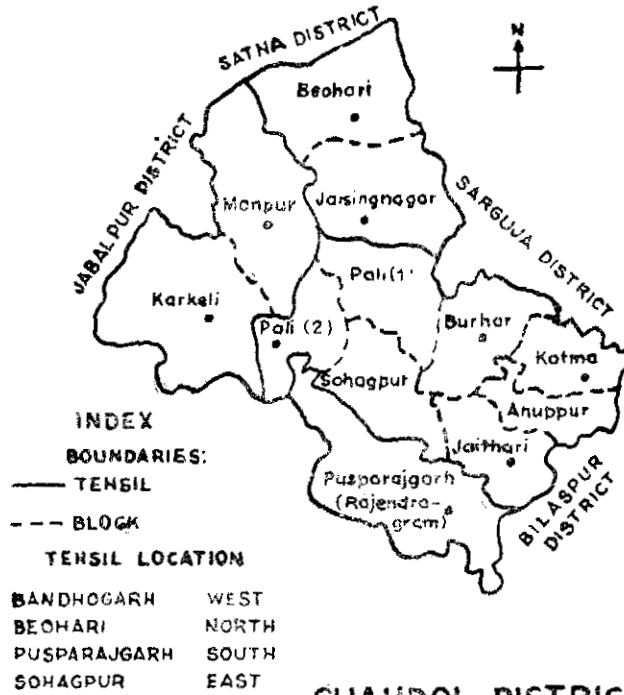
SHAHDOL DISTRICT
ANNUAL RAINFALL



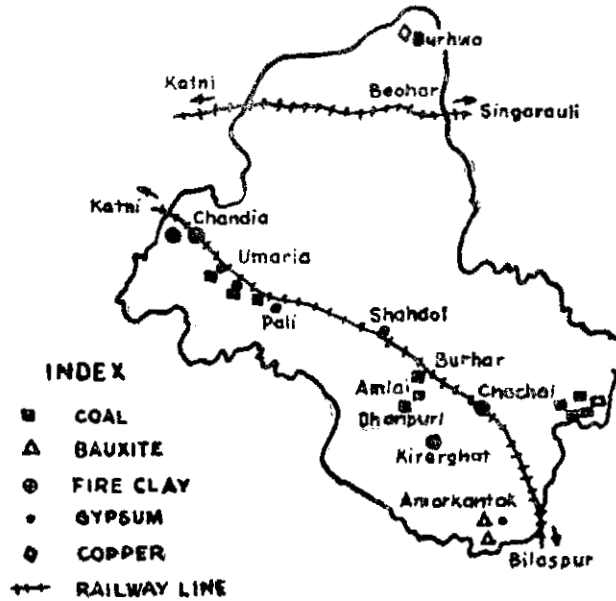
SHAHDOL DISTRICT
TOPOGRAPHY



SHAHDOL DISTRICT TEHSILS & BLOCKS



SHAHDOL DISTRICT MINERALS & RAILWAYS



The Kaimur range consists of gneiss, sandstone, clays, Deccan trap, laterite as capping on rocks-red, yellow, brown, grey, mottled colours (hydroxides of iron, aluminium and manganese).

4.01.31 The district is rich in mineral resources. Bauxite and coal are the two major minerals being mined; the others are gypsum, sand, ochre, limestone, fireclay and soils. Details are covered under 'Minerals' in section 4.03.

4.014 Climate

The average rainfall for Shahdol during 1971-'72 was 145 cms. Generally the monsoons begin by 20th June and end with September. It generally rains erratically in winters. The maximum temperature is around 4FC in May, and the minimum is 7°C in December. The difference in daily maximum and minimum temperature is around 14°C.

4.02 HISTORY AND CULTURE

4.02.01 The region finds mention in the epics. In the 2nd century B. C. some of the Sakas captured parts of M. P. and established their kingdom. In 57 B. C. Chandra Gupta II or Vikramaditya of the Gupta dynasty defeated the Sakas and established the Vikram Samvat. The Guptas were followed by the Huns-Tormana and Mihirkula in the eastern sections who were subsequently defeated by Harshvardhana in the 7th century A. D. Hiuen Tsang visited Bundelkhand at this time. Among the early settlers were the Malvas and the Abhiras. Around the 6th century the Kalchuris seized the tract along the Narbada and most of the areas of Bundelkhand and Baghelkhand (in which Shahdol lies). The Gurjars (Rajputs) controlled most of Central India but after the death of Bhoj I the Gurjar power declined and around A. D. 900 the whole area was split between the various Rajput clans. Baghelkhand remained within the control of the Kalchuris.

4.02.02 The Chiefs of Rewa are Baghel Rajputs, descended from the Gujrat family which ruled at Ahilwara Patan from 1219 to 1296. A member of the family migrated to Northern India and obtained possession of Bandogarh, which remained the capital of the Baghel possessions until its destruction by Akbar in 1597, when Rewa became the chief town. By 1562 Akbar had seized large parts of M. P. including Rewa (which included Shahdol). Mughal rule remained undisturbed until 1690 when the Marathas crossed the Narbada and had occupied land upto Baghelkhand and Bundelkhand by the first quarter of the eighteenth century. Gond kingdoms were allowed to exist upto this stage as captive states but beginning with the Mughals and ending with the Marathas, they were systematically deprived of their authority until totally destroyed by the system of Tehsildars and Pawaiars who were essentially administrators and revenue collectors appointed by the rulers. Mughal and Maratha rule gave way to the British, who preserved the patterns even within the so called 'independent' princely states-the biggest of which was Rewa.

4.02.03 The first Chief of this State with whom a treaty was framed was Raja Jai Singh Deo. Overtures which were made in 1803 after the conclusion of the Treaty of Bassein were rejected by the Raja. In 1812, however, a body of Pindarics invaded Mirzapur through Rewa territory. The Raja was believed to either have abetted this enterprise through deliberate design, or to have countenanced it through weakness. He was accordingly required in 1812 to accede to a treaty by which he was acknowledged as the ruler of his possessions and was brought under the protection of the British Government, to whose arbitration he bound himself to refer all disputes with neighbouring Chiefs; and engaged to permit British troops to march through, or be stationed in his territories.

The Raja failed to fulfil his obligations, and when a military post was established in his territory, he attempted to starve out the detachment. Troops were sent to enforce the execution of the engagements and to obtain security for their future fulfilment.

Jai Singh Deo abdicated in favour of his son, Biswanath Singh who was succeeded in 1854 by his son, Raghuraj Singh. He, according to native history, was the thirty-second of his line.

In 1847 the Maharaja abolished sad throughout his domain. For his services in the mutiny of 1857 the districts of Sohagpur (this includes Shahdol district of today) and Amarkantak were conferred in sovereignty upon him on his guaranteeing that he would respect the rights of the zamindars of Amarkantak.

In 1863 the Maharaja ceded the land required for railway purposes with all his sovereign rights thereon,

In 1868 the Maharaja abolished the system of levying transit duties as well as that of farming the revenue to contractors, and as a further means of remedying the disorganisation into which the State had fallen, appointed as his Minister Raja Sir Dinkar Rao, K. C. S. I., who was compelled eventually to abandon the task he had undertaken.

4.02.04 In 1875 the Chief represented his inability to manage the affairs of his State and agreed to make over the administration to the Political Agent, aided by the minister Lal Randiman Singh until the debts of the State should be liquidated and a proper Govt. be established. The proposal was acceded to on the understanding that when the time for the British Govt. to withdraw from the active management of the State should arrive an engagement should be given by the Maharaja to maintain the system of administration introduced by the British Govt. and to protect any rights which might have sprung up under British administration. Maharaja Raghuraj Singh, who had been created a Knight Grand Commander of the Star of India in 1864, and had been granted a personal salute of 19 guns in 1877 on the occasion of the Delhi Assemblage, died in 1880 and was succeeded by his son.

4.02.05 In 1883 the State agreed to cede, with full jurisdiction thereon, the lands required for the Bengal Nagpur Railway.

On the 21st January 1885 the Rewa State handed over to the G. O. I., with other necessary concessions for the mining purposes, the surface and mining rights in the Umaria coalfields, a tract of about three square miles. In 1900 the colliery was retransferred to the Rewa Durbar.

In May 1902 an agreement was made between the Bengal Nagpur Railway Company, Ltd, and the Maharaja for the performance of the latter of certain services at the pit-head terminus of the Umaria Branch line, for the purpose of developing the coal traffic between the colliery and the stations of the railway company and other connected railway lines via the Umaria station of the company.

The territory of Rewa including Sohagpur contains an area of 33,780 sq. kms. and a population according to the census of 1901, of 13,27,385. The annual revenue amounts to about 29 lakhs of rupees exclusive of Jagirs and religious grants, which probably absorb about fifteen lakhs.

In 1905 the military forces of the State consisted of 574 cavalry, 1140 infantry, 230 armed

police, 94 artillery men and 13 serviceable and 44 unserviceable guns. The liability of the Rewa State to the payment of nazarana on successions had not been decided.

Memorandum by the Rewa Council of Sirdars-1883 : “We, the Sirdars of the Council, came to Sutna this day, and the Superintendent of Rewa has informed us that the G. O. I. propose to open up the Umaria, Johilla and Sohagpur coalfields, and to construct a railway from Katni to Bilaspur through the above named places.

As to the coal mines of Umaria, Johilla and Sohagpur, a contract is to be given to a company of capitalists for 99 years, and the agreement which may be entered into by Govt., on behalf of Rewa State should be observed by this State..... without making a

railway, the coal cannot be developed, and the greater the facility of means for conveying it, the greater will be the extent to which the coal mines will be worked, and the consequent profits to the State. We believe that this line from Katni to Silaspur will cost above two crores of rupees food grains and timber etc which are now exported with great difficulty for want of roads and transport, will be easily carried to markets by rail and there sell to advantage: that, in addition, the prosperity of towns and villages will increase, as will also the trade of the State. The rail will secure safety and comfort to the country, and improve the condition and civilisation of the people. In times of famine, food will easily be carried from place to place.

..... In 1863 when arrangements were made for the Singrowli coal in the time of His Highness Maharaja Raghuraj Singh, the rate of Royalty was fixed at 6 pies per maund, or 14 annas per ton.”

4.02.06 Political rule was stabilised under the British, operating through the Maharaja of Rewa. There were no movements, even of a reformist nature. New coal mines were explored by the British and handed over to indigenous capitalists for exploitation. The British also systematised methods of forest exploitation and preservation, which were subsequently handed over to the State Forest Department at the time of independence. Railway lines extended in the region to service new coal mines.

Independence brought vast improvements in communications along with a greater external awareness of the untapped natural resources of the region, leading to a surge of immigrants. Over the centuries, however, a slower process of immigration by non-tribals-Brahmins, Thakurs and Patels (Kurmis) has been instrumental in appropriating the choicest agricultural land into the hands of the non-tribals. The gradual and systematic exploitation of resources has been achieved by:

- denying the tribals the knowledge of the real value of products.
- denying know-how of processing of raw materials.
- introduction of needs like tea, cloth etc leading to a consolidation of the money economy.

4.02.07 At this point in time, tribals constitute approx. 50% of the population. A measure of the cultural alienation of the people is indicated by the fact that though the population has increased 2½ times in the last 70 years, traditional customs are still very prevalent in the villages

and development does not seem to have affected the life style of the people except to increase the magnitude of their exploitation by the trader, the landlord and the contractor. For instance, agricultural operations even today are performed caste-wise.

4.02.08 The various sub-castes within each caste, specific to the area are:

Brahmin: Brahmin, Mahapatra, Tiwari, Sharma, Pande, Brijpuria.

Kshatriya: Ahir, Nayak, Bhagel, Thakur, Yadav, Singh.

Vaishya : Kurmi, Bania, Teli, Kachhi, Sindhi, Halwai, Patel.

Shudra : Chamar, Agaria, Dimar, Nai, Lohar, Ghadaria, Darji, Dhobi, Kachar, Jangara, Kotwar.

Tribals : Gond, Kol, Bharia, Bhumia, Baiga, Jogi, Gomia, Kori, Domari.

4.02.08.1 Brahmins: - Their economic life was dependent on performing religious rites. They now hold influential jobs with the government bureaucracy and possess good quality land. They do not plough their fields themselves, but get work done through 'Harwahas', yearly contractual labourers. They have consciously endeavoured to maintain their elitist status.

4.02.08.2 Kshatriyas; - Have been able to maintain and perpetuate their political and economic power by supporting the feudal and pre-capitalist structure. Most of the Baghel Rajputs are Ilakedaars. Having traditionally been fighters they have developed an ability to undertake risks. They have been the most progressive in adopting modern techniques for cultivation. They possess large tracts of the best quality land.

4.02.08.3 The trading community largely comprises of migrants who have come and settled in the last 2-3 generations. Prominent among them are Marwaris, Gujratis, Mohammedans, Agarwals and Sindhis. Between them, they control 80% of all trade. They themselves do not engage in production. However, as suppliers, middlemen, commission agents they reap hefty profits. Here and there they contribute funds for 'temple construction' and other religious functions, to maintain their social prestige.

The local Baniyas-Gupta, Kesharwani and Lamnas form the trade link between village and town. Called 'Fadiyas' they remain under control of the big traders. Apart from cultivation they also make their profits in money - lending.

4.02.08.4 Tribals: - Gonds are the highest class amongst tribals. Some of them are Ilakedars and possess large tracts of land. Cultivation is their main occupation. Their men and women labour together on land. The Kols are largely landless, and earn their living by working as 'Harwahas'. Panika tribals traditionally engaged in spinning, but this trade is fast dying. Baigas are the tribal 'Ojhas'. By and large most of the tribals are dependent on collecting forest produce for their subsistence.

4.02.09 Deliberate policies were followed by the Rewa rulers to keep the tribals in a state of content backwardness. The royal family parcelled out the royal lands to selected pawaidars who were of royal blood. This has resulted in an enormously strong feudal set-up. Both the Mughal and British rulers operated through this feudal structure; with the merger of Rewa with

the Union of India other outsiders entered the district. Marwaris from Rajasthan monopolised the industries, Sindhi refugees from West Pakistan captured the trade and commerce, Bengalis from both parts of Bengal entered the administrative machinery and various martial races gained control over transportation and allied services. These influxes have merely acted as buffers in the feudal structure. The feudal outlook permeates every facet of local life. Anyone in a khaki dress is referred to as Sipahi. Titles such as Diwan, Kunwar and Seth abound as do impressive moustaches. In public transport peasants are pushed off seats to make room for Thanedars, Advocates and virtually anybody with any claim to distinction.

The feudal system is widely accepted by the peasantry partly since it seems to offer a protection of sorts, since the Thakurs build the temples, recover the impounded cattle and control the panchyat decisions.

4.02.10 The Politics of the Region

A study of the recent political history of the region suggests that while 5 of the 8 Vidhan Sabha constituencies have been reserved for tribals, the elected “representatives” have been part of the old system of absorbing the elite among the oppressed. The MP from the region after the '71 elections was a tribal who owed his success to the patronage of the ex-Maharaja of Rewa. In the handbills circulated before the election, the ex-Maharaja's photograph was given far more prominence than the candidate's with the patron touring and actively canvassing on behalf of his protégé. The former MLA from Kotma constituency was the eldest son of the ex-ruler of Sohagpur. A former member of the MP Cabinet was reputed to not have much support in his own constituency but was a loyal supporter of royal families in other parts of MP.

Shahdol town has direct rail and road links with the capital, Bhopal. There is a constant flow of VIP's from the State capital to Shahdol, the more important amongst them flying in via the OPM airstrip. Most of the others come by car. The reasons for these visits are hidden from the public eye; the destinations most frequently are Amarkantak, a hill station, and Rewa, the seat of power.

4.03 MINERALS

4.03.01 Gypsum occurs about 8 km. away from Anuppur over a stretch of 6 km. The lease for its mining is under private ownership though mining operations have been stopped since May 1972. Deep overburden is probably responsible. According to one estimate gypsum deposits will last about 15 years if exploited on a small scale. In the absence of output data there is no indication of the size of gypsum reserves at this site. Gypsum is an ingredient in the manufacture of cement. Cement plants in M.P. get their requirement of gypsum from Rajasthan. A 200,000 TPA cement plant requires about 8000 tonnes of gypsum annually. Plaster of Paris of 'technical and medical grades can be manufactured from gypsum, while medical grade Plaster of Paris will have application in the hospitals of the State. Chandiya mining and ceramics industry employs Plaster of Paris moulds made from the technical grades.

4.03.02 Plenty of sand is available for use in constructions. Sand is classified as a minor mineral. A possibility of manufacturing concrete poles used in transmission of electricity exists in the area. The demand for these poles is rising because of electrification programs- There is no manufacturer of poles in Shahdol district. M.P.E B. has its own factories at Raigarh, Bilaspur, Satna. It also buys poles from private manufacturers. Despite this it uses wooden poles to meet demand in Shahdol. Other concrete products are rings for wells, and-pipes. . The demand for both will grow with irrigation.

4.03.03 Ochre is used to make distemper paints. It occurs at depths of 6-8 metres and is mined by board and pillar system. The lease for yellow ochres is in private hands for three areas of roughly 15 hectares each. The lease for red ochre also occurs in the area and was yet to be obtained in 1974. The output-of these mines is.8-10 tons/day with peaks of 30 tpd. Ochre is transported from Amarkantak to a pulverising plant in Anuppur at Rs.25/tonne. Impurities are hand picked, and upto 4t of material can be pulverised in a shift of 8 hours. Pulverised material is packed in gunny bags and sent to other States.

4.03.04 Fireclay is found in Chandiya and is being used by Orient Potteries in their ceramics plant. Fireclay is the basic raw material in the manufacture of refractory bricks. Sawdust and rice husk can be used with fireclay for manufacture of insulating bricks. Earthenware of various kinds, including pipes, are possible:

4.03.05 High grade limestone for manufacture of calcined lime in shaft kilns— can be operated on fairly small scales which permit utilisation of even very small reserves Of limestone. Shaft kilns are operated on almost cottage scales in and near Katni. Coal required to fuel these kilns is available in abundance in the area.

4.03.06 Coal is by far the largest mineral resource of Shahdol.

4.03.061 There are nine centres of coal mining in the district stretching from Bijuri to Umaria along the railway line in an East-West direction. Even richer deposits lie in the Chirmiri area of Sarguja district east of Kotma. Coal mines are located at

Amlai	Umaria	Nowrozabad
Kotma	Pali	Budhar
Rajnagar	Ramnagar	Bijuri

Coal mines are now under Government control. Exact figures on outputs are not available. Most of the coal mined is despatched to various thermal power plants and heavy industries outside the district.

The coal seam under the Sohagpur area lies at a shallow depth of 28 m to 100 m. Thickness of seam is 1.5 m to 8 m. These mines are categorised as 1st degree gas mines.

4.03.06.2 Coal mining and coal based industries are normally on a large scale. Coal based chemical industries tend to be capital intensive. A few small scale and cottage industries can definitely be based on coal - soft coke is one instance. During coal mining and crushing, large quantities of dust get accumulated at mine heads, of either high or low calorific value. The briquettes of this dust using various kinds of binders, the easiest being cow-dung, provides a cheap domestic fuel. Another possibility is incorporating sawdust.

4.03.06.3 A qualitative picture of the coal mines emerges from the data for Budhar Sub-Area mines. These are deep mines of minimum depths 15 m. to maximum depths of 140 m. Budhar Sub-area covers 2000 hectares, and the estimated coal reserve is 1,96[^]00,000 tonnes.

	No.1 Mine	Amlai	Rungta	No.8 Mine
Average Annual Production	516,739 tonnes	480,210 tonnes	70,553 tonnes	218,329 tonnes
Life of Mine	33 yrs.	19 yrs.	29 yrs.	19 yrs.
Area covered	617 ha	588 ha	293 ha	495 ha
Total Estd. Coal Deposit	4 m.t.	8.3 m.t.	1.0 m.t.	6.3 m.t.

amounts of chemicals for beneficiation. It is estimated that every kilogram of silica in the ore entails a consumption and loss of 1-2 kg of alumina and 2-3 kg of caustic soda. However, metallurgists hold that Bayer's process is not economical for ores containing more than 7% silica on a dry basis. Apart from metal extraction which requires high grade ore, bauxite is also used in the manufacture of refractories, cement, abrasives and chemicals and hence is an extremely important resource.

4.03.07 2 In Shahdol district, the thickness of over burden layer at the bauxite mines goes upto 5 metres. Figures for the HINDALCO mine are presented below:

	1971	1972	1973
Production (Metric tons)	1, 21,373	1, 48,806	86,267
Dispatch (m. t.)	1, 18,407	1, 45,810	66,426
Dispatch Value Rs.	13, 52,761	23, 24,226	8, 27,653

4.04 AGRICULTURE

4.04.01 Soil

Land is undulating, broken with steep banks of nalas and in areas where the forests have been long cleared, is highly eroded. The soil changes almost every hectare. All types of soil are found in the district like black cotton, black less sandy, black medium sandy, grey, yellow, yellow sandy and sandy soils. It can be technically classified under skeletal soil whose parent material is conglomerate, quartzite, sandstone and shale. Fertility status is medium nitrogen, low phosphorus and high potassium. The kind is good for tuber-crops (potato, sweet potato), bulb crops (garlic, onions), root crops (carrot, beet), and groundnuts because of its semi-sandy nature. Citrus varieties are suitable for horticulture.

N 1
N 2

4.04.02 Traditional Agriculture

Traditional agriculture as practiced in the vast majority of farms is at a subsistence level and production is for consumption for the family rather than for sale. In many cases even this is not possible. Savings are marginal and many families with upto 4 hectares of land seek wages for labour in fields of a few larger farmers for more than 3 or 4 months to meet their survival needs. Other employment is in the collection and sale of forest produce. Rich farmers use their savings of grain and cash as seed and survival loans to small and marginal farmers and landless against mortgages of land or promised labour. Large holdings acquired in this fashion on failure to repay loans with interest are than farmed out on terms of sharecropping. The shortage of regular work throughout the season keeps the labourers compelling for the few opportunities on the fields of the middle and rich farmers. Sharecropping is done with 1/3 to 1/2 of the

M 1
M 2
M 3
M 4
M 5

produce (after deducting costs of inputs provided by the landowner) going to the landowner. The quality of the land determines the actual division of the produce between the sharecropper and the landowner. Tenancy is not observed probably because there is so little assured irrigation. Bonded labour is at rates of Rs 1.50 or less for a variety of purposes. Bonded labour is highly exploitative and it is impossible to repay the debts which lead to this form of labour. Most labour is on wages from between Rs 2.50 to Rs 4.00 for men and between Rs 2.00 and Rs 3.00 for women. These rates are much below the stipulated minimum wage rates for agricultural labourers. While new land is being prepared for cultivation, alternative employment should be available to meet survival needs. The ceiling lands scheduled for redistribution by the Revenue Department are of such poor quality that without development they cannot be productive. There seems to be a growing awareness that agriculture cannot develop without irrigation.

District figures are (for 1974) for the working population.

	<i>Men</i>	<i>Women</i>
Farmers	1, 78,014	28,250
Labourers	63,934	50,869

which indicate that 80% of labourers' women work along with their men folk, whereas 15% of the farmers' women work on fields. The women manage the store, cleaning of grain, weeding, sometimes grazing; the children of 4 to 5 years also assist by minding house. At the age of ten a girl or boy is a semi -adult-they begin to plough, weed, harvest. People begin their day by 4 to 5 a.m. and end by 8 p.m. in the busy seasons.

4. 04. 04 Cropping Patterns

4.04.04 1 Sesamum (Til)

Sesamum or til is an important Kharif oil seed crop for the district and about 2,000 tonnes were produced in 1971-72. The productivity is about 100 kg/ hectare. Both groundnut and til are Kharif crops and dependent on the vagaries of monsoon.

The Bombay prices of Til in March '74 were for seed Rs. 4.300/ T, Oil Rs. 8,200/T, and Cake Rs. 1,200/T. Khadi and Village Industries Commission (ICVIC) estimates yields of 43% and 40 % oil in a power driven and bullock driven ghani respectively.

4.04.04 2 Mustard (Rai)

The oil content in seed is between 37 to 43% The seed is well suited for expelling an edible oil in a Kolhu (Ghani). ICVIC claims a yield of 35% oil on the power ghani.

There is potential of improving yields through improved seed varieties and education of the villager on better farming techniques. Sufficient seed is available in the area for a power or bullock driven ghani.

4.04.04 3 Linseed (Alsi)

India is one of the large producers of Linseed in the world and the maximum Linseed production in India is in the state of Madhya Pradesh. About 2000 tonnes of Linseed are produced in Shahdol district. Linseed is a drying oil, i.e. when exposed to atmospheric oxygen it dries to form a crust. 65% of the total production is used by the paint industry. It is also used by large soap manufacturers after hardening. Its use for edible purposes especially for deep frying should be restricted. The small size linseed is popular in Madhya Pradesh. The crop is sown from September to October and harvested between February to March.

The meal is edible and generally used for cattle feed. The market for compound cattle feed within the district will be small or nonexistent. The small seed variety of Alsi contain 40-42% oil. About 35% may be recoverable. March 74 prices for Linseed in Bombay were : seed Rs 3400/T., Oil Rs. 7600/T, Cake Rs 1300/T.

4.04.04 4 Vegetables

In areas near Anuppur some small farmers have taken up vegetable cultivation in a small but systematic manner. A local businessman in Anuppur has procured orders for about 35 electric pump sets. These are to be installed in wells dug by the help of bank loans. Some of these farmers see a potential in using new technologies appropriate to the region but lack the necessary entrepreneurial facilities and equipment backing to undertake the necessary experimentation.

Ready money can be got from the sale of vegetables in industrial and Government colonies. Inhibiting factors seem to be:

(a) Aversion to the use of fertilizers and pesticides, which destroyed crops after using wrong concentrations:

(b) Social factors such as a farmer's pride in being a 'Kashtkar' only. Selling vegetables is supposed to be the job of low caste and poor people;

(c) Time consuming nature and constant care. Cultivators would rather grow staple food than vegetables that can only supplement their diets;

(d) Besides, vegetable cultivation involves more risk right from the time of production to marketing; traditional precautions are primitive such as use of wood-ash to kill insects; root diseases are not traced until rapid damage all but wipes out the plants. Market prices are not stable. Losses do not occur commonly, yet the fear of loss is widespread.

(e) Diesel, pesticides and other inputs are in short supply. Spare parts and mistries (mechanics) are not easily available.

M 6

M 7

M 8

M 9

4.04.04 5 Grain

Paddy fields are always used only for paddy, because the general non-availability of irrigation for Rabi discourages a wheat crop on these fields. Maize is grown in the backyards only where there is no sandy soil and most cultivators crop between 0.25 to 0.5 hectare of maize; this is the first crop sown after the rains. Because of destruction of the crop by animals, the crop is not extended to many fields. Kodo is very commonly grown because it is a hardy and a sure crop. Even when all crops fail some Kodo output is definite. Arhar is mixed with Kodo since it is an extra income and provides for composting. As a Rabi crop, horse gram, wheat, linseed and mustard are grown; mustard in the back yard after the maize crop. Hence the cultivator has that much double crop land. Linseed and gram is grown in heavy soil as is Kodo.

M 10

4.04.05 Manure

Manure is generally used in the backyard for maize cultivation and the rest is put in the paddy fields. Consumption of chemical fertilizer in the district is indicated in the table (in tonnes):

	74— '75	'75— '76
N	267	350
P	153	249
K	35	29
Total	455	628
Kharif	67	95
Rabi	388	533

These are sold mainly through co-operative societies.

The procurement for the cultivator is a time wasting procedure; smaller quantities than 50 kg. are not available. This forces the farmer to buy more than he needs or not buy at all. Transportation from store to fields is difficult.

M 11

4.04.06 Inputs

There are very few centres for the distribution of seeds, seedlings for vegetable cultivation, or fruit tree saplings. Even for the richer farmers it can be a time consuming rigmarole to get these inputs from the concerned departments. The scarce time that the

M 8

M 12

M 6

majority of small and middle farmers manage to take off from working their fields goes to marketing their produce at the towns, or in futile chases for supplies of diesel to run their pumps. Those farmers with electric pumpsets are far more comfortably established. Many marginal and small farmers close to the power lines who could avail of the facility are frustrated on account of their ownership of the land not being in legal order. There are many such cases since land is being acquired through encroachments, and there are irregularities in the land records. Credit is available through banks only when the records are in order, and this takes several years.

4.04.07 Land Distribution

Details for the entire district are neither available nor is it feasible to present them here. However, from a study of 14 villages of Sohagpur tchsil which is the more densely populated and cultivated of the four tehsils a rough indication is obtained.

Below 2 ha

Above 2 ha

Ratio of amount of the title land

in category to the total land in all holdings.	15.5%	84.5%
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Ratio of number of owners in category

to the total number of title holders.	61.1%	38.9%
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About 2/3rd of cultivators own about 1/6th of the cultivated land in less than 2 ha holdings and the remaining 1/3rd of the cultivators own the remaining 5/6th of the cultivated land. Less than 1/6th of the so-called cultivators own less than 1/2 hectare.

4.04.08 Land Use and Land Disputes

In consequence of the fact that about 1/3rd of the land area of the district is designated as forest land, there is a trend to acquire agricultural holdings from the forest around villages and fields. Various tracts of such land are lying waste. After years of cultivation and developing such land, titles are made out by Patwaris for the cultivator. In many cases these titles are of temporary validity, although the cultivator believes them to be permanent. Revenue department officials frequently profiteer from making out titles to land. Village-based forest guards take money and allow encroachment.

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Disputes over land are not only with government officials, but also with large landowners. Instances are of such landowners who have settled migrant labourers with promises of portioning off land to them in exchange for developing the landlord's fields; at a later stage the landowners have tried to evict the labourers, on grounds of

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encroachment on fallow land. Such migrant labourers and marginal farmers face problems of inadequate information on legal procedures and are often at a loss to determine whether the land they cultivate belongs to the Forest department, the Revenue department or the landlord.

The newly acquired agricultural land that is being developed for farming by the migrant labourers is what was formerly used for the free grazing of cattle and goats. This has also figured in the expansion plans of established farmers who have plots adjacent to these grazing lands. In the months between the rabi crop and the monsoons, cattle are left loose. They damage crops of the few farmers who cultivate during this period. The cattle population of the district exceeds the human population, hence grazing land is at a premium.

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4.05 IRRIGATION

4.05.01 Water Resources

A picture of the existing state of utilisation of this resource and the potential that exists for its development is possible at this stage. The regions in the district may broadly, be classified as follows:

- (i) Plane regions; the water resources were:
 - (a) Tanks which contain water from July to May, with a depth of about a foot in May;
 - (b) Nalas which hold water up to October from July;
 - (c) Perennial rivers; Son, Mahanadi and Johilla are the big rivers;
 - (d) Wells with water level depths from 15 to 50 feet that normally have weak sources; most wells dry up in February, or the recharge reduces to almost nil;
 - (e) Drilled wells of capacity 5000 to 10,000 gallons/hour, depths of 150 to 250 ft.
- (ii) plateau regions; the water resources were-
 - (a) Tanks, same as above;
 - (b) Very small nalas but a lot of them are perennial;
 - (c) Wells with a high water table, but weak sources.

4.05.02 Irrigation Potential

On the one side where nature has not assisted by giving sufficient quantities of water in wells, yet the terrain and rainfall is such that enormous resources lie in the making of small reservoirs on the nalas which surround almost all the villages. These nalas go through fields with many curves and deep valleys. Several good sites exist where the runaway flows can be checked with little effort. Flow irrigation is possible in many sites; a large number can be served by shallow lifting devices; the remainder would need powered pumps.

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4.05.021 Surveys of the water resources around 19 villages of Pali block and around Anuppur clearly demonstrated the potential.

Development of Irrigation in Chandas Valley A Expanse

(i) Chandas Valley total catchment around 80 sq km.

(ii) Of the above around 35 sq km highly undulating and forested-say the entire region above 1,700 r. l.

(iii) The balance 45 sq km undulating (or rolling) plain good land for cultivation.

(iv) Besides Anuppur, the larger villages in the valley include Bairibandh, Jaraudi, Sakra, Taradand, Lakhanpur, Agridhar, Chandahatola and Karratola,

(v) Total good cultivable land needing irrigation may be estimated at 25 sq kms or 2,500 hectares.

B Main Features

(i) Very thin topsoil underlain by hard igneous rocks of low total porosity-hence no tap able aquifers.

(ii) Terrain generally undulating and unfit for development of long canal systems, such as those in the gangetic or deltaic plains.

(iii) Chandas and its tributaries Kalchi, Karaundhia and Paraspani nalas have some, even if small, fair weather flows essentially from the water percolating into the top soil and cracks and fissures.

(iv) All older irrigation in the valley is based on tanks in the plains, storing rain water and irrigating small tracts of land close by.

(v) Recent irrigation development has been limited to the more progressive farmers and has depended on pump-sets lifting water from the river on its tributaries directly or from percolation wells close to the river channel. The seepage input into such percolation wells or any other wells (if at all) is very slow yielding only enough water for a few hours pumping each day and in the summers reducing to as little as 30 minutes pumping in a day.

C Direction for Irrigation Development

(i) The area gets an annual average rainfall of around 100 cms. and even in a drought year the rainfall is over 50 cms. Thus in case there were no losses the precipitation on a particular patch itself, suitably stored and deployed should be adequate to raise crops.

(ii) The area to be irrigated being only 30% of the total area of catchment's, even

after providing for losses, it would be possible to adequately meet all irrigation demands by properly harnessing as much of the precipitation as possible.

(iii) In view of the terrain as also the nature of agricultural development in the area, it will be desirable to go for low capital investment lift-cum-gravity small schemes than for a large high capital storage-cum-gravity canal system.

D Proposals to be investigated in detail

(i) Maximum possible absorption of the rainfall in the fields through contour bunding - this would reduce soil erosion and need for irrigation and will improve availability of water in wells and also base flows in nalas.

(ii) Proper use of existing tanks and their expansion or deepening where necessary.

(iii) Foot hill storages: 3 small storage schemes, one each on the three main tributaries Kalchi, Paraspani and Karaundhia as they emerge from the forested hilly zone. The schemes would imply 10-15 m, high stones fill-cum-stone masonry dams, storing about 5, 2 and 6 million cubic meters (mcm) of water respectively along with limited length of canals to irrigate those areas by gravity where it is feasible to do it economically. The remaining water will be released in a controlled way to fill tanks and used for lift irrigation.

(iv) Rain bed storage: This appears to be the most imaginative way of harnessing water for irrigation in such valleys. Low stone masonry weirs 3-6 m high at suitable locations across the bed of the rivers and tributaries would retain monsoon water to be lifted for early winter irrigation would encourage seepage and lengthen base flows, in the winter serve as large seepage wells, and would act as sumps for using the water released from the foot-hill storage by lift irrigation. On a first look the following could be a list of such storages.

(a) 6m weir just downstream of confluences of Kalchi with Chandas storage $1.5 \times 10^6 \times m^3$

(b) 6-m weir just downstream of confluence of Paraspani nala with Chandas storage $1.2 \times 10^6 m^3$

(c) 3 nos. 4m weirs across Kabhi nala storage $0.75 \times 10^6 m^3$

(d) 4 nos. 3m weirs across Baruahhi nala storage $1.0 \times 10^6 \times m^3$

(e) 2 nos. 4m weirs across Karaundiha nala storage $0.5 \times 10^6 \times m^3$

(f) 8 nos. 3m weirs across Chandas river storage $2.0 \times 10^6 \times m^3$

(v) Thus a total storage of about $20 \times 10^6 \times m^3$ which is 25% of the average annual rain fall would become available which along with the seepage reserve should be adequate to meet all irrigation and other water needs.

E Costs

A rough estimate of costs would be as follows:

Foot hill dams:	Rs.	15.0	lakhs
Riverbed weirs:	Rs.	7.0	lakhs
Canals and other:	Rs.	8.0	lakhs
Total:	Rs.	30.0	lakhs

which is less Rs. 500 per acre.

F Charging

Canal irrigation should be charged at a minimum of Rs. 100 per acre per crop and all pumping sets Rs. 500 per annum up to 5 H. P. and Rs. 1,000 per annum for larger. If such water rates be acceptable then a Chandas Valley Development Board could even take a loan from banks with confidence and repay.

4.05.03 Irrigation Schemes

The 20 years between 1956-1976 has seen a designed irrigation of 7,607 hectares, which amounts to 1.67% of the cropped area. On completion of on-going works at 1976 this would rise to 5.32%. Even so the district figures would be less than the State or National averages.

4.05.031 The situation with irrigation schemes is actually much worse. The details of Irrigation Schemes in Sohagpur Tehsil that were completed by December 1974 reveal that out of a designed capacity of 1818 hectares, only 505 hectares actually were irrigated. These schemes undertaken over a period of 20 years have achieved adding irrigation to less than 0.1% of the total land cropped in 1972-73 which was 524374 hectares.

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4.05.032 The sum total of these schemes between 1955 and 1974 in Sohagpur tehsil has contributed to irrigating 11% of the area under irrigation (4485 hec.) in 1972-73, with a cost density of Rs.6,000 per hectare.

4.05.033 The percentage of irrigated to cultivable area in the district is much below the state and national averages. About half of all the cultivated land is devoted to growing paddy and wheat in both rabi and kharif seasons. In the rabi season, irrigation water is largely used to grow wheat. At many places existing dam water cannot be effectively utilized because channels to the fields have still not been constructed.

4.05.034 There is practically no agriculture in the summer months of March to mid-June. A few farmers who have an assured source of water, and power for pumps and are favourably located near market towns do vegetable farming in this period. Yet other middle and rich farmers who aspire to vegetable farming are frustrated by the delays in credit disbursement for pump and wells. Wells can collapse if not completed before monsoons. SFDA has performed miserably in the district; the farmers have had

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discouraging experience with banks as well (dealt with in CREDIT section). Surface water storage schemes of the Irrigation Department are not utilizable without the channels to conduct water to the fields of the farmers. Although the Minor Irrigation Projects exist in some areas, the water is not being put to productive use. The poorer peasants are aware that unless the Irrigation Department can assure water for agricultural use, agriculture cannot generate productive employment for them.

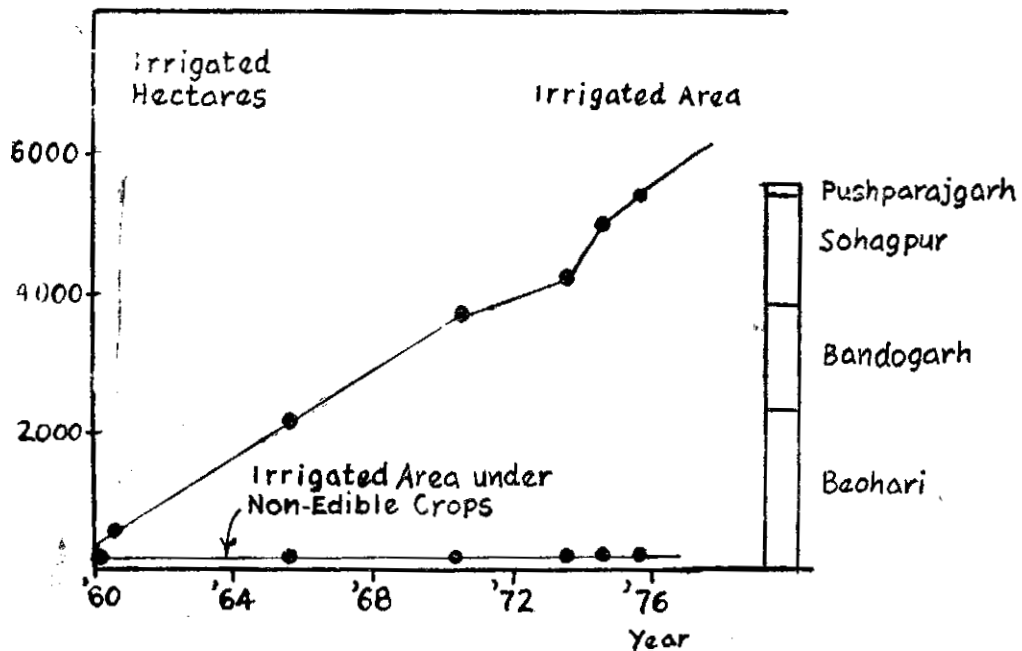
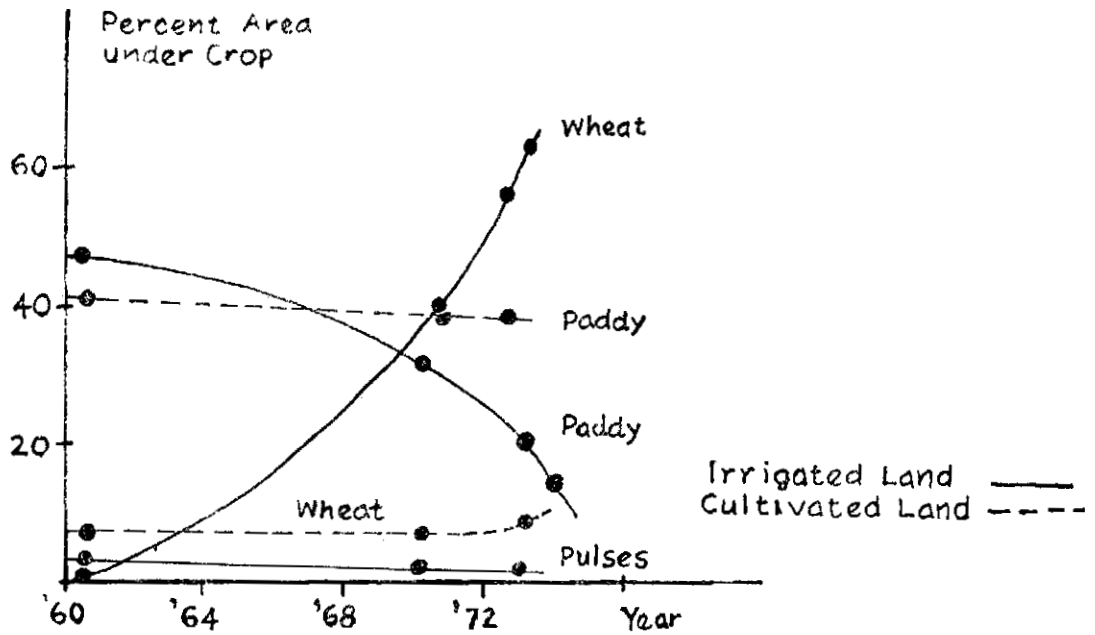
4.05.04 At the Bansagar Hydel project site at Deolond a host of special problems due to the submergence of villages and fields by the reservoir have been pressed upon the people. The number of persons who will be displaced by the reservoir is estimated at 1, 27, 000. The project is a multipurpose one to be completed by 1984 at the cost of Rs 320 crores. The proposed annual irrigation is 2.488 lakh hectares over a total area of 1.548 lakh hectares. The gross command area is 2.476 lakh hectares, of which the cultivable area consists of 2.06 lakh hectares. Of the land coming under submergence by the reservoir 66.6% is cultivable and 20% is forest land. The total land submerged will be 51,648 hectares. These figures give an idea of the size of the huge project. One of the specific problems faced by the oustees will be of assured employment once their means of survival are lost. It seems probable that the proposed township for resettlement will never become a reality. The crisis of survival will be immediately after evacuation when shelter, food and fodder are all lost. For an attempt to ensure some security against a bleak future the poor of this region have been asking for various terms of allocation of land near forest areas, with the possibility of obtaining fields near their homes; for transportation of their worldly goods and cattle to the new location of work and livelihood. Most of the villagers are entirely ignorant of the schedules of evacuation and submergence and of completion of the work of building the dam. Those farmers who have not repaid their loans to banks want them written off. Some are hoping to get land in the command area of the dam and ask for immediate imposition of ceilings before the beneficiaries of the region-mainly around Rewa-rearrange their legal records to retain the irrigated land. The changed status of land would make between 1/3 and 2/3 of the land in the command area available for redistribution-The ceiling on un-irrigated land is 54 acres; on once irrigated land it is 36 acres and on irrigated land it is 18 acres. The richer farmers and traders seek money compensation so as to be able to choose the land they resettle themselves on.

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4.06 Forestry

4.06.01 Shahdol Circle (Forest) consists of Shahdol district with, in addition, the forest division of Korla. According to a confidential government document 53% of Shahdol Circle is under forests. Other Forest Department sources put area covered by forests at about 35%, whereas people living within the region would place it at 18%. Such is the confusion regarding estimates of forests.

To give an indication of the revenue generated by forests for the State Government,



the contribution of Forestry revenue to the total state revenue is 18.1%, which comes to 57.5% of the total non-tax revenue. Another way of looking at it is that every hectare of forests yields a net income of Rs. 32.41 and the forested area of the state covers 1, 56, 38,600 hectares.

4.06.02 Forests play a vital role both ecologically as well as for the satisfaction of a variety of production and consumption needs. Forest produce is classified as major or minor forest produce on the criterion of revenue generated for the government.

Major forest produce: timber, firewood and charcoal.

Various qualities of timber come out of the forest of the area, chiefly Sal (Sarai) and Sagaon (teak). Nearly forty to fifty thousand cubic meters of Sal timber is sold by the forest department every season. Both Sal and Sagaon are used for furniture manufacture and construction. Smaller quantities of timber come from haldu, tendu, sitija, kharner. According to an earlier estimate, fifteen sawmills within the district have been registered with the Industries Department in Shahdol while another twenty are not registered-

The total sawing done by the registered sawmills is estimated to be about six thousand cubic metres, which is roughly 14% of the sal timber sold.

Collection of dry fallen wood is permitted and forms an important source of urgent money, a buffer against unemployment. Timber rejects are also sold as firewood.

Most of the charcoal, whose production is handled by the Forest Department, is exported from the district, since it has industrial uses. Three to four fuel stacks are converted to one bag of charcoal.

Most of the timber goes out of the district. Furniture shops in Rewa and Gujarat use timber from Shahdol. Timber plank from the region finds its way to Haryana, Agra and other parts of U. P. Charcoal goes to ferro-alloy industries in Andhra Pradesh, as also to Indian Metal and Ferro-Alloys, Bhubaneswar. Also to Katni as fuel. Hardly any finished wood products are manufactured within the district.

Amongst major consumers of timber are: Railways for rail sleepers, coal mines for mine shorings, and Defence departments for constructional requirements. The Forest Department normally supplies them timber on a priority basis.

4 06.03 The largest paper mill in the country is located in the district. It has a capacity of 250 tonnes of high grade paper per day; for this it consumes 450-500 tonnes of bamboo and 150-200 tonnes of hardwood daily. The mill has its wood catchments area in all the forests of Eastern M. P. Due to the increasing shortage of bamboo and hardwoods, the Forest Department has turned towards plantation of eucalyptus to be used for paper manufacture.

The forests of Madhya Pradesh supply raw material for many paper manufacturing units, both inside and outside the state. The annual supply of bamboo for the year 1978-79 gives an idea of the scale of exploitation of forest resources for paper manufacture alone:

Orient Paper, Amlai	103,833 tonnes
Bengal Paper	30,000 tonnes
MP Pulp and Paper	25,000 tonnes
Nepa Mills	97,500 tonnes
Sirpur Mills	8,333 tonnes
Orient Paper, Brijrajnagar	8,333 tonnes

Three of the above units are owned and controlled by a single monopoly house.

4.60.031 The profits of manufacturing units which utilize forest resources are linked to the prices at which they receive these resources. For example, Orient Paper Mills, Amlai, which started operations in 1964, had entered into a 20 years contract with the government of M. P. whereby it was to receive bamboo at 36 paise per tonne. The market price of bamboo today is Rs. 270 per tonne.

4.06.04 Minor forest produce: Mahua, Tendu leaves, Harra, Mahulain leaves, Katha, Bamboo and Cane, Lac, Sal seeds, Gums and resins, Chirounji Seeds and Minerals.

4.06.041 Mahua is the most important forest product for the people after wood. The flower is eaten by humans and cattle and the seed has 35% to 40% oil content. The mahua flower is collected from mid March to mid April and has high sugar content. An estimated 10,000 tonnes of flower is collected annually, about 40% from forest lands and rest from the lands of farmers. Half of it is consumed domestically, both as food and liquor. The collection, consumption and sale of the flower and seed forms an important part of the survival pattern of the poorest. It provides employment in the agricultural slack season, provides a dietary supplement as also a source of money with which to buy other requirements. In season, the flower is sold for as little as 25 paise per kg. - the price later rising to Rs. 1.50 per kg. Collection and sale of the flower bring in R. 150 to Rs. 200 per month to a family in summer. The inahua seed season stretches from mid June to end July. The seed passes through a chain of 2-3 middlemen before reaching the processor. The processing points seem to be Agra and Indore where the seed is crushed and solvent extracted. The villagers use the oil for cooking vegetables and say that the oil from the young fruit is better to eat, though the mature fruit yields more oil which is, however, more bitter. A simple oil expeller used in the villages yields about 38% crude unsettled oil.

4.06.042 In 1969, the mahua trade was nationalized. In that year, only 5% of the mahua found its way to the retailers through the highest bidder. The remainder was either exported to distilleries or used by distilleries in the district itself. Today, the production and sale of mahua liquor by the tribals has been declared illegal though the government operates its own legal distilleries. In 1972 the government revoked its nationalization order seeing no profit in the trade.

4.06.043 Tendu leaves are used for the outer wrapping of bidis. Collection of leaves is done in the months of May and the early part of June, in the agricultural slack season. Though the government is the sole purchaser, over the years middlemen and contractors have earned fortunes in the trade. The government pays Rs. 2.75 for 5000 leaves (50 leaves x 100 bundles); a group of three persons can earn Rs. 6 – Rs. 7 per day out of this activity. The revenue accruing to the government from Tendu leaves is high; in 75 - 76 for Shahdol District it touched Rs. 2 crores.

40.6.044 Harra (myrobalam) fruit, though not a major contributor of revenue is an important source of tannin for the leather tanning industry. The dried green fruit has

medicinal value and is used in the treatment of digestive disorders. The collection of the fruit is done between November and January; some collection of the green fruit is also done in May and June. The fruit is sun dried, crushed and the seedless husk is exported.

In 1973, the production in Shahdol was 50,000 qtls. Bastar and Raipur produced 3 lakh quintals.

4.06.045 Sal seed is abundant in the eastern parts of M. P. Though the seed is directly edible, oil cannot be extracted by mechanical expelling. The oil 12% in content is extracted by solvent extraction process, though the meal leftover is toxic and can be used in animal feed in small quantities

4.06.046 An excerpt from the March 1980 issue of EPW serves to throw some light on the organisation of the Sal seed trade.

“Hindustan Lever has established an all time new record by nearly doubling its exports from Rs. 17 crores in 1978 to over Rs. 32 crores in 1979. The Company’s single largest export in 1979 was its own product, processed sal derivatives, manufactured in its plants at Bombay. The product alone earned Rs 10 crores in foreign exchange. Here the major contribution of Hind Lever has been developing a branded product through R & D effort as a cocoa butter substitute which has enabled it to obtain a much larger value-added product - its price realization being more than double of the Sal oil prices.

Nearly 48,000 sq. miles in Orissa, M. P. and Assam are under Sal forests. The fallen seed yields 14-16% greenish yellow fat, of which the potential is estimated at 700,000 tonnes.”

4.06.047 Hindustan Lever developed (he solvent extraction process for Sal oil in 3968 which set into motion the large scale systematic exploitation of sal seed for commercial use. At that time, Hindustan Lever was the sole purchaser and bought the seeds from three cooperatives:

Year	Wholesale purchase rate	Market rate
1968	Rs. 150 per tonne	Rs. 350 per tonne
1973	200 „ „	Rs. 524-Rs.650
1974	300 „ „	Rs. 700-Rs.800
1977	400 „ „	Rs. 800-Rs.1100

The trade was nationalized in 1974.

The adivasis dry the collected seed and pound it to extract the kernel which is sold. There is demand both in India and abroad for sal oil in the manufacture of soap. A 100 tonne solvent extraction unit costs Rs, 60 lakhs.

In 1977 the Government started Adivasi Uplift Schemes to organise the sal trade through selected Forest Departments. Credit was made available through State Govt channels, Khadi Commission and State Bank of India. The purpose was to streamline the storage and transport facilities for the 14,500 tonnes of seed worth Rs.80 lakhs. To

this end 76 Seva Sahakari Samitis and 4 Van Shramik Sahakari Samitis were handed over the organisational responsibility, in exchange for a Rs 4.5 lakh commission,

406.048 Chirounji is an edible fruit whose seed yields oil. The seed is a high value item, selling in the local market at Rs.30 per kg and is used as a flavouring agent in a variety of sweets. These trees are less numerous than mahua and are mostly privately owned.

Other minor oilseeds of tree origin are Neem and Karanja which are traded in large quantities. Piloo and Kusum also have large quantities of extractable oil.

4.06.05 Animal bones and hides also come under the purview of the Forest Department, The bones and hides are flayed and skinned by the Bhariya caste who bring head and shoulder loads from distances up to 65 km to the nearest buying station-In Anuppur, there are two buyers and consequently prices are slightly higher than at Bucihar which has a single purchaser.

In Jabalpur, the bones are crushed and in the process 70% of the bones are reduced to small lumps and 30% to powder. The bone lumps are forwarded to Bombay from where they are subsequently exported to London. The bone powder is sent to Cochin and eventually sold as fertiliser without further processing. Horns are sent to Moradabad for making combs, buttons etc.

Parts of the hides are locally tanned by the chamars, using either Chuna or Harra in the process.

406.06 The villagers are specific in stating their requirements of wood for fuel, house construction, ploughs, carts and fencing. In addition, edible fruits and seeds are also obtained from the forest, chiefly mahua, tendu fruit, harra and chirounji. The sale of firewood and minor forest produce has provided a subsidiary source of income to tide over hard times. With the recession of forests, more time and effort has now to be expended in collection of wood and other requirements. The increasing commercial and industrial demand has resulted in larger areas being converted to Reserve Forests and Protected Forests as a result; there is greater harassment of villagers by forest officials. The Forest Department has established wood depots for sale but these prove inconvenient to the villagers.

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4.06.07 Forest lands are divided into three categories (i) 'Nistar' forest, free for use, (ii) Reserve forest, (iii) Protected forest, where cutting is illegal but dry fallen wood may be collected.

4.06.071 According to an official document, the rate of deforestation over the entire state is 800 sq km. per year.

Conflicting viewpoints are offered regarding the causes of deforestation. According to the Forest Department, their felling is systematically planned and does not cause deforestation. The major causes of deforestation are illegal cutting for firewood and construction, clearing of land for agriculture. Minor causes are forest fires, cattle grazing,

erosion, lightning and mining. According to villagers, the amount of fallen wood is insufficient for firewood requirements. Government wood costs Rs.8 per quintal and coal Rs.16 per quintal. It is cheaper and easier to bribe a forest guard. Further, they claim that excessive and illegal felling by contractors is responsible for the depletion of the forests.

4.06.072 Illegal felling by contractors is done in a number of ways. Contractors are permitted to fell only a specified number of marked trees, which are either imperfect or fully grown. Contractors however, fell healthy growing trees in greater numbers than permitted as also trees of less than specified girth. They manage to get away, by bribing forest guards who are ill paid and expected to look after large areas. Excessive felling destroys the canopy cover of the land, resulting in erosion of precious topsoil which in turn affects future growth.

4.06.08 The reforestation programmes undertaken by the forest department have concentrated mostly on teak, eucalyptus, sal and bamboo. Comparatively little attention has been paid to Mahua, Chirounji and other trees of use to the local population. Some fruit trees such as mango, guava and jamun have been sold or distributed to the villagers. Homogeneous plantations of teak have suffered from pests called defoliators which can wipe out entire plantations by quickly spreading from one tree to the next. Similarly, forest fires in such plantations are also devastating because the entire plantation dries up in the same season; lack of interspersed other species results in no check on the fire. Similarly, competition between trees of the same family for the same type of soil nutrients leads to stunted growth in homogeneous plantations. Eucalyptus plantations have showed signs of a drop in the water table because eucalyptus requires large quantities of water for quick growth. Sal plantations have registered increase in soil acidity. Again, mortality of plants is higher in such plantations because of competition for sunlight. According to forest department figures, plantation programmes have succeeded in generating slightly more than 1% of the total forested area of the state. M 34
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4.06.081 The seed system of plantation, in the case of teak, requires 120 years to develop into a fully mature tree. An alternative proposed is the coppice system, in which the root is preserved and made to yield more than one stem thus increasing the total yield of wood per tree. Whereas this will reduce time period of growth, it fails to provide a satisfactory canopy cover to protect the soil from erosion. N 10

4.06.09 There are varied attitudes towards the forests. Many villagers though aware of depletion of forests, are forced to continue cutting as they cannot afford any other fuel. They are also forced to bribe the forest guards but resent having to do so. On the other hand, forest guards and rangers feel that they are poorly paid by the Forest Department and expected to look after large beats in the forests, ranging from 15 to 30 sq. km. Further, the poorer peasants ranging from landless, marginal and small farmers up to middle farmers do not see reforestation as their responsibility considering it the duty of the government. The forest department has through its own policies and lack of perspective succeeded in alienating itself from the people. Though the department claims M 35
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that it is trying to educate the people through radio broadcasts and posters, people say they have never seen or heard of any such programmes. Forest guards say that their own strength is too small to prevent illegal felling and that no stringent action is taken against offenders. Senior forest officials blame corruption, interference by other government departments in Forest Department policies, such as, by not punishing offenders, settling encroachers and being forced to fell more trees for increased revenue. Also, that the locals are ignorant and lack foresight.

4.06.091 The task of forest planning is in complete charge of the DFO of each division. He works according to guidelines laid down by experts, revision of which is made every ten years. Local people are not involved in this planning exercise and their survival needs are not given due weightage. The planners are trained and experienced officers who get information on suitable trees from the Forest Research Institute in Jabalpur.

4.06.10 The government of M.P. has established a Forest Corporation whose task is to set up forest based industries all over the state. Some of the major units planned are.

INDUSTRY	LOCATION	CAPACITY (Tonnes per annum)	INVESTMENT (Rupees in crores)
Newsprint	Bastar	66,000	50
	Bilaspur	66,000	50
Paper	Bilaspur/Raipur	33,000	30
	Bastar	1, 65,000	90
	Balaghat	33,000	30
Rayon Grade	Bastar	66,000	50
Pulp	Bilaspur	33,000	30
	Central Circle	33,000	30

4.06.11 Non-cooperation by the rural poor is easily understandable considering the convoluted nature of legal controls exercised through forestry legislation and regulations. A simplified picture is presented below:

4.06.111 Building wood needs of agriculturists are met provided they obtain a certificate for the purpose from the Sarpanch of their Gram Panchayat. The next step is to get the certificate converted to a license from the authorised personnel of the Forest Department. This enables the agriculturist to obtain 15 logs subject to availability at the

depot. The wood is classified into 3 categories depending on type and size; this classification seems to be different for different divisions. The wood is available to agriculturists from 1st January to 30th April after which date the agriculturist can obtain wood from a depot attached to another village provided he procures an additional certificate from the sarpanch of the concerned village. After 30th April the wood is sold to non-agriculturists.

4.06.112 Firewood-fallen, dead and dried wood-is permitted free by the department for head and shoulder loads, but a small price is charged for cartloads. The wood should not exceed a specified size else it is classified as building wood. The size specification for South Shahdol Division was in feet and inches whereas North Shahdol preferred the metric system up to 1974. Cartage of firewood for both commercial and personal uses requires a licence issued by the appropriate forest authority, after procuring a certificate from the panchayat. If the agriculturist does not possess the necessary license he is charged at the higher commercial rate. Commercially cut firewood cannot be carted to a spot and then lifted by truck. Departmentally cut firewood may be obtained from specified locations only. The firewood rates appear to be different in the various divisions. The wood may be obtained after showing the license money receipt to the forest guard in whose beat the area lies.

4.06.113 Bamboo is also sold at differing rates in the various divisions. Rural bamboo users are classified into 4 categories and per family, each category is allowed a certain maximum number of pieces of bamboo annually. The purchase of bamboo requires certification from the Sarpanch and for agriculturists is open up to 30th April, after which it is sold to non-agriculturists. Non - agriculturists may use bamboo for household purposes but may not sell. In spite of the certificate license, bamboo maybe taken only by head and shoulder loads from specified areas. Various technical specifications are in forces which permit felling of certain types and sizes of bamboo.

4.06.114 Those villages surrounded by Reserve Forests may not obtain personal needs directly from the forest. The forest department has laid down a list of 15 items which includes stones, earth, murrum along with strictly specified forest products which may be carried away for personal use. The villager has to pay for these items and obtain a license in case he uses a cart or animal for transport purposes.

4.06.115 Village artisans — blacksmiths, cobblers, lac and bangle makers, ornament makers, licensed brewers, lime makers, bamboo users - as also vegetable growers are each allowed specific items only as per needs related to production. For agricultural labour also a whole list of items is specified. For example, 25 logs of building wood are allowed out of which no more than 17 should have the thicker edge no more than 24 inches in circumference. For obtaining these needs, passes have to be obtained which require renewal every year.

4.06.116 There are two kinds of licenses issued for grazing viz. yearly and transitory. Those who keep animals for business purposes have to obtain a special license; the

ages of cattle and calves are noted on the license and calves less than a notified age need not be covered under the license. The license should always be carried by the cowherd and produced on demand, else he may be subjected to a fine. The license has to be renewed every year between 1st June and 31st July.

4.06.117 Those whose houses are destroyed by fire should immediately inform the Tehsildar and through him obtain a recommendation from the Collector to approach the concerned DFO to get wood for a specified size of house - 3m x 4 m with a single 2 m verandah and a single animal shed. The wood and other requisite forest produce may be obtained after the permission of the DFO is presented to the concerned Range Officer in whose presence it has to be collected.

It is quite easy to see how such widespread systemic control can be converted to corrupt practices and also how it serves to alienate the rural poor from the policies and programmes of the Forest Department.

The information presented has been collected through wide ranging interviews and discussions with forest officials, farmers, shopkeepers, villagers from both forested and deforested areas.

4.07 Industries:

4.07.01 Orient Paper Mill (OPM), Amlai, was set up in 1965, at a cost of Rs. 30 crores. The entire plant and equipment has been imported from abroad. It has an installed capacity of 250 T of paper a day. Cheap raw material, cheap labour, concessions in taxation and a well developed rail net work were some of the determining criteria for setting up OPM in a backward district.

The Mill, over the last 15 years has chopped up all nearby verdant bamboo forests and converted them into paper, earning the Mill a declared gross profit of Rs. 5.95 crores last year. Now bamboos, which constitute 80% of its feedstock, have to be got from as far Balaghat, Hoshangabad and Betul, some 500 kms. away. Hardwoods are obtained from Himachal Pradesh.

The Mill gives permanent employment to only 1600-1700 people. It however, employs more than double these workers as casuals and contractor workers.

OPM has 3 saw-mills, to chop huge wooden logs into smaller pieces and a 20T per day capacity lime kiln. But the running of these units have been subcontracted to labour contractors, who employ migrant tribals to work for a pittance. The Trade Union of the Mill has never taken up the demands of the casual and contractor workers - who remain totally unorganised.

The Mill has been dumping its effluents in the nearby Son River. The ecological implications of the Mill have been dealt elsewhere. The Paper Mill has a captive Thermal Power Station for supplying its needs for electrical power; from '64 up to '73 it also had a captive coalmine for supplying coal to its TPS. Following nationalization of coal mines in '73, it purchases coal from Western Coalfields, a Govt. undertaking.

4.07.02 The Hukum Chand Jute Mill (H.TM). Amlai, is a sister concern of the Orient Paper Mill (OPM) A major part of the plant has been imported from Japan, It commenced production in 1965 and presently employs about 400 people. The quantum of output for a three shift day is 60T of Caustic Soda, 30T of Chlorine (liquid), 15T of Hydrochloric Acid and 12T of Hypo. Most of these products are supplied to OPM for production of paper. There is no canteen for workers though as per law the management is obliged to set up a canteen if the workforce exceeds 250. Only 5% of the workers have been provided with quarters.

Like its cousin OPM, in HJM too the casual labour system was rampant. In the 1978 strike the workers were able to abolish the casual labour system. About 30 workers were made permanent and 9 converted into the category of substitute workers. The contractor workers, however, have remained. During the strike the minimum wages were increased from Rs. 300/- to Rs. 500/- per month. The HJM, like the OPM is also a very polluting industry. Its ecological impact has been discussed in a separate section.

4.07.03 Amarkantak Thermal Power station (ATPS): Of the 3 Thermal Power Stations in Madhya Pradesh, one is in Shahdol. It stands at Chachai and produces 300 MW of electricity. It provides electricity to the Hukum Chand Jute Mill for electrolysis of brine. Though OPM has its own captive Power House, it still takes some electricity from Chachai. This Madhya Pradesh Electricity Board (MPEB) plant also supplies electricity to the nearby towns and collieries.

There are 2 Generators of 30 MW each, imported from Germany and installed in 1964. Another 240 MW capacity was added in two expansion phases. By 1978 the installed capacity was 300 MW. These two 120 MW plants have been supplied by BHEL. A perennial nala - Suthna, has been dammed in an area of 208 hectares, to create a reservoir for water storage. The reservoir capacity is insufficient to cater to the needs of the plant. So, used water, with a lot of ash content is dumped back into the reservoir leading to a rise in temperature of water in the reservoir. A thick seam of ash has piled at the bottom of the reservoir.

The plant needs a total of 4000 T of coal a day, for its running. There are four ramshackle steam locomotives bought second hand from the Indian Railways. Their maintenance is very poor and two of the locomotives are in permanent breakdown. The other two locomotives haul only about 1,500T of coal a day. The rest of the coal haulage (about 2,500 T a day) is done by road employing dumpers and trucks. The rates charged by contractors are Rs. 8/T. The cost of transportation by road comes to nearly 3.5 times that by rail. The MPFB/Chachai pays approximately Rs 0.2 lakhs a day to coal transport contractors.

There is a central repair workshop, where most of the repair and reconditioning is done.

There are about 1,200 permanent employees. But a multiplicity of unions keep the workers divided, and prevents them from asserting their legitimate demands.

The 240 MW expansion cost about Rs. 85 crores. The capital expenditure per KW of installed capacity was Rs. 3,077.08 and production costs are estimated at Rs. 0. 1132 / unit-

Despite supply of power to OPM HJM/ WCL and towns, most of the villages even in the close vicinity of MPEB/Chachai have not been electrified. According to the 1971 census report, only 49 villages out of a total of 2,150 villages (2.3%) in Shahdol had been electrified. By 1976, this figure had increased to 95 villages and 8 towns.

4.07.04 A Super-Thermal Power Station is coming up at Manthar, near Birsinghpur. The rationale behind setting up the Super - TPS is that, it is much cheaper to transmit electricity in bulk over large distances, than transporting coal, whether by rail or road. Hence, the proposal of setting up a Super - TPS near the coal pitheads. The initial capacity of the plant would be around 400 MW, which will gradually be expanded to produce 1,150 MW.

Most of the trained manpower for running the plant - engineers, technicians and operators would come from outside the district. Even during the construction phase, most of the contractors would be from outside, and only the most menial and unskilled jobs would be available to people within the district.

However, the local youth are organising themselves into a committee to press their demand that they be given preference in jobs over outsiders.

4.07.05 Western Coalfields Limited (WCL): There are 14 coal mines in Shahdol. Three of them at Jamuna, Chachai and Harrad, are open cast. The rest are underground. Prior to nationalisation of the coal mines in 1971, they were owned by the A. C. C., Shaw Wallace, Rungta, Nagrath and other private entrepreneurs. All the coal mines are now under the management of Western Coalfields Limited, a subsidiary of Coal India Limited. Most of the coal is dispatched to various Thermal Power Stations and other industries outside the district. Within the district coal is mainly used by the 300 MW Amarkantak Thermal Power Station, located at Chachai.

Each mine has its own captive workshop to undertake repairs and maintenance of plant and equipment. There is a large central workshop located at Dhanpuri, which apart from having a 5 Tonnes per month capacity foundry also caters to repairs of larger machines which the small captive workshops cannot handle. A large part of the equipment used for excavation of coal like coal cutting machines, winches, draglines, Haulpak dumpers and road graders are imported.

The working conditions of coal miners have bettered after nationalisation. The minimum wages for permanent miners are Rs. 512/- per month. Housing, sanitation, drinking water, supplies of essential commodities at controlled rates for the townships are some of the persistent demands made by workers.

4.07.06 Maikal Minerals (Yellow-Ochre Factory): The owner has got a 25/30 year lease of the yellow-ochre mines at Amarkantak. The choice of Anuppur for setting up

the factory was because Anuppur was the nearest rail-head from Amarkantak. The other alternative site was Pendra, but wagons are not easily available there. A hammer mill, powered by a 75 H. P. motor pulverises the yellow - ochre into fine powder. The powder is packed in 25 kg gunny and plastic bags and sent off in wagon loads to distemper manufacturing units all over the country. It is also used to give a protective layer to tarpaulin.

For 4 months during the rainy season the Amarkantak mines get waterlogged and remain closed. So before the onset of the monsoons the factory stocks 4 months of raw material. This stock lies in mounds in the open. To prevent erosion from wind and rain it is covered with green stalks and leaves of the pernicious 'Ipomea' weed.

The plant has a capacity of grinding 3 T of yellow ochre a day.

4.07.07 The Shahdol Industrial Estate lies about 3 kms. away on the Singhpur road. There are 5 massive industrial sheds, covered with galvanised iron sheets and each having 6 roller shutter gates. Only one shed has been occupied by 'Shahdol Bone Crushers'. Foul, nauseating smell pervades the air. No entrepreneur came forward to occupy the factory sheds. The Industries Department was forced to give the shed on rent to the bone crushing unit.

A hammer mill of 15 HP crushed bones into fines. A vibrating sieve 7.5 HP and a blower separate the fines into several grades. The thread like appendages from the bones run down a vibrating ramp like wood shavings and are tapped out. The sorted fines are packed in burlap bags. Most of the crushed bones are supplied to the animal feed division of M/s Hindustan Lever, who use it to fortify their chick feed.

4.07.08 There are 14 coalmines in the district. Railway wagons being always in short supply, large quantities of coal are transported by trucks. The roads are in a bad shape. Only temporary patchwork is done in the name of road maintenance. The rubble and sand with which the potholes are filled get washed off with the first rains. In most of the 10 tonne trucks, drivers normally load 15 to 18 tonnes of coal to make an extra buck. Bad roads plus overloading leads to heavy vehicular breakdowns. Rear axle tubes, axles, leafsprings, crown and pinion shearing are regular occurrences.

A lot of small workshops have mushroomed to cater to the demand of truck repairs. Battery and auto-electric work, radiator, puncture repairs and vulcanising; and 2.5-3 metre lathes for repairing rear axles of trucks. Gas welding facility is available only at the bigger towns. Most of the workshops are run by Sardarjis who came and settled in Shahdol after partition. The rest have been started by mechanics from Rewa.

Apart from catering to the needs of the transport sector, these workshops also handle pipe cutting, threading and socket making jobs required by the Public Health Engineering Department (PHED), the Irrigation and the PWD. Two workshops in Shahdol manufacture steel cupboards and household steel furniture.

There is only one foundry in Shahdol. It has an oil fired cupola furnace, and casts tub wheels for the Sohagpur Coal sub-area. It has an attached machine shop with four lathes. Between Budhar and Kotma, a distance of some 75 kms, there is no truck repair mechanic. A number of auto parts dealers have set up their shops in Shahdol. The rates, however, are quite exorbitant, and a lot of second quality spares are palmed off as “original equipment”.

4.07.09 Bauxite mining operations are carried out at Amarkantak, one by the private sector HINDALCO and the other by the public sector BALCO. Whereas HINDALCO exports its ore to Renukoot in U.P., BALCO sends its ore to Korba in Bilaspur District, for aluminium manufacture. BALCO has greater mechanisation than HINDALCO and its output rates at 3-4 tonnes per head per day as compared to HINDALCO’s 2 t.p.h.d. BALCO also pays better wages to its workers, the minimum being fixed at Rs 8 per day whereas HINDALCO pays Rs 4-Rs 5 per day at the minimum level. The BALCO mines can produce up to 11-12 t.p.h.d. but the problem seems to be with the machine operators who aim for overtime wages. At one stage production incentives were introduced but were withdrawn after a time for reasons unknown. As a result, BALCO once had to borrow 40,000 tons of bauxite from HINDALCO. Whereas miners and machine operators are directly recruited by either the mines or the factory office, certain operations such as sizing, sorting and screening are given on contract. The BALCO workers, on the whole, seem more satisfied than their counterparts at HINDALCO as regards the functioning of their unions, though housing of miners is still an outstanding issue at BALCO.

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4.07.10 The first railway line in the region was laid by the British in the mid 1880’s for transportation of coal from the Umaria minehead. Subsequently, a branch line leading from Anuppur to the Chirimiri coalfields in Surguja District was added and another line, intersecting the northern portion of the district connects Katni to the Singrauli Thermal Power Station, Renukoot and Obra TPS, linking up at Garwa Road. Both tracks carry much heavier goods traffic as compared to passenger trains; the southern line carries coal and forest produce in large quantities as also bauxite ore. At present, there is a single loco-shed at Shahdol; a second one, proposed for the district, has been the subject of political controversy regarding whether it should be located at Anuppur or Bijuri.

The working staff of the railways consist of coolies, catering staff, khalasis, signals staff, commercial staff, track maintenance gang men, booking clerks, workshop staff, coach and car maintenance crews, TTE’s, Engine drivers and Guards, ASM’s and SM’s. The track maintenance crew are mostly uneducated labourers little concerned beyond wage increases. Kerosene issued to them for night lamps is put to domestic use. Materials from the railway workshops forms the basis for a lucrative trade on the open market. The coach and car maintenance crews rarely check the bearings of short distance trains or adjust the brake shoe distance. In the rare cases when these operations are performed, the attitude is to replace the parts rather than economise on the materials.

Lubrication oil provided for oiling buffers and couplings is traded for milk by the babus and mistris. Carpenters refuse to work as also plumbers because they are not provided with Khalasis. Khalasis are employed on a non-regular basis. Booking clerks at ticket windows are often missing at train times so that ticket windows are closed. Even otherwise, about 30% of passengers between Shahdol to Pendra travel without tickets; on the Chirimiri branch line this is as high as 60%, since vigilance checks on that section are even more infrequent. The normal practice is to give 50 paise to the TTE on the train and an additional 50 paise to the TTE at the gate. The Chirimiri TTE posting is considered one of the choicest, and can be purchased by suitable investment at HQ level. The more militant running staff of engine drivers and guards often enforce their demands by stopping goods trains between stations and asking that the relieving crew take over as their shift of duty is over. Similar patterns can be seen in the activities of the other staff as well.

4.07.11 Relationships in Industrial Production

4.07.111 The practice of employing workers on a casual, temporary or contract basis is widely prevalent in the region. This is normally done by sub-letting certain tasks to contractors rather than directly to the workers. Thus OPM, while retaining ownership of a lime kiln and saw-mill, awards the operation of both units to contractors who employ workers from surrounding villages. Details of both operations have been outlined in the case study. Additionally, casual workers are also employed in construction activities and at times even operate through the Time Office of the Mill, when they act as substitutes for absent regular employees. Similarly, in HIM casual and contract labourers are used in semi-skilled jobs to cut down on production costs by virtue of having to pay lower wages to such workers. In ATPS, contract work is fanned out for such tasks as earthwork, reservoir dredging and construction activity. The Madhya Pradesh Electricity Board (MPEB) also employs gang men on a muster-roll basis; it is reputed that over the entire state about 20,000 workers enjoy this status for doing jobs ranging from pole erection to line maintenance.

In general, this category of workers is not covered by industrial legislation of any sort. They have no tenure on their jobs, are daily-rated or piece rated with no paid holidays, have no guarantee of being regularised on their jobs, do not receive amenities such as medical, safety equipments, DA or unionisation rights. Further, the same type of work gets roughly 50% of the wages as compared to a regularised worker, out of which the contractor normally takes a further cut before paying the labourer the wages agreed to by the industrial employer. Thus, unskilled workers receive in - hand wages of Rs. 4.50 per day, semi-skilled up to Rs. 7 and skilled replacement workers get Rs. 9 - Rs. 11 under such a system.

The aspirations of rural youth deriving mostly from middle, small and marginal farming backgrounds are tuned into this process viz. seeking casual employment in a fringe

activity of an industrial centre for 2-5 years, then being employed by a contractor for a similar period on a more continuing basis, and finally being absorbed into the semi-skilled category of the industrial concern. The transition at each stage is normally lubricated by an offer of gratification in terms of cash, grain or liquor.

4.07.112 A brief history of union activity in the region serves to show how industrial relations have changed over the years. Prior to independence the communist led unions were divided. INTUC sided with the ruling party. After independence, the bourgeoisie saw a threat to their own interests in the growth of the unions and so collaborated in bringing about the split of the unions. In '65- '66, AITUC started organisational work in the region and opposed the practice of coal - mining by the contract system. Until then, an organisation named Central Recruitment Office used to operate from Gorakhpur, supplying labourers to the various privately owned coal mines. The labourers were kept in camps, more like jails, and escorted to and from the workplace by plain clothes men in the owners' employ. Thus unionisation in the private coal mines was effectively stalemated and only after the nationalization of the coal mines in '73 has there been any effective unionisation and communication between workers in the mines Welfare activities among workers, taken up by management, also have a short history. Even today, unity between unions is weak and industrial workers from the region do not have any political pull at the centre. Similarly, of the three Thermal Power Stations operated by the MPEB all over the state (Korba, Sarni and Chachai), the one at Chachai (ATPS) has had significant union activity only in the last 5 or 6 years.

4.07.113 Currently, unionised labour is demanding a canteen at HJM, a wage board settlement at ATPS and its activity is at a low ebb at OPM following a 100 day strike in '78-'79 There is a proliferation of unions at each industrial workplace (3 to 4 on an average); workers at HINDALCO and ATPS are dissatisfied with the way their unions are operating and want a more democratic representation and functioning of these bodies. The more educated and urbanised workers do not see eye to eye on union issues with the lesser educated workers coming from rural backgrounds. Such issues include, unity amongst workers to protect their economic interests against soaring prices in an inflationary market uncontrolled by the bureaucracy, against management/employers, resort to strike, concessions in working and living conditions such as housing, sanitation, transport and recreation etc. Local workers owning land in the nearby villages are loath to risk their jobs by displeasing management as the income from industrial employment goes to supplement earnings from land. Such workers often act as strike breakers, thereby earning the wrath of their fellow workers whose survival depends on their wages alone. This division amongst workers is especially prevalent in the coal mines, OPM and ATPS. In the Railways, broken shift duty (3 hrs in the day and 3 hrs at night) has become a bone of contention between the more educated Bengalis and Telugus on the one hand and the more backward Oriyites and Raigadhiyas on the other. Broken shift duty has affected the health of the workers leading to gastric problems and fatigue and the first group would prefer continuous

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duty timings. The second group is opposed to this as it means loss of about Rs. 100- Rs. 150 p.m. by way of over time. This over time is normally obtained without having to perform any work, since the late running of a train means that the workers have to just stay on duty till the train leaves the station. Similarly, loss of OT wages is an issue between regularised workers at OPM and casual workers who are brought in to make up production shortfalls. The OT system enables the company to employ a smaller workforce. Further, issues of region, caste, religion and language are widely prevalent amongst workers and serve to prevent the emergence of unified action. Thus, local workers feel that preference in employment should be given to local people in industry, if possible, rather than employing workers from other areas. Similarly, workers already employed in industry would prefer to have newer workers from their own regions or communities. Further, local workers because of their links with the local area, feel involved in local development issues such as pollution, education, industrialization, power shortage, literacy and so on and resent the aloof attitudes presented by their non - local fellow workers on these issues.

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4.07.114 Management in some of the industrial units such as OPM and HJM want to give production contracts to their supervisory staff. Union leaders perceive this as an effort to destroy workers unity by giving arbitrary authority to the supervisors and ensuring that the supervisor's economic interest comes into conflict with workers interest. Union leaders also feel that the executive and judicial machinery at the State and District levels is partisan in its approach to labour - management conflicts especially in the process of negotiations.

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These are representative of the patterns of industrialization seen within the district.

4.08 Services

4.08.01 Education & Training

4.08.011 In 1972-73 the district had 1,183 primary schools with 94,941 students, 191 secondary schools with 25,764 students, and 36 higher secondary schools with 10,181 students. This was for 2,150 villages and the student-teacher ratio was approximately 1:50, 1:25 and 1:20 at the respective schools. There are 3 government colleges and only 907 students have managed to reach this level. There are 70 teachers in these 3 colleges. The tribal student's percentage drops perceptibly from 52% at the primary stage to 9% at the college level. In addition, there is one Polytechnic with 126 students and one Industrial Training Institute with 585 students. There are 3 tribals in the former and 64 in the latter. The literacy levels are extremely low - 37. 9% in the urban areas, 11.6% in the rural areas, average of 14. 59%. Of this women comprise 5, 78%. In 10 years literacy levels have risen by 5% for men and 2. 9% for women.

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4.08.012 This is the statistical picture. The reality is, of course, even worse. The example of the school in the village Jamudi, lying on the main road, may be taken as somewhat representative. There are 57 students on the rolls, but the average attendance

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is about 12. There are supposed to be 2 teachers but one is invariably absent, either on leave or on transfer while the other is forever scheming to get out of the trap he finds himself in despite the comparatively higher salaries - the teacher gets Rs 350 as compared to a landless labourer earning Rs 90 per month. Teachers complain of many irregularities in their service conditions like ad - hoc transfers and suspensions on trumped up charges of insubordination. The facilities of transport to the schools from their place of residence are poor, if not non - existent. There is little respect afforded to their profession from other departmental officials, and they are considered extra manpower for various governmental functions when the need arises. Instruction is confined to the rudimentary alphabet, beatings, and drawing water or making tea for the teacher. Materials like maps; charts etc. provided by the Education Department are collecting dust and cockroaches in a store-room. Pass percentages are set by the department irrespective of examination performances.

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4.080.13 It is naively thought that the poor and oppressed don't know about the existence of schools. On the contrary, they have assessed the schooling system, and rejected it given their own existential constraints. A child is better employed collecting mahua flowers, sal seeds and mahulain leaves, or else grazing cattle than going to school. He at least earns one rupee per day.

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The State, too, makes education a bane for the poor. Education is a disqualification for the majority of the jobs the State itself creates. There are 14 coalmines in Shahdol, recruiting 1,300 people annually. 95% of these jobs are for the categories of miners and loaders and the rest 5% for the other categories like clerks and technicians. The local coal Recruitment Office - as per a government directive-rejects all applications with qualifications of High School or more for the jobs. There are scores of instances of educated youth faking their qualifications, writing eighth class fail, even when they were High School Pass.

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4.08.014 Through the system of examinations the State weeds out all undesirable elements at various stages. The choicest jobs are doled out those who have 'conformed' the most. The State fails to provide jobs to those it brands as 'educated'. It then makes a "degree" a disqualification. Educated loaders have organised workers in the past, posing a problem. Students in the science and arts colleges have expressed their dissatisfaction with the quality of education. The education does not prepare them for the competitive conditions under which a few jobs are available and they are disadvantaged in comparison to youth from the various cities in the neighbouring districts. Neither does the education prepare them to seek independent work. There is corruption in the administration of college affairs. Stipends for adivasi students are pocketed, funds for facilities are not used efficiently and those facilities that do exist are badly maintained.

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4.08.015 The artisans in the village are mainly cobblers, blacksmiths, masons, carpenters and potters. The masons are practiced in mud work constructions and are ignorant of the elementary skills of RCC and cement construction. Most of them cannot

even use a plumb-line. The town masons are a little more skilled but unable to do any new kind of construction work especially in RCC. The same level of [raining is true of the other artisans.

The different sections of village dwellers are becoming conscious of needs that are not being met at the village level itself. Landless labourers require legal information on their rights to land; when working on earthwork contracts they are often cheated of their due wages due to inability to make the necessary computation. Village leaders are unable to comprehend the Block Development Schemes so as to make best use of the money available for village development. Youth from small farmer and middle farmer families are unemployed, even those with minimum educational qualifications are unable to get jobs in industries. The technical training institutes offer no alternative for these youth, since the minimum educational requirement of a high school pass is beyond their financial capacities.

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4.08.02 Transport

4.08.021 In 1973 there were 1474 kms of metalled roads and 557 kms. of motorable dirt roads in the district. Registered with the local RTO were 35 buses (private), 514 trucks, 219 motor cars. 112 two wheeled vehicles, 1 taxi and 15 three wheelers. There were nine local agents handling the private bus transport and a large number of forwarding agencies operating from the bigger towns. These catered to the heavy movement of forest and industrial produce that took place on the roads.

4.08.022 The buses carry enormous overloads. There are quite often as many as 50 standing passengers. The private operators of these buses rarely take more than a year to recover their investment in the bus. Tickets are rarely issued for short hauls. Heavy luggage invariably doubles or triples the cost of the ticket. And whenever a member of the social or economic elite gets on to a bus the seat he or she occupies will be one from which a villager has just been ousted. The RTO and police frequently crack down taking heavy payoffs for permitting the overloading. Curs are very rarely seen in the district. Most transport still remains confined to the bullock-cart or human labour.

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4.08.023 Anuppur Station is the main junction on the Katni-Bilaspur line. The main commodities brought in at Anuppur station by railway wagons are salt, onions, cement, livestock, and industrial raw materials. The main commodities transported out via Anuppur station by railway wagons are bidi leaves, mahul leaves (used for making leaf cups and plates), hides, oilseeds and oilcakes, timber, coal, yellow ochre, harra and also rice and wheat. South Eastern Railway is more concerned with developing the goods transport facility since there is more profit in it. Passenger trains are hopelessly overcrowded.

4.08.024 Due to shortages of wagons, huge quantities of coal are transported by truck to as far away points as Ahmedabad and Bombay. Instead of the normal 12 T loading, the truck operators load between 16-18 T. Bad roads are unable to withstand

such loads, leading to heavy vehicular breakdown. This makes life miserable for drivers and causes economic losses to the owners. It is common throughout the year to see stranded trucks with heavy loads and broken axles. RTO and police officials in roving vans and at toll gates are keen to catch such infringements and profit from permitting the overloading. Between Kotma and Bndhar, a distance of nearly 75 km. there is no workshop with repair facilities available. Chai shops and brothels have sprung up at choice places.

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4.08.025 Road building is organised through local labour contractors. A few tractors from small town businessmen are pressed into service, with a road roller from the PWD. The maintenance operation consists of patching up pot-holes which does not survive long. Gross malpractices prevail in road-building activity. Boulder base is not provided where recommended but claimed in the accounts, constructional materials are siphoned off, fraudulent muster rolls are maintained etc,

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4.08.026 Local truck owners had formed an association during the diesel shortage in '79-'80 and secured as much as 45% of the quota supply received by the district. The black market prices were as high as Rs.4.litre. Passenger buses and trucks used to carry barrels of diesel. There were many heated arguments at pump stations.

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4.08.027 Employees of road transport passenger services are unionised. Their demand is for wage increase and a portion of the passenger fares not shown in ticket sales. Drivers of buses and conductors are from Rewa and other cities of eastern M.P. Truck drivers of the local goods transport services are more disorganised and insecure. There have been a few attempts to improve the wages of the employees and the terms of employment.

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4.08.028 Both the State Transport buses and private buses ply on the some routes. The ST buses are very few and are long distance, for example from Ambikapur to Allahabad, a distance of almost 500 km. There is little competition between private and public road passenger transport. The State Transport employees discourage short distance travel and do not advertise their route to the illiterate populace. Private buses have agents who shout themselves hoarse before the bus leaves the station. Between private buses plying on the same route, however, there is a continuous tension and a tight schedule of timings. Any delay in departure of a bus would mean that passengers for the following bus would be lost. The bus employees are very conscious of this economic calculation on chronology. The passengers within the district towns and villages are largely marginal and small farmers reporting for court summons at the District Collectorate over land conflicts, middle farmers to buy farm inputs or to sell vegetables, industrial workers who are commuting, traders transporting their goods to and from market centres, and lower level employees of various departments. Labourers travel by bits only for contract jobs at distant places. Passengers are generally dissatisfied with the packed conditions of bus travel and the high rates that are continuously rising. Labourers who have regular unskilled work at PWD sites and in small manufacturing units prefer to walk daily distances of 15 kms and more.

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4.08.03 Relief and Welfare

4.08.031 Various departments at the district level were involved in the administration of what were called “Rahat Karya” (relief works). In 1979 the drought resulted in badly damaged crops. The acute problem of unemployment could not be met by ongoing plan works. All Govt. departments took up additional budgets for providing employment.

General guidelines were laid for the various Departments on selection of works within the Plan, non-Plan, Adivasi Sub-Plan, DPAP, scarcity works and village Employment Plans formed for the district. Various other works could be undertaken upon special considerations of representation and sanction by the Collector.

4.08.032 The wages were set at Rs.3.25 for male-labour, Rs.3.00 for female labour, and Rs.2.00 for child labour in the scarcity works. Extra work would be on piece rates, with the additional allowance available up to 25% more wage. When grain was available as payment under the food-for-work allotment, the wages would be 2 kg of wheat and Re 1 cash; 2kg coarse rice and 80p cash; 2kg medium rice and 60p cash in lieu of Rs 3.20 cash. The total value of the daily wage when there was an element of food grains was stipulated to be Rs 3.80. The initial sanctions for Relief Works in the district were Rs 3.0 lakhs and 2580 M.T. of rice. Under regular Plan Works Rs 1.45 lakhs was available for each Development Block.

4.08.033 At one stage the local administration claimed to have given employment to over 1 lakh persons. In many villages there was dissatisfaction with the delays in opening of relief works, and with the lack of information about the possibilities of relief works being sanctioned in the region. Some estimates were that three-quarters of villages needed relief jobs. Often village in the region surrounding the site of a typical work in Jaithari Block with an average population of 500 working persons per village, there were between 3,000 and 3,500 persons who were in need of employment; of these only 450 were provided for by the work and this too for only two months. M 67
M 68
M 67

4.08.034 Work would start at 7 a.m. and continue to 4 p.m. with an hour’s break in the afternoon. Girls as young as 8 years of age were working along with women of 70 years; students of middle school were working with landless labourers; and small farmers for the first time in years were seeking work outside their fields. Work was carried out under very difficult conditions. Hard earth had to be dug during the summer months and the heat and strain were tremendous. The roads were washed away during the rains that followed. The hierarchy in the relief works in the district started with the Collector, and went through the BDO, Sarpanch, Overseer, Timekeeper, Mate (1 for every 20 labourers), Gang leader (1 for every 5 to 8 labourer) down to the mazdoor. M 69

4.08.035 Different works had various histories of non-payment, underpayment, delayed payment for work done and other manner of cheating by the supervisors and authorities. Several works had to be abandoned when the labourers deserted due to these malpractices. It was usual to receive Rs 2.00 as the daily wage instead of the

stipulated Rs 3.20. Whereas it was declared that extra work would be piece rated, most of the payment was made on the 'Khanti' (2m x 3m x 1m) rate of Rs 6.20 per khanti of earthwork; however, daily attendance for 8 hours was insisted upon. This enabled the supervising authorities to falsify the employment records and claim that many more labourers were reporting than were actually employed.

4.08.036 In the welfare schemes during normal years there are provisions of milk and wheat porridge to pregnant women and primary school children. In many cases these schemes are not implemented to benefit these sections. The porridge finds its way to poultry farms. M 70

4.08.037 The location and maintenance of hand-pumps is bad. Several of these have fallen to total disuse for want of a simple replacement. People walk great distances past these pumps to a nearby stream for their daily water supplies. In the villages deprived of their river water source due to pollution from paper mill effluents, there is a perennial problem for adequate drinking and cooking water. Even the wells and talabs sanctioned for these villages have not been constructed. N 15
M 71

4.08.038 Following the drought there have been demands for postponement of repayment schedules for bank loans taken by farmers. Villagers have asked for control price shops to be opened in the villages, and farmers have asked for seed loans. Many have consumed the portion of their grain stock that they would have used as seed in the next season. M 72

4.09 Credit

4.09.01 Commercial and development banking operations in the district are conducted through four nationalized banks, a Credit Cooperative bank, a land Development bank and Village Service Cooperative societies.

4.09.011 Apart from carrying on normal commercial banking operations the nationalized banks extended various forms of credit for specific agricultural, industrial and service purposes.

On the basis of detailed data, the figures estimated for all the six banks in 1976 are:

Total bank loans: Rs 1, 16, 00,000

Number of loans: 3, 900

Average per loan: Rs 2, 970

The loans range from a maximum of Rs.65, 000 for a tractor for a single big farmer to a minimum of Rs.180 for an artisan under a DIR Scheme. For the 4 banks for which data is available the following is the distribution of loans:

Range	Total Loan	Number of Loans
Over Rs 10,000	Rs 10,75,000	32
Rs 5000 - 10,000	4, 54,000	90
Rs 1000- 5,500	30, 14,000	917
Under RS. 1,000	4, 55,000	1041

4.09.012 The over Rs 10,000 loans have been given for tractors, dealerships, business and small industry and there are considerable outstanding. The majority of the Rs 1000 - Rs 5,000 loans fall under the World Bank SFDA Scheme or the IDA scheme.

All the loans under Rs 1000 are either under DIR scheme at 4% or advances to VSCS at 12%.

4.09.013 The Central Bank of India (CBI) has 3 branches within the district. As the Lead Bank it has a check on the operations of all Nationalised/Scheduled Banks and priority over any developmental program in the district. This authority does not however extend over the Cooperative banks. The CBI is supposed to handle over half of the total advances but it has failed to fulfil this role. Up to '76 it had advanced Rs 8, 80,000 to 257 persons for agricultural purposes. Two of its branches were opened for implementation of the IDA program; this was not successful as the lending figures indicate: 45 at one branch and 190 at the other, totalling Rs 8, 50,000 As regards its activity in other sectors, it gave 4 loans amounting to Rs 13,000 for small industries; 45 loans under DIR for bamboo manufacturing totalling Rs 8,000. It has pending applications for loans to rickshaw pullers. Its terms of lending are same as other banks.

4.09.014 The State Bank of India (SBI) is the oldest bank in the district but it first advanced agricultural loans in 1970. Up to '76 it had advanced 12 pump loans, 3 in '74-'75 and 9 in '75-'76 totalling Rs 45,000. The break up of these loans is:

3 to agriculturists less than 5 acre holdings @ 12%

1 to agriculturists less than 10 acre holdings @ 13%

8 to agriculturists greater than 10 acre holdings @ 14.5%

Of 9 cases of lending to tribals, 3 were within 5 km of the bank and the remainder within 10-15 km from the branch office. In the first 3 cases, it recovered Rs 5000 but the remainder were totally outstanding. The bank gives two types of loans (i) direct (ii) indirect through Co-op, societies. It does not believe in giving direct loans for wells but would prefer giving direct loans in adopted villages. Villages have not been adopted due to personnel shortages. Its tractor loans show large outstanding; its other loans have gone towards pump set dealerships and an Agro-Service Centre. Loans to small industries are few in number for such activities as wheel manufacture, furniture and coiling instruments. Under DIR at 4% it gave 846 loans for purposes such as tile and brick making, blacksmith and bamboo product manufacture. Its other business loans

are also of small amounts in small numbers - tailor, automobile repairs, plastic works etc. Its sundry loans included credit to a doctor for a motorcycle, a typing institute and a railway book stall.

4.09.015 The Union Bank of India (UBI) has two branches, one of which started operations in '64 but advanced rural credit only in '71 and the other which started in '74 but up to '76 had extended credit for one pump.

The Budhar branch has various interest rates for agriculturists:

Less than 3 acres	10%
3-5 acres	11%
5-7 acres	12.5%
7 - 10 acres	14.5%
Greater than Rs. 50, 000 ...	15%

Its short term crop loans to 87 cultivators holding less than 10 acres amounted to Rs. 1, 49,000 and its total financing up to mid '76 was Rs. 16, 89,000. Its medium term loans for pumps and wells and its advances under the IDA program for minor irrigation both amounted to Rs. 3,70,000 up to mid' 76. Under the 20 point program it gave small amounts for bullocks, to small farmers belonging to SC/ST, some Gobar Gas plants to big farmers. It has been the largest financier of tractors, 10 in 5 years and other sundry loans for medical purposes.

4.09.016 The Bank of Baroda could not divulge any information without seeking prior authorisation from its regional office.

4.09.02 The feedback received from several progressive small farmers indicates that (i) in the past, bank agents have forced farmers to purchase diesel pump sets rather than electric pump sets because they have received a commission on such transactions from the concerned dealers. Diesel pump sets have many more maintenance problems as compared to electric pumps, (ii) while the market rates of equipment (motors, pumps, pipes) have been steadily increasing, the loan quantum has remained static (iii) banks which have an AEO are very far away and many trips have to be made in pursuit of the credit (iv) due to cement shortages and inordinate delays in obtaining loans, wells collapse before completion so the entire investment becomes non-productive (v) wheat production under irrigated conditions is not economically viable, whereas vegetable cultivation requires a highly developed infrastructure (vi) gram sevaks are not available because they are burdened with departmental work ranging from family planning to earthwork assessment in relief programs to census operations.

N 16

4.09.03 The credit requirements of artisans and petty tradesmen receive little attention from the banks. Such loans have, of necessity, to be on soft terms since these units normally operate on the brink of survival under harshly competitive conditions.

M 73

4.09.04 The disbursement of credit is an area which deserves to be studied much more thoroughly; this is impossible in the absence of highly detailed and specific data

necessary for the purpose. Many small mid marginal farmers are scared of taking loans from banks because of their experience with Village Service Cooperative societies, through which many loans were supposedly given but the money never reached their hands-the same illiterate hands which were necessary for obtaining thumb impressions on documents whose contents were rarely divulged by Bank or Panchayat officials. Another reason for fighting shy of credit is the jungle of rules that surrounds access to credit. There is no provision of credit for crisis situations such as crop failure, bereavement and ill health; thus the poorest of the village community from landless up to middle farmers are forced to borrow from moneylenders at exorbitant rates of interest ranging from 25% to 50%.

M 74

M 75

M 76

M 77

4.09.05 A Credit Plan for the entire district was prepared by CBI, the lead bank. Selected data from the document may clarify the overall financial picture of the district. The deposits of all commercial banks within the district (not including refinance) in 1976 were Rs. 551 lakhs. The trend in deposits over the years '72 to '76 show a steady increase of 30% per annum. The proposed investment over the 3 year plan period '79—'82 totalled Rs. 491 lakhs. This includes refinance from Governmental and World Bank sources.

4.10 Marketing

4.10.01 The marketing structure has to process petty production from agriculture, agro-industrial resources, and secondary manufacture. Some of the exchange inside the village is as barter; the commercialisation is largely in town markets. A small volume of the transactions is directly between producer and consumer such as petty food items and vegetables. Shahdol district is one of the bigger oilseed surplus districts in the paddy belt of M.P. Most villages had little vegetable production a few years ago; markets of the present size were not existent earlier and hence produce could not be sold. Villages were not self-sufficient. Villages are normally looked upon as production centres for markets. With larger numbers of landless forced to purchase their grain requirements, there is a growing need for cheaper grain from other centres of grain surplus, such as Bilaspur. Commodities like jaggery, sugar, cloth, salt, tobacco, edible oils, and kerosene are purchased at the closest town on market days. The markets for agricultural produce expanded due to opening of offices by the Government and due to industries and mining operations. For example, the Anuppur vegetable market depends largely on the Chirimiri coal mines, Dhanpuri on local coal mines Amlai and Chachai on OPM and MPEB establishments. Changes in the pattern of irrigation have contributed to what is marketable. Most production is still not marketed. Most 5 to 10 decimal vegetable growers spare only what they cannot themselves consume for the market. For purchases during the week the villagers are constrained to buy from village shops which make high profits. Many sales of small quantities are made to the villagers. Some of the villagers run weekly credit accounts with the shopkeeper,

4.10.02 The consumer items that are supposed to be available through the rationing service at municipality towns and villages are kerosene, sugar, cement, wheat and rice. The quotas for most of the rationing centres rarely arrive, and when they do they are siphoned off into the black market. Villagers have to travel to towns to avail of their rations, and are unable to determine at what moments the rations had arrived for distribution and in what quantities. Townspeople have also to wait for months on end, with no guarantees, for obtaining their cement quotas for construction purposes.

M 78

M 79

4.10.03 In organisation of markets one can also distinguish between Anuppur and Chachai, Amlai, etc.; whereas the former is primarily an export market, latter ones are consumer markets only. Anuppur market and surrounding villages export to Chirimiri, Amlai, Chachai, Bhijuri, Kotma-places at distances of 10 to 50 km. A good number of traders procure an estimated value of vegetables outgoing per day of about a thousand rupees, and four to five thousand rupees on market days. Local consumers are few. The Anuppur market has 20 regular shops and some 70-80 sellers daily visiting the Mandi to stay throughout the day. Green vegetables are disposed off soon.

Now cooperative stores are functioning at OPM and Soda Factory, but these do not deal in vegetables primarily because these are perishable. For green vegetables the colony depends on daily vendors and weekly markets. OPM has two weekly markets and Amlai and Soda Factory one each, which covers four days a week-Tuesday and Friday for OPM, and Saturday and Thursday respectively for the latter ones. Market at Chachai is held on Sundays. This gives the petty trader an opportunity to make a minimum of 5 days a week in different markets. The nearest other marketing centre is Budhar which has its weekly market on Wednesdays, and has a regular vegetable market. The common noticeable factor is the nature of the consumers, who are employees of an advanced industrial organisation in a semi-tribal environment.

N 17

4.10.04 Mahua Seed

4.10.041 The Mahua seed is free of any excise or trade restrictions. There is more collection from trees in village fields than from the forest. Season for the seed is mid-June to July end. The seed passes through a chain of 2 or 3 middlemen before reaching the processor. A medium sized farmer in Jamudi keeps about 10-12 kg of seed for his own consumption the oil of which he prefers to extract himself rather than take it to a mechanical expeller in Anuppur. The expelled cake is added to cow-dung heaps and eventually used as manure.

4.01.042 The availability of mahua changes from year to year and the consumption pattern changes with the affluence of the individual villagers. In 1973, the crop was poor with yields 40% of the previous year. The villagers earned Rs. 75/qt. for the decorticated seed. The oil prices for that year were Rs.480/ qt. and Rs.25/qt. for extracted cake. In 1974, the season was a little early and the seed fetched Rs.200/qt. at the time of collecting. The prices went to Rs.235/-qt. within 10 days after the season

was over. In addition, 10,000 T. of mahua flower is produced.

4.10.05 Sal Seed

4.10.051 Sal seed from the tree *Shorea robusta* is available in large quantities in the forests of Shahdol district. The collection and marketing of sal seed has got organised only lately in M.P. The method of collection is as follows:

Leases for collecting sal auctioned in May. In 1973 the leases for South Shahdol went for Rs.15, 100. The estimated potential for sal seed in the year was 200 T.

There is a talk of a move by the Forest Dept. to auction leases for a number of years at a time, so that it becomes attractive for the contractor to invest money in collection and marketing.

The contractor fixes a collection price for the area and arranges to purchase the seed through fadiyas or village agents. The contractor sells the seed either directly to the oil contractor or to another large oilseed dealer/stockist. The extracted meal of sal seed fetches R.s.400 per tonne,

4.10.06 Total oilseed production in the district is about 25,000 T. of which 40% is locally consumed, the rest being exported.

Oilseed goes to large ultimate processors like Hindustan Lever resulting in very large outflow of profit. Further, the products of the oilseed, namely oil and soap, come back into seed producing areas for local consumption.

4.10.07 The following brief notes, moving from smaller to larger markets, may help in understanding the pattern.

4.10.071 Jamudi - Village with pop: 652, majority Kol and Gond tribals, few Hindu and Muslim families. The majority survive on agriculture. There is no village market.

Oilseed production in 1974 in quintals:

Mustard	75
Nizer	14
Mahua (seed)	70
Linseed	8
Til	16

50% of mahua flower and 60% to 70% of oilseeds are sold. The produce comes to Anuppur which is 8 km. from this village. It is brought either by an intermediary or the producer or bought by traders who visit the village at harvest time. In Anuppur, it is either sold to a wholesaler, small retailer, or auctioned by a fadiya. This may in turn either go to larger adjoining market or later in the season back to the rural population. 25% of the produce is sold at harvest time; 35%-40% is retained and the remainder is sold in two or three steps around the year. The producer is forced to sell after the

harvest in order to repay various loans taken before harvest. Rates of interest are 25% on cash and 50% on seed and grain loans.

4.10.072 Rajendragram- Main market of Pushprajgarh tehsil, held every Sunday, Major oilseed market and biggest agro produce procurement centre of the area. About 80% of Nizer and 35% of Mustard in the district comes from Pushprajgarh.

5-6 weeks after harvest in every oilseed the turnover is: Nizer (1200-1400 T) Mustard (1000 T) and Linseed (200 T). For the purpose of seed procurement, traders from Anuppur and Budhar visit this market. Locals bring quantities which vary from 1 to 20 kg. There is a tendency amongst villagers to sell to particular traders who are thereby assured of getting produce without incentive. Three oil expellers and five oilseed shops also double as local money-lenders. Liberal loans given out ensure appropriation of produce at harvest time. The main mode of transport is by truck, the mule being the only alternative for large loads in this hilly region.

4.10.073 Kotma - Small Township, pop. 15000, approachable by rail and road, connected to Shahdol, Katni and Chirimiri coalfields

It has been declared a notified tribal area, one of the biggest markets in the district, falling in the paddy belt with rice a surplus produce: a major market for oilseeds and mahua. Consumers comprise both locals and mining population.

Oilseed market is both primary and secondary i.e. producers bringing oilseeds to mill-owners, retailers, wholesalers and also wholesalers putting commission agent to collect from producers.

There are two big wholesalers who market 900-1000 m.t. of oilseeds; Sarguja district is tapped for export requirement and Anuppur for local consumption needs; apart from the district other major feeders are Keshwahi, Nigwani and Pindara.

25% of the producers are in the habit of consuming from the market at off-season times; the wholesale traders have the capacity to store the produce for more than a year and sell when prices are favourable^

Total market input is 2000 m.t. which includes the amount converted to oil and oilcake. Although there are 17 expellers in the market there is ample scope for more. The mill-owners are the only big retailers, besides whom there are 30 shops dealing exclusively in oil and oilseeds.

Oilseeds, mainly mustard marketed -

- (a) To consumers in and around town;
- (b) To producers in processed form of oil or oilcakes;
- (c) Exports to adjoining districts like Katni, Satna and even Ranchi.

4.10.074 Anuppur: Composite market, primary as a procurement centre and secondary since it transfers processed goods to big wholesale dealers who in turn transfer it put of the district by train or road.

Since it is the only other rail junction besides Shahdol in this belt and is linked with Bilaspur, Katni, Bhopal and Indore, it becomes a convenient spot for transfer by rail. However, though the actual trade in oilseeds has multiplied, figures for April '73 through March '75 for export by rail show a marked decline. Thus export of oilseeds by rail for .1974 was 54.6 m.t. as .against 290 m.t. in 1973. This is due to the rapidly flourishing road transport.

Oilseed market is held twice a week with the produce being either directly bought by a retailer or auctioned. The retailer in turn sells to the wholesaler though not on a commission basis. Some wholesalers employ people to procure seeds directly from the villages. Seeds are also brought from other primary markets, mainly Rajendragram, and in turn fed into Kotma and Burhar markets. The total turnover of oilseeds is about 9200 m.t. per annum.

There are seven oil expellers in Anuppur. They crush seeds for domestic consumption of the cultivator who brings it for crushing 5 to 6 times a year. The normal practice is to leave the oilcake with the mill-owner. These mills crush about 200 m.t. per annum for cultivators; some mill-owners also assist cultivators in selling on a commission basis.

4.10.075 Jaithari: Primary market, collection centre for oilseeds:

Collection is made by four methods:-

- (a) Produce brought by intermediary to the Mandi for auction.
- (b) Cultivator brings small quantities on other days.
- (c) Traders collect directly from villages.
- (d) Cultivator brings for processing for domestic purposes.

There are 7 oil mills, (8-10 H.P) which expel 300- 350 m.t. annually.

It is not a big consumption centre since most of the people are farmers. Eight retail shops deal in oilseeds, the wholesalers mainly exporting to Raipur, Kharagpur, Katni, Satna and Ranchi. One of the wholesalers doubles as middleman between export end buyers and traders around Shahdol, operating on a credit basis. The local consumption is 8-10% of market arrivals.

4.10.08 Mustard, linseed and nizer in that order are the major arrivals in the market. While monthly figures are available for these and Til, those for Dori (Mahua seed) are not available since it is termed a forest produce and subject of the Forest Department. However, approximate annual arrivals are: Mustard 1000 T, Linseed 300-350 T, Nizer 300 T, Til 30 T. and Dori 30-40 T.

4.10,09 Pricing

4.10.091 Fluctuations in prices of vegetables are very high and a farmer cannot be sure of his income. In case there are many growers, competition brings prices down and hits farmers individually; whereas in wheat, paddy etc, prices are stable. Professional traders normally purchase at 20% less than the local market price. They make a 50% profit by selling in industrial markets. Quite often the payment is deferred to after sale of the goods by the trader. Local demand for vegetables is so high that prices are sometimes 2 to 3 times higher than Katni prices. M 80

4.10.092 The price of mahua flower at the time of harvest was as low Rs.33/qt'l. Within a few days the prices came down to Rs 25/ctl. Just after a little more than a month the price went up to Rs.55/ctl. A major portion of the surplus was sold at Rs.25 to Rs.33 per quintal. Mustard started the year at Rs.250/ctl. The producers thought the price would increase further so they sold only a small quantity and stocked the rest. The market came down to Rs.200/- and later to Rs.175/ctl. Later the prices rose again to 250/- quintal. The reason for price variation is manipulation by traders. M 81
M 80

4.01.093 For oilseeds, normally the rates are decided by the big wholesale trader of the area who has contacts elsewhere. In the beginning of the season the small retailer has a say in the prices, but at the end of the season the wholesaler determines prices, thus creating an authoritarian attitude of the wholesaler. Rate fluctuation in the primary market is very high, M 80

4.01.094 An idea of forest produce pricing and costing pattern can be obtained from the following information: (a) The route for Harra fruit used for leather tanning can be traced in the following manner: Tribals collect ——— sell to Forest Department. M 81

Ripe fruit	1969	Rs. 9/ctl.
	1972	Rs. 11- to 11.75/ctl.
	1974	Rs. 15/ctl.

Forest Department —auctioned to businessmen: ruling rates Rs. 25/ qtl.

The main consumption centres are Kanpur, which takes 30,000 tonnes every year, and Madras which takes 10,000 tonnes every year. Kanpur is reported to have 36 tanneries,

(b) The Forest Department auctions its divisions annually for bone collection. For South Shahdol area the rate has been Rs. 200/- per year for the last three years.

Buying rate at Anuppur ...	Rs. 25.30 per 30 Kg.
	Rs. 650/- per tonne.
Buying rate at Burhar ...	About 25% less
Selling price at Jabalpur ...	Rs. 1100 per tonne.
Buying rate for horns at Anuppur ...	Rs. 0.90 per kg.
Buying rate for hide at Anuppur ...	Rs. 2.50 per kg.

4.10.10 Local traders purchase wheat at the rates of Rs. 75 to Rs. 90 per quintal whereas the rate declared by the Government for wheat procurement had been Rs. 113 to Rs. 115 in 1979, depending upon the quality of wheat. Few centres for procurement purchases were opened, however, and various hindrances from the officials of these centres forced the farmers with grain surpluses to sell to grain traders. The traders in turn sold to the officials, or stocked the grain for sale when the prices would rise on the open market. M 82

4.11 ECOLOGY

4.11.001 Twenty two km. away from Shahdol is located the Orient Paper Mill at Amlai. The Mill draws its water requirements from the river Son and discharges its effluents downstream in the same river. OPM has a production capacity of 250 T of paper per day. The Mill employs the sulphate process using bamboo and hardwood as raw material from nearby forests. The water consumption is 720 million litres per day, water is drawn from the Son river which has a flow of 14 cusec (falls as low as 7 cusec during summer months). The Mill requirement of 32 cusec is got by impounding the river flow with an earthen dam. The dam is built around mid December and washed away by floods in mid July.

4.11.002 The wastes from the Mill are classified as:

Grade I: non-polluting; these include spills and leaks of cooling towers, condensers, and various other units; these are re-circulated in process.

Grade II: given off from bleaching and rolling operations; discharges are said to be 20×10^6 litres/day and 29×10^6 litres/day, colour is dirty white; contains pulp fibres, spent chemicals such as bleaching powder and hypochlorites, china clay and talc. Bleaching waste is pale yellow and acidic. Its pH is between 2.2 to 2.4. The Biological Oxygen Demand BOD varies between 160 to 200 mg/1. Paper machine waste is whitish, alkaline and has 120 to 140 mg/1 BOD, Overall Grade II is alkaline, rich in suspended and dissolved matter; BOD between 120 and 130 mg/1.

Grade III: intensely polluting and is discharged from digesters and washers; contains caustic compounds and lignin; caustic soda is recovered and after that the waste is disposed into lagoons; deep brown and emits foul odour-the colour is due to lignin and the odour to formation of mercaptans by interaction of sulphur compounds; approximately 13.5×10^6 litres/day. This waste is alkaline pH 10.5-11. Its BOD is 250 to 460 mg/1. The composite of II and III Grades is dark brown, alkaline with pH 8.5 - 9.5 and BOD of 160 -195 mg/1.

4.11.003 The pollution control measures adopted by the Mill are:

(i) Grade II effluent is allowed to flow through contours and then passed through a stack of stones put across the channel at two separate places;

(ii) Grade III effluent is lagooned and the lagooned effluent is discharged into the river. Detention periods of 13 to 15 days are provided for.

4.11.004 Details of the chemical pollutants are:

Sulfite waste liquors: Sulphur Chlorides, Gas, liquid; irritant to eyes, nose and throat; irritates or burns skin; strong pungent odour, peculiar taste (dilution of 1 : 25000 needed to eliminate taste and odours); probably toxic to fish.

Kraft (Sulphate) Pulp mill wastes:

Black liquor: Toxic to aquatic life.

Hydrogen Sulphide: Gas; high in flammability; irritant to eyes, nose, and throat; may cause dizziness, nausea and headache.

Methyl Mercaptan, Sodium Sulfide, and Sodium Hydroxide: Very toxic to aquatic life, irritant to eyes, nose, throat; irritates or burns skin; causes nervousness, diarrhoea, and retarded growth in animals.

The effects noted are for exposure by inhalation and contact with skin or eyes. Most chemicals listed are poisonous if swallowed.

Sodium Carbonate: Toxic to plants, not so much to humans; in high concentrations, causes diarrhoea, malnutrition, interference with reproduction in animals.

Turpentine (resins): Liquid; high in flammability, irritant to eyes, nose, throat; skin sensitizer; dermatitis on prolonged exposure, may also lead to kidney and/or liver damage; irritates skin.

Methyl Alcohol or Methyl isobutyl carbinol: Liquid; highly inflammable; irritant to eyes, nose and throat; irritates or burns skin.

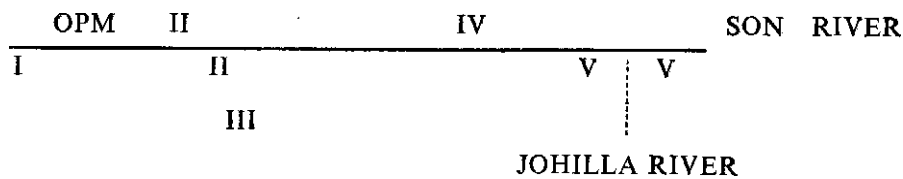
Ground wood; pulp mill wastes: Chokes aquatic life.

White water: Fine fibres, dyes, sizing materials, toxic to aquatic life.

The entire flow of the river has been tapped and impounded by the paper mill, 126 villages down - stream have been deprived of their basic necessity of water, for villagers and for cattle. Water supply scheme of Shahdol was originally based on Son river water from 22 Km down stream of Amlai. This scheme has been shifted to another stream at a higher cost.

Had the mill been located about 22 km downstream of its present site it would have safeguarded the interest of Shahdol. Secondly, the distance of travel for the waste to reach the confluence of Son and Johilla rivers, where the dilution increases suddenly to a large extent would have been reduced. This, thus, would have ultimately meant a shorter total length of objectionable waste travel.

4.11.005 The Regions selected for the profiling study are shown in the schematic:



Region I is the base for reference and represents the situation where people have access to unpolluted river water. Region III is removed from Region II in a direction perpendicular to the river. Comparison with the results for Region II are expected to disclose what effects are due merely to the presence of the river rather than river pollution. Region IV reveals the effects of distance profiling, and finally Region V gives effect of distance combined with dilution of the pollutants due to confluence with another river.

4.11.006 The action of water itself can be broadly classified according to the following manifestations:

- i. Diseases of the feet
- ii. Skin diseases
- iii. Internal gastric disorders from water consumption.

M 83

Among human beings the major ailments (which can be considered dependent on the number of river crossing) were -

(a) Cracks and fissures on the soles of feet and tearing of soles to the extent of bleeding:

(b) Cracked, broken, brittle, upturned nails;

(c) Upturned nails offering a ready scope for growth of fungi;

(d) Dermatitis type rashes over entire areas of limbs, scabs showing incidence of rashes:

(e) An extreme tendency to scratch the inflamed or tender skin:

(f) Pain between nails and skin.

People living by the riverside are reported to have eczema, ringworm (about 10%) whereas others have only 5% incidence. People are unable to procure medical aid, so disease spreads greatly. Small boils and white patches on the legs were quite common. Wounds are aggravated and there is pus formation.

Re- gion	No. of people surveyed.	Crossing less than once in a week.				One to four times a week				Crossing more than four times a week.			
		VL	L	M	H	VL	L	M	H	VL	L	M	H
II	174	38	15	7	1	26	23	19	5	8	11	11	10
III	13	7	1	1	—	3	—	—	1	—	—	—	—
IV	41	2	—	—	1	8	5	3	2	6	12	1	1
II	In percents	62.5	24.5	11.4	1.6	35.6	31.5	26	6.9	20	27.5	27.5	25
III		78	11.0	11.0	0	75	—	—	25	—	—	—	—
IV		67	0	0	33	45	27.5	16.5	11	30	60	5	5

VL = Very low

L = Low

M = Medium

H = High.

From the data, two conclusions can be drawn:

- Increased contact with polluted water increases incidence of skin disease;
- Effects of pollution do not decrease appreciably even at large distances down stream of the mill.

4.11.007 Death of Cattle

Region	Total No. of Cattle	No. of Deaths of Cattle / Year / Thousand				Total
		Death due to Pollu- tion.	Death due to old age.	Death due to dise- ease.		
I	146	0	37.6	9.4	47.0	
II	1477	76.5	18	9.4	103.9	
III	202	5.6	88	40	133.6	
IV	122	0L	34	32.5	136.5	
V	312	38.8	5.6	20	56.4	
Zones	Average No. of Deaths of Cattle / Year / Thousand					
I	51.7					
II	124.6					

(a) Looking at the overall figures for the death of cattle it is clear that two Zones can be formed;

Zone I Regions I & V

Zone II Regions II, III & IV.

In Zone I the overall figures for the death of cattle are much lower than those in Zone II,

(b) From the overall death rates in Regions II, III and IV which are nearly the same it can be further deduced that the flow of water downstream to a distance of sixty four km does not significantly decrease this effect of pollution; this is supported by findings of 4.11.006 and 4.11.008 (b).

(c) Zone I was unpolluted and Zone II was polluted; therefore by subtracting the average number of deaths in Zone I from those in Zone II we get number of deaths due to pollution alone in Zone II: 72.9 per year per thousand. This figure corroborates the death rate due to pollution as noted individually for Regions II and IV.

4.11 008 Milk Yield per Cow per Lactation Period

Regions	Before 1965 (litres)	Difference before '65 and '73 (litres)	Percentage fall	
I	156	76.5	49	M 84
II	403	326	81	
III	132	110	83	
IV	400	290	72	
V	435	340	78	

(a) The low values for Regions I and III of milk yield per cow per lactation period before 1965 is not explainable. The fodder available in the Regions I, II and III were roughly the same.

In Region V it can be seen that the polluted water has adversely affected the milk yield more than it has the death of cattle.

(b) The percentage fall in milk yield per cow per lactation period for the Regions after the Mill (II, III, IV & V) is almost the same for all four. This implies that the effect of polluted water does not decrease appreciably over the sixty four km flow to Region V. This is further supported by 4.11.007.

(c) The drop of 49% in Region I is most probably due to the decrease in available grazing and fodder for the cows caused by deforestation encouraged by the Mill. Assuming the same percentage drop due to worsening fodder conditions in the other regions as well, we obtain the percentage fall in milk yield due to the pollution as:—

Region	I	II	III	IV	V
Fall in Milk Yield due to Poll, water %	0	32	34	23	29

Averaging the fall for the regions downstream of the Mill we see that: —

Region	Fall in Milk Yield (%)
Unpolluted Water	0
Polluted Water	29.5

The drop in milk yield due to worsening fodder condition is 49% and that due to effects of polluted water is 29.5%. We observe that in this particular aspect the bad grazing conditions are more significant in comparison to the effect of effluent.

4.11.009 Reduction in Birth of Calves

Region	Average Reduction in number of births per cow.
I	0.83
II	2.1
III	2.5
IV	1.7
V	3.8

M 84

(a) Evidently Regions II, III, IV can be classified as one Zone, and Region I as another because for Regions II, III and IV the value for average reduction in number of births per cow are of the same magnitude. This supports the view that the effect of polluted water on the vitality of the cattle does not fall appreciably with distance downstream. This is understandable because algae, fungi and other micro-organisms harmful to the system may develop upon the organic wastes and multiply with distance rather than the other way.

(b)

Zone	Average reduction in deliveries/cow.
Unpolluted water	0.83
Polluted water	2.10

(i) From this a reduction of 0.83 in the zone having access to unpolluted water is due to worse grazing conditions. Lack of fodder is observed in Regions II and III as well.

(ii) The reduction solely due to pollution effects (i.e. 1.27) is significantly larger than that due to lack of fodder (i.e. 0.83).

4.11.010 The effect of smoke on agriculture in areas close to the Mill was assessed in a qualitative way. People living near the banks of the river used to grow kalindra and tarbuj which they have now stopped. Quality of crops and fruit trees seem adversely affected.

N 19
M 85

4.11.011 A survey designed to estimate the quantitative damage to fisheries due to polluted water was carried out in '73 on a forty kilometre stretch of the Son River

M 86

downstream of OPM. Whereas the catch at the time of the survey was zero, it was estimated that before the mill went on-stream it used to be an average of 2375 gm/family /week. Taking an average family size of five with the population under study then being 2922 and the fishing season lasting five months, the total seasonal catch amounted to 277 quintals. According to the '70-'71 figures of the Fisheries Department, the total catch all over the district was 200 qt so that the loss in fisheries is seen to be of tremendous significance. Qualitative change in the fish has also been noted. The taste, colour and smell of fish from even mildly polluted regions are reported to be offensive. Fishing constituted the traditional occupation of the Kewat caste who are either landless or marginal farmers. The loss of occupation has forced heavier reliance on agriculture or employment as agricultural wage labour.

4.11.012 According to ISI specifications, for Grade IT effluent the permissible BOD level is 30; by 1980, this had apparently been achieved but Grade III effluent has still not been controlled and present values average 80 ppm. The colour of the Grade III effluent can be reduced by bleaching with chlorine available from the sister concern HIM situated next to OPM. At present, part of the chlorine is a process waste for HJM but it has refused to oblige. Most of the committees that have studied this problem in the past have recommended that OPM undertake research to utilize Grade II & III effluents for agricultural purposes. The results of such research, if conducted, have not been publicised.

4.11.013 The factory had to completely suspend production for 22 days in the summer of '80 because of acute water shortage in the river. Even drinking water for the colony was brought in tankers from Shahdol.

4.11.014 A lime kiln set up for supplying lime to the paper mill has an average production of 20 tons daily. Lime fines, however, cannot be used in the manufacture of paper and has to be separated and dumped. These dumps by the side of the road have started assuming hillock proportions.

4.11.015 The unit consumes in excess of a 100,000 tonnes of bamboo annually, in addition to hardwood. In the absence of supply of salai wood by the M.P. government, it has had to use increased quantities of mixed hardwoods. The supply of bamboo from leased out areas of Orissa is already proving inadequate and currently hardwoods are being imported from as far away as Himachal Pradesh.

4.11.016 In order to tackle the shortage of feedstock for paper manufacture, the Forest Department has undertaken extensive plantation of eucalyptus in its reforestation programs. There are indications that homogeneous eucalyptus plantations cause recession of the water table. Also, the total yield of wood is far less than under natural conditions of growth.

4.11.02 The Hukumchand Jute Mills is a sister concern of OPM also situated at Amlai. Its products are caustic soda, hydrochloric acid, liquid chlorine and calcium hypochloride. The pollution caused by the unit is:

(i) By Act, only 0.03% caustic sludge can be disposed as waste from the factory premises. This is being violated, the sludge being dumped in the Son River which flows alongside the unit;

(ii) Mercury, which is used as electrode in the electrolysis of brine, also finds its way out with the caustic sludge and is dumped into the river; mercury is very toxic.

(iii) At least 3 villages down wind of the unit are affected by the chlorine emitted as gas in the manufacturing process;

(iv) The workers colony is also situated downwind and 8 months of the year it has to bear with the noxious fumes emitted by the unit.

N 19

M 85

M 83

4.11.03 Coal Mines

4.11.031 Most of the coal mines in the district are underground mines, referred to as incline or shaft mines. Three of the mines are opencast i.e. the topsoil or overburden is completely removed to allow access to the coal seam. Open cast mining is preferred where the overburden depth is no more than 25 m. The overburden ratio as per present calculations should not exceed 1 tonne of coal per 4 cubic metres of overburden. Open cast mining is much more economical as it reduces ventilation and lighting costs and is much safer. The open cast mine at Harrad started in 1975 and already massive heaps of overburden are in evidence, having been piled up on any spare space available. The plans for the disposal of overburden include construction of a new incline up to the mine, filling for a large conveyor and construction of a new railhead. In addition, there is a proposal for using the overburden for filling up of a previously expired coal seam. The question remains as to whether such lands can be used for agriculture. The authorities claim that in 20 years time when the present seam expires there will not be any significant change in overall land characteristics. Due to shortage of transport and handling capacity, a large hill of coal has appeared and is growing steadily. The coal dust affects areas up to half kilometre away and blasting, which is done three times a day, creates noise pollution and vibrations in the workers colony located a kilometre away from the site. Additionally, the surrounding land has started developing fissures due to the blasting effects.

N 20

M 87

N 21

4.11.032 Due to the mining operations there is a thick cloud of dust in the atmosphere and the only protection the worker has is the cloth wrapped around his face leaving his eyes exposed. A tanker provided to sprinkle water is largely ineffective in keeping the dust down. The main diseases in the area are respiratory (bronchitis, pneumoconiosis and tuberculosis) and gastrointestinal (hyperacidity and ulcers). It further appears that the colliery is neither providing nor is capable of providing adequate medical attention to the workers as stipulated by regulations.

M 88

4.11.033 An investigation of the underground coal mines at Birsinghpur revealed further the ecological implications of mining activity. There is a great deal of water seepage into the mine shaft and this has to be continuously pumped out. Huge pumps

N 22

M 89

throw up nearly 3000 litres/minute of water to the highest point near the pithead and from here the water is diverted into the Ganjra Nala, to flow away into the Johilla River.

4.11.034 Underground coal mining operations have resulted in a drop in water table in the surrounding regions, to the detriment of local farmers situated around the mines. Large areas near underground coal mines have become barren of vegetation.

N 22
M 89

4.11.035 There is also a great fire hazard involved in coal mining operations, especially due to pockets of methane gas. It is reported that 25 years back, when the mines were privately owned, a fire broke out in one of the pits resulting in several hundred deaths. The matter was sought to be hushed up; the pit is now being reopened and the case deserves further investigation. Subsequent to nationalization of the coal mines in 1973, the underground passages are sprayed with a mixture of gypsum and stone powder to reduce fire hazard and suppress dust formation which is detrimental to miners' health. This practice, however, was not followed prior to nationalization.

4.11.036 The Jhagraha Colliery is an abandoned coal mine near Amlai. Hundreds of acres of land above the mined area have collapsed and signboards all round the periphery warn visitors that it is a danger zone; the possibility of further collapse in the future cannot be ruled out. The Birsinghpur Colliery, in operation since the early 40's has already covered 2500 hectares underground and is still going strong. Such de-pillarising operations in abandoned mines have affected those-sections of the peasantry surviving off agriculture.

M 90

4. 11.04 Bauxite Mines

4.11.041 Bauxite is an ore containing more than 45% alumina, other major minerals being iron oxide and silica. Its minor constituents are titanium, vanadium, and manganese. Ores containing less than 45% alumina are known as laterite. Amarkantak has some of the richest and best reserves of bauxite in the country. The chief impurity in bauxite at Amarkantak is silica. Therefore selective mining of bauxite is done whereby only low silica material is taken up for aluminium extraction. Amarkantak mines are reserved for the exclusive use of aluminium metal industry. Electrolytic reduction process for manufacture of aluminium requires very high purity aluminium oxide; the manufacturers therefore take bauxite only above a certain purity level. Bauxite is a very valuable mineral reserve, particularly for the future. A world-wide shortage of bauxite in the near future is predicted. A major consumer like the U.S.A. has no reserves of its own and is looking at raw materials other than -bauxite to extract aluminium metal. The major bauxite exporting countries have already formed a cartel to jack up prices taking a hint from OPEC. Our own reserves of bauxite are limited, though sufficient at the moment. A judicious use of this resource keeping our long-term interest in mind is absolutely essential because (like petroleum crude) we will find it very difficult to import bauxite if required. Bauxite is classified as a major mineral. Indian bauxite reserves are 260×10^6 T; high grade reserves are 80×10^6 T.

4.11.042 Aluminium metal manufacturers employ bauxite mining practices which usually are not compatible with our long term interests. This is done to keep their present costs of production as low as possible to enable quick profits. Bauxite mining operations provide three grades of materials at Amarkantak.

- (a) Acceptable grade with impurities below a maximum level;
- (b) Marginal grade with impurities around the prefixed maximum level;
- (c) Sub-grade with impurities much above maximum acceptable level.

Under presently employed mining practises, only the material in the first grade is taken for aluminium extraction and all the remaining material is left piled up at mine sites as rejects. Use of high silica bauxite for the extraction of alumina by conventional process increases the cost of extraction. It may be possible to extract alumina economically from high silica bauxite, but such known processes have not been commercially tried in our country. Since use of Amarkantak bauxite has been restricted to metal industry, all the low grade bauxite, which can be a raw material for so many industries, is going waste.

4.11.043 There is a great deal of dust raised in bauxite mining operations and one of the long term effects on miners is silicosis, a lung condition paving the way for more serious lung diseases.

M 91

4.11.05 Forest

4.11.051 The ecological damage due to deforestation has already been dealt within the section on Forestry. Loss of game meat has been yet another result of deforestation in the region; miles of eucalyptus and not a bird! Other animals include deer, wild fowl, boar, rabbits and other rodents which were hunted by the poorer sections of the peasantry namely landless, small and marginal farmers and even middle farmers mostly of tribal origins. This practice was prevalent until as recently as twenty years ago but the last two decades has witnessed a sharp decline,

N 23

M 92

4.11.052 Besharam (Ipomea) was a weed originally introduced for its value in producing green manure. It is extremely fast growing and spreads very rapidly. It has started covering uncultivated areas, depleting the soil of essential nutrients; it is slightly poisonous and therefore finds no use as cattle fodder. It harbours snakes in its tangled root system and provides fertile breeding ground for mosquitoes. It is feasible to manufacture paper from this weed.

4.11.06 DDT powder supplied by the government for anti-malarial spraying is finding its way to vegetable growers. Thus, not only is the malaria hazard growing but vegetables which reach the market are now impregnated with chemical poison.

4.11.07 A Yellow ochre producing unit in Anuppur has a grinding capacity of 3 tonnes per day. When the pulverizing machine is in operation, the air inside the shed is thickly laden with the yellow dust. Labourers from the surrounding villages are provided

neither protective clothing or other gear and are forced to constantly inhale the dust. At the end of a day's work, the men and women troop down to the nala for a wash before heading homewards. Since the mine from where the material is obtained is flooded in the monsoons, the owner normally stacks a four month supply of yellow ochre on a neighbouring plot adjacent to his unit.

4.11.08 Small towns in the region suffer from the debilitating effects of polluted drinking water supply. This is because of the total lack of sewage disposal systems forcing people to use the fields. The faecal matter contaminates all surface and ground water sources resulting in frequent outbreaks of gastrointestinal disorders such as amoebiasis, dysentery and diarrhoea and worms.

N 24

4.11.09 Water erosion is the most important component of soil erosion for the region. Deep and shallow gully formation seems to be the main mechanism of erosion in the district. While there is no visual indication of black soil being eroded, there is significant evidence to show sand and murrum erosion by the nalas. The local practice is to plough along the slope and not across it, thus aggravating the problem of loss of topsoil. Various government agencies all look into the problem of soil erosion but there is little evidence of fruitful action. The scheme was taken up in one of the nearby villages but though farmers showed willingness, the work was stopped after 2 hectares had been bunded and no reasons were offered. While government thinks it is a serious problem, farmers have not adopted techniques of conservation because:

N 25

(i) The effects of erosion are prolonged over time and not easily visible; hence they are not willing to invest;

(ii) There is a lack of capital;

(iii) Farmers are reluctant to take loans for the purpose, often having little idea of the subsidy or repayment norms.

4.12 Health

4.12.01 There are the following major facilities in the health organisation within the district:

Hospitals	5
Primary health centres	12
Mini-PHCS	15
Civil dispensaries	10
Ayurvedic dispensaries	29
Homeopathic dispensaries	2
Dental clinics	1
T B clinic	1

Staffing these there are about 750 personnel, of whom 83 are doctors and 23 are Ayurvedic practitioners. This, of course, does not include private practitioners. In addition, there are now 98 Community Health Workers, in three blocks.

4.12.02 Some specific features of health services in the district:

4.12.021 Given the population of the district and the total number of doctors in Health Services Organisation, the doctor to population ratio is 1 for 10,000 which is quite high compared to the Indian average.

4.12.022 The district has special schemes like mini-PHC which is in addition to the general pattern of Primary Health Centres in the country.

4.12.023 The district being a tribal one gets additional inputs in the field of health from sources other than the health department like tribal development projects.

4.12.03 However, in spite of these inputs the performance of HSO is not very exemplary as indicated by the achievements of its various health programmes. Malaria is still a major problem; Tuberculosis cases, even if detected, are not followed through to complete the treatment; Goitre, a prevalent problem in the area has not been tackled as yet; Gastroenteritis and Cholera still continue to threaten the lives of the people. Though in Family Planning the district has been showing high numbers of sterilisations, the family welfare services like those of immunisation, treatment of iron deficiency anaemia's, antenatal, postnatal, and natal services have not been successful.

4.12.04 An in-depth study of health services over an entire block indicates the reasons for the failure of the health services to effectively tackle health problems of the region. PHC doctors as well as the lower level staff (nurses, midwives, clerks, attendants) feel that the Health Department does not pay well nor do the higher authorities pay sufficient attention to streamlining procedures regarding travel reimbursement, postings, vehicle maintenance, and more equitable distribution of the workload among other things. The Community Health Workers (CHW), who work under a separate scheme directly administered by doctors from the PHC, resent the overbearing and patronizing attitudes of the other health personnel (nurses, MPW's) who often interfere in their work. The CHW's also claim that doctors supervision is sporadic and that there is no follow up or refresher training organised for them by the doctors. The Health Department is slack and does not ensure supply of drugs to the CHW's. The wages it pays are insufficient for the amount of work that they have to do. There is no provision for them to become regularised employees within the framework of the Health Department. Hence they cannot enjoy the benefits that other Health Department workers enjoy. Lastly, the poorer sections of the peasantry i. e. the landless and marginal farmers; small and middle farmers want better health services from the departmental personnel. These same sections, which are most affected by problems of ill health, also say that the CHW scheme is ineffective. The CHW's are either not accessible to them due to problems of caste and economic differentiation or that the CHW's are not available as they engage in other more gainful economic activities.

M 93

M 94

M 95

M 96

M 97

M 98

4.12.05 There are a number of private practitioners in the towns and rural practitioners of herbal medicines and witchcraft. Most of the modern facilities are being availed by the privileged few. The medical and paramedical staff is misusing government funds, vehicles, and supplies for their own benefit. Both the neglect at the official level as well as the widespread malpractices and corruption tends to make villagers wary of the whole system. They would take their ills to the government hospitals or to private doctors only in extreme cases. Many possibilities exist for health education, sanitation, public hygiene, school programmes, etc., but the responsible staff has barely any interest or desire to do the necessary work as there is no profit in it.

4.12.06 Drinking water wells are not treated. The water in ponds is used for washing cattle, bathing, and washing clothes leading to spread of parasitic infection. Dung and waste disposal are inefficient and this is one of the focal points for the spread of infectious diseases. All these require preventive medicine and, therefore, health education. Welfare schemes have invariably not benefited those they have been intended for, due to corruption in the delivery mechanisms.

4.13 Employment

4.13.01 By the 1971 Census the distribution of the working population in the district is:

	Women	Men	Total	%
Cultivators	28,250	1, 78,014	2, 06,264	53.83
Agricultural Labour	50,869	63,934	1, 14,803	29.96
Livestock/Forestry				
Hunting / etc.	322	4,333	4,655	1.22
Mining & Quarry	643	12,827	13,470	3.49
Household Industry	1,534	8,664	10,207	2.67
Other than H.I.	485	5,422	5,857	1.54
Construction	70	653	723	0.19
Trade & Commerce	531	6,229	6,760	1.77
Transport/Storage/				
Communication	76	3,142	3,218	0.85
Other Services	1,951	15,240	17,191	4.48
	84,690	2, 98,458	3, 83,148	100.00

4.13.02 The male agricultural labour has gone up by 6.8% since 1961, and agriculturists by 4%. The area under cultivation has risen by 9%. The figures are illustrative of the primarily agricultural nature of the population. Industrialisation is very low. The coal mines, bauxite mines, paper mill, and caustic soda plant offer less than

5% of total employment. Trade, commerce and transport occupy about 10,000 people and almost all of them are concentrated around the bigger towns.

4.13.03 Industrial Employment

4.13.031 Orient Paper Mill: There are eight grades of workers in the firm with basic pays from Rs. 157 p.m. to Rs.488 p.m. A survey of the employment at OPM in August 1980 puts the total number employed at 2,500 workers. Of these 1650 are permanent on the rolls. The minimum wage for an unskilled permanent worker is Rs.485 per month. Casual labourers employed through the Time Office are paid Rs 16 per day. Casual workers who are separately recruited to work regularly within factory premises obtain Rs. 11 per day. Together the number of workers in these categories is between 400 and 500. Those casual workers who are recruited for short jobs outside the premises get Rs 7 per day, and total to 250. Apart from these categories there are about 1,500 casual workers organised under about 25 contractors. Such contract workers obtain between Rs. 4.50 for a fresh recruit and Rs 11.20 for one with several years of work with the contractor. Helpers get between Rs 4.50 and Rs. 7.50 with no wages if there is no work. These details are presented since the wage pattern is representative of all industrial employment in the district,

4.13.032 Hukumchand Jute Mills is at Amlai and manufactures chemicals. It employs 210 skilled workers and 110 staff. There are 4 grades for workers and the basic pay varies from Rs 349 to Rs 436 p.m. Upto 1978 there were 500 unskilled workers who obtained Rs 4.50 when daily rated, and upto Rs 525 per month if on the rolls. A strike in 1978 helped abolish the casual labour system. Workers under contractors remain, getting upto Rs 4.50 per day.

4.13.033 Coal Mines: There has been no industrial development of any kind in the district since 1965. Only in 1980 the decision to situate a Super Thermal Power Station at Mangthar has been taken and civil works have commenced. However, for over three quarters of a century there has been a coal mining sector in the region in what is called the Jhilmilli Coalfield, which covers an area of 170 sq kms in the Rewa-Chattisgarh basin. 95% of the jobs are for labourers and loaders. Other categories like gang men, electricians and office staff comprise only 5%. The number of registered applicants at the Budhar sub - area employment exchange were 48,000 in early 1981. The number of applicants short-listed every year are 5,000 to 7,000; and the number eventually recruited is one - tenth of this. The registration rules are cumbersome — age should be below 30 years; Gram panchayat should certify the applicant as a domicile of MP; the card should be renewed year after year; and a degree is a liability for 95% of the jobs. The miners get Rs 16.40 per day to Rs 20.40 per day. The wagon loaders get Rs 21 per wagon and can manage 2 wagons/ day/head. The wage structure for other categories is a many tiered affair with varying increments in three basic divisions technical grade, clerical grade and daily wage.

4.13.034 Employees at Hindalco are on piece-rate wages, and total upto 325 workers. The minimum daily wage is Rs 5.80 and the average about Rs 8.00. The skilled workers get at least Rs 8.70 and average about Rs 10.00. Balco's productivity is lower than Hindalco's in spite of greater mechanisation. This could be because contract workers do not enter into productivity calculations.

4.13.035 Balco employs 825 workers and staff of which 238 are unskilled, mainly miners. The basic scales are from Rs 196 to Rs 430 for unskilled work in 5 steps and Rs 330 to Rs 700 for skilled in 8 steps. Balco has given contracts to 3 thekedars for the mining of bauxite. A total of 600 to 700 workers are employed. The rates are Rs 3.00/ cubic metre for digging the ore on the surface (1.0 to 1.5 cu.m. per man day). The contractor sells the ore for Rs 11.10 to the company after paying Rs 6.50 / cu.m. for transportation. For digging underground the workers get paid more.

4.13.036 The thermal power station at Chachai employed 700 regular workers before its first expansion in 1977. During the four years of expansion program an estimated number of 5000 workers were employed temporarily for varying periods. On completion of the second expansion in March '78, the number of regular workers went upto 1200. The pay scales for plant Assistants have changed from Rs 70 p.m. in '76 to Rs 350 p.m. The highest wage a worker can get is Rs 650 p.m. for Plant Superintendents. Muster roll workers obtain Rs 5 to Rs 7 per day, from which contractors pocket Rs 2. D.A. is in addition to the wage for the permanent workers in accordance with State index - on the average, Rs 125. Officers however get D.A. in accordance with the Central index, which is three times the D.A. obtained by workers. Trainee engineer's start with Rs 750 per month, and after a year obtain Rs 1150 per month. There are a large number of workers within MPEB who work on erection and maintenance of electrical lines and connections - Unlike their counter-parts in the TPS, they are distributed all over the district attached to the offices and sub - stations operated by the Board. These workers are generally underpaid, overworked under field conditions where they are put up in camps and often have to work with the barest minimum of equipment and facilities which it is incumbent on the Board to provide.

M 99

4.13.037 In Anuppur the employment in the Railways numbers 200. Maintaining the track are 80 gang men, who have take home salaries of Rs 500 per month. This includes overtime wages amounting to Rs 150. Other categories of workers in SE Railways notably mechanic grades and train checkers (BTM & TXR Staff) are unhappy with their working conditions and say that the management of SER does not respond to their demands. The issues include supply of materials and tools, disbursement of uniforms and work timings.

M 100

4.13.04 Lower level employees of State Government Departments often feel frustrated and suffocated in implementing the tasks imposed on them. Thus patwaris are opposed to the Revenue Department higher-ups on the issue of salary and authority which should be commensurate with the responsibilities of maintaining land records. They see little scope of advancement for themselves.

M 101

4.13.05 About 340 students are enrolled in the ITI at Shahdol. After 1 to 2 years training in various fields they are apprenticed at O.P.M., H.J.M., M.P.E B., for 2 to 3 years. The MPEB employs quite a few of these apprentices, but O.P.M. and H.J.M. rarely do so. The ITI students get jobs in Bhilai, Jabalpur etc. Few of the students think in terms of their own workshops or SSI. Their reluctance seems to be that they do not have the property to mortgage for loans, or are unwilling to take the risk.

CHAPTER V CONFLICTS

The Lion and the Unicorn were fighting for the crown:

The Lion beat the Unicorn all round the town.

Some gave them white bread, some gave them brown:

Some gave them plum - cake and drummed them out of town.

Chapter V

5.1 Conflicts

We have seen that a conflict can exist as an unfulfilled need or as a demand. We now look at the data we have gathered about production in the district to identify the conflicts. We ask ourselves: “What are the assertions or claims that are being made by some men of other men? What are the oppositions of interests that underlie these issues? Where are the interests of men being opposed by the processes of Nature?” We have the guidelines from our definition of Environmental Planning that the issues will have to do with the allocation and management of resources. We have also seen that the opposition of interests that are inherent in these issues are clear. We see that it is one or more sections, comprising of “some men”, who are making the issue a bone of contention with another section or sections, consisting of “other men”. The definition of the section is in terms of what is its role in production, so that we can understand how its point of view is related to what it does in society. The conflict is therefore identified as a Man-Man conflict when the interests of two groups of sections over an issue are recognised to be in opposition,

A listing of the Man-Man conflicts identified from the data is what follows. While reading the listing two things should be borne in mind. Firstly, that the quantitative magnitude of the conflict can best be assessed by referring back to the data (which is marked for convenience with the serial number of the Man-Man conflict). Secondly, that it might be possible for us to identify a few more conflicts from the data which have been omitted in the listing. These would, however, be either included at a subsequent stage under a hierarchical linkage with the listed conflicts, or they would be identified when the network interlinkage between the conflicts is being examined.

5.2 Man-Man conflicts- What the Data tells us.

Conflict Number	Source	Conflicting Sections	Issue of Conflict
AGRICULTURE			
M 1	4.04.02	Landless	Landless
			Too many people, too few jobs
M 2	4.04.02	Landless Marginal farmers	Middle farmers, Rich farmers
			Equitable sharing of produce
M 3	4.04.02	Landless	Middle farmers, Rich farmers
			Indebtedness leads to bondage which leads to further indebtedness
M 4	4.04.02	Landless	Middle farmers, Rich farmers
			Raise wages
M 5	4.04.02	Landless	Block Development Officials, Sub-Div. Officer
			Interim employment during land development
M 6	4.04.044 4.04.06	Marginal Farmers Small farmers without pattas	Bank Officials
			Disconnect credit from land title
M 7	4.04.044	Middle farmers, Rich farmers	Block Development Officials
			Sprayers, pesticides and farm equipment, They subsidise on paper but do not implement.

Conflict Number	Source	Conflicting Sections	Issue of Conflict
M 8	4.04.044 4.04.06	Marginal farmers Small farmers, Middle farmers, Rich farmers	Better saplings and better seeds, Higher yields for growing needs
M 9	4.04.044	Middle farmers, Rich farmers	Teach new techniques
M 10	4.04.045	Landless, Marginal farmers, Small farmers	Save crops from cattle
M 11	4.04.05	Middle farmers, Rich farmers	Streamline fertilizer distribution
M 12	4.04.06	Middle farmers, Rich farmers	Assure diesel supply
M 13	4.04.08	Landless, Marginal farmers.	Allow farming of idle lands
M 14	4.04.08	Landless	Distribute waste land
M 15	4.04.08	Landless	Give up promised land in lieu Of building your fields anew

Conflict Number	Source	Conflicting Sections		Issue of Conflict
M 16	4.04.08	Landless	Patwaris and Tehsildars	Provide information On land acquisition
M 17	4.04.08	Recent Marginal farmers	Middle farmers Rich farmers	Grazing land we reap and sow Cattle have no fodder now
M 18	4.04.08	Middle farmers, Rich farmers	Panchayat Office holders	A year-round cattle pound To keep crops safe and sound
IRRIGATION				
M 19	4.05.02	Marginal farmers, Small farmers, Middle farmers, Rich farmers	Irrigation Dept.	Dam larg dams Scheme small Schemes
M 20	4.05.031 4.05.034	Marginal farmers, Small farmers, Middle farmers, Rich farmers	Irrigation Dept	Improve our yields Dig channels to fields
M 21	4.05.05	Middle farmers, Rich farmers	Irrigation Dept.	Water for a third crop
M 22	4.05.034	Middle farmers, Rich farmers	Bank Officials	Don't delay credit outlay If wells collapse loans will lapse
M 23	4.05.034	Landless, Marginal farmers	Irrigation Dept.	Ensure employment through irrigation

Conflict Number	Source	Conflicting Sections	Issue of Conflict
M 24	4.05.04	Landless	Bansagar Project Authority Our homes you rob, So give us a job
M 25	4.05.04	Landless, Marginal farmers, Small farmers	Bansagar Project Authority Pay heed to our survival need
M 26	4.05.04	Landless, Marginal farmers, Small farmers	Bansagar Project Authority We lose land, We choose land
M 27	4.05.04	Landless, Marginal farmers, Small farmers, Middle farmers, Rich farmers	Bansagar Project Authority Transport aid Must be paid
M 28	4.05.04	Landless, Marginal farmers, Small farmers	Bansagar Project Authority Let us know When to go
M 29	4.05.04	Marginal farmers, Small farmers	Bank Officials Redeem mortgages On submerged land
M 30	4.05.04	Middle farmers Rich farmers	Bank Officials Sink the land so Scuttle the loan
M 31	4.05.04	Marginal farmers, Small farmers, Middle farmers, Rich farmers	Bansagar Project Authority Enforce immediate ceiling on command area

Conflict Number	Source	Conflicting Sections		Issue of Conflict
M 32	4.05.04	Rich farmers, Traders	Bansagar Project Authority	Cash compensation for sub-merged land.
FORESTRY				
M 33	4.06.06	Landless, Marginal farmers, Small farmers, Middle farmers, Artisans	Forest Dept.	Regenerate nistar forests,
M 34	4.06.08	Landless, Marginal farmers, Small farmers	Forest Dept.	Local trees for fuel and food, Pine and teak do us no good People's loss in commercial wood.
M 35	4.06.09	Landless, Marginal farmers, Small farmers	Forest Guards	Forest tribes will resent Giving bribes and harassment
M 36	4.06.09	Forest Guards, Forest Rangers	Forest Dept.	Save forests in this way, Smaller beats and higher pay
M 37	4.06.09	Landless, Marginal farmers, Small farmers, Middle farmers	Forest Dept.	Forest wealth is your bonus So preservation is your onus
INDUSTRIES				
M 38	4.07.09 4.07.113	Unionised Workers	Union leaders	Workers say, leaders obey

Conflict Number	Source	Conflicting Section	Issue of Conflict
M 39	4.07.09 4.07.113	Industrial Workers Management	Pay heed to our civic need
M 40	4.07.111 4.07.113	Railway workers, Industrial workers Management	Worker's word must always be heard, Safety, timings and tools observed
M 41	4.07.113	Workers Management	Pay more
M 42	4.07.113	Workers Bureaucracy	Control prices
M 43	4.07.113	Land-based workers Landless workers	Workers owning patches of land, In breaking strikes do lend a hand
M 44	4.07.113	More educated and aware workers Less educated and less conscious workers	Overtime bait employed with impunity Means ill - health, less jobs, disunity
M 45	4.07.113	Local workers Non - Local workers	Religion, language, region, caste, For recruitment should be last
M 46	4.07.113	Workers from one region Workers from another region.	Ban regional links with employment

Conflict Number	Source	Conflicting Sections		Issue of Conflict
M 47	4.07.113	Local workers	Non - Local workers	Without a local root, Local progress matters a hoot
M 48	4.07.114	Union leaders	Management	Workers' contract is manager's bait, workers acceptance will seal their fate
M 49	4.07.114	Union leaders	State & District Administration	When State favours owners Workers are mourners
EDUCATION				
M 50	4.08.011	Small farmers, Marginal farmers	Block level Officials	End the long farce Give us the 3 R's
M 51	4.08.012	Middle farmers, Rich farmers	Teachers	Make primary school An effective tool
M 52	4.08.012	Teachers	Education Dept.	Teaching comes first Guard its interests
M 53	4.08.012	Students	Teachers	Beat less, teach more
M 54	4.08.013	Landless	Teachers	Make education relevant
M 55	4.08.013 4.08.014	Landless, Marginal farmers, Small farmers, Students	College Authorities	Educate for existence Educate for emancipation

Conflict Number	Source	Conflicting Sections	Issue of Conflict
M 56	4.08.014	Students	College Authorities Check corruption
M 57	4.08.015	Small farmers, Middle farmers	Industrial Employers. Learning with earning
M 58	4.08.015	Small farmers, Middle farmers	Technical Training Institutes Provide subsidised training
TRANSPORT			
M 59	4.08.022	Owners of vehicles buses / trucks	R.T.O., Police Ban overloading
M 60	4.08.022	Landless, Marginal Farmers, Middle Farmers, workers and employees of various Depts.	Roadways, State Transport, Railways Reduce expense, Reduce strain
M 61	4.08.028	Employees of private buses	Employees of other private buses. Stick to schedules
M 62	4.08.024 4.08.025	Vehicle drivers	FWD, Contractors Pot-holes and rain Make driving a strain
M 63	4.08.024 4.08.025	Owners of vehicles	PWD, Contractors. Pave the roads, save the trucks
M 64	4.08.026	Owners of buses, trucks	Supplies Authorities More fuel for trucking

Conflict Number	Source	Conflicting Sections		Issue of Conflict
M 65	4.08.027	Employees of Road Transport Union	Bus Owners	Higher pay, fairer share
M 66	4.08.027	Employees of truck transport	Truck Owners	Higher pay For night and day
WELFARE				
M 67	4.08.033	Landless, Marginal farmers, Small farmers, Middle farmers	Officials of various Depts.	More relief works for more people.
M 68	4.08.033	Middle farmers Rich farmers	Block level Officials	Publicise news of relief works
M 69	4.08.034	Landless, Marginal farmers	Block Development Officer, Rahat Karya (Relief work) Supervisors.	Easier work of lasting value
M 70	4.08.036	Landless, Marginal Farmers, Small Farmers, Middle Farmers.	Block level officials.	Distribute milk and dalia for women and children
M 71	4.08.037	Landless, Marginal Farmers, Small Farmers, Middle Farmers.	Orient Paper Mill	Water, not waste
M 72	4.08.038	Small farmers, Middle farmers	Block Dev. Officer	Special seed loan after drought

Conflict Number	Source	Conflicting Sections	Issue of Conflict
CREDIT			
M 73	4.09.03	Artisans, Petty Traders Bank Officials	More soft credit
M 74	4.09.04	Small farmers Middle farmers VSCS and Co-op. Bank Officials, Panchayat Officials.	Make co-operatives accountable
M 75	4.09.04	Middle farmers, Rich farmers. Bank Officials	Rules delay credit
M 76	4.09.04	Landless, Marginal farmers Small farmers. Bank Officials	Soft credit for crisis
M 77	4.09.04	Landless, Marginal farmers, Middle farmers, Small farmers Moneylenders	Lower interest rates
MARKETING			
M 78	4.10.02	Landless, Marginal farmers, Small farmers Municipality Officials	Stop theft of village rations
M 79	4.10.02	Middle farmers, Rich farmers, Traders Municipality Officials.	Rations come and go; Townsppeople don't know
M 80	4.10.091 4.10.092 4.10.093	Small farmers Middle farmers Rich farmers Traders	Favourable prices for field produce

Conflict Number	Source	Conflicting Sections	Issue of Conflict
M 81	4.10.092 4.10.094	Landless, Marginal farmers	Higher prices for forest produce
M 82	4.10.10	Small farmers, Middle farmers Rich farmers	They cheat in wheat
ECOLOGY			
M 83	4.11.006 4.11.02	Landless, Marginal farmers, Small farmers, Middle farmers, Workers	Factory wastes are bad for health
M 84	4.11.007 4.11.008 4.11.009	Landless, Marginal Farmers, Small Farmers, Middle Farmers, Rich Farmers,	Dirty water kills cows and calves
M 85	4.11.010 4.11.02	Marginal farmers, Small farmers, Middle Farmers	Smoke kills crops
M 86	4.11.011	Landless, Marginal farmers	Dirty water kills fishes
M 87	4.11.031	Marginal farmers, Small farmers, Middle farmers, Rich farmers.	Blast coal, not land

Conflict Number	Source	Coal miners	Conflicting Sections	Issue of Conflict
M 88	4.11.032	Coal miners	Western Coalfield Ltd. Management.	Stop lung damage by coal dust
M 89	4.11.033	Marginal farmers, Small farmers,	Western Coalfield Ltd.	Prevent lowering of water table
	4.11.034	Middle farmers, Rich farmers.		
M 90	4.11.036	--do--	--do--	Stop land subsidence
M 91	4.11.043	Bauxite miners	HINDALCO BALCO	Stop lung damage by dust.
M 92	4.11.051	Landless, Marginal Farmers, Small Farmers, Middle Farmers.	Forest Dept.	Meat to eat.
HEALTH				
M 93	4.12.04	Community Health Workers	Primary Health Centre Doctors, Staff.	Regular supervision and training
M 94	4.12.04	Paramedics, Primary Health Centre Staff.	Health Dept.	Higher wages and better working conditions.

Conflict Number	Source	Conflicting Sections	Issue of Conflict
M 95	4.12.04	Community Health Workers	Health Dept. Personnel, Primary Health Centre Staff. Equal status for equal work.
M 96	4.12.04	-do-	Health Dept. Higher pay, more supplies.
M 97	4.12.04	Landless, Marginal farmers, Small farmers, Middle farmers.	Health Dept. Improve Services
M 98	4.12.04	-do-	Community Health Workers. Where are the CHW's ?
EMPLOYMENT			
M 99	4.13.036	Erection and maintenance workers.	M.P. Electricity Board Better work facilities
M 100	4.13.037	BTM, TXR Staff	S.E. Railways Management Inadequate work facilities
M 101	4.13.04	Patwaris	Revenue Dept. More pay, more promotions.

5.3 Man-Nature Conflicts

Various processes in nature are in conflict with each other. Some of these are beneficial to man's survival and others are recognised as being in opposition. We now identify those processes in nature that are in the interests, of those engaged in production in their interests, and in opposition to their interests. This will give us the man-nature conflicts that are relevant to planning. This listing is what follows :

AGRICULTURE		Opposed Forces	
Conflict No.	Source		
N 1	4.04.01 4.04.08	large and level fields are required for crops.	Land in the terrain of the district is undulating, stony and broken.
N 2	4.04.01	Land has to be cleared of its tree cover to be used for agriculture.	Denuded land is prone to soil erosion proving detrimental to agriculture.
N 3	4.04.08	More and more land is needed for growing food crops through extensive agricultural practices.	Fodder, fuel and forest is required around agricultural settlements.
IRRIGATION			
N 4	N.A.	Rainfall is the only irrigation; paddy is the only rain-crop. For more paddy, more jungles have to be chopped	Rainfall is growing erratic due to deforestation.
N 5	N.A.	Requirements for raising production of crops in the district tends to bring more land under cultivation. Also pressures on land force cultivators to seek expansion of arable land.	A given amount of rainfall over the land will irrigate cultivated land better if it is concentrated into a smaller fraction of the total catchment area of the rainfall. As land under cultivation increases, the necessary catchment area for agriculture decreases.
N 6	4.05.02	A combination of surface and ground water based irrigation schemes is necessary for a stable irrigation system.	Flash floods empty rain water through nalas into the rivers. Flash floods occur because of stony, undulating nature of the ground and lack of vegetation cover. As a result water is not being retained on the ground to be able to recharge ground water sources.

- | | | | |
|-----|---------|---|---|
| N 7 | 4.05.05 | Water lies deep making lift irrigation necessary. | Power is in short supply. 'Dhekul' and 'Charas' type arrangements cannot lift water from the depths needed. |
| N 8 | 4.05.06 | Large reservoirs are devised as a storage scheme to irrigate land in a concentrated command area. | Forest and cultivable land is lost in submergence. |

FORESTRY

- | | | | |
|------|----------|--|---|
| N 9 | 4.06.08 | Homogenous forests are needed for successful reforestation under existing Forest Department policies. | Natural processes such as fire, pests, changes in soil constituents, loss of ground water and undergrowth vegetation oppose the regeneration of homogenous forests. |
| N 10 | 4.06.081 | Natural forests of bamboo, teak, mahua and other useful trees have long growth periods and low yields. | The raw materials require much higher yield rates than the forests can support. |

INDUSTRIES

- | | | | |
|------|------|--|--|
| N 11 | N.A. | Work is hazardous to health. | Work is essential for survival. |
| N 12 | N.A. | Chemicals and heat processes are used in the manufacture of paper. | The adverse and trouble some conditions of work caused by these processes are detrimental to workers well-being. |

TRANSPORT

- | | | | |
|------|------|--|---|
| N 13 | N.A. | Development leads to the growth of the road and rail network, and the establishing of growing townships. | Roads and railways affect the drainage patterns of the land. Built up townships concentrate heat, changing the temperature map of the country side. Present estimates put the limit at 10% of land to be used for infrastructural facilities. |
|------|------|--|---|

RELIEF AND WELFARE

- | | | | |
|------|------|--|--|
| N 14 | N.A. | Kachcha roads of earth and murrum are built in summer. | Monsoons immediately following the summer months wash away the built up earth roads, which are invariably not surfaced to withstand the heavy rains. |
|------|------|--|--|

N 15	4.08.037	Handpumps, dams, talabs, roads -all need regular maintenance.	Funds required for maintainance means less money for further increase in facilities.
N 16		Wells are dug at a site which is considered most likely to yield water.	Often wells are abandoned because inadequate water is found at the site.
MARKETING			
N 17	N.A.	Agricultural and Forest produce have to be preserved for consumption throughout the year	Produce decays in storage.
ECOLOGY			
N 18	4.11.004	During rains, effluents from paper mills and soda units on the Sone get diluted to acceptable levels.	During summer months, water in the Sone falls to a trickle and effluents reach high levels of concentration.
N 19	4.11.010 4.11.02	By-products of factories are released as waste into the atmosphere.	Winds carry these wastes over colonies, villages and fields causing damage to health and agriculture.
N 20	4 11.031	Where the overburden is less, open-cast coal and bauxite mining is practiced because it is cheap and safe.	Open cast mining defaces the land, and the thick dust in the air creates a health hazard.
N 21	4.11.032	Blasting of coal seams is necessary to dislodge the coal in open-cast mines.	Around Harrad the blasting done by WCL has caused fissures in the agricultural land.
N 22	4.11.033 4.11.034	Ground water seeps into coal pits. Pumps are used to throw this water into rivers and nallas.	Less ground water means destruction of vegetation, harm to crops and drying of wells.
N 23	4.11.051	Deforestation has decreased the natural habitat of game.	Preservation of game demands maintenance of natural forests.
N 24	4.11.08	Town sewage is flushed into drains	These drains empty into streams on which are based the water supply schemes of small towns.
N 25	4.11.09	Ploughing along the slope rather than transverse to the slope is practised in the region. Deep ploughing is necessary to turn up nutrient rich soil.	Surface water runoff along the slope carries away topsoil. Deep ploughing loosens the soil and makes it vulnerable to erosion by wind.

* * *

CHAPTER VI

INTERLINKAGES

Will you, won't you, will you, won't you,
Will you join the dance ?
Will you, won't you, will you, won't you,
Won't you join the dance ?

Chapter VI

6.1 Hierarchical Interlinkage-what is important to whom and why

The *Clustering* of Conflicts, whether they be of the Man-Man kind or of the Man-Nature kind, is now done. The basis for this interlinkage is the dependence upon a primary issue of all the conflicts within the hierarchically linked cluster. The sections involved in the issue are listed along with the issue itself as two opposing groups of sections. This tells us who are those in conflict over the important issues and what are the natural processes that they must consider as related to their conflicts.

6.2. Hierarchical Interlinkage-Clustering of conflicts on the basis of issues

Cluster Number	Man-Man Conflict Number	Landless	Conflicting sections	Cluster Issue	Associated Man-Nature Conflict
I	M 1 M 5	Landless	Landless Block Dev. Officers, Sub Div. Officers.	Employment should be given to landless.	N1. Undulating land unfit for agriculture.
II	M 2 M 3 M 4	Landless Marginal farmers	Middle farmers Middle farmers	Wages are too low in agricultural work.	
III	M 6, M 7, M 8, M 9, M10, M11 M12, M18	Landless Marginal farmers Small Middle Rich	Agriculture Dept. (BDO & Extension officials) Co-op. officials).F.C.I. officials, Bank officials Forest Panchayat Middle farmers Rich farmers	Inputs for the development of agriculture	N7. Lift irrigation and power is in short supply. N25. Deep ploughing along the slope hastens the erosion of land

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
IV	M 13	Landless	Distribution of land for cultivation.	N 2. Forest land cleared of trees is prone to soil erosion.
	M 14	Marginal farmers		
	M 15	Forest Dept. (Forest Guards, Rangers)		
	M 16	Revenue Dept. (Patwaris, Tehsildars), Landlords		
V	M 17	Recent Marginal farmers	Land for cultivation is taken from fallow and grazing land.	N 3. Land used to grow food is diverted from fodder, fuel and forest requirements
		Middle farmers		
		Rich farmers		
VI	M 19 M 20 M 21	Marginal farmers, Small farmers, Middle farmers, Rich farmers	Water should be available in adequate quantities for irrigation.	N 4. Seasonal rainfall is erratic. N 5. Drainage patterns flush away water that could be useful in agriculture. N 6. Surface and ground water sources are unreliable due to nature of terrain. N 8. Large bodies of water inundate forest and cultivable land.
		Irrigation Dept.		
		Bank officials		
VII	M 22	Middle farmers, Rich farmers	Get rid of delays in bank loans.	

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
VIII	M 23	Landless	Employment should be available from increased irrigation.	
	M 24	Marginal farmers		
	M 25	Landless		
	M 26	Marginal farmers		
IX	M 27	Small "	Terms of rehabilitation on evacuation from the area coming under submergence.	
	M 31	Middle "		
		Rich "		
		Rich "		
X	M 28	Landless	Information on schedules for evacuation from submerged area should be disclosed.	
		Marginal farmers Small "		
XI	M 29	Marginal farmers	Debts to banks to be written off.	
	M 30	Small "		
		Middle "		
XII	M 32	Rich farmers	Money should be given in compensation to land submerged.	
		Traders		
		B.P.A.		
XIII	M 33	Landless	Sufficient wood for nistar uses should be available.	N 10. Yields from forests are low.
		Marginal farmers		
		Small "		
		Middle "		
		Artisans		

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
XIV	M 34	Landless	Plantations should have locally useful trees instead of pine, teak and eucalyptus.	N 9. Homogeneous forests are vulnerable to destruction,
	M 37	Marginal farmers Small " Middle " "		
XV	M 35	Landless	Excessive bribes are demanded by guards.	
		Marginal farmers Small " "		
XVI	M 36	Forest Guards	Wages and working conditions are unsatisfactory; salaries are too low.	
		Forest Dept. Lower level employees of Forest Dept. forest guards, rangers		
XVII	M 38	Unionised workers	Workers want their Unions to function more democratically.	
XVIII	M 39	Industrial workers	Civic amenities should be provided	
XIX	M 40	Railway workers	Working conditions should be improved.	N 11. Industrial processes affect health. N 12. Safeguards against effects of heat and chemicals are required.
		Industrial workers		

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
XX	M 41	Workers	Purchasing power of wages is low and declining.	
	M 42			
XXI	M 43	Local workers	Organisational unity is sought.	
	M 44	Land based workers, More educated and aware workers		
	M 47	Non-local, landless workers, less educated workers		
XXII	M 45	Local workers	Employment generation in the district is inadequate to meet the need for employment.	
	M 46	Workers from other regions		
XXIII	M 48	Union leaders	Sub-contracts are being given to workers in industry, which should be disallowed.	
XXIV	M 49	Landless	State and District Administration.	Negotiations stumble due to the partisan approach of the State and District administration.
XXV	M 50	Landless	Quality of education in schools is poor.	
	M 51	Marginal farmers		
	M 53	Small farmers		
	M 54	Middle farmers Rich farmers Students		

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
XXVI	M 52	Teachers Education Dept.	Teachers receive low salaries, are subject to ad-hoc transfers, and used for other official purposes.	
XXVII	M 55	Students, Landless, College Marginal farmers, Authorities Small farmers	Better the quality and content of higher education.	
XXVIII	M 56	Students College Authorities	Administrative staff of colleges is corrupt.	
XXIX	M 57 M 58	Small farmers, Middle farmers Industrial Employers, Technical Trg. Institutes	Vocational training is inaccessible.	
XXX	M 59	Owners of buses and trucks RTO, Police	Overloading of buses and trucks should be banned.	
XXXI	M 60	Landless Marginal farmers Small " " Middle " " Workers Employees of various Departments.	Better transport facilities should be provided at cheaper rates.	
XXXII	M 61	Employees of private buses Employment of other private buses	Timings of buses on the same routes are to be strictly kept.	

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
XXXIII	M 62 M 63	Vehicle drivers Owners of vehicles Public Works Dept. Contractors	Poor conditions of roads to be improved upon.	N 13 Roads interfere with the natural drainage pattern of land
XXXIV	M 64	Owners of buses and trucks Supplies Authorities	Adequate supply of diesel should be made available.	
XXXV	M 65 M 66	Road transport and truck transport employees Bus Owners Truck Owners	Wages and earnings of employees are too low.	
XXXVI	M 67 M 68 M 69	Landless Marginal farmers Small Middle Rich Block Dev. Officers Rahat Karya (Relief Works) Supervisors.	Opening of relief works for temporary employment.	N 14 Roads get washed away in rains. N 15 Equipment depreciates and requires maintenance.
XXXVII	M 70	Landless Marginal farmers Small Middle Block Level Officials	Milk and dalia (porridge) intended for pregnant women in rural areas should be distributed.	
XXXVIII	M 71	Landless Marginal farmers Small Middle Orient Paper Mill	Inadequacy of wells to substitute a polluted river.	
XXXIX	M 72	Small farmers Middle Block Dev. Officers	Issue of seed on loan after drought years.	

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict
XL	M 73	Small farmers Middle "	Misuse of funds by the Co-operatives.	
		VSCS Co-operative Bank Officials Panchayats		
XLI	M 74	Landless	Credit on soft interest terms to tide over crisis situations	
	M 76	Marginal farmers		
	M 77	Small "		
		Middle " Artisans Petty traders		
XLII	M 75	Middle farmers Rich "	Expedite loans	N 16 Wells dug at wrong sites leads to waste
		Bank Officials		
XLIII	M 78	Landless	Better rationing service is needed	
	M 79	Marginal farmers		
		Small "		
		Middle "		
		Rich " Traders		
XLIV	M 80	Landless	Better prices for produce	N 17 Grain, vegetables and oilseeds require storage facilities to be preserved in good condition.
	M 81	Marginal farmers		
		Small "		
		Middle "		
		Rich " Fadiaz Traders		

Cluster Number	Man-Man Conflict Number	Conflicting Sections		Cluster Issue	Associated Man-Nature Conflict
XLV	M 82	Small farmers	Government Officials, Traders	Improper management of procurement centres.	
		Middle			
		Rich			
XLVI	M 83	Landless	Western Coalfields Ltd.,	Industrialisation leads to unnecessary health hazards	N 18 Water pollution poses health hazard.
	M 88	Marginal farmers	Orient Paper Mill, Hukum-chand Jute Mill,		N 19 Air pollution poses health hazard.
	M 91	Small	HINDALCO		N 20 Dust pollution is a health hazard.
		Middle	BALCO		
		Coal miners			
	Bauxite miners				
	Workers				
XLVII	M 84	Landless	Orient Paper Mill	Pollution harms crops and cattle.	
	M 85	Marginal farmers	Hukumchand Jute Mill		
		Small			
		Middle			
	Rich				
XLVIII	M 86	Landless	Orient Paper Mill	Loss of the food that was nature's gift.	N 23 Game can survive only in a natural habitat
	M 92	Marginal farmers	Forest Dept.		
		Small			
		Middle			
XLIX	M 87	Marginal farmers	Western Coalfields Ltd.	Agricultural land is being harmed	N 21 Blasting causes fissures in land
	M 89	Small			N 22 Deep coal mines adversely affect ground water conditions.
	M 90	Middle			
		Rich			

Cluster Number	Man-Man Conflict Number	Conflicting Sections	Cluster Issue	Associated Man-Nature Conflict.
L	M 93 M 97 M 98	Landless Marginal farmers Small Middle CHWs Health Dept., PHC Doctors CHWs	Better health services should be provided by personnel,	N 24. Sanitation measures are necessary to prevent epidemics.
LI	M 94	Health Personnel Health Dept.	Better wages and better working conditions should be provided.	
LII	M 95 M 96	CHWs Health Personnel Health Dept.	Respect is not given, equipment is withheld and stipends are too low.	
LIII	M 99 M 100	Electricity Board Erection and Maintenance workers, Railway BTM & TXR staff Managements of MPEB and SE Railways.	Low salaries and bad working conditions.	
LIV	M 101	Patwaris Revenue Dept.	Low salaries, too much responsibility without authority and poor advancement prospects.	

6.2 Network Interlinkages

So far the linking of conflicts in a hierarchical cluster has only partly completed our work of interlinkages. The next step is the *Network* interlinkage. The twin basis for this is.

1. Finding similarity in the cluster issues.
2. Finding commonality in the conflicting Sections.

Network Number	Cluster Numbers	Context	Opposed Sections
A	IV	Land usage : M 13, M 14, M 15, M 16, M 17 N 2, N 3	Landless Marginal farmers Forest Dept. Officials, Revenue Dept. Officials, Landlords, Middle farmers, Rich farmers
B	III VI VII XXXIX XLI XLIV	Agricultural Development M 6, M 7, M 8, M 9, M 10, M 11, M 12, M 18, M 19, M 20, M 21, M 22, M 72, M 74, M 76, M 77, M 80, M 81 N 4, N 5, N 6, N 7, N 8, N 17, N 25	Landless, Marginal farmers Small Middle Rich Artisans, Petty Traders Co-operative, F.C.I., Forest Dept., Agriculture Dept., Block Development, Bank and Irrigation Dept. Officials, Middle farmers, Panchayats, Moneylenders, Fadias, Traders.
C	I VIII XXII XXIX XXXVI	Employment : M 1, M 5, M 23, M 24, M 45, M 46, M 57, M 58, M 67, M 68, M 69 N 1, N 14, N 15	Landless, non - local workers, workers from another region, Sub - Divisional and Block Dev. Officials, Relief Works Officials - All Depts., Bansagar Project Authority, Industrial employers, ITI, Polytechnic, Banks, Orient Paper Mills Landless, Marginal farmers Small Middle Rich Local workers, Workers from one region, Artisans, Petty traders.

Network Number	Cluster Numbers	Context	Opposed Sections
D	II XVI XX XXVI XXXV LI	Wages : M 2, M 3, M 4, M 36, M 41, M 42, M 52, M 65, M 66	Middle farmers, Rich farmers, Education Dept., Managements, Bureaucracy, Owners of buses and trucks
E	IX X XI XII	Rehabilitation : M 25, M 26, M 27, M 28, M 29, M 30, M 31, M 32	Landless, Marginal farmers, Railway and Industrial workers, Teachers, employees in bus and truck transport. Landless Marginal farmers Small Middle Rich Traders
F	XIII XIV XLVII XLVIII XLIX	Ecology : M 33, M 34, M 37, M 84, M 85, M 86, M 87, M 89, M 90, M 92 N 9, N 10, N 21, N 22, N 23	Bansagar Project Authority, Banks Forest Dept., Orient Paper Mill, Hukumchand Jute Mill, BALCO, HINDALCO, Western Coalfields Ltd., Amarkantak Thermal Power Station.
G	XVIII XXV XXVII XXXI XXXIII XXXVIII XLII XLIII XLV L	Civic Amenities : M 39, M 50, M 51, M 53, M 54, M 55, M 60, M 62, M 63, M 71, M 75, M 78, M 79, M 82, M 93, M 97, M 98 N 13, N 16, N 24	Block Level Officials Bank Officials Govt. Officials Teachers College Authorities Other employees of Private buses, PWD and contractors. CHWS OPM

Network Number	Cluster Numbers	Context	Opposed Sections
H	XVI	Working conditions : M 36, M 40, M 83, M 88, M 91, M 95, M 96, M 99, M 100, M 101 N 11, N 12, N 18, N 19, N 20	Landless, Marginal farmers, Lower level employees of various Depts., Railway and Industrial workers, Health personnel, CHWs.
	XIX		
	XLVI		
	LII		
	LIII		
I	LIV	Unionisation: M 38, M 43, M 44, M 47, M 48, M 49	Less educated and less conscious workers, Management, State and District Administration, Union leaders.
	XVII		
	XXI		
	XXIII		
	XXIV		
J	XV	Corruption: M 35, M 56, M 70, M 73	VSCS Officials Bank Officials Co-op., Officials Forest Guards Panchayats, College Authorities.
	XXVIII		
	XXXVII		
	XL		
	Landless Marginal farmers Small Middle Students		

6.3 Contradictions

The contradictions will polarise the Sections into two main opposing categories – C1 and C2. All the opposition of interests that we have seen as conflicts can then be traced down to these contradictions. Three abstract ideas characterise the opposition of forces. These are:

1. The distribution of authority;
2. The distribution of credit;
3. The distribution of profits.

Are these interconnected in any way?

Yes, they are interlinked in a hierachical fashion to a *central contradiction*. This is

the control of resources

categories C3 and C4 also face the same central contradiction.

Category	Sections	Sections	Sections
C 1 (Allying with each other)	Lower level employees of Govt. Departments.	Landless; marginal farmers, Small farmers.	Artisans; Industrial workers; Petty trader's. Students
C 2 (Allying with each other)	Officials of various Depts. (Health, Forest, Irrigation, Agriculture, Education, Revenue Depts.); B.D.O.; SDO; Co-operatives; FCI; Authorities of Relief works, Schools and Colleges, ITI, Polytechnic, Banasagar Project; State and District administration; R.T.O.; Police.	Moneylenders; Fadias (trader's agents); Banks.	Industrial employers; Managements; Railways; Landlords.
C 3 (Allying with both C 1 and C 2)	Forest Guards and Rangers; Patwaris; paramedical staff; Primary Health Staff; Teachers; Community Health Workers.	Middle farmers; Rich farmers Traders.	Union leaders; Vehicle owners;
C 4 (Conflicting within themselves)	Landless; Workers in Industry.		

6.4 Resolution

We have seen that the objective of Environmental Planning is to show how conflicts can be resolved to “improve the well - being of those engaged in production, prevent the harmful by-products of industrialisation and conserve the resources. “Therefore, the remaining task of the Demand Model is to show how the Central Contradiction of control over resources—which is “the opposing force right in the centre, responsible for all the disparities, the problems, the tension”—may be resolved. There are three options we must consider.

1. We may deny that the resources need to be controlled. This, however, is a denial of the reality, and a negation of planning itself. On these grounds this option has to be rejected.

2. We may say that either category C 1 or category C 2 of the sections will voluntarily give over all claims to control over resources in order to resolve the contradiction. This is certainly not what we have seen as happening when we examined the historical process through which planning has passed. In fact, we have seen the reverse. This option is, therefore, both ahistorical and a negation of, the need for planning. On these grounds it can be rejected.

3. We may say that it is the category C 1 demanding the resolution of its own conflicts, which will resolve the contradiction in its favour.

This tells us who are those “engaged in production”. It also bears out the definition of the Demand Model of planning. Thus, it is necessary to adopt this option.

It is, therefore, to the sections of category C 1 to whom we turn our attention in the following chapter. Will they be able to resolve the conflicts that our society is prey to? Will they, through their creative activity, come to realise their innate relationship with the environment? Will they be able to emerge from their cocoon of deprivation and misunderstanding to set right the skewed balance? The questions emerge from the present. The answers belong to the future. Theoretical models can only point the way.

CHAPTER VII
THE ENVIRONMENTAL PLAN

I heard him then, for I had just
Completed my design

To keep the Menai bridge from rust
By boiling it in wine.

I thanked him much for telling me
The way he got his wealth,

But chiefly for his wish that he
Might drink my noble health.

Chapter VII

7.1 Taking stock

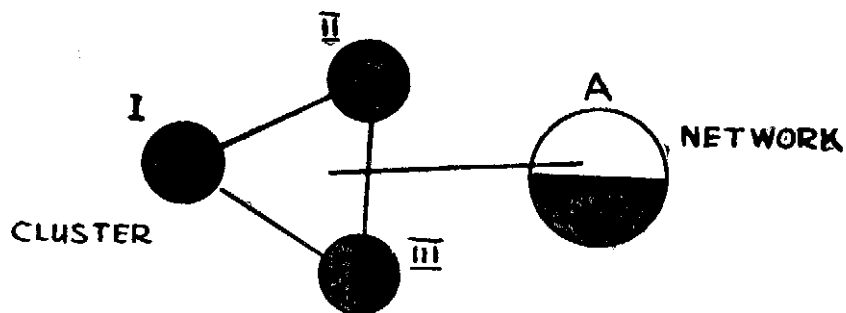
It is now time to pause and take stock of what we have done so far. Starting with a hundred and one Man-Man *Conflicts* and twenty-five Man-Nature *Conflicts* the *first* step has been to hierarchically link up these Man-Man and Man-Nature conflicts in Clusters on the basis of common issues. The linkage is done by identifying the issue, the resolution of which would result in resolution of the Conflicts dependent upon it. The resolution of this issue requires the resolution of certain Man-Nature Conflicts also. These, then, are also linked at this stage. This has resulted, at the first level of inter-linking, in fifty four primary Clusters. What we have done can be represented pictorially as follows:



The small black circle represents Man-Man *Conflict*, the small white circle represents Man-Nature *Conflict* and the large black circle represents the primary *Cluster* of conflicts.

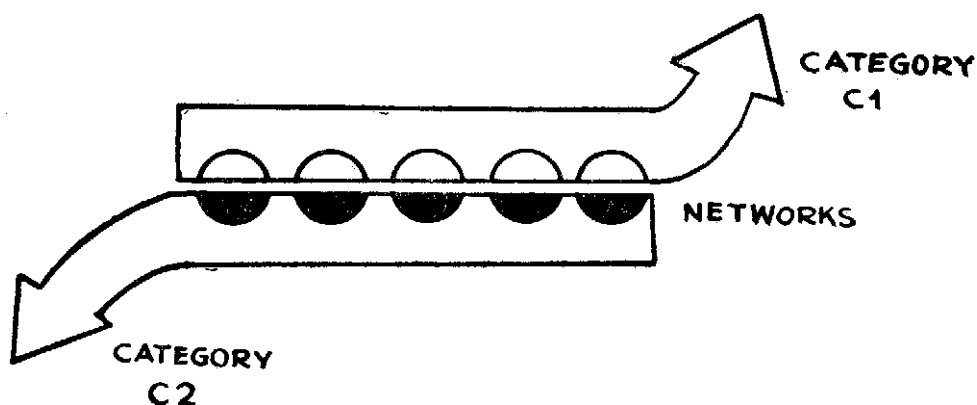
The second step has been to link these fifty four primary *Clusters* through a Network interlinkage resulting in ten principal *Network* conflicts. A Network interlinkage is made by considering:

- i. A similarity of issues, this similarity being expressed as the principal issue.
- ii. The sections that are involved: sections that are in opposition to the same section are connected. Both these criteria are simultaneously used to establish the interlinkage. This corresponds to the *second* level of interlinkage and can be represented pictorially as follows:



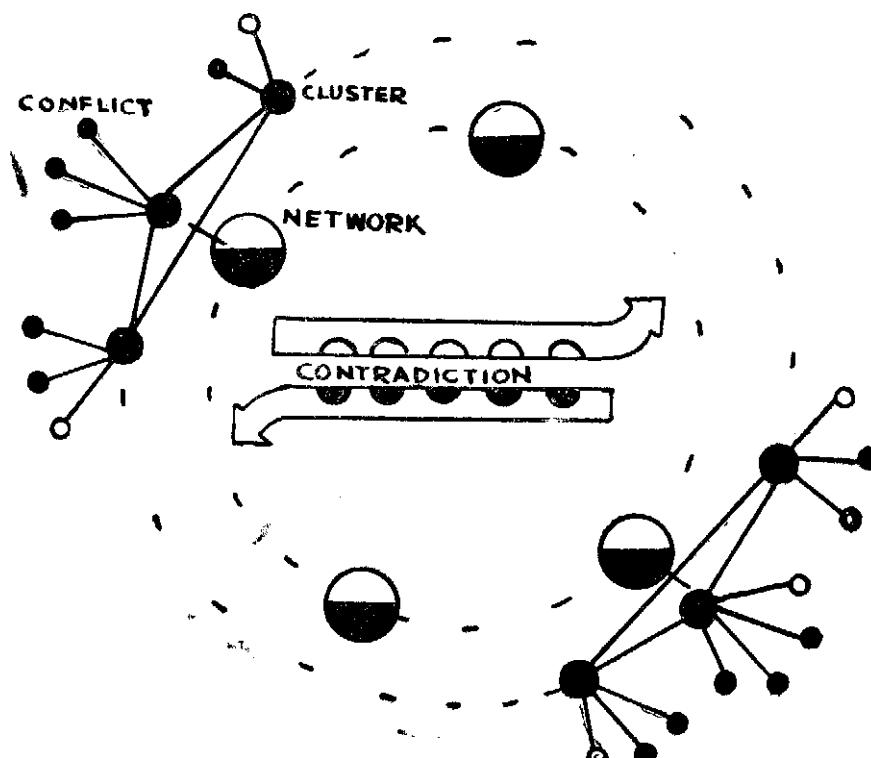
The black and white circle represents the principal Network, the black portion representing one section-alliance and the white portion the opposing sections.

We now have a pattern of issues with some sections in alliance with other sections and in opposition to still other sections. This pattern can be generalized over all the issues on the basis of alliances and oppositions to yield the main *Categories* that are in opposition. A corresponding generalisation of the issues yields the abstract *Contradictions* over distribution of authority, distribution of credit and distribution of profits; which finally leads us to the Central Contradiction of control over resources. This can be pictorially represented as follows;



The sections in alliance are shown within each of the arrows and the opposition between the sections is shown by the direction of the arrows. The issues are therefore split in terms of the contradiction of interests they manifest.

Let us now proceed to bring together the various pictorial steps.



Let us take the Conflict M 13 corresponding to the first level to illustrate the method.

Opposed Sections

Landless and marginal Farmers

Forest Guards and Rangers

Issue

Land for agriculture being encroached from Forest Land.

If the landless and marginal farmers continue seeing their conflict as being limited to Forest Guards and Rangers alone, the conflict will not be resolved as they will continue encroaching on forest lands and the Guards and Rangers will continue harassment and or bribery. It is only when M 13, M 14, M 15 and M 16 are linked at the level of Cluster IV that Landless and marginal farmers will come together as a group and demand that land distribution take place. At this Cluster level, there will also be a growth of understanding namely that the issue of land distribution invites opposition from Revenue and Forest Department Officials and landlords and, therefore, it is necessary to ally with other groups of landless and marginal farmers on the issue.

The Man-Nature Conflict N2 linked to the primary Cluster IV is that forest land cleared of its forest cover gets eroded, gradually leading to impoverishment of cultivable land and the consequent demand for more forest land to be brought under cultivation. This process has been in operation historically as seen from the shifting pattern of agriculture leading to barren land. Hence the alliance will have to consider how to resolve this Conflict also.

Success of the demand at Cluster IV will convert these groups, especially of the landless, to marginal farmers with adequate land for the time being. They will thus lose interest in the issue of land distribution *per se* but will now become involved in the other conflicts of marginal farmers such as issues of agricultural development and soil conservation. The Demand Model of planning, however, is capable of tackling this dynamic change in the conflicts and issues by linking them at the Network level.

Failure of the demand at Cluster IV will force the various groups back to their original Conflicts at M 13, M14, M15 and M 16.

Why the demand at Cluster IV failed constitutes an educational question for this section at this point. The plan has to devise a specific program through which the sections can understand the reasons for their failure.

Two particularities of this specific example need to be pointed out. The starting point of a section of landless and a section of marginal farmers, who are demanding land to be distributed, is whether *individuals* from these sections perceive their demand as the demand of two *sections* of the people. If this were not true it would be necessary to start with the demands of *individuals*. Second, since at the level of the Network interlinkage the issue of land distribution does not show similarity with the other issues, the sections either remain with the same issue or they arrive at an understanding of the Central Contradiction at the very next step.

Let us consider another example, starting from Man-Man Conflict M 40.

Opposed Sections

Issue

Railway / Industrial workers

Vs. Management

Workers have no choice duty timings, are often not supplied with proper equipment for doing their tasks and have to work under unsafe conditions.

In the hierarchical Cluster interlinkage, this Conflict stands aloof. In the Network interlinkages, this Conflict is linked up with the Network H. This leads to a specific understanding of the opposition from the alliance of managements of Industry, S E Railways and Madhya Pradesh Electricity Board to the issue of improvement of working conditions. The alliance sought is between Industrial workers and the lowest level employees of the Govt. service departments. As in the previous example, the perceptions of industrial and service department workers provides the starting point for the educational process related to improvement of working conditions.

The Man-Nature Conflicts linked to the primary Cluster (i. e. N 11 and N 12) are: effects of industrial processes on health are little understood and safeguards against heat and chemicals should be provided. Educational programs designed for this purpose will deal with aspects of

chemical, noise, thermal, dust pollution effects and safe practices developed in other areas which are seen as benefiting the workers e. g. rubber gloves, earmuffs and glasses, protective clothing and internationally acceptable safety standards for the working environment. As an illustration, the upper limit of tolerance to noise, on a continuous basis, is in the range of 80 decibel (dB); where decibel is a measure of the loudness of sound. However, when the decibel rating of sound goes from 80 dB to 90 dB, the sound has become ten times louder. Continuous subjection to sound above 90 dB is capable of driving the hearer deaf or insane in a short while. Similarly, sound which is continuously produced in a frequency below the hearing level produces extreme fatigue in the hearer without his being aware of the source of his fatigue.

7.2 From theory to practice

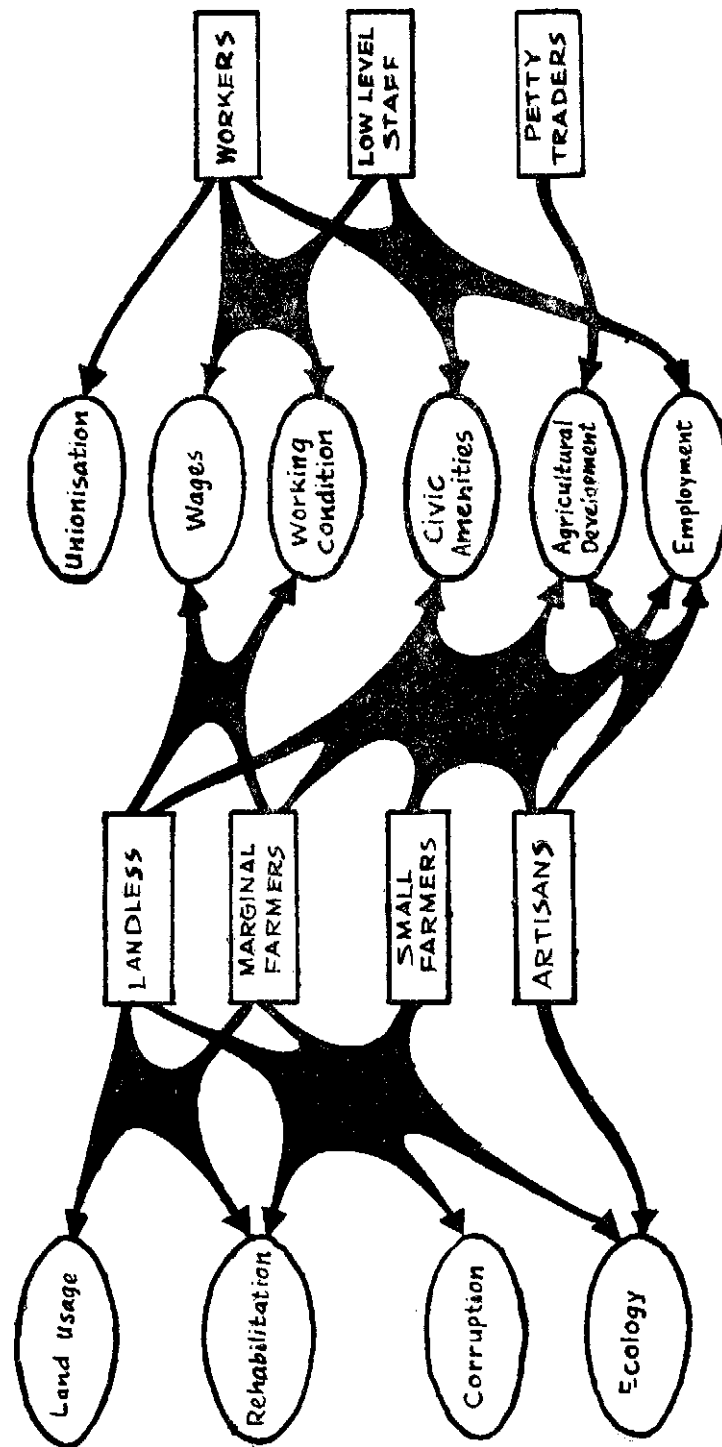
Theoretically, we have built an elaborate structure. From the Conflict we proceeded to the Cluster; from the Cluster we came to the Network; and from the Network we finally discovered the Contradiction. This theoretical understanding can now be converted into specific programmes. We shall take as our starting point only those conflicts at the periphery of our Model with which the sections in Category C 1 are associated. We shall trace from the peripheral conflicts inwards towards the Central Contradiction, designing educational and organisational programmes as we go along. These programmes will point to the need for organised action for overcoming Man-Nature and Man-Man Conflicts. They will show further how the path winds through the woods.

7.3 Sweeping up the sand:

Over 30% of the capable working people are looking for secure and regular employment in the district. They can hardly be put to work sweeping up the sands of the River Son. But what can the Demand Model have to say about this demand? Let us trace the path.

The Demand Model has the following things to say about The demand for employment by landless labourers:

- a. The landless will have to first resolve their own differences on this issue; by understanding that only together can they resolve it.
- b. Landless share this demand with marginal farmers.
- c. The possibility they commonly see of increased employment is linked to the development of agriculture which, in turn, is based on the provision of irrigation.
- d. Irrigation in the region can be accomplished by efforts to harness the run-off of monsoon water through a series of small dams.
- e. The development of agriculture is equally dependent on the capacity of middle and rich farmers of resolving *their* conflicts. These conflicts are related to provision of inputs and adequate facilities, as also the existence of a skilled labour force.
- f. The technology for agricultural development shall have to focus on appropriate techniques for soil conservation, fencing, vegetable cultivation, agricultural equipment, and training.
- g. Employment is also linked to the development and expansion of industrial units like the coal mines.



h. Other industrial development is dependent on appropriate techniques to use available forest, mineral, agricultural, and industrial resources for local processing.

i. Agricultural and industrial development are, in turn, linked to a host of health, educational, transport, and ecological problems.

j. Even after employment is assured, the conflicts around wages and working conditions will remain.

All this can be placed before the landless in terms of their own experiences as an educational programme. To what extent they will begin to translate their experience into learning and back into action depends on their organisational strength and weaknesses. Thus organisational programmes around the issues of employment will be the guide to what extent the landless will proceed towards the Central Contradiction.

7.4 Using the method outlined earlier, detailed programmes emerge for implementation with the sections identified in Category C1.

Issue	Sections	Programme
Land usage	Landless Marginal farmers	Legal procedures related to obtaining land title and consolidation of possession will be explained. It will be necessary to develop a clear understanding of the status of land; whether it is forest land, revenue waste land, land held in excess of ceiling laws, village common land or pasture land. Educational programmes will also show erosion mechanisms due to deforestation, the harm due to loss of topsoil and the effects of shifting agriculture. Organisational programmes will be directed towards forming alliances with other landless and marginal farmers over this issue, and the need for avoiding settling on common pasture land as it harms the interests of other landless and marginal farmers, thereby negating the organisational purpose.
Agricultural Development	Landless Marginal farmers Small farmers Artisans Petty traders	The development of agriculture will mean more productive work for all these sections. A major obstacle in the development of agriculture is the low level of irrigation in the region. The educational tasks will elucidate the feasibility of small dams, weirs, percolation tanks and field channels for promoting irrigation. Knowledge of intensive agricultural techniques, crops more suitable to the region, credit and development schemes put forward by banks and governmental agencies and appropriate technologies for increasing productivity and retaining more surplus will also be included in the educational component. Technical and vocational training for the introduction of newer skills is also a necessary component in the development task. For increasing the level of irrigation in the region, the organisational tasks involve the formation of an alliance of all sections of the peasantry for more concerted action. For securing access to credit from banks and in order to break the stranglehold of the moneylenders, the marginal and small

Issue	Sections	Programme
Employment	Landless Marginal farmers Small farmers Artisans Lower level Govt. employees Industrial workers	<p>farmers will have to organise and form alliances amongst themselves and also with middle farmers. Artisans and petty traders who provide services to agriculturists also need credit; the former for tools and implements and the latter for working capital. However, the diverse and distributed nature of these activities makes the formulation of more specific educational and organisational tasks difficult.</p> <p>For sections of the peasantry, the employment demand is linked to the development of agriculture, the provision of irrigation, the expansion of existing industrial units and the development of appropriate technologies for local processing of available forest, mineral, agricultural and industrial resources. In common with artisans, some of these demands can be met through the incorporation of newer skills and information. With lower level Govt. employees and industrial workers, the educational and organisational tasks have to deal with regional and caste affiliations which weaken their overall organisational effectiveness. Organisational tasks with the poorer peasantry are connected with the implementation of relief works of lasting value and information on the possibilities of opening up relief works in the vicinity of villages.</p>
Wages	Landless Marginal farmers Lower level Govt. employees Industrial workers	<p>The educational tasks with regard to the peasantry are connected with information on minimum wages and other legislation and also the increased shares possible through agricultural development. More wages and greater returns from agriculture will strengthen the bargaining position of the poorer peasantry with respect to the landlords and richer farmers. With Govt. employees, the educational task will be to explore the avenues for regularisation of employment and the consequent benefits in wages. With industrial workers, education in this context will seek to clarify the mechanisms underlying the wages-price spiral and inflation. The organisational tasks with the peasantry are to form alliances on</p>

Issue	Sections	Programme
Rehabilitation	Landless, Marginal farmers, Small farmers	<p>this issue within and between landless and marginal farmers. With Govt. employees and the casual and temporary contract workers operating on the fringe of industry, the organisational task is to bring about collective demands for higher wages.</p> <p>The demands of the poor peasantry are for land as compensation for the land they will lose under submergence. Other demands are for survival employment, money compensation for assets and annulment of credits and mortgages. The demands are not clearly formulated nor does an organisational basis exist for seeking implementation of the demands. Another educational component that needs to be explored is the consequences of resettlement in the case of various other similar projects around the country.</p>
Ecology	Landless Marginal farmers Small farmers, Artisans	<p>The maintenance of natural forests and the plantation of locally useful trees has to be coupled, at the educational level, with information on the harmful effects of homogeneous plantations and deforestation. Similarly, the employment benefits of industries have to be balanced with social costs in terms of pollution, health hazards and environmental destruction causing economic losses to the poorer peasants. Enough case material exists within the region for devising educational programmes for the purpose. The organisational tasks include alliances amongst the poor peasantry for reforestation and introduction of better species of plants into the region.</p>
Civic Amenities	Landless, Marginal farmers, Small farmers Artisans	<p>All sections of the peasantry suffer from the lack of educational facilities at the village level. For the landless, there is an urgent need to learn simple calculation to deal with wage earnings, earthwork calculations and price manipulations. Literacy and Adult Education programmes prove useful to the small and</p>

Issue**Sections****Programme**

marginal farmers for land and credit dealings. Artisans and youth from the peasantry want to acquire newer skills. There is tremendous scope for experimentation with educational programmes.

Rationing services, when available in the villages, operate to the inconvenience of the poorer peasants. Thus, when quotas are not collected, they can be siphoned off into the lucrative black market. The benefits of rationing are possible only when a concerted demand emerges from an alliance of these sections of the peasantry.

Access to private and public health services remains the preserve of the few. Preventive Health care is virtually non-existent. Health education for the poorer peasants has to be coupled with an organised demand for a more active, vigorous health delivery system; this demand will have to emerge from the poorer peasants as well as middle farmers who are at the present moment most helpless to combat ill health.

Working conditions

Landless
Marginal farmers
Small farmers,
Lower level Govt. Staff,
Industrial workers.

Due to the lack of employment in agriculture, members of the poorer peasantry are increasingly forced to seek jobs outside agriculture. As labourers employed in loading and unloading, of trucks and tractors, they work very long hours in the heat and cold, sun and rain, without food. Conditions are similar in construction, road building and relief works. Lower level Govt. staff have to stay in camps at various work sites under conditions of hardship. The spectre of unemployment and starvation stills their voices and dulls their senses to the daily misery, often arbitrarily imposed by their superiors. Most often these hardships are coupled with poor wages and irregularities in payments. The organisational demand for better wages has

Issue

Sections

Programme

to be coupled with the demand for a greater say in the conditions of work; the educational component has to deal with bringing about the consciousness of the working conditions.

Industrial workers face many hazards related to their workplace : radiation from welding causes eye damage; chemicals and gaseous pollutants lead to skin, respiratory and other physiological malfunctions; sound and heat lead to psychological stress and fatigue; under the diverse conditions obtaining in industry, the list is a very prolonged one. Case studies and other educational materials can be made available in order to seek realistic alternatives.

Unionisation

Industrial workers

A great deal of decision making and handling of Union funds has become concentrated in the hands of the Union leadership. The first programmatic step is to explore and discuss this issue with workers themselves. Translation and dissemination of case experiences in other places will also form a component of the educational programme. The further course of the programme will have to await the evaluation of the preliminary approaches.

Corruption

**Landless,
Marginal farmers,
Small farmers**

The starting point is unified opposition to the lower level functionalities of various departments such as forest guards, patwaris and in general, the local representatives of the Government resource departments. This means that organised resistance is offered by landless, marginal and small farmers who are most affected by it.

7.5 We are aware that the Demand Model is not a substitute for action. Hopefully, it is a guide to action.

We are also aware that the Demand Model, as we have placed it before you, may be incomplete in many respects. This much we can say : that when other Conflicts become manifest they can be easily drawn into the structure of the Model; that further theoretical refinements we shall leave in the hands of persons better equipped than us.

And we are aware that, having completed the theoretical exercise, the harder practical tasks lie ahead of us. Awareness and organisation do not blossom on wild trees, to be plucked at will. The seeds have to be painfully searched for and assiduously nurtured to full growth. We are confident that the Demand Model shows us how to do this. For it provides an analytical instrument for the people themselves, a way of penetrating the darkness that surrounds them.

Finally, we are aware that we have left many questions unanswered. We seek your help in raising and answering them.

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