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Drought Proofing in Rajasthan:
Imperatives, Experience and Prospects

by

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PROLOGUE

Droughts have affected many people's lives in Rajasthan. The adverse impact is due to widespread crop failure, which leads to shortages of food, fodder and drinking water, and migration.

This paper calls for a comprehensive drought policy, as droughts are a recurring phenomenon in the State. But it also argues that successful policies need a change in the understanding of droughts. The impact on people's lives should be taken into account and diversification of livelihoods in Rajasthan should be promoted. The analysis is also based on fieldwork carried out in four districts of the State.

This paper is one of the studies commissioned by the HDRC to have a deeper understanding of the livelihood situation in a few States.

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CONTENTS

ABBREVIATIONS

CRF	Calamity Relief Fund
DDP	Desert Development Programme
DPAP	Drought Prone Areas Programme
GOI	Government of India
GOR	Government of Rajasthan
IRDP	Integrated Rural Development Programme
OBC	Other Backward Castes
NCCF	National Calamity Contingency Fund
PDS	Public Distribution System
SC	Scheduled Castes
ST	Scheduled Tribes
SWRC	Social Work and Research Centre
URMUL	Uttar Rajasthan Milk Union Limited

GLOSSARY

Anna akaal	Food drought
Bajra	Pearl millets
Bania	Trader caste
Bigha	Measure of land
Chana	Chick peas
Chowktis	Casual labour market
Dhanis	Hamlet
Gauna	Beginning of effective married life
Girdawari	Land-use report
Gram sewak	Gram Sabha Secretary
Gwar	Cluster beans
Jal akaal	Water drought
Jeera	Cumin
Jow	Barley
Jowar	Sorghum
Kasidakari	Embroidery
Kharif	Monsoon crop
Luhar	Caste of blacksmiths
Makka	Corn
Mochi	Caste of cobblers
Moong	Green gram, a kind of pulse
Moth	Haricot, or dew bean
Nadi	Pond
Nai	Caste of barbers
Panchayat	An administrative unit comprising of a few revenue villages
Patwar	Land Revenue Circle
Patwari	Land Revenue Officer
Rabi	Winter crop

Sunars	Caste of goldsmiths
Suthars	Caste of carpenters
Tanka	Underground water storage structure
Til	Sesame seeds
Trinakaal	Food, fodder and water drought
Tuar	Arhar lentils
Urad	Black gram

Executive Summary

Droughts are a recurring phenomenon in Rajasthan. This paper discusses various aspects of this phenomenon: how people deal with drastic crop and livestock losses, especially when coupled with limited employment opportunities elsewhere ("Coping Strategies"); government policies to provide relief in such times ("Drought Mitigation"); and government policies to prevent the occurrence of droughts ("Drought Proofing"). Currently, droughts are perceived as sporadic events so policies are not designed in the best possible manner. This paper argues that successful policies for drought mitigation and proofing require a change in our understanding of droughts. Thus a review of drought-related policies must be accompanied by a review of the definitions adopted to declare a drought.

This paper is partly based on fieldwork carried out in four districts of Rajasthan from May 2002 to February 2003, collecting information on the drought of 1999-2001. The first section looks at how droughts are defined, and what evidence is used to judge their frequency. The second section outlines the methodology used and attempts to judge the severity of the drought on the basis of various indicators. Section III discusses the drought of 1999-2001, based on data collected during fieldwork. It also contains a discussion of the coping strategies that emerged in the sample areas. The concluding section provides a short overview of the government's drought policies, and discusses the policy implications and recommendations that emerge from the discussions in the earlier sections.

Successful policies for drought mitigation and proofing require a change in our understanding of droughts

SECTION I

Drought: Its Periodicity and Measures

A drought is a failure of rain, leading to moisture stress, that in turn leads to agricultural losses and other forms of social and economic hardship

Currently, droughts are *not* treated as a regular feature of Rajasthan, but rather as sporadic events. In this section, we look at various indicators of drought and their shortcomings. The period under study spans approximately two decades – from 1981-2 to 2002-3. The discussion will bring out clearly the need to change our perceptions of drought, because these perceptions influence policy design.

1.1 Types of Drought

What counts as a drought? Put simply, a drought is a failure of rain, leading to moisture stress, that in turn leads to agricultural losses and other forms of social and economic hardship. There are many definitions and classifications of drought, including that of the National Commission on Agriculture (quoted in Bokil 2000) which has defined three types of drought:

- *Agricultural*: When crops are affected due to moisture stress and lack of rainfall.
- *Meteorological*: When there is more than 25 per cent decrease (from normal) in rainfall in any area.
- *Hydrological*: When recurring meteorological droughts result in decrease in surface water and groundwater levels.

Droughts are a matter of concern as they affect the lives of people. We will focus on agricultural droughts. In keeping with this focus, we may classify droughts according to the shortage of three commodities: water *(jal akaal)*, food (*anna akaal)* and fodder (*trinakaal)*.

1.1.1 Rainfall

Rajasthan can be divided into four broad agro-climatic regions and indeed physiographical regions: the arid region in the west, the eastern plains (which are fertile and receive a good deal of rainfall), the hilly region of the Aravallis extending from the north to the south in the eastern part of Rajasthan, and the plateau in the south-eastern part of the State. Rajasthan receives most of its rainfall over a period of three months – roughly from July to September. The average annual rainfall is 531 mm, compared to the all-India average of 1100 mm. Rainfall is not only low, but also uncertain. Further, there are wide variations in rainfall across the State – from as little as 193 mm in Bikaner in the west, to as much as 607 mm in the eastern plains in normal years.

The Indian Meteorological Department defines a failure of the monsoon as a year in which the actual rainfall has been 20 per cent less than the "normal" rainfall.[1] By this definition, in Rajasthan the

[1] Normal rainfall is calculated as the long period average.

monsoon failed in just two years – 1987 and 2002 (Table 1, p. 31).

Rainfall and agricultural operations in Rajasthan, and indeed in many parts of India, are very closely related. Therefore, rainfall and land area sown tend to be positively correlated.[2] In Rajasthan, only 25 per cent of agricultural land is irrigated. However, the relationship between rainfall and area sown is quite complex and depends on the regional dispersion, the timing and duration of each spell, as well as the gap between successive spells. These factors are likely to be as important for agricultural output as total rainfall. Meteorological droughts do not take these factors into consideration and therefore cannot be used to make judgements about agricultural droughts.

The area sown is a slightly better indicator of a drought because it reflects one of the ways in which the lack of rainfall affects human life. Since most agriculture in Rajasthan is rain-fed, and people's livelihoods are still quite heavily dependent on agriculture, fall in area sown provides us with a good starting point to judge the severity of a drought. Table 2 (p. 32) demonstrates that rainfall data can be misleading because there is only a loose relation between amount of rainfall and area sown. It provides a cross-tabulation between the amount of rainfall and the proportion of villages that were declared "famine-affected" in the year 2001. By the State government's classification, an area is declared "scarcity-affected" when it reports crop losses of 50-75 per cent, and "famine-affected" when the losses exceed 75 per cent. If one were to judge the occurrence of a drought based only on whether rainfall was normal or not, only 6 districts would have been classified as drought-hit (column 3). However, when we look at crop losses, we find that in as many as 16 out of the 25 districts that received normal to excess rain, more than fifty per cent villages had been declared "famine-hit". Thus we see that lack of rainfall (a "meteorological" drought) does not adequately capture what actually affects people's lives and we need to use alternative criteria to determine whether or not a drought has occurred.

Lack of rainfall does not adequately capture what actually affects people's lives

1.2 Alternative Indicators

While it is true that meteorological reasons have been the cause of the worst droughts in Rajasthan (1987 and 2002), it is important to separate the "trigger" event from its consequences. Though droughts may be triggered by lack of rainfall, they affect people in many ways (e.g. loss of home-produced foodgrain, loss of employment, difficulty in getting water for daily domestic needs and for agriculture, lack of fodder for livestock, etc.). Change in level of agricultural output, availability of fodder, employment and water are therefore good indicators of drought.

When the State government declares a drought, it uses indicators that, in principle, include those mentioned above. In this section, we examine changes in

[2] In his analysis of rainfall data for the period from 1877-1986, Sivasami finds that when rainfall has been less than 20 per cent of normal, the area sown in the country can fall by as much as 50 per cent. When the shortfall is between 10-20 per cent, the affected area ranges between 20-40 per cent (Sivasami, 2000: 1991).

agricultural output and livestock population, government expenditure on relief works, and person-days of employment generated. The analysis relies on secondary data published by the Government of India or the Government of Rajasthan (Table 1, p. 31).

The Scarcity Manual (formerly known as the Famine Code) for Rajasthan lays out the rules and procedures to be followed in declaring a drought. In this process, the *girdawari* report plays a key role. The *girdawari* report is a land-use report and is prepared by the *patwari* (land records official) of each *panchayat*. The other criteria in the Scarcity Manual include distress migrations, increase in thefts, news of starvation deaths, etc.

The most important indicator of the severity of a drought is the number of people it affects

While the Scarcity Manual includes many criteria, in practice, the State government has come to rely almost exclusively on the *girdawari* report and the losses in sowing and production reported therein. To calculate the losses, the current year's figures are compared with area sown and production in "normal" years (defined as the average production for the past few years). On the basis of this, calculations of affected population are made.

Affected population

Probably the most important indicator of the severity of a drought is the number of people it affects. In 14 of the 22 years between 1980 and 2002-03, agricultural operations in more than 10,000 villages were declared either scarcity - or famine-hit. Only in three years during this 22-year period, was the number of affected villages less than 500.

Labour employed

It has been mentioned that during droughts the State government provides relief for the able-bodied by opening employment sites in the affected villages. Only in two years over the entire period 1981-2003 did the State government deem it unnecessary to provide such relief work. In each of the remaining 20 years, the government generated, on an average, 3.35 lakh person days of employment. During the drought of 1987-8, nearly 220 lakh person days of employment were generated.

Government expenditure

Government commitment to provide relief measures can also be gauged from its drought relief expenditure (Table 1, p. 31). These funds are used largely to initiate food-for-work programmes, to ensure water availability during a drought, the supply of subsidized fodder for the conservation of livestock and the provision of gratuitous relief for the weak, old and disabled. The government's commitment is quite clear from the financial resources it sets aside for these obligations. In the period from 1981-2 to 1989-90, the State government expenditure on relief operations was Rs. 1515 crores and in the period from 1991-2 to 1999-2000, it was Rs. 1057 crores.[3]

Agricultural production

Given the overall importance of agriculture in the State, in terms of its contribution to the Gross State Domestic Product (27.4 per cent in 1999-2000), as well as in terms of proportion of

[3] This expenditure is at current prices. If we look at expenditure at real prices, the fall in expenditure in the 1990's is likely to be larger still.

people who rely on agriculture as their main means of livelihood, it makes sense to look at the growth of this sector. Trends in the production figures of foodgrain for the State show that, since the 1980's, in four years, the fall in agricultural production was much higher (more than 20 per cent) than that of the previous peak year.

Livestock population

The Government of India carries out a livestock census every 5 years. The last column in Table 1 (p. 31) reports the total cattle population at various points of time. This brings out clearly the impact of the drought of 1987-8, which caused the total cattle population to decline to such an extent that it had not recovered to its pre-drought levels even at the time of the last census in 1997. This probably also has to do with a change in the composition of livestock: there is a move away from cattle towards sheep and goats, which are known to be sturdier.

Thus, going by many of the above indicators, while there has been a meteorological drought in just two years of the 22 years under study, by all the alternative indicators, only three or four years (depending on which criterion one uses) have remained "drought free".

From the available data it is not possible to say whether the intensity or severity of droughts has been increasing over the years, as has been suggested by previous research.[4] For doing so, one would have to look not only at the above indicators, but also at the duration of each drought cycle and at the regional spread of each cycle. Localised droughts or single-year droughts are known to be less severe on the human populations affected by them.

Localised droughts or single-year droughts are known to be less severe on the human populations affected by them

[4] Jodha (1991) and Vidya Sagar (1995) both have suggested that the intensity of droughts has increased over time.

SECTION II

The Drought of 1999-2001: Methodology Used

This section discusses the methodology used to study the impact of the drought of 1999-2001. Data was collected from nearly 400 households in eight villages by means of a questionnaire. In addition to collecting data on the background characteristics of the households and individuals, the questionnaire covered the severity of the drought, coping strategies, the public distribution system and food-for-work programmes. This was supplemented by group discussions and informal discussions with various people in the villages, including the *sarpanch*, *ward panches*, *patwari*, *gram sewak* and others.

The survey was carried out in four districts, chosen to reflect regional variations

2.1 Selection of the Districts

Since the survey could not cover very large parts of the State, or provide a sample in which all regions got adequate representation, it was carried out in four districts, chosen to reflect regional variations. The sample districts were Barmer, Bikaner, Jaipur and Udaipur. Barmer and Bikaner are in the south-west and north-west of Rajasthan respectively (along the border with Pakistan). Jaipur lies in the north-eastern part of Rajasthan and Udaipur in the south. These districts not only give a fair geographic spread, but also reflect agro-climatic variations and differing levels of development in different parts of Rajasthan. Bikaner and Barmer are both semi-arid regions with sandy soil. Jaipur is mostly flat, with fertile land, while Udaipur lies in the Aravallis and has fertile but not level land, and rich forest reserves.

2.2 Selection of the Villages

Once the districts were selected, a two-stage random sampling procedure was adopted. The first stage was a selection of *clusters*, which were taken to be revenue villages according to the 1991 census.

The household population of the revenue villages tends to vary quite a lot-thus smaller villages would stand proxy for a small number of households and larger villages (with a population of more than 1500 persons) would be proxy for a larger number of households. But the bulk of the population lies in villages with a population of 800-1500. A simple random sample of villages would give rise to bias in the estimates of population characteristics because it would give equal probability of selection to houses in small and large villages as it would to houses in medium-sized villages. To improve the precision of the sample, such (i.e. medium-sized) villages should have a greater probability of selection. This suggests that to get unbiased sample estimates for the

population, households in medium sized villages should have a higher probability of selection than those in small or large villages. This can be achieved by employing probability proportional to size sampling.[5]

Another consideration in the selection of villages was whether it would be possible to stay in the village for the duration of the fieldwork. This meant that only those villages in which some contact was available - mainly through NGOs working in that district - were included in the final frame from which the sample was chosen.[6] This gave a list of villages from which the sample villages were chosen.

Replacement villages were also chosen at this stage. In cases where there had not been any relief work in the sample village during the summer of 2000, a replacement village where there had been relief work during this period was surveyed. Three of the villages in this sample are replacement villages. In one case, the sample village was inaccessible since it lay across a river which could not be crossed because of the monsoon. In this case, the last accessible village on the road to the sample village satisfying the population criterion was chosen for the survey. Thus the final sample includes 4 sample villages (Biramsar, Dulmera Station, Baasri Jogiyan and Sukaliya), three replacement villages (Morda, Kharad and Badli) and one other village (Birothi).

2.3 Selection of the Households

At the second stage, a simple random sample of 400 households was chosen from the voter list of the village prepared by the district authorities. The voter lists are updated each year and an attempt was made to use the electoral roll for 2001 (the latest available). But this was not possible in all cases, in which case an older electoral roll had to be used. The oldest electoral roll used for selection of sample households was from 1998.

A consideration in the selection of villages was whether it would be possible to stay in the village for the duration of the fieldwork

While sampling, up to 10 replacement households were also selected to make up for missing or unresponsive households. However, all the sample households proved willing to respond; in fact, in most villages, it was those who were left out of the sample who were unhappy. In most cases, this was due to the misconception that the households that were being surveyed would receive some benefits, which non-sample households would be deprived of. Replacement households were surveyed when

- Members of sample households were unavailable even after the second visit to the house, or during the investigators' stay in the village. (This was the most common reason for replacing a sample household).

[5] See Deaton (1997: 15).

[6] The NGOs were URMUL in Bikaner, SURE in Barmer, Sewa Mandir in Udaipur, SWRC and Vishaka in Jaipur. As it turned out, in three cases the NGO did not really work in the sample village but did in a neighbouring one. As a result, they were able to introduce the author to an acquaintance with whom she then stayed for fieldwork. In the other four villages, Biramsar, Dulmera Station, Birothi and Morda, people knew about the NGO through whom the author had made contact, and quite often had benefited from it in some way or another. In one village, the local contact did not work for an NGO but for a youth group with whom the author was acquainted.

- The sample households had migrated from the village.[7]
- Due to pressure of time, the sample household seemed too far away to visit.
- There was no surviving member from the sample household.

Since the voter lists were slightly outdated in some cases, it often turned out that sample households had split into more than one household since the list was compiled. In such cases, the oldest member of the family, or the most easily available member, was surveyed. Finally, the sample also contains some households that were neither in the list of sample households nor in the list of replacement households. This includes extremely destitute people who were encountered during the survey.

It often turned out that sample households had split into more than one household since the list was compiled. In such cases, the oldest member of the family, or the most easily available member, was surveyed

The interviews were carried out with adult members of each family. Balance was maintained between the number of male and female respondents. Sometimes an interview was repeated with two members of the same household at different times to corroborate answers given by the first respondent. At other times, the interview was carried out in the presence of more than one adult member of the family, with different persons answering different questions.

2.4 The Villages

2.4.1 Demographic and Social Characteristics

This section provides some background information on the villages that were surveyed. Table 3 (p. 33) gives a detailed picture for each village in the sample.

Caste Structure

The largest caste group in the sample (42 per cent) is that of "other backward castes" (OBCs), a category that includes a large number of castes. This group is far from homogenous. It includes politically articulate and economically powerful castes such as the *Jats*, as well as castes lower down on the social scale such as *Nais*, *Luhars*, *Suthars*, *Sunars* – small in number as well as less articulate. In fact, the *Jats* have managed to have themselves classified as OBCs in Rajasthan precisely because of their political clout.[8] The other large group in the category of OBCs is that of the Muslim castes (nearly 11 per cent of the OBC population of 42 per cent are Muslim)[9].

The Scheduled Castes and Tribes form 17 and 19 per cent respectively of the population, with the other castes (*Brahmins* and *Rajputs*) comprising 22 per cent of the population.

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[7] The greatest number of such cases was in Badli where the migration was not drought-related, but was related to a local feud which had caused all the members of one family to flee from the village. In the other villages, when there were such households, their numbers were quite small and never more than three households.

[8] As a result of a recent political mobilization, the *Jats* were able to attain the status of OBCs so that they could benefit from the policies of affirmative action, mainly reservations in government jobs. *Jats* were added to the category of OBCs as recently as 1999 (Datta, 1999).

[9] Many of the Muslim households said that they too had a caste (e.g. *Alisar*, *Langa*, etc.) and attested to a hierarchy among these castes.

Education

More than half of the individuals in the sample households were illiterate. About a third had completed school up to primary level, and just 11 per cent had finished secondary school.

Sex Ratios

The sample villages had a female-male ratio of 913, i.e. 913 women per 1000 men. According to the 2001 census, the female-male ratio in Rajasthan is 922, which is slightly lower than the All-India figure.

Age distribution

One-fifth of the population was children aged less than six years and about a third of the population was in the school-going age group (7 years to 18 years). Another third of the population constituted the working age group (19-40 years) and 5 per cent of the population was aged 60 years and above.

Marital Status

Forty three per cent of the individuals in the sample households were currently married; another 2 per cent were married but had not performed the *gauna*[10]. Four per cent of the individuals were widowed and the remainder (approximately 50 per cent) had never been married.

2.4.2 Physical and Social Infrastructure

Location and Status

The geographic location and administrative status of a village is significant in terms of providing (or denying) access to *panchayat* officials and also to government services such as healthcare centres, schools, and especially fair price shops (PDS ration shops). Each *panchayat* has up to 10 villages, one of which is the administrative headquarters for that *panchayat*, and after which the *panchayat* is usually named. Not belonging to the *panchayat* headquarters (the '*gram panchayat* village') can mean not knowing when the ration shop will be open or wasting many days to get a signature from the *patwari* or *gram sewak*. Only two of the eight sample villages were also *gram panchayat* headquarters: these were Badli and Birothi, both in Udaipur. One village, Biramsar, had its own ration shop and high school, though it was not a *gram panchayat* village; these privileges were courtesy the local MP, who hailed from it. The other five villages did not have ration shops, so people faced tremendous difficulty just in getting their monthly rations. Since ration shops were not open on fixed days, they had to make repeated trips outside their village, incurring the cost of transport as well as losing wages.

Access to primary schools is no longer a problem in any of the villages. On the other hand, access to health facilities is still a huge problem

Access to primary schools is no longer a problem in any of the villages. In fact, except for two, the remaining villages even had a middle school within 3 km, if not within the village itself.

On the other hand, access to health facilities is still a huge problem. Some villages even lack access to an Auxiliary Nurse Midwife (ANM). For people living in Sukaliya, the closest Primary Health Centre is more than 10 km away.

Miscellaneous infrastructure

All the villages but one have access to a road. The exception is Sukaliya, which

[10] *Gauna* is the ceremony after which the bride leaves her natal home to live with her husband.

is 6 km from the nearest road. Four villages have a direct bus service. Two villages are not electrified and the others, though electrified, have erratic supply. In half of the villages, some homes had telephones.

Drinking water

The drinking water problem is most acute in Bikaner and Barmer, where it is a perennial problem. Here people have to rely on rain-water harvesting and on government supplies (generally through a pipeline) for their needs. The main form of rain-water harvesting in the sandy regions is the construction of *tankas* (underground storage tanks). In contrast, people in Jaipur and Udaipur, rely mainly on handpumps for water, which is available most of the time, except occasionally, when handpumps dry up or stop working. Four years of consecutive drought have lowered the water table, and some handpumps have gone dry as a result. The quality of water is also a matter of concern. In western Rajasthan, water salinity is a problem, whereas in Jaipur, high fluoride content in drinking water was reported as the cause of many health problems.

Four years of consecutive drought have lowered the water table, and some handpumps have gone dry as a result

The worst-off villages were those which government supply of water did not reach. People had to walk for up to 4-5 hours to get their supply of drinking water from the nearest government source. In Sukaliya (Barmer), it was common to hear stories of men who left after the morning meal and returned with water when it was time for the evening meal.[11]

Where water is supplied by the government, it is generally piped water supplied to a water tank in the middle of the village. However, this does not solve the problem entirely. The water supply remains uncertain: when water is not supplied to the water tank, villagers are left stranded. In western Rajasthan, the dominant pattern of settlement is in *dhanis* where only a few families of the revenue village reside near the water tank and the majority live a few kilometres away. Thus even when water does come to the village tank, those who live in the *dhanis* (hamlet) still have to spend some hours each day to get to the village and fill water. Those who are able to afford it, pay for the water to be put into their private *tankas*. The cost is, however, quite high – in Biramsar, people were paying up to Rs. 250 per month for their water supplies.

2.4.3 Occupational Structure

A large proportion of the population of Rajasthan relies on agriculture and related activities such as cattle rearing and collection of forest produce. This is indicated by the secondary data on the occupational structure in Rajasthan and borne out by the present field study. The data indicates that more than 60 per cent of the population still considers self-employment in agriculture as their primary occupation, though this does not mean that agriculture is their sole activity. There isn't much variation in this proportion either by caste or region.

The share of the population earning a living from other forms of livelihood is

[11] In the same village one woman's husband was suffering from TB and diarrhoea, and she did not have any animal on which to fetch the water. She walked 3 hours each day in the sand dunes to the nearest water source to fetch one *matka* of water on her head for the day's needs.

quite small. For example, only 5 per cent reported being self-employed in non-agricultural occupations. This often meant that they were employed in their caste occupation – e.g. working as *Suthars*, *Luhars*, *Mochis, Sunars, Nais* etc. The other main category was that of casual labour, where again only 5 per cent reported it as their primary occupation.

This is indicative of the lack of development of occupational choices other than agriculture and traditional caste occupations for the rural population. However, it should not be taken as evidence of lack of diversification in the occupational structure. Of the 397 households visited, as many as 379 households (95 per cent) reported a secondary occupation as well.

The diversification of livelihood strategies is best studied at the individual level. Only when all members of a household report the same occupation does it indicate a lack of diversification of the occupational structure. Members of a particular household could diversify in two ways: a) each person does a different job, or b) the same person may do different jobs at different points of time.

Thus, there may be houses where one member has a regular job whereas the other members concentrate on agriculture. Or, those who report agriculture as their primary occupation may migrate in search of work during the lean agricultural season. Such examples are not difficult to find – girls who help in agricultural operations, or in grazing cattle, may supplement the household income by doing *kasidakari* (embroidery).

In households where traditional caste occupations were reported as the primary occupation, close to 60 per cent reported being engaged in agriculture as well. Even for those with regular jobs, where the flexibility to move between jobs is presumably the least, approximately 40 per cent reported agriculture as their secondary occupation.

2.4.4 Ownership of Land

It is important to note that the data on landholding is not entirely reliable. Many people seemed to be afraid to state the total area of their land holdings. This must be due to the fear that if they were seen to be rich then they would be deprived of any potential benefits that could come as a result of this survey. In one village we were able to get the land records from the *patwari*. In other cases, two members of the same household were interviewed separately on different days, or at least at different times to cross check the answers, or the same person was asked some of the questions a second time, on another day to verify earlier claims. Quite often, these cross-checks revealed that there had been under-reporting of assets and sometimes even output of cereals.[12]

In households where traditional caste occupations were reported as the primary occupation, close to 60 per cent reported being engaged in agriculture as well

A majority of the sample households (38 per cent) are marginal and small farmers, with land holdings of less than one hectare. The second largest group, comprising nearly a quarter of the households, have land holdings of more than 4 hectares. One must bear in mind

[12] These crosschecks were not done in a systematic manner – therefore, one cannot say with certainty the extent of measurement errors. Similar crosschecks were also applied wherever possible for the other data collected. The most glaring differences were in the case of land owned.

A high degree of regional inequality in the distribution of land holdings is offset by the differences in productivity of land

that in the western part of the State, population density is low and in general, the size of land holdings tends to be higher. However, these larger land holdings are accompanied by much lower productivity of land in the region. Thus a high degree of regional inequality in the distribution of land holdings is offset by the differences in productivity of land. Table 3 (p. 33) clearly shows that the land holdings in the four villages of western Rajasthan are the largest, whereas holdings in the villages of Udaipur are the smallest.

To look at inequality in the distribution of land as a measure of inequality in wealth, we would have to delve further and study the distribution of land across households. However, since the quality of land data is slightly suspect, this has not been attempted here. To give an indication of such intra-village inequalities, the average size of landholdings for various caste groups has been shown in Table 4 (p. 35). This table provides a clear indication of the favourable position of the "other backward castes" group on the one hand, and of the small land holdings for the scheduled tribes group on the other. However, one must bear in mind that this category includes a large number of castes, ranging from quite prosperous farmers belonging to the *Jat* and *Bishnoi* castes, to extremely poor ones such as the *Kumbhars*, *Luhars*, *Nais*, *Sunars*, etc. For example, the average holdings vary from 45 *bighas* for the Bishnois, to only 2 *bighas* for the *Nais*.

SECTION III

The Severity of the Drought of 1999-2001

There are several ways by which the severity of the drought of 1999-2001 could be evaluated. Since Rajasthan's economy is primarily agrarian, it makes sense to look at losses in the agricultural sector by studying various parameters. The ones that were included the questionnaire related to the area sown and the fall in agricultural output. The western part of the State, as mentioned earlier, is arid. As a result, people here rely on livestock rearing as much as they do on agriculture.[13] Thus it is important to look at changes in the aggregate livestock wealth of the sample households, as well as changes in the composition of their livestock assets. Since migration outside the village, and in some cases even outside the State, is not only a coping mechanism to seasonality and drought in the region, but an important source of livelihood, it will also be discussed briefly.

3.1 Agriculture

Land conditions in the sample villages vary considerably in the four districts. Some of the agro-climatic differences have already been discussed. Here we describe the main crops and their production levels, as well as losses in each of these regions.

Barmer and Bikaner both have sandy soil that is suitable mainly for *bajra*. Agricultural operations in this region rely on the monsoon rains. Consequently the *kharif* (monsoon) crop of *bajra*, the staple, is the main crop of the year. The only exception here is Dulmera Station where *bajra* cannot be sown because the rains come very late. Thus no cereals are grown here in the *kharif* season. However, there are variations within the sample villages as well. Irrigation facilities are available in two of these villages, Kharad (Barmer) and Dulmera Station (Bikaner). In Kharad, some fields are irrigated with groundwater, while in Dulmera Station a few fields are in the command area of the Indira Gandhi water canal.

It is important to look at changes in the aggregate livestock wealth of the sample households, as well as changes in the composition of their livestock assets

Udaipur has fertile soil, but fields are not level. Here again, *kharif* is the main crop, though a small proportion of the population do have irrigation (river water and groundwater) and are able to sow a *rabi* crop as well. The staple in this region is maize, supplemented with rice. Those who do grow a *rabi* crop sow wheat.

Finally, Jaipur probably has the most productive soil of the four sample districts, in addition to having level fields. Here the norm is to sow both the *kharif* and the *rabi* crops. Jaipur does receive some rain in the winter as well, so the second crop is not entirely dependent on irrigation facilities. The main cereals grown in the monsoon are *bajra* and *jowar*,

[13] Rajasthan has the largest livestock population in the country, and a substantial part of the State's economy consists of earnings from its cattle wealth (Rajesh, 2000).

whereas wheat and *jow* are the main cereals grown in the *rabi* season. The fields that are irrigated are irrigated by tubewells and dug wells.

Other Kharif crops: The other important *kharif* crop is *gwar*. It is used mainly as fodder and sold on the market. The *kharif* pulses include *moong* and *moth* in western Rajasthan and Jaipur and *moong*, *tuar* and *urad* in Udaipur. These are also generally grown for self-consumption, though it is not uncommon for them to be sold in good agricultural years. In Dulmera Station, people are able to sow groundnut in the monsoon, which is harvested in early December. Some people in Biramsar (Bikaner) also grow groundnut. Sesame (*til*) is another crop that is widely grown in the region for its oil.

If, after an initial good spell, the rains fail, it could mean a double blow for the farmers – not only do they lose their crops, they would also have to bear the costs of the sowing operations

Other Rabi Crops: Apart from the *rabi* cereals – wheat and *jow* – *chana*, *jeera* and mustard seed are the other *rabi* crops. *Jeera* (cumin) is grown extensively in Kharad and is a highly remunerative crop. *Chana* is mainly grown for self-consumption.

3.1.1 Crop losses

As discussed above, the rainfall in 2001 was quite close to normal and that year has been considered as the benchmark in evaluating the area sown and output levels in 2000, which was a drought year. Table 5 (p. 36) shows the shortfall in area cultivated for the main cereal crops. A small shortfall in the area under cultivation is not necessarily a good sign. This could just mean that following a good rain at the beginning of the monsoon season, farmers undertook their sowing operations expecting that the good rain would continue. If, after an initial good spell, the rains fail, it could mean a double blow for the farmers – not only do they lose their crops, they would also have to bear the costs of the sowing operations which include purchasing the seed, expenditure on ploughing the fields, and, in some cases, the cost of fertilizers and pesticides. Over and above this, is the imputed labour cost of their own time spent in the sowing operations. Therefore, the shortfall in area sown must be considered in conjunction with the output data.

An example of a small fall in area sown accompanied by a large fall in total output is clearly demonstrated in the case of *bajra*. Though area under cultivation of *bajra* fell by just 4 per cent, the fall in output was to the tune of 70 per cent! This is in spite of the fact that *bajra* is among the most sturdy cereals in terms of being able to tolerate a high level of moisture stress. Table 5 (p. 36) suggests that the largest decline in output was for *bajra*, along with rice, *jowar* and pulses. *Makka* seems to have been the only crop that managed to survive in spite of a large decline (nearly 60 per cent) in the area under *makka*.

Overall, one can see that the failure of the rain in the year 2000 caused a large drop in the production of *bajr*a and wheat, both cereals that are widely consumed by the population. On the other hand, *makka*, which is grown only in Udaipur, did not see much fall in production. Pulses, which are an important part of people's diet, also saw a drastic fall in output.

Most households reported using approximately 100 kg (one *bori*) of cereals each month.[14] Using this as a benchmark, we can look at the average production of cereals per family to see how many months their home-produced cereals would last them. This also gives us a measure of their vulnerability. If they are able to produce enough to last them until the next harvest (approximately 12 *boris*) then they are unlikely to be badly affected by fluctuations in the market price of cereals that may result from a general shortfall in total output of cereals. Indeed, many families that were purchasing from the market complained about the price of *bajra* having increased from Rs. 3 per kg to more than Rs. 7 per kg in a few months; or from Rs. 5 per kg more than Rs. 10 per kg in the case of wheat.

Using this criterion, for the "good" year (i.e. 2001) we find that the worst hit villages are Badli and Birothi (Udaipur) and Dulmera Station (Bikaner) in which people were able to get only about 3-4 months' consumption requirements from their own fields and had to rely on the market for the remaining months. At the other end of the spectrum we have the villages of Jaipur, where farmers were not only able to produce enough to last them the entire year, but in the case of Morda, had enough for 2 years' consumption needs. The remaining three villages produced enough to last them for 9-10 months.

When we look at the same figures for 2000, the greater vulnerability is immediately obvious. Even a village like Morda, which in the normal year produced enough for two years' consumption, could only produce enough for about 10 months in 2000. The worst affected were the villages of western Rajasthan, which were able to produce enough for nearly 10 months in a good year but produced only between one to four months consumption in 2000. The production of *makka* did not vary much between the two years as mentioned above (Table 5, p. 36). There is not much difference in the vulnerability of the tribal villages of Udaipur between drought and normal years. For them, vulnerability remains high under both circumstances. Finally, for Dulmera Station, the source of vulnerability is *not* the drought, but the cropping pattern in the village. As we noted above, the *bajra* crop cannot be sown there because the rains come late to the region; while some fields have access to water from the Indira Gandhi Canal, the supply from the Canal is irregular and unpredictable. In any case, only a small proportion of fields do actually benefit from the Canal.

If they are able to produce enough to last them until the next harvest then they are unlikely to be badly affected by fluctuations in the market price of cereals that may result from a general shortfall in total output of cereals

3.2 Livestock

The main livestock wealth in the sample villages was in the form of cows, buffaloes, goats, sheep and camels. While cows and buffaloes are important mainly for their milk and to a lesser degree as draught animals, sheep and goats are reared for their wool and meat as well as for their milk. Camels are found only in the sandy western regions, where they are quite useful as draught animals as well as for transport.

[14] The median consumption of cereals is 100 kg whereas the average household consumption of all cereals is 114 kg. This has been calculated by summing up the total monthly consumption of wheat, rice, *bajra*, *makka* and *jowar*.

If one looks at the total composition of livestock wealth in 1999, one finds that the smaller animals, i.e. goats and sheep, predominate. Goats and sheep constitute 49 per cent and 22 per cent respectively of the total holdings. The only change over the three drought years is that the share of cows in total holdings increases to 24 per cent, pushing that of sheep down to 18 per cent.

Though goats are believed to be the sturdiest of all livestock, Table 6 (p. 37) shows that the population of goats nearly halved in the three years of drought (between 1999 and 2002). The largest losses were in the holdings of sheep (53 per cent).

Death has been the main cause of decline in livestock population. Most of these deaths were due to illness or lack of fodder

Death has been the main cause of decline in livestock population. This is true for cows and buffaloes, goats and sheep as well as camels. Between half to two-thirds of the losses can be attributed to deaths, most of which were due to illness or lack of fodder.[15] In many cases, the illness was due to the poor quality of fodder upon which the livestock was forced to subsist.

The second largest cause of loss has been due to sales. Here too, as in the case of deaths, sales were mainly due to the lack of fodder, or because fodder was too expensive. The need to meet daily consumption expenses also figured as a major cause for livestock sales. Between 5-10 per cent of the losses were classified as being due to "other" causes, including thefts, partitioning of households, gifts, etc. Some of these losses were offset by an increase due to purchases or because of new births.

3.3 Coping Strategies

Apart from diversifying their sources of income, households resort to various other coping strategies to survive the drought. Some of these are best viewed both as coping strategies as well as strategies to diversify livelihoods. The primary coping strategies discussed here are migration, credit, distress sale of assets, and change in pattern of food consumption and level of consumption.

3.3.1 Migration

Nearly half of all households surveyed reported that at least one member of their family had to migrate in the summer of 2001 (before the "normal" monsoon) in search of work. In nearly half of these households, the reasons for migration were related to the drought and were not instances of usual seasonal migration.[16]

When one looks at individual data, one needs to compare migration in the summer of 2001 with migration in the summer of 2000 to ascertain whether more people were driven out of the local areas in the second year of drought. If the number of migrants increased in 2001 compared to 2000 across the sample households and within each household, this would indicate that migration was being used as a coping mechanism.

A study of migrants seeking work in the *chowktis* (urban daily labour market) of

[15] It is quite likely that that the lack of water was as important as the lack of fodder. However, none of the respondents mentioned this when asked about the causes of deaths.

[16] To distinguish usual seasonal migration from drought-related migration, the respondents were asked whether they migrated in that particular season every year or whether migration in the summer of 2001 was something new.

Jaipur, did in fact find that the numbers had swelled quite considerably even though 2001 was closer to being a normal agricultural year (Kerbart and Sivakumar, 2002).

The incidence of entire families migrating was quite rare in all the villages visited. When this did happen, it was uniformly a sign of great distress and implied hardship for those concerned. The data collected indicates that most often, these families seemed to get work only as casual labourers in the cities and villages to which they migrated.

Migration to save cattle was also uncommon. When people migrated to save cattle, they would take the cattle of others in the village with them, so that fewer people would need to migrate. In Morda (Jaipur), in some *Gujjar* families, one son took the family cattle along with that of others in the village, and set off towards the Madhya Pradesh border in the hope of saving them. Quite often, those who had sent their cattle away said that they were as good as lost since they would not be returned to them. This seemed to imply that the person who had taken the cattle would sell them but tell the owners that they had died.

The most common form of migration was when one male member of the family migrated or commuted to the nearby city, where he would undertake one of a range of activities. Migrants would be employed in shops and restaurants, or would work as casual labourers. In Baasri Jogiyan (Jaipur), most young men go to Jaipur city each day, where some have jobs at shops and similar establishments, others work in Sanganer at dyeing and printing factories, and yet others to go *chowktis* to work as masons, porters as casual labourers. Migration from Morda (Jaipur) was not a very common feature. Those who did migrate went to the stone quarries in Ajmer district (Morda is in the southern most part of Jaipur and quite close to the Ajmer border).

Seasonal migration is most common in western Rajasthan. In the villages of Barmer, seasonal migration has become a regular feature of people's lives. Most people (probably even all) migrate to Gujarat to earn a living. Their earnings from migration are not insubstantial, and generally employment seems guaranteed for the period of migration. For example, in Sukaliya people go to Valsad to work as caretakers on mango orchards in the summer months and are able to earn enough for the entire year. But there are other seasonal migrants who are not so well off. They are faced with uncertainty regarding employment and other adverse conditions as well. In Bikaner, men would migrate north towards Punjab to work as agricultural labourers in the wheat harvesting season.

The duration of migration seems directly correlated to the distance to the nearest centre for employment. Thus, in places where the city is easily accessible (Baasri Jogiyan), or there is a big market centre nearby (Kharad) the incidence of seasonal migration was lower than in villages like Sukaliya, where there is no nearby employment option available and consequently people go for the entire summer season. In Dulmera Station, the author met one family that had just returned from north Rajasthan where they

The most common form of migration was when one male member of the family migrated or commuted to the nearby city, where he would undertake one of a range of activities

had been working as agricultural labourers in conditions that seem to have been quite miserable – camping in the open air, in the middle of nowhere, with no shelter, without social support in terms of friends and family, or any guarantee of employment.

3.3.2 Credit

Resorting to credit is known to be one of the most common ways of tiding over shortages that occur in times of drought. In this sample of 397 households, 247 (62 per cent) had to borrow money in the drought year. But we must bear in mind that households borrow for a variety of reasons, not all of which are related to drought. For example, borrowing for medical expenses or to meet marriage costs should not be attributed to drought, as such borrowing can occur in normal years as well. Besides this, households may borrow to accumulate assets.

Resorting to credit is known to be one of the most common ways of tiding over shortages that occur in times of drought

In our sample, a majority of the households (50 per cent) that borrowed did so in order to meet their food consumption needs (see Box). The other major reason why people borrowed was for agricultural expenses, which included the purchase of seeds, payment for tilling the land with tractors, digging wells, etc. Some of these could be drought-related – e.g. some households may have needed to use tractors to till their fields because their own draught animals died, or were sold, in the wake of the drought.

The reasons given by nearly three-quarters of the borrowing households could be linked directly to the drought. These include borrowing for food consumption needs, for other daily consumption needs (a very small category, with only 18 households), to buy fodder and to migrate. The remaining 25 per cent borrowed for reasons that cannot be linked so easily to the drought – these include medical and marriage expenses, and expenses for agricultural operations.

More OBCs borrow as a proportion of their social group than do members of any other group; there is not much difference in the proportions of SC and other households who borrow (Table 8, p. 39). The smallest group is that of STs. When we look at the reasons for borrowing across the caste groups, the patterns do not vary much across households – borrowing for daily needs is followed by borrowing for other reasons. Table 8 (p. 39) provides some evidence that borrowing among the "better-off" households is higher than among poorer households. This could indicate that households are borrowing to accumulate assets. However, we have already seen that daily consumption expenses form the main reason for borrowing. So it is more plausible to assume that the larger share of better-off households among debtors reflects their greater creditworthiness. For example, for ST households, borrowing from institutional sources is limited by economic and

Main Reasons for Borrowing

Of the 247 families that did borrow,*

123 borrowed to meet their food consumption needs

81 mainly for agricultural operations

46 to buy fodder

42 to meet medical expenses

30 to meet marriage expenses

18 to meet other consumption needs

1 to migrate

* *The total for all the households does not add up to 247 because the categories are not mutually exclusive, i.e., some households borrow for more than one reason.*

non-economic factors (these include small land holdings, greater social distance from institutional mechanisms, etc.). Borrowing from friends, relatives and family members is equally difficult as they are likely to be in a similar situation. Other informal sources of credit (such as the local *bania*) are known to dry up in times of distress.[17] As a result, even though the share of STs among borrowing households is small, it is due more to a restriction in the supply of credit rather than a lack of demand. This also explains to some extent the small proportion of borrowing households in Udaipur, which is where most of the tribal population of the sample is concentrated.

The main sources of credit were the local *bania* (39 per cent), followed by relatives and friends (27 per cent). Only 8 per cent of households borrowed from institutional sources. The larger share of informal sources of credit is probably linked to the fact that most households are borrowing for their food consumption needs, for which credit is not available from formal sources. The main sources for borrowing for agricultural purposes were from institutional sources (23 per cent) as well as informal sources. Relatedly, one finds that people borrowing from informal sources are being charged usurious rates of interest. The average monthly interest rate is 2.4 per cent, and in some cases, as much as 10 per cent! The highest rate of interest is charged by *banias*. The advantage of borrowing from relatives and friends is that they sometimes provide interest-free loans for a flexible time period, which are not available elsewhere.

3.3.3 Hunger

A quarter of the houses (101 out of 397) reported that they had been skipping meals around March 2001. Nearly half (47 per cent) of these were in Udaipur district.

When food was short in the house:

- 105 homes reported eating less than usual.
- 85 reported borrowing money, buying food on credit.
- 18 sought the help of their neighbours and relatives.
- 13 resorted to changing their food basket.

People try to preserve their holdings of key productive assets rather than protect a certain standard of consumption

There has been a debate on the sequencing of coping strategies and their relation to the level of distress.[18] Jodha has argued that people will try to preserve their holdings of key productive assets rather than protect a certain standard of consumption. This is in direct opposition to Corbett's (1988) position. Chen's (1991) research in Gujarat validated Jodha's proposition, and indeed some evidence for this can be found in the sample villages as well. The proportion of houses that had to resort to distress sales of productive assets (mainly land and cattle) is much smaller than, for instance, the proportion of households that report skipping meals. Chen lists the following main coping strategies in their rough order of sequencing: adapting or diversifying activities,

[17] See Chen (1991) for more on this. When asked if they had borrowed during the past year, many households complained vehemently that the *bania* no longer gave them credit.

[18] See Chen (1991), Jodha (1975, 1991), Corbett (1988) and Chambers (1981) for more on this debate.

reducing or modifying consumption, reducing commitments, participating in relief programmes, borrowing, migrating, mortgaging or selling assets and other drastic measures such as distress migration of the entire household and breakdown of families.

This study does not look at sequencing of coping strategies over a period of time. Therefore it is not possible to say much about sequencing. However, we can get some clues about sequencing by looking at the proportion of households resorting to the various strategies at a particular point in time. If the proportion of households using a strategy declines as we move from strategies earlier in the sequence to strategies later on, this may confirm the sequencing of those strategies.[19] In Table 7 (p. 38), as we move down the column, we can see that the proportion of households resorting to that particular strategy falls.

The most vulnerable group when we use land ownership as the basis of classification, is predictably the small or marginal farmers

3.3.4 Vulnerable Groups

Based on the discussion above, we try to highlight some of the particularly vulnerable groups. In Table 8 (p. 39), some indicators of vulnerability have been tabulated for three socio-economic groups. These three groups are based on land ownership, primary occupation and caste group. The most vulnerable group when we use land ownership as the basis of classification, is predictably the small or marginal farmers. Whether we look at incidence of skipping meals or seeking work at relief sites, we find a gradual decrease in proportion of households as we move up the land-owning scale. For credit, we see further evidence supporting the hypothesis that the groups that do borrow are the wealthier ones because they are perceived as creditworthy debtors, and that the low proportion of borrowing households among the small and marginal farmers may be related to them being perceived as unreliable borrowers.

When we look at the same indicators of vulnerability by occupation, there is some evidence to show that agricultural labourers are the worst affected. This is not only in terms of having to sleep hungry or because the proportion of households seeking work on relief sites is very high, but also because the proportion of agricultural labourer households that had to sell or mortgage land is the highest among the five occupation categories. The other category that looks quite vulnerable by these indicators is that of casual labourer households.

When one looks at vulnerability among the various caste groups, the Scheduled Tribes seem the worst off. The Scheduled Castes are better off than them, but not by much. This is further substantiated by the fact that they are also overrepresented in the class of marginal and small farmers, a category that is also very vulnerable.

[19] This assumes that the most frequent strategies are also those that come first, which may not always be true. These results should therefore be interpreted with caution and as something to be explored further.

SECTION IV

Government Policy

This section presents a brief but critical review of the government's drought policy. It highlights some areas where change is possible, without giving concrete recommendations.

Given that large parts of the country are drought prone, the government has a history of policies and programmes to deal with its consequences. This history can be traced back to the Famine Commission Reports of the colonial era. These identified the lack of work and access to food as the main cause of suffering, but stressed the development of irrigation facilities as the most important weapon against drought-related suffering.[20] Based on this evaluation, the colonial government's solution to droughts was two-pronged:

- Generation of work for the able-bodied with gratuitous relief for the others.
- The development of agriculture independently from the monsoon.

The government's response can be studied under two heads – drought proofing and drought mitigation. The two are differentiated by the duration for which they are deemed to have an effect on people's lives. Thus, drought mitigation measures are generally treated as short-term measures that evolve to deal with a "crisis" that might develop if these measures are not undertaken. The food-for-work programmes fall under this category of drought policy. Drought proofing refers to policies and programmes that are put in place with the hope of evolving a long-term solution to the problem of drought. Such measures might include development of irrigation facilities or the development of alternative sources of livelihood so that dependence on agriculture itself is reduced. The two types of measures cannot always be differentiated in a clear manner – for example, measures for mitigation include the creation of durable assets. Until recently, drought mitigation measures formed the larger (in terms of expenditure) and more dominant part of the government's strategy to deal with drought. However, there has been a gradual shift away from mitigation measures to the more "permanent" proofing measures.

There has been a gradual shift away from mitigation measures to the more "permanent" proofing measures

4.1 Drought Mitigation

Government policies for drought mitigation can be viewed as its short-term response to drought. The main responsibility of dealing with drought relief lies with the State Government as it is treated as a State subject. The Scarcity Manuals play a pivotal role in the framing of drought mitigation policy. Their role is important not only in defining what counts as a drought, but also in prescribing when a drought will be

[20] See Drèze (1990: 15-35) for a description of the evolution of famine policy.

declared and how relief will be allocated. For example, in the allocation of relief work quotas, villages that are declared "famine-affected" are given priority over villages that are declared "scarcity-affected".

The Manuals are very thorough, but were last revised in 1968. Since then, there have been many changes in the economy, in politics (e.g. the introduction of *panchayati raj* institutions) and in society. The Manuals, as they exist, do not reflect this changed socio-political reality. They were designed to provide "objective" criteria on which to base the declaration of droughts. In practice, however, the declaration of a drought involves a lot of politics as well and there are various ways in which these criteria can be subverted. It is possible that a careful revision may still be the best way to deal with drought-related policy issues. The discussion that follows further highlights the need for an immediate and drastic revision and design of the Scarcity Manual of Rajasthan.

Droughts should not be treated as separate and/or occasional phenomena to be dealt with as and when they occur, but rather as another constraint in the design of policies

Reliance on the Scarcity Manual is fraught with many problems. **First**, the Manuals have been designed with the underlying assumption that droughts are *not* a regular feature of the economy. It focuses on timely identification of droughts so that they do not develop into a crisis. In the first section, we saw that judging by various indicators, droughts are actually a recurring feature of the State, affecting some part or another each year, and manifesting themselves in the form of shortages of drinking water, crop losses, etc. Thus droughts should not be treated as separate and/or occasional phenomena to be dealt with as and when they occur, but rather as another constraint in the design of policies. They are a chronic problem that should be addressed as such rather than in an *ad hoc* manner as is the case at present. All development policy measures should be designed with this in mind. The *ad hoc* treatment of droughts means that the chronic problems that are a direct consequence of droughts, such as unemployment, underemployment, poor health conditions (especially undernutrition amongst vulnerable groups), etc. are ignored by government interventions.[21] One clear indicator of the permanent nature of drought conditions in Rajasthan is that it is difficult to separate people's coping strategies against *drought* from their coping strategies in general. Migration is a prime example of this – people migrate not only because of droughts, but also on a seasonal basis. Decisions to migrate depend on whether work is available in the village. People adjust their migration patterns to the nearby city or town to fit in with their chances of getting employment on the food-for-work site in their own village.

Second, there are problems with the way the Scarcity Manual is used. Though the Manual lays out other indicators that should be included in ascertaining the existence of a drought, in practice most governments have come to rely almost exclusively on the *girdawari* report, ignoring other indicators such as cattle deaths, migration, etc. Cattle deaths are

[21] One finds the government giving out contracts for various jobs that are as easily done by manual labour to mechanised firms, while people in the same area clamour for work and sometimes in extreme conditions, even die of starvation.

especially pertinent in the case of Rajasthan, which has the largest livestock population in the country. For a large proportion of the rural population, livestock is a more important source of income than agriculture.

Third, undue reliance on the Manual causes unnecessary delay in the commencement of relief work. Since the assessment of land use requires that crops be close to harvest and since, in principle at least, each field has to be visited by the *patwari*, it becomes a long drawn out and time-consuming process, which can be started, at the earliest, in August. Because of this, the declaration of drought is often grievously delayed. For example, in 1999-2000, the second consecutive year of drought, the government took until January 2000 to declare it. To make matters worse, relief work does not always begin immediately after the declaration of a drought. Quite often there is a further lag of upto two months before relief work is initiated. In fact, even in 2000-1 relief work began only in February 2001 though the drought was declared in November 2000.

Also, relief work is stopped as soon as the first monsoon showers come. The government's claim in this case is that people no longer need work because they prefer to work on their fields anyway. There is some truth to this; but the period from the beginning of the monsoon until the crops are harvested is also the period of maximum distress, since by then people have exhausted whatever little stocks they might have had from previous years.[22] Since, as we noted earlier, people do diversify their sources of livelihood within a household, the continuation of relief work would allow some members to continue using it as a source of income to tide over this difficult period, while others would be free to work on their fields.

Fourth, the sincerity with which a *patwari* may carry out his duty in the measurement varies tremendously. Quite often the *patwaris* do not live in the region they are responsible for. Many are known to remain absent from their offices for long periods of time, are corrupt, etc. The *girdawari* report involves the *patwari* visiting all the fields in his *panchayat* to record the area sown, and to provide an estimate of the expected damage to the crops. Even if they want to carry out these measurements properly, the sheer magnitude of the task bears them down, especially given the fact that the *patwaris* have numerous other responsibilities as well. Besides this, in some villages at least, it has been noticed that when the villagers are aware of the significance of over-stating their agricultural losses in order to get additional relief, the *patwaris* are often under a lot of pressure to exaggerate the losses.[23]

The Scarcity Manual also details the types of work that should be started in order to provide relief. This list includes tasks that would create durable assets. However, government policy has deviated from the Manual's guidelines. Especially since the implementation of

Since people diversify their sources of livelihood within a household, the continuation of relief work would allow some members to continue using it as a source of income, while others would be free to work on their fields

[22] This has been referred to as the "hungry season" by Longhurst (1986). See also Chen (1991: 106). In this study as well, many households did say that the worst season in terms of food availability was the monsoon.

[23] This was noticed in the *gram sabha* meeting of one of the villages that the author did fieldwork in. Many people were asking the *patwari* to be "*meherbaan*" (generous) in reporting losses in their village.

Fifth Pay Commission's recommendations, State Governments have been facing a severe financial crisis. This resource crunch, combined with the objective of providing employment to as many people as possible, has meant that the Relief Department sanctions only those projects where the materials component in the total cost is close to zero. As a result, it is common to find that roads are being laid in sand dunes where the previous day's work could be wiped out in a single night. *Nadis* (ponds) dug in any particular year to harvest the following year's rainwater often do not survive that long.

People's faith in the panchayati raj institutions suffers when their proposals and demands are not considered

On the other hand, since *Panchayati Raj* institutions have been put in place, a *gram sabha* takes place four times a year in each *panchayat*. At these meetings, the elected representatives of the people are asked to submit proposals for the projects to be undertaken in their *panchayat*. These proposals are sent religiously to the block administration after each *gram sabha* meeting. However, the list of sanctioned works that comes back from the district or block administration rarely includes the proposed work. This is partially due to the above mentioned resource crunch.

There are several problems with this approach. First, the top-down approach means that projects that do not always reflect people's needs and priorities get precedence, leading to wasteful expenditure. Second, people's participation in and ownership of the relief work suffers. It is widely recognized that these two factors are vital in ensuring the success of interventions. Third, the top-down approach is especially detrimental when it is accompanied by the rhetoric of people's participation. People's faith in the *panchayati raj* institutions suffers when their proposals and demands are not considered. This has the effect of reducing their participation in these democratic local institutions.

Though drought is a State subject, the Central government does play a very important role. Specifically, the finances for dealing with a drought are provided mainly by the Central government. The Centre has two schemes for dealing with "calamities" such as droughts, floods, earthquakes etc. These are the Calamity Relief Fund (CRF) and the National Calamity Contingency Fund (NCCF). Both were started in 2000-1 and have a duration of five years. The Centre contributes as much as 75 per cent of the funds to the Calamity Relief Fund (CRF). In the case of NCCF, the entire contribution is made by the Government of India, and allocations to the States are made when the National Centre for Calamity Management (NCCM) finds that the State government needs to spend in excess of the CRF to meet the calamity.[24]

This pattern of funding relief leads to delays of its own. The State government has to prepare a report of the losses and provide the Centre with estimates of funds required. Once this is received, the Centre sends its team to the State to determine the validity of the claims and only when the Centre is satisfied, are the funds released. Smooth implementation of relief activities requires the existence of good Centre-State

[24] See http://ndmindia.nic.in/documents/document.html

relations. However, the case of the recent drought in Rajasthan illustrates how relief operations can suffer on account of political rivalries.[25]

4.2 Drought Proofing

Drought proofing policies can be of two kinds: those aimed at drought *prevention*, i.e. countering the trigger event, and those aimed at reducing the *impact* of drought on people. Examples of the former include attempts to predict the extent of rainfall or devise early warning systems, and extend to reforestation programmes (based on the assumption that the failure of rain is related to environmental degradation).[26]

Within the second category of responses, i.e. those aimed at reducing the impact of drought, policies tended to focus too much on agriculture and within that, on the development of irrigation. This has led to the implementation of large-scale irrigation projects,[27] reforestation programmes, etc. From independence until the 1970's the reliance was almost solely on such large-scale irrigation projects. Over the years, there has been a gradual shift away from such policies. However, the focus on the agricultural sector has continued. Later programmes such as IRDP and TRYSEM were included in drought proofing efforts.

There have been other policies aimed at reducing the impact of drought on people. These policies include measures that would strengthen people's position within their existing livelihood patterns– such as agricultural extension services, veterinary services, access to credit and markets, etc. Their failure can be traced to their flawed design as well as to problems in implementation. Drought-resistant varieties of seeds, varieties with short stalks, short ripening period, etc. have also been tried. What seems to have been neglected is the already existent diversity in people's livelihood strategies and the need to focus on them.

4.2.1 Government Programmes

In its attempt to "drought proof" the drought prone areas of the country the Central government has undertaken various programmes such as the Drought Prone Areas Programme (DPAP) and the Desert Development Programme (DDP).

What seems to have been neglected is the already existent diversity in people's livelihood strategies and the need to focus on them

The DPAP was launched in 1973-4 and covers 180 districts spread over 16 States. Similarly, the DDP covers 40 districts in 7 States and was launched during the Fifth Plan in 1977-8. The programmes undertaken under the DPAP and DDP include pasture development, afforestation, and water resources development. The unsatisfactory progress of the programmes led to a review in 1993 by the Hanumantha Rao Commission. As a consequence, there was a concerted move to bring decision-making closer to the beneficiaries of the programmes as well as carry out decentralisation. This change came

[25] For more on Centre-State relations and the fiscal arrangements related to droughts see Mathur and Jayal (1993: 53-62).

[26] Wijkman and Timberlake (1984) note that policy responses tend to focus on trigger events even though we have little control over them.

[27] This emphasis can be traced back to British India (Mathur and Jayal, 1993: 31). Baviskar (1995), also comments on this tendency of government policy (see pp. 26-22). See Jodha (1990) for the changing priorities in policy.

together with an exclusive focus on watershed program-mes. The recommendations came into effect in 1995. They also changed the financial arrangements from a 50:50 partnership between the State and the Centre to a 25:75 sharing arrangement.

The long term objectives of the Centre that have been laid out in the Contingency Plan for Drought 2000, GOI,[28] include the development of drought-resistant varieties of crops, a greater emphasis on small and medium scale irrigation projects, watershed development and rainwater harvesting, implementation of relief works that are sustainable, afforestation, etc.

There is a need to move away from large scale irrigation to small and medium projects which have proved to be more efficient

4.2.2 Government Policies

Water Policy

In discussing water policy, it is useful to separate issues relating to the supply of water from issues relating to its demand. The problem of supply has to do with the availability of water for various purposes, such as agriculture, drinking and sanitation. The problem of demand has to do with *how* the water is used: for instance, whether it is used wastefully or unsustainably, who has access to the water, etc. Government policy has tended to focus on the problem of supply over that of demand, and has concentrated on irrigation over other needs. Recent interventions such as water harvesting and watershed management, though commendable, have also continued to ignore the demand aspect of the water problem.

We have already noted that Government water policy has concentrated almost exclusively on irrigation. The emphasis here has been on *large-scale* irrigation projects: during 1951-85, the Indian government invested 64 per cent of its total irrigation expenditure on major and medium projects, even though they are more costly than minor projects.[29] The cost of irrigating one hectare of land by a large project is Rs. 19,310 compared to Rs. 4,520 when irrigated by a minor irrigation project (Baviskar, 1995: 27). Even in the dry State of Rajasthan there have been attempts to sell the idea of solving the water problem by linking the State with the Indira Gandhi Canal in the north and the Sardar Sarovar Project in Gujarat in the south. There is a need to move away from large scale irrigation to small and medium projects which have proved to be more efficient.

Since rainfall in India is concentrated during three months, small-scale efforts such as water harvesting could also be explored further. In addition to irrigation, they have the potential to alleviate the shortage of drinking water, and help replenish groundwater resources. A number of such initiatives have already been taken by some local NGOs – these include the building of community *tankas* in some parts of Barmer. In the Udaipur region, small-scale irrigation projects such as the construction of *bandhs* and anicuts, have been undertaken by Sewa Mandir. However, there does not seem to be any systematic evaluation of the progress or success of these initiatives. Such an

[28] Source: http://ndmindia.nic.in/documents/document.html

[29] This emphasis on large and medium irrigation projects and the neglect of minor irrigation schemes has been highlighted by Baviskar (1995) and Mathur and Jayal (1993).

evaluation would provide useful insights into whether such projects work, under what circumstances they work and finally, whether or not there needs to be further thrust towards such projects.

The focus on supply should not obscure a more fundamental problem with water policy, which is that it has ignored issues relating to the *management* of water resources. In the drive to immunise agriculture from the vagaries of the monsoon, there has been an uncontrolled expansion in the use of groundwater resources. Groundwater is the single most important source of irrigation for farm-land in Rajasthan. In 1998-9, 64 per cent of irrigated land was irrigated by tubewells and dug wells.[30] This has depleted groundwater resources, making water saline in many areas, and has also interfered with people's traditional coping mechanisms.[31] Thus, what was earlier treated as a scarce resource is now used quite uneconomically (Jodha, 1991).[32]

Unrestricted water use is irrational and ultimately unsustainable. This has been highlighted in the recent literature, which also links food security in the future to the management of water resources today.[33] We must explore ways to regulate water use, perhaps by the imposition of charges for different types of water use, e.g. water meters make volumetric water pricing straightforward (Johanssan, 2000).

Finally, the management of water resources is *unfair*. First, the benefits of unrestricted supply flow to rich farmers who can afford to buy high-yielding crops that require extensive irrigation. Second, as the water table drops, only those who can afford to bore deep tubewells have access to water in a time of scarcity.

Diversification of livelihoods

Much of the vulnerability of the population to drought can be traced to its sole or primary reliance on subsistence agriculture. Consequently, most of our efforts for drought proofing have concentrated on reducing this vulnerability, which is triggered by an unpredictable monsoon, and is exacerbated by social and economic factors. This has meant that policies have tried to ensure higher and more predictable returns to agriculture by the provision of better irrigation, seeds, etc.

Much of the vulnerability of the population to drought can be traced to its sole or primary reliance on subsistence agriculture

What has been ignored is the equally important need for further diversification of livelihood strategies, especially a move away from sole or primary reliance on subsistence agriculture. If share of income from other sources (within a household and across households) can be raised and made more predictable, the objective of drought proofing would have been achieved. This may be easier said than done, but there is evidence that points to the success of, and the future potential for, such interventions. This is

[30] Gross area irrigated from wells as a proportion of total gross irrigated area, calculated from data posted on http://agricoop.nic.in/statistics/st3.htm.

[31] Jodha (1989) explains how technological change, public intervention and the increased role of the market have encouraged an uneconomical use of water, which was earlier treated as a scarce resource by people.

[32] Nor is exploitation of ground water an exclusively rural phenomenon. In Jaipur, tubewells provide 60-70 per cent of the city's water needs (Rajesh, 2000).

[33] See Batchelor et al (2003), Economic and Political Weekly (2002), World Bank (2000), http://www.iwmi.cgiar.org/Press/brief2.htm

partially because of the *existing* diversity in occupations of a household.

If agriculture had been the only source of livelihood, any policy intervention would require a much larger thrust than is required in a more diversified occupational structure. The pre-existence of diversity in the sources of livelihood provides us with a wider variety of intervention options. Thus, when we know that the rural population does sell forest produce, wool and livestock (for meat) in the market, or migrates to other areas, then policy interventions can work towards strengthening the position of people in such dealings as they might have with the market and ensuring they get a fair price for the things they sell. On the other hand, if such strategies were not already a part of their survival strategy, then they would either have to be developed or, it would reduce the scope of interventions only to the field of agriculture.

The pre-existence of diversity in the sources of livelihood provides us with a wider variety of intervention options

There are already existing examples of successful interventions in the State itself. Uttar Rajasthan Milk Union Limited (URMUL) in Bikaner and Saras in Jaipur are both co-operative dairies as a result of whose operations even small farmers in villages are able to sell milk at least once a day at remunerative and non-exploitative rates.[34] It might be possible to develop a similar institutional setup for those who sell wool and sheep (and other livestock such as chicken) in the market but are currently at the mercy of the trader who comes to their village to buy their goods. This would also be helpful in the south-eastern tribal region, where reliance on sale of forest products is an important means of livelihood. Similarly in western Rajasthan, embroidery provides employment to many women but not at remunerative rates. In one village there were a few women who spun wool into thread and sold it to the Khadi Gram Udyog. Spinning provided an important supplement to the incomes of these families. But they also complained that supplies from the Khadi Village Industries outlet were irregular.

Another initiative could be the improvement of livestock breeds, especially cows. This is important as an improvement in breed of cows would result in improved milk yields, and therefore the need to maintain large herds would be reduced. This in turn reduces the pressure on fodder requirements.[35]

Co-ordination of government and non-government efforts

Rajasthan has a thriving non-governmental sector active in development work. Financial resource flows to this sector are not insubstantial. A wide range of initiatives has been undertaken by them – from income generation programmes, to environment conservation and water harvesting, education, etc. However, what seems lacking is an overall vision. Even this sector does not seem to recognise the permanent nature of the drought. As a result, their efforts remain fragmented with other problems

[34] See Gurumurthi (1999) and Kurien (1997) for more on the success of the co-operative movement in the dairy sector.

[35] Such a suggestion has been made by Mehta (2000) for the region of Kutch, which in agroclimatic terms is very similar to western Rajasthan. Society for Uplift of Rural Economy (SURE), a Barmer-based NGO has a programme for cattle breed improvement.

such as duplication. There does not seem to be a system that would make them accountable to the people, at least in the areas in which they work. Government efforts are monitored and evaluated systematically at regular intervals; such a process should also be put into place for the activities of the non-governmental organizations that are working in these areas. Co-ordination and collaboration with the government could also be taken much further. While NGOs play an important role in development, their area of operation continues to be small. It is possible for the government to learn from this sector. Such learning has taken place in the past. For instance, Social Work and Research Centre (SWRC) initiated relief work in some of its villages and introduced job cards. The purpose of this exercise was not only to provide relief, but also to present before the government a model of how the introduction of job cards at relief sites can counter some of the problems that are faced by government run food-for-work programmes. These include false entries in the muster rolls, a small section of people getting work repeatedly at the cost of others, cheating in the recording of wages, etc. As a result of SWRC's work, the government of Rajasthan has started issuing job cards to each household in the village.[36]

While NGOs play an important role in development, their area of operation continues to be small

[36] The job cards are distributed to everyone according to the type of ration card that they hold. Thus, those who have a pink ration card (BPL card) are given pink job cards.

SECTION V

Conclusion

A comprehensive drought policy that treats drought as a feature of the economy and aims at co-ordinating government and non-government development initiatives needs to be devised

This paper has argued that drought should not be thought of in terms of a shortfall in aggregate rainfall alone, but also in terms of the various ways in which human lives are affected. When we think of drought in this broader sense, it becomes obvious that drought is a regular feature of life for many in Rajasthan. This has important ramifications for the way policy-makers deal with the issue. Currently, it is largely dealt with by the provisions made in the Scarcity Manuals. By their very nature, the Scarcity Manuals provide *ad hoc* relief. There are various problems with *ad hoc* relief, some of which can be addressed by providing a universal Right to Work. The advantages of having the Right to Work are as follows:[37]

- A guarantee of work at minimum wages would ensure that wages in other sectors do not decline or, that if they do decline, workers have an option that would protect them from these declines.
- Guarantee of work would ensure that enough work is available for those requiring it. The way the programme is currently designed it generally tends to fall short of the demand for work. This has the consequence of leading to tensions and sometimes even quarrels to get work. It is not surprising that the really vulnerable sections tend to get left out or get too little.
- The security afforded by the Right to Work is likely to have other positive outcomes in terms of reducing the extent of distress migration. Currently, people in the villages have to time their movements in and out of villages to coincide with their chances of getting work on relief programmes.

A comprehensive drought policy that treats drought as a feature of the economy and aims at co-ordinating government and non-government development initiatives needs to be devised. A revision of the drought policy, especially in the Scarcity Manuals, is needed, so as to incorporate the popular demand for the Right to Work, amongst other things. Rather than continuing to focus and rely on the agricultural sector, a further thrust needs to be given to diversification of livelihoods away from agriculture and to diversification even within the broad category of agricultural livelihoods. This also entails moving away from a water policy that emphasizes the development of irrigation, to water harvesting.

[37] For more details see www.righttofood.com

Statistical Annexures

Table 1: **Some Indicators of Drought in Rajasthan, 1981-2 to 2002-3**

Year	Total monsoon rainfall (mm)	Number of affected villages	Labour engaged (lakh)	Expenditure on relief operations, (Rs. Crore)	Index of Foodgrains production (1991-2=100)	Total Cattle (lakh)
1981-2	-	23246	28.142	109	90.21	-
1982-3	-	22606	28.37	102	104.00	135
1983-4	-	282	0	68	126.55	-
1984-5	-	10276	4.86	6	98.99	-
1985-6	434	26859	32.05	91	98.99	-
1986-7	292	31936	62.05	163	85.20	-
1987-8	523	36252	125.82	622	60.14	109
1988-9	444	4497	219.50	323	132.82	-
1989-90	649	14024	11.05	31	106.50	-
1990-1	463	0	0	38	-	-
1991-2	587	30041	14.69	6	100.00	-
1992-3	519	4376	1.06	131	143.83	116
1993-4	665	22256	15.75	34	88.40	-
1994-5	615	0	0	167	146.72	-
1995-6	726	25478	20.75	46	119.87	-
1996-7	588	5905	0.87	204	160.64	-
1997-8	503	4633	21.62	5	176.03	121
1998-9	450	20069	29.84	187	162.06	-
1999-2000	-	23406	42.96	277	133.88	-
2000-1	381	30583	27.29	566	30.77	-
2001-2	517	7964	-	-	-	-
2002-3	173	41000	15.75	-	-	-

Note : 10 lakh = 1 million
1 crore = 100 lakh

Source: Rainfall: http://www.rajirrigation.com/Annexure-C5.htm; Affected Villages: Government of Rajasthan (1999); Labour engaged and Expenditure on relief operations: Government of Rajasthan (2000) unpublished data provided by the Department of Relief; Index of Agricultural production: Vidya Sagar (1995) and Government of India (2000). Cattle population: Government of Rajasthan (1983), (1988) and (1997).

Table 2: **Rainfall and "Famine-affected" Villages, 2001**

Rainfall[1] / % villages "famine-affected"[2]	Excess rainfall	Normal rainfall	Deficit rainfall
> 50 per cent	Jhunjhunu Jodhpur, Pali, Sikar	Ajmer, Barmer, Bhilwara Churu, Dungarpur, Jaipur, Jalore, Nagaur, Rajsamand, Sirohi, Tonk and Udaipur	Banswara, Bikaner, Hanumangarh
< 50 per cent	Kota	Baran, Bharatpur, Bundi, Chittorgarh, Dausa, Sri Ganganagar, Jhalawar, Sawai Madhopur	Alwar, Dholpur, Karauli

Note: [1] Excess rainfall means rainfall has been 20 per cent more than "normal"; Normal rainfall means it is between +19 to -19 per cent of normal as calculated over a given period of time; and Deficit means it has been 20 per cent or more below normal rainfall.
[2] "Famine-affected" villages are those where the area sown has fallen to less than 75 per cent of normal.

Source: Government of Rajasthan (1999), *Memorandum on scarcity* (*Samvat 2056*), Relief Department, Jaipur, Annexure 1 and Annexure 6.

Table 3 : Basic Features of the Sample Villages

	Barmer		Bikaner		Jaipur		Udaipur	
	Kharad	Sukaliya	Biramsar	Dulmera Station	Baasri Jogiyan	Morda	Badli	Birothi
DEMOGRAPHIC CHARACTERISTICS								
No. of sample households	50	47	47	49	51	50	43	51
Caste Composition (%)								
Scheduled Caste	34	2	17	0	26	14	0	14
Scheduled Tribe	0	15	0	0	14	2	100	12
OBC	4	72	72	86	31	74	0	6
General	62	11	11	14	29	10	0	68
Religion (%)								
Hindus	100	19	100	76	94	90	0	78
Muslims	0	66	0	22	0	10	0	2
Jains	0	0	0	2	0	0	0	6
Tribals	0	15	0	0	6	0	100	14
PHYSICAL INFRASTRUCTURE								
Distance to (in kms)								
All weather road	0	6	2	0	2.5	0	0	15
Bus stop	0	6	0	4	0	0	4	0
Health facility	4	3	4	4	1.5	0	6	0
Primary school	0	0	0	0	0	0	0	0
Middle School	4	3	0	0	1.5	0	0	0
Source of drinking water (%)								
Piped water in the compound	6	0	2	4	4	40	0	2
Piped water outside the compound	54	40	83	51	2	4	0	0
Private handpump	0	0	0	0	2	0	26	0
Public handpump	0	0	0	0	90	52	0	82

Table 3 (contd.) : **Basic Features of the Sample Villages**

	Barmer		Bikaner		Jaipur		Udaipur	
	Kharad	Sukaliya	Biramsar	Dulmera Station	Baasri Jogiyan	Morda	Badli	Birothi
Covered well in the compound	0	2	0	0	2	2	2	0
Uncovered well in the compound	30	0	6	0	0	2	26	0
Covered well outside compound	0	0	0	0	0	0	5	0
Uncovered public well	10	53	9	0	0	0	40	14
Tanka	0	0	0	0	0	0	0	0
Surface water (pond, river, lake)	0	0	0	0	0	0	2	2
Other	0	4	0	45	0	0	0	0
ECONOMIC								
Occupation Structure (%)								
Self employed in agriculture	74	72	78	33	47	78	98	78
Self employed in non-agriculture	6	2	7	25	10	14	0	6
Agricultural labour	0	2	0	13	12	2	0	2
Casual labour	8	15	13	25	10	4	0	4
Regular employment	8	6	0	4	10	2	0	8
Average per household land owned (*in bighas*), 2001								
Unirrigated	19	42	34	18	6	17	2	5
Irrigated	9	0	0	5	8	6	0	1
Total	28	42	34	23	14	24	2	6

Source: Based on data collected during fieldwork.

Table 4 : Land Owned and Area Cultivated (*Bighas*) by Various Caste Groups, 2001

Land area	Scheduled Caste (%)	Scheduled Tribe (%)	Other Backward Castes (%)	General (%)	All Castes (%)
Size of holding (in bighas)					
Less than or equal to 5	42	73	14	39	35
6-15	41	21	24	29	28
16-25	11	5	17	13	13
26-35	1	2	8	6	5
More than 36	5	0	36	13	19
Land area	**Scheduled Caste**	**Scheduled Tribe**	**Other Backward Castes**	**General**	**All Castes**
Average owned (in bighas)					
Unirrigated	9.0	4.4	30.6	11.1	17.8
Irrigated	1.1	0.4	5.1	5.1	3.6
Average sown (in bighas)					
2001					
Unirrigated	10.0	4.3	22.0	8.2	13.8
Irrigated	1.8	0.5	2.2	3.7	2.6
2000					
Unirrigated	8.6	4.0	20.6	7.2	12.6
Irrigated	1.4	0.5	2.7	3.3	2.2

Source: Based on data collected during fieldwork.

Table 5 : **Changes in Area Sown and Total Output of Main Foodgrains**

		2001	2000	Shortfall (%)
Total Area Sown (*in bighas)*	*Makka*	452.0	186.0	**59**
	Bajra	3913.0	3751.0	**4**
	Wheat	561.0	325.0	**42**
	Other cereals	1407.0	262.0	**81**
	Pulses	854.0	417.0	**51**
Total Output (in '000 kgs)	*Makka*	24.5	19.8	**19**
	Bajra	217.4	61.8	**72**
	Wheat	122.4	74.4	**39**
	Other cereals	25.4	4.4	**83**
	Pulses	11.8	2.4	**80**

Source: Based on data collected during fieldwork.

Table 6 : Change in Total Livestock Wealth of the Sample Households

	1999	2002	Decrease in total holding (%)
Cows	1506	1068	29
Buffaloes	526	529	0
Goats	3793	2022	47
Sheep	1710	808	53
Camels	143	92	36

Source: Based on data collected during fieldwork.

Table 7 : **Coping Strategies of Households in Order of Importance**

	Proportion of households reporting (%)
Adapting or diversifying activities	95
Participating in relief works	70
Borrowing	64
Migrating	48
Mortgaging or selling assets	24
Migration of entire families	Negligible

Note: When households report both a primary and secondary occupation, they are classified as "adapting or diversifying activities"; if any member of the household sought work on relief sites, that household was treated as "participating in relief work"; if any member of the household had to migrate out in search of work in the summer of 2001, that household is classified as "migrating".

Source: Based on data collected during fieldwork.

Table 8 : **Vulnerable Groups in the Sample Population**

Proportion of households (%)		In sample population	Reporting skipping meals	Reporting seeking work on food-for-work programme	Where at least one member had to migrate out	Borrowing	Selling or mortgaging assets
All		100	27	70	48	64	24
Female headed households		10	32	76	45	65	24
Ownership of land (in hectares)	<1	38	40	77	51	55	22
	1.01-2.0	15	26	71	46	61	19
	2.01-4.0	22	17	69	51	77	28
	>4	25	15	55	40	66	28
Occupation groups	Self-employed in agriculture	69	27	77	50	64	25
	Self-employed in non-agriculture	9	9	41	21	53	15
	Agricultural labour	4	39	79	53	67	33
	Casual labourer	10	32	66	59	74	28
	Regular jobs	5	5	18	48	55	14
Caste	SC	14	28	79	43	63	24
	ST	17	45	93	62	48	23
	OBC	42	15	64	42	75	29
	Other	28	34	53	52	56	17

Source: Based on data collected during fieldwork.

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Droughts have affected many people's lives in Rajasthan. The adverse impact is due to widespread crop failure, which leads to shortages of food, fodder and drinking water, and migration.

This paper calls for a comprehensive drought policy, as droughts are a recurring phenomenon in the State. But it also argues that successful policies need a change in the understanding of droughts. The impact on people's lives should be taken into account and diversification of livelihoods in Rajasthan should be promoted. The analysis is also based on fieldwork carried out in four districts of the State.

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