# Poverty in Remote Rural Areas in India: A Review of Evidence and Issues

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## 1. The Context

Three fourth of India's poor live in rural areas but poverty is concentrated in certain geographical regions. For instance, in 1993-94 about 50 per cent of the rural poor were concentrated in the four most populated states viz. Bihar, Uttar Pradesh, Maharashtra, and Madhya Pradesh (Chaudhri 2000). However, if one looks at the incidence of poverty at regional level, one finds a more diverse picture with some of the regions in Assam, Orissa, Tamil Nadu, West Bengal, and Rajasthan having more than 40 per cent of the rural population living in poverty conditions (NIRD 2000). This suggests that apart from population size, rural poverty is characterized by certain deep-rooted processes, superimposed on the relatively weak endowment and/or access to natural resources in a large number of states and regions in the country. To a large extent, poverty emanating from the deep-rooted factors or processes is likely to be chronic in terms of both-duration as well as severity.

The phenomenon of spatially determined poverty traps has been recognized world over. For instance, a recent study covering a large number of developing countries notes that the majority of the rural poor are located in difficult areas characterized by low agricultural potential, fragile ecology, weak infrastructure, poor connectivity and weak functioning of markets (Farrington and Gill 2002). Many of these areas are constituted by hilly or mountainous regions. According to an estimate, nearly one quarter of Asia's poor live in mountain areas. They

are rain-fed farmers, forest dwellers, highlanders and indigenous people (UNDP 1997; IFAD 2002). Similarly, it is estimated that nearly 60 per cent of the world's population lives in marginal lands, a large proportion of which are prone to frequent shocks of droughts. Hence, about half of the two million people living in dryland regions are likely to be poor (Dobie 2001; UNDP 2001). The above evidence suggests spatial concentration of poverty world over, and the critical importance of mobility through the process of economic growth.

Given the significance of the spatial distribution of poverty, the Government of India adopted an area-based approach to facilitate economic development and explicitly recognised certain 'backward regions' in the First Five Year Plan (Government of India 1981). The National Commission on Agriculture, noted that "special programmes are necessary to create facilities and thereby promote balanced regional development. These areas should receive due consideration in allocation of resources for the development of the requisite infrastructures. In the cost-benefit analysis for investments in these areas, due regard should be paid to social returns" (Government of India 1981).

Subsequently, a National Committee was set up to look into the problems of backward areas, which recommended six categories of regions for providing special developmental support. These were: desert areas, chronically drought affected, tribal areas, hilly areas, chronically flood affected, and coastal areas affected by salinity. While most of these areas, except for tribal regions, are characterized on the basis of natural resource endowment, it was envisaged that perpetual 'backwardness' in a region could be caused by certain social, economic, and political forces. Thus, the concept of backwardness was extended to incorporate aspects like presence of a feudal agrarian structure, lack of market and/or formal support system, absence of industrial development, and socially marginalized communities (community based characteristics). Subsequently, a number of special schemes were designed and implemented over the past three decades so as to help people in these areas to overcome the spatial disadvantage and create a conducive environment for development of these 'backward' or disadvantaged regions. Chronic poverty in India's remote rural areas (RRAs) needs to be examined in light of the above.

## *Regional Disparities: Convergence vs. Divergence*

Over time significant effort has gone into developing some of these disadvantaged areas, especially tribal and hilly regions.

Unfortunately, data availability does not permit separate analysis of the level of development of the six categories of regions noted above. Analysis of regional disparity at the state level shows some resemblance of convergence in economic growth at least till the late eighties (Dholakia 1994). The more recent experience however, suggests a tendency of divergence and polarization (Nagraj 2000; Bhalla 2000; Dasgupta *et. al.* 2000). The evidence tends to suggest that basic investment made by the state during the early phase of planning did help in reducing the initial handicap of some of the lagging regions. Nevertheless, the momentum seems to have been lost as the economy started progressing on a higher growth path, especially in the post nineties.

To a large extent, divergence in economic growth could be attributed to availability of irrigation and road and rail infrastructure which play a critical role in growth of agriculture and industrial sector respectively. What is crucial is that whereas growth did exert a positive influence on poverty reduction in general, its impact on the specific backward regions or spatial poverty traps has been fairly limited. Hence, it appears that while the backward areas might have experienced some improvements in indicators like literacy, life expectancy, agricultural productivity, transport and mobility, etc., the impact does not seem to be robust enough to pull these areas out of poverty on a sustained basis.

Two processes seem to have worked in this context: (i) increased mobility as well as human capabilities may have reduced the incidence of poverty to some extent, and (ii) increased agricultural productivity due to new crop technology and market development might have reduced severity of poverty, especially in the wake of the increased population pressure on land and water resources. But, poverty might have continued to be long duration for most of the people who failed to migrate out and/or who did not have entitlement to the basic factors of production except labour.

The phenomenon seems to have been reflected in terms of certain stylized features of rural poverty in India (Mehta and Shah 2001). For instance, incidence as well as severity of poverty is higher among tribal vis-à-vis non-tribal population. Similarly, a large part of the hilly areas, especially in the North-East region, continue to have higher incidence of poverty (NIRD 2000). On the other hand, some of the dryland regions in states like Haryana, Rajasthan, Maharashtra and Karnataka have very high incidence of rural poverty, despite the fact that all these states,

except Rajasthan, are economically more developed in terms of growth in state domestic product (SDP).

The above observations confirm the finding by Nagraj (2000) that the trend in poverty reduction is not systematically linked with the growth process. And that, a large part of poverty reduction since the eighties could be attributed to the state's investment in public works and relief measures. This suggests that poverty, especially in the disadvantaged regions, continues to exist, as the basic features leading to 'backwardness' have remained more or less unchanged. There is increasing recognition of the fact that agricultural growth in some of the lagging regions can help in reducing rural poverty (Shand and Bhide 2000; Fan and Hazell 2000; Radhakrishna 2002). But this mechanism does not seem to work universally as several other factors like agrarian structure, stability in foodgrain prices, and incentives for developing land and water resources may determine the link between agricultural growth and poverty reduction at the state and regional levels.

One of the major factors weakening the link is lack of land ownership. This is clearly indicated by Gaiha (1995) who notes that although rural poverty and agricultural income are inversely related, the impact is stronger among land holding classes; for the landless, price of foodgrains plays a much more important role given the oligopsonistic labour markets. Given the fact that over 40 per cent of the rural households are landless or semi-landless (A. Shah 1997; Reddy 2002), and the proportion is likely to increase along with increase in population, the positive impact of agricultural growth, witnessed since the eighties, may not persist in future.

Moreover, vast tracts of dryland regions are highly susceptible to year-to-year fluctuations in agricultural production and thereby to the fluctuations in foodgrain prices. A substantial part of the rural households in these areas therefore, are likely to remain in poverty despite rapid agricultural growth (Gaiha and Deolalikar 1993). Besides, there are a large number of forest-based areas where agricultural growth may not exert substantial influence on the forest dependent communities. Exit from poverty among these rural households in dryland as well as forest based regions is possible only if agricultural growth is accompanied by other support systems like public works programmes (Sen 1996), effective food distribution system, and in certain cases opportunities for diversification of work force, especially in industrially developed states.

Thus it appears that the reality is fairly mixed and also context specific. Whereas growth, especially in agricultural sector, has helped in mitigating the adverse impact of population pressure, increased mobility along with the state's investment in public works programmes has also helped in containing further increase in incidence of rural poverty during adverse agro-climatic conditions like droughts or floods. However, a number of rural areas seem to have been bypassed by both these processes owing to the various factors noted above. These may constitute spatial poverty traps, where a large proportion of rural population is caught in severe, long duration and multi-dimensional poverty because of a logjam of several constraints - natural, economic, market or administrative, social, and political (Bird *et. al.* 2001).

Unfortunately, there are no systematic studies on the processes of development and poverty reduction for the various categories of 'backward regions' or the spatial poverty traps described above. Understanding the dynamics of sustained poverty is crucial for overcoming the spatial disadvantages faced by some of the backward areas, notwithstanding the various policy initiatives undertaken over a long period of time. This paper attempts to look into the dynamics of poverty, especially chronic poverty through reviewing the literature on a wide range of themes pertaining to poverty in remote rural areas in India.

Given the vastness of geographical areas and diversity, this is a difficult task. For instance, there are a number of studies on regional aspects of development, especially at state level. Similarly, there are sector specific studies having an important bearing on poverty such as agriculture, industries, forest, mining, education, infrastructure, etc. analyzing variations across the major states. Also, there is a vast body of literature on tribal communities dealing with various aspects of their socio-economic conditions and changes therein over a period of time. Finally, a plethora of evaluation studies focus on the impact of various developmental schemes and interventions in some of the poorer states. What is missing in most of these studies is a specific focus on poverty, especially chronic poverty, across typologies of backward areas or remote rural areas. To a large extent, this could be attributed to the fact that estimates of income poverty are not available for remote rural areas having spatial poverty traps. Hence, what is attempted here is a review of a selective set of studies dealing with (a) extent of income poverty and human capabilities in the lagging regions and (b) explanation of income poverty and its interface with human capabilities.

## *Defining Remote Rural Areas with Reference to Chronic Poverty in India*

We have tried to identify two broad categories of regions that face spatial disadvantages due to agronomic constraints and/or socio-political marginalisation. These areas are referred to as dryland and forest based regions respectively (see Table 1). The former also covers desert areas, the latter includes hilly and tribal regions. The forest based regions may also cover a part of the flood prone areas, especially in the eastern states. It is also likely that large parts of the forest areas have virtually become dryland, and tribals are also concentrated in some of the dryland regions (Shah *et. al.* 1998). This kind of overlap is difficult to resolve while creating broad typologies of RRAs, especially when the idea is to conduct an empirical enquiry into the dynamics of development (or deprivation) in these areas.

Identification of the areas under dryland and forest based regions has been done in two stages. The first stage required classification of the major states on the basis of dryland or forest areas. The former is based on the official delineation of drought prone and desert areas and the latter on area under forest and/or proportion of tribal population. The second stage involved identification of districts. Punjab and Haryana were left out because of high agronomic potential, Kerala because of overall good performance with respect to multidimensional poverty, and Tamil Nadu due to a somewhat mixed profile. Jammu-Kashmir, Himachal Pradesh, Arunachal Pradesh and the North-Eastern states have not been covered due to lack of comparable data at district and regional levels. Together the states in these two sets of regions account for 77 per cent of the total geographical area and 81 per cent of the total population in the country.

A complex mix of geographical, economic and social factors put the dryland and forest regions at a disadvantage. The constraints faced by dryland regions emanate from weak agro-climatic conditions and the state's neglect in terms of appropriate investment in developing land and water resources. In comparison, poverty in the forest based regions is largely an outcome of failure of entitlement to the region's rich natural resources, physical isolation and low social capabilities among tribal people. Apparently people in these two sets of regions face different kinds of poverty and have different strategies to cope with it (Table 1). It is observed that incidence of poverty in dryland regions is relatively low and transient in nature whereas that in forest based regions is higher and more chronic in terms of duration. There is, however, a strong

possibility that the present low level of poverty in dryland regions might get transformed into severe and long duration poverty, especially if the widespread over-exploitation of ground water is not checked. On the other hand, poverty in forest based economies is not only widespread, but is also likely to be severe and of long duration. Nevertheless, the region has a better potential to get out of the syndrome of chronic poverty, provided the right kind of policies and institutions are in place.

Table 2 presents a broad characterization of dryland and forest based regions in India. The important observations are as follows:

(i) Incidence of poverty, reflected by head count ratio (HCR), is higher than the all-India estimates for the majority of forest based states. Compared to this, the incidence of poverty is substantially lower among dryland states except Maharashtra. The pattern is more or less same during 1993-94 and 1999-2000.

(ii) The forest based states have performed poorly in terms of indicators of human development such as literacy and infant mortality rate (IMR) as compared to most of the dryland states. The exception is Rajasthan with female literacy as low as 44 per cent and IMR as high as 80 per thousand vis-à-vis 54.2 per thousand and 67.6 per thousand respectively at all India level. Conversely, West Bengal is a major exception among forest based states with significantly favourable indicators of human development.

(iii) Higher land productivity in forest based states suggests better agronomic conditions in these states compared to dryland states. While this could be partly due to relatively higher rainfall as well as better soil conditions among forest based states, irrigation is yet to be developed in large parts of Orissa, Eastern Uttar Pradesh, Chhatisgadh (in erstwhile MP), and Assam. Overall, the irrigation scenario suggests substantial untapped potential in the case of forest based states and over use of ground water among dryland states.

(iv) To countervail the relatively weak natural capital, dryland states generally, have a more dynamic economic structure and industrial sector with a higher level of urbanization.

(v) Dryland states have somewhat better infrastructure index (except in the case of Rajasthan), as compared to forest based states like Bihar, MP, and Orissa.

Table 2 confirms the pattern of poverty and socio-economic conditions in dryland and forest based areas as discussed in the previous section. It appears that the constraints faced by dryland regions emanate from the region's weak agro-climatic conditions and the state's neglect of appropriate investment in developing land and water resources in these areas. In comparison, poverty in the forest based regions is largely an outcome of failure of entitlement to the region's rich natural resources, besides physical isolation and low social capabilities among the tribal people. Thus, people in these two sets of regions may face different kinds of poverty and adopt different coping strategies. Poverty in dryland regions is likely to be low and transient in nature whereas that in forest based region it is more widespread and chronic. There is however, a strong possibility that the present low level of poverty in dryland regions might get transformed into severe and long duration poverty, especially if the widespread over exploitation of ground water is not checked. On the other hand, given their relatively rich natural resources, forest based economies seem to have better potential for redressing chronic poverty, provided the right kind of policies and institutions are in place.

The diverse pattern of poverty among dryland and forest based regions has been aptly summarised in a recent study on rural development in India which notes that 'drier states (in the west) harbour lesser poverty proportions than the wetter ones (in the east). In general, the states which were under the Zamindari regime and have experienced relatively ineffective agrarian and land reforms and thereafter green revolution, have been the losers, while those in the west, have been gainers. Within these contours, if the monsoon fails, all suffer, and vice versa' (NIRD 2000).

The above description is further substantiated by an earlier study by Chambers *et. al.* (1989) which developed a typology of poverty as core and periphery. Describing the typology, it noted that in the 'core' poverty there is more landlessness, limited involvement of poor in non-farm employment, and dependence and exploitation are more mediated by social relations. 'Peripheral' poverty, in contrast, is more linked to water scarcity, resource degradation, lack of infrastructure and distance from markets; dependence and exploitation are more commercial and relations with contractors and officials are more bureaucratic. This typology is also in conformity with the earlier observations by Dasgupta (1975) from a study of 126 villages in five agro-climatic zones in the

country. The authors pertinently note that core and peripheral conditions can be found in the same taluka, district and state, though mapping them is difficult. While pockets of remoteness may exist over most of the space, a macro study like this requires a broad based categorization such as the two-way classification of dryland and forest based regions proposed in this paper.

What is the extent and nature of poverty? And what are the major factors responsible for sustaining or alleviating poverty in these two sets of regions? These issues have been examined in the light of the existing analysis and evidence in the Indian context, supplemented by an empirical analysis of determinants of poverty across regions and districts in the two sets of RRAs in India.

The paper is divided into five sections. Section 2 reviews the dynamics of poverty in dryland regions, while section 3 reviews poverty in forest based regions. Section 4 examines determinants of poverty in regions and districts. The last section summarises the discussion and identifies issues for further investigation.

## 2. Poverty in Dryland Regions: A Review

There is no official delineation of dryland regions in India except for the one adopted for identifying districts to be covered under Drought Prone Area Programme (DPAP) - a major policy intervention in these regions. Researchers have tried to define dryland regions using different criteria (ICRISAT-ICAR 1999; Fan *et. al.* 2000; Shah *et. al.* 1998).

Recognising the critical importance of agronomic potential in determining poverty, it might be useful to define drylands by focusing primarily on the moisture deficiency. Shah *et. al.* (1998) have tried to define dryland by considering three sets of factors: (i) areas located in agro-climatic regions 1 to 12, (ii) length of the growing period (LGP) < 180 days, and (iii) proportion of gross irrigated area between 40 and 50 per cent. Accordingly, 53 per cent of the total cropped area is identified as drylands.

This section tries to understand the dynamics of poverty in the light of some of the basic features of dryland regions covering DPAP districts among five major states in India (Table 3). Following observations emerge from Table 3:

(i) DPAP districts have significantly lower density of population and also lower urbanization in most of the states.

(ii) To some extent lower density of population in DPAP districts is likely to result from higher incidence of migration, especially of male workers. This is reflected in the higher sex ratio in DPAP districts in three out of the five states, viz. Gujarat, Maharashtra, and Karnataka. Infant mortality is lower in DPAP districts in these three states. Apparently, this coping strategy seems to be supported by the relatively higher level of industrial development in these three states relative to Andhra Pradesh and Rajasthan. This suggests that out migration is facilitated by sectoral diversification in the three states. The proportion of non-farm employment however, is lower in DPAP vis-à-vis non-DPAP districts in all the states. This reiterates the importance of migration as an important livelihood strategy in dryland regions.

(iii) Inspite of higher sex ratio, female literacy rate is lower in DPAP districts in all the states.

(iv) Land productivity is lower in DPAP districts in most of the states except Karnataka. This is due to lower proportion of irrigated to the total cropped area. However, it is important to note that inspite of the extent of irrigation being fairly substantial in some of the DPAP areas, much of this is directly dependent on rainfall and hence likely to be non-sustainable in the long run.

(v) Developmental index (for infrastructure) is lower in DPAP districts.

All the above factors taken together lead to higher incidence of poverty in DPAP vis-à-vis non-DPAP districts as reflected by the proportion of population below poverty line.

## *2.1 Incidence of Poverty: Hidden vs. Explicit*

Although, there are no systematic estimates of poverty in dryland areas, a recent analysis based on state level comparisons indicates that the incidence of poverty has been lower among drought prone (DP) vis-à-vis non-drought prone (NDP) states (Conroy *et. al.* 2001). In 1993-94, the proportion of poor in DP states was 29 per cent vis-à-vis 37 per cent in NDP states.

A similar pattern was also observed in the areas under Semi Arid Tropics (SAT) in India. In a detailed study, Kelley and Rao (1995)

observed that there were significantly fewer absolutely poor people residing in the more marginal rural environment i.e. districts with productivity less than Rs. 500 per hectare. In terms of severity of poverty, there was no significant association with the marginal lands. This implies that incidence of rural poverty is greater in higher-potential regions within SAT in India. This suggests the occurence of out migration and resultant low density of population among the marginal areas under dryland conditions.

Conroy *et. al.* (2001) characterize drylands as having lower incidence of rural poverty but higher urban poverty, as a larger proportion of the rural workforce has to depend on non-farm employment within or outside the rural areas.

Given the dynamics of migration, especially long duration rather than seasonal, rural poverty in dryland regions is likely to be more of a transient phenomenon, influenced by rainfall related uncertainties in farm production. Hence in terms of typology, a large part of poverty in dryland regions is likely to be transitory in nature. Detailed analysis based on the panel data collected by ICRISAT provides evidence of this. According to the study by Singh and Binswanger (1993) covering three SAT-regions, poverty was not a permanent characteristic for all household. The study observed that out of 218 households, 131 (i.e. 60 per cent) were initially poor. After nine years 48 (i.e. 37 per cent) of these households had income above the poverty line, and another nine (i.e. 10 per cent) of the initially 87 non-poor households became poor despite considerable growth in average income of the sample households. What is however more important is that the average absolute income gains were about the same or larger for the initially poor as for the initially non-poor. Moreover, because the initially poor have been able to accumulate productive wealth, their gains are not a transitory. While this is quite encouraging, it needs further scrutiny, especially with respect to access to irrigation. For instance, there is a wide variation in terms of extent of irrigation across the three locations from which sample had been selected. The percentage of irrigated area ranged from 42 in Mehboobnagar to 16 in Akola, and, the proportion of irrigated area had increased over time. A large part of the poverty reduction is thus likely to be due to increased access to irrigation. In that case, the sample may not be representative of dryland regions, especially those with spatial poverty traps.

A close look at the results obtained from the above analysis suggests that Mehboobnagar, having the highest proportion of irrigated

area, happened to have gained more in terms of poverty reduction. This was mainly because many poor households in this region were extremely poor and experienced a higher increase in income than the non-poor. This is in conformity with the earlier finding by Gaiha (1987), who noted that poor households improved their income position and resource base while the non-poor were not able to do so.

The above observations suggest a somewhat dichotomous situation with respect to poverty in dryland regions. This, by and large, is characterized by some features of dynamism among poorer households due to increased employment opportunities on the one hand, and stagnancy among non-poor households, already having access to irrigation on the other. It may however be noted that a part of the income growth among the poor is due to state interventions in the form of drought relief measures or employment guarantee schemes, especially in Akola (Maharashtra). Similarly, it is likely that some of the non-poor might get into a poverty syndrome, especially in the event of unsustainable use of ground water resources in the long run.

## *2.2 Low Agronomic Potential and High Valued Crops*

Recently, ICRISAT and ICAR have developed a detailed categorisation of rain fed agriculture considering activity based zones. Table 4 provides information about the classification of the zones as well as productivity of different activities in each zone. It is observed that the value of crop output per hectare varies significantly, from Rs. 1,634 in zone 4 to Rs. 10,031 in zone 14. Incidentally, 6 out of the 16 zones having a total value of output of less than Rs. 6,000 per hectare are located in some of the NSSO regions with high incidence of rural poverty. These include parts of Maharashtra, Madhya Pradesh, Rajasthan, Karnataka, and Uttar Pradesh.

An important feature of the dryland region is low agronomic potential in terms of frequent fluctuations in yield due to inadequate and/or uncertain rainfall. As a result of the low agronomic potential, land productivity is found to be fairly low and also varying. According to the estimates provided by Fan and Hazell (2000), average land productivity during 1981 and 1994 was Rs. 8,485, Rs. 6,464, and Rs. 3,291 in areas categorized as irrigated, high potential rain-fed and low potential regions (consisting mainly of dryland regions) in the country. It is important to note that low-potential regions had registered a decline in land productivity compared to the previous year, in 6 out of 14 years;

for irrigated and high potential rain-fed regions the incidence of decline was observed in 3 years and 1 year respectively.

The above observation is further substantiated by the estimates of incidence of instability in cereal production. Instability was observed to be very high in some of the dryland states like Gujarat (58 per cent); Rajasthan (39 per cent); Maharashtra (29 per cent) as compared to states like Punjab, Kerala, West Bengal, Uttar Pradesh, Madhya Pradesh and Assam where instability is about 10 per cent or less. Incidentally, most of the states showing low instability in cereal production constitute irrigated or high potential regions (WFP 2001; Sawant and Achuthan 1995).

The phenomenon of higher uncertainty has been considered the most distinguishing aspect of dryland agriculture in semi-arid tropics (Walker and Ryan 1990). It has been noted that higher rainfall uncertainty at the planting stage induces area variability, which often looms larger in conditioning crop income volatility than fluctuation in yield. This is what makes the poverty in drylands a transitory rather than a long duration phenomenon, which eventually leads to overall low incidence of poverty in these regions. Of more concern is the observation by the study that 'rainfall induced uncertainties in crop income may also have serious ramifications in terms of devising a sustainable crop insurance or credit scheme'. Non-existence of an effective credit system for a long time might exert a deepening impact on poverty, with the result that many of the transient poor might end up being chronic poor in the long run; or else, they might out-migrate.

## *2.3 Coping Mechanism*

Four sets of coping mechanisms are adopted for overcoming the basic constraints of low agronomic potential in the region. First, dryland regions have lower density and larger land holdings. However, this feature is likely to disappear along with increasing population. Second, increasing efforts for drought relief measures by the state. Third is specialization in high valued commercial crops like oil seeds, spices, horticulture etc. Fourth, and perhaps, most important is out-migration. Since the first two are more or less exogenously determined, the latter two may need detailed probing.

*(a) Predominance of High Valued Crops and Diversified Farming System*

Drylands in India constitute 45 per cent of the total area under cereal production, 66 per cent of the area under oil seeds and 68 of the

area under non-food crops (Shah *et. al.* 1998). A number of studies have examined the impact of commercialization on Indian agriculture. Among these, is a seminal work by Nadkarni (1985) providing a vivid account of how commercialisation works in dryland vis-à-vis wet regions in the case of three south Indian states viz. Karnataka, Tamil Nadu and Andhra Pradesh. The study observed that, to a large extent, commercialisation of agriculture in dryland regions has helped increase income among cultivating households across different categories of land holdings. However, commercialisation has been facilitated by substantial contribution of labour from the landless households, which also gain in terms of employment and higher wage rates. Therefore, commercialisation seems to have a poverty reducing impact, though it increases inequality within the village. The important feature of commercialization is that it tends to work more effectively in areas with large scale adoption of commercial crops rather than in isolated and less commercialised regions. Remoteness thus plays an important role in determining the poverty reducing impact.

Cash crops like oil seeds need to be tapped through right kind of technology and policy support. But agricultural research and development (R and D) in India have been heavily tilted towards irrigated farming (Jodha 1990) with the result that farmers in dryland regions are pushed to grow more of irrigated crops with disastrous results. For instance, this kind of crop-choice may lead to over depletion of ground water resources, and threaten their sustainability. What is worse is that the temptation of ensuring a requisite level of income might result in many farmers going for highly risky investment, which given the uncertain rainfall conditions, may result in crop failure and bankruptcy. The increasing incidence of suicide cases among cotton growers in different parts of dryland regions is partly a manifestation of lop sided research and development (R and D) as well as price structures that distort the crop choice and hamper long term sustainability of dryland farming.

Besides growing high-valued crops, dryland regions also have natural advantages in terms of adopting a more diversified farming system, especially with livestock producing milk, wool, and meat. The recent categorisation of zones in India's SAT takes this aspect into consideration. Accordingly, 5 out of the 15 dryland zones (excluding irrigated rice in zone 1) have livestock as an important activity (ICRISAT 1999). Given the fact that livestock economy is losing ground in most of the dryland regions, and that dairying is increasingly getting

associated with availability of irrigation, sustainability of livestock as a coping mechanism is increasingly getting reduced.

*(b) Migration as a Coping Mechanism*

Given the initially low agronomic potential and the limited technological support, migration turns out to be an important coping strategy especially among the landless and the poor (NIRD 2000; Bilsborrow 1992). The phenomenon, though difficult to establish at the macro level, has been substantiated by a number of micro level studies from various dryland regions in the country (Haan 1999; Shah 2001; Mosse *et. al.* 2002; Lipton 1980; Reddy 2002; M. Singh 2002).

Apart from low and uncertain returns from agriculture, declining size as well as quality of common property resources (CPRs) have also led to deepening of poverty (Jodha 1986). This in turn, has led to a significant increase in out-migration, especially among the landless and the poor (Chopra and Gulati 2001). Following the seminal study by Jodha (1986), a number of studies have tried to examine the dependence of the poor on CPRs. The evidence of late however, deviates from the earlier finding about significant dependence of the poor on CPRs. Strangely the recent studies suggest only limited dependence on CPRs among the poor (Iyengar and Sukla 1999; Nadkarni 1996) possibly because there is not much left to depend on due to severe depletion of these resources. The poor from dryland regions thus, seem to be increasingly dependent on migratory income. This phenomenon has been observed by a number of studies examining the impact of droughts or efficacy of drought relief programmes in different parts of dryland regions in the country.

The emerging perspective on migration, thus recognizes it as an integral part of livelihood strategy rather than an aberration or as a transitory phenomenon. In terms of impact, there seems to be some consensus that migration tends to contribute much to the host economy, and that it leads to higher rates of labour force participation. Nevertheless, there is little evidence that migration reduces inequality between areas of origin and of destination (Haan and Rogaly 2002). What is however of concern is that migration in absence of appropriate interventions for land and water development, might lead to further depletion of ground water resources by inducing private investment in wells.

A number of studies have enquired into the conditions of migrants at the place of destination. Most of the studies suggest that these migrants, especially from the marginalised areas, have to face a hostile environment in terms of employment, exploitative institutions such as contract-labour, living conditions, loss of identity, etc. at the place of migration. While most of these features are fairly common particularly in the case of distress migration, one of the important aspects specific to migrants from dryland region could be long duration and/or permanent migration of a large number of households to the regions with better agronomic conditions and/or better opportunities for diversification. The long history of out-migration from dryland regions might have helped build strong social capital, thereby inducing a chain of long duration migrants from the region.

Another implication of sustained out-migration from dryland regions could be higher wage rates. This could be further strengthened by relatively higher importance of livestock economy absorbing a major part of household labour on the one hand, and high valued cash crops on the other. Increasing development of ground water resources might further increase the wage rate for local labour. While there is no systematic evidence on wage rate differentials across dryland and the other regions, the issue needs detailed probing to increase understanding of the dynamics of local labour markets and out-migration from the region.

The above evidence suggests that the hitherto low incidence of poverty, with predominance of transient poor in dryland regions, is based on the two sets of mechanisms that appear to be quite fragile. These are (i) out-migration and (ii) depletion of ground water. The non-sustainability of both these mechanisms emanates from the fact that out-migration is increasingly getting constrained due to overcrowding of surplus labour force pushed out of rural areas to urban centers (S. Bhalla 2000). Also ground water has reached a danger mark implying that future availability of water, in the absence of the requisite measures for recharge, is going to be lower than the present level. A combined effect of both these might lead to worsening of poverty in dryland regions in the next 10-15 years, with increase in incidence of poverty consisting of a larger proportion of people trapped in long duration poverty.

## *2.4 Depletion of Ground Water: The Issue of Sustainability*

The problem of depleting ground water seems to have worsened since the late eighties, the period which has been marked by (a) diffusion of high yielding varieties; and (b) frequent occurrences of droughts.

Table 5 depicts the levels of ground water depletion among Indian states. It is observed that the states with very high level of ground water exploitation like Rajashtan, Gujarat, Maharashtra, Karnataka, and also Tamil Nadu have exploited more than 30 per cent of the available ground water resources (WFP 2001). However, a large part of the ground water exploitation is through tube wells, which are fast becoming the single largest source of irrigation in the country (Shah *et. al.* 1998; Shinoda 2003). The growth of tube wells has been particularly alarming since the eighties. Between 1977-79 and 1988-90, the area irrigated by tube wells had increased by more than 300 per cent. The situation seems to have been aggravated further during the nineties as reflected by a large number of areas, especially in dryland regions, getting classified as dark zones where further depletion of ground water is banned. Similarly, the number of wells getting defunct is also increasing at a rapid rate. All this suggests non-sustainability of ground water resources for containing poverty, especially chronic poverty, in dryland regions.

The impact of droughts has increased during the last few decades and, more than availability of food grains there is scarcity of drinking water as well as fodder, essential for supporting life, human as well as livestock (A. Shah 2001). A large proportion of people are thus faced with frequent shocks of insecurity of the basic sources of survival viz. employment and income, asset base (i.e. livestock), food and drinking water. The extent to which this could be recouped through the state's support in terms of relief measures would, to a large extent, determine the outcome. The next section discusses this aspect.

## *2.5 Impact of Policy Interventions: Drought Prevention and Drought Relief*

The above description of dynamics of livelihood and poverty in India's dryland regions suggests a dichotomous situation, where the regions have been able to overcome chronic poverty through a number of factors - structural (i.e. Ryotwari system), agro-climatic (i.e. conducive for high valued crops), and physical (i.e. mainly in plains). Nevertheless, it does ring an alarm bell, which was sounded way back in the mid-eighties by Nadkarni (1985) who noted that "drought proneness unattended to can be an important reason for endemic poverty". It was further noted that "while interventions to overcome drought proneness through irrigation and industry have altered the environment and reduced poverty, poverty still persists. For new institutional forces have

emerged in a manner that they accentuate inequality and even produce backlash effects on traditional adaptation to environment" (Nadkarni 1985). Evolving effective policies for drought proofing and calibrating the institutional forces that are creating backlash impact have to be the major plank of developmental processes, if the risk of a wide spread endemic poverty in dryland regions is to be averted.

Given this backdrop, attempts have been made to understand and revive the traditional coping strategies adopted by people in different parts of dryland regions. While there is a lot to learn from how people in these regions have dealt with droughts, the policies at present have to address some of the new challenges (and also opportunities) in terms of population pressure and resources, institutions, and technologies (Jodha 1990). For instance, the state's perspective, especially in the post Green Revolution period, is to assume the primary responsibility of providing at least food and fodder to the people affected by droughts. Accordingly, the official policies have been influenced by considerations of 'drought relief' rather than drought proofing or prevention. This is despite the fact that the Drought Prone Area Programme was designed mainly as a drought-proofing strategy.

Recognising the need for reorienting the policy, a Technical Committee was appointed to look into the functioning of DPAP scheme in different parts of the country. The Committee headed by Dr. C. H. H. Hanumantha Rao observed that lack of clarity about the objectives to be achieved had led to a shift in the focus of these programmes (Government of India 1994). As result, the programme, despite having spent a large amount of funds, has not helped in solving the basic problem of increasing the productivity of areas by conserving soil and moisture and thereby, reducing the impact of droughts on human life. On the contrary, it is widely believed that drought conditions in the country are increasing and ecological degradation is proceeding unabated, especially in drought prone and desert areas. In Rajasthan, 18 drought years of different magnitude have been observed in the past 32 years. Another study in Rajasthan reveals, that on an average, as much as 40.4 per cent of the precipitation or rainwater goes untapped, and only 6.9 per cent is used for recharging the ground water. In some districts of Tamil Nadu, the water table is reportedly going down by 1 ft. every year. It has been reported that in the dark blocks in Uttar Pradesh where more than 75 per cent of ground water has been exploited and where rainfall level is 700 mm, as much as 50-70 per cent of the run-off from rainfall is wasted.

The official policy reiterated the need to focus on the basic objective of 'restoring ecological balance on a watershed basis within the framework of area development plans' (Government of India 1994). While this is a commendable move, the actual implementation of watershed programmes in dryland regions does not provide clear evidence on drought proofing and poverty reducing impact of the programme (Kolavalli 2002; A. Shah 2001; L. Mehta 2000).

An important policy implication of the above scenario is continued emphasis on relief measures, especially through employment programmes like 'food for work'. Unfortunately, these programmes work somewhat better in relatively developed states like Maharashtra and Gujarat, but not in poorer states like Rajasthan or Madhya Pradesh (Hirway 1997). On the whole the state expenditure on relief works programme seems to have exerted a positive impact on poverty as indicated by the NSSO estimates for 1987, which was one of the worst drought hit years. Radhakrishna (2002) also notes that in rain fed regions where agriculture has stagnated, real wages have improved. This could be attributed to expansion of employment programmes and perhaps, to political mobilisation of labour. The question however, is: Can this kind of increase in wage be sustained in the absence of a commensurate increase in labour productivity?

Moreover, ensuring public expenditure on employment generation programmes is getting increasingly difficult, in the new policy environment. This in turn is reflected in the slowing down of poverty reduction during the nineties (Sen 1996). Similarly, targeted food distribution in some of the southern states like Andhra Pradesh has also started dwindling due to resource crunch. Also, the state monopoly in terms of providing food has created a huge system of corruption, which eventually has become an accepted norm among the communities. Breaking this self-perpetuating system is almost impossible given the nature of the polity. The result is wide spread migration as well as hunger among some of the poorer states like Rajasthan. Besides these, it is imperative to go beyond the state and explore options for people's own initiatives where the state could operate as a facilitator rather than as a provider. A number of initiatives, especially in terms of water harvesting, provision of drinking water, and grain banks have come up, though scattered in coverage, and small in size. The need is to consolidate these experiences and evolve an institutionally sustainable mechanism for drought proofing (Rao and Deshpande 2002; A. Shah 2001).

It is therefore essential that the next round of policy formulation start taking cognizance of the increasing severity of droughts. It is likely that in the absence of a structural shift in composition of agricultural growth and institutional arrangements for drought relief measures, large parts of dryland regions may get trapped in chronic poverty and at times occurrence of hunger deaths as reported recently in states like Rajasthan, and Andhra Pradesh. Since some of these policy aspects are more generic rather than specific to the situations in dryland regions, we will get back to them in the last section.

## 3. Chronic Poverty in Forest Based Regions

As noted earlier, forest based regions have been defined to include hills or mountain topography, and indigenous or tribal communities. A plethora of literature describes conditions of widespread and acute poverty in these regions. Apart from physical remoteness and lack of infrastructure, poverty in these regions is linked to problems of property rights (or entitlement), and social marginalisation. Thus, compared to dryland areas, the forest based regions represent a more complex interface (or a log jam) of the forces that cause poverty, exiting which is almost impossible. Table 6 presents some of the basic features of these regions.

It is observed that the population density in the forest based districts is significantly lower than in the rest of the districts in the state. However, there is no systematic pattern across the two sets of districts. For instance sex ratio is found to be higher in forest based districts in three out of the six states viz. Bihar, Madhya Pradesh and Uttar Pradesh; it is almost same in the case of West Bengal; and lower in the case of Orissa and Assam. Similarly, literacy rate is found to be lower among forestbased regions in the case of Bihar, Madhya Pradesh and Orissa while in the other three states literacy is found to be higher in forest based districts vis-à-vis the rest. But, infrastructural development index is found to be lower among forest based regions in the case of four states, the exceptions being Assam and Uttar Pradesh. Finally, land productivity is significantly lower among the forest based districts in the majority of the states except Assam and Madhya Pradesh. Together, the above observations bring out two important features. First, Assam appears to be an outlier, with most of the indicators being favourable in the case of forest vis-à-vis other districts. And second, absence of any difference in development indicators across the two sets of districts within the state may partly be due to inaccuracy in identifying forest

areas due to non-availability of data at a more disaggregated level i.e. below the district level.

### *3.1 Multiple Discrimination and Mainstreaming*

As noted earlier, most of the areas comprising the forest based regions constitute parts of states with predominantly zamindari or feudal agrarian relations. What perhaps makes it worse is the legal structure governing forest areas. Most of these laws were designed during the colonial period and continued thereafter. Basically, these laws were meant to deprive the local communities from their traditional rights, hence their stakes in long-term management of the resources. Finally, the policies adopted for development of indigenous or tribal communities in the post-independence era have been over-occupied with the idea of mitigating physical remoteness by mainstreaming the people and their economies. To a large extent, this was done at the cost of strengthening the resource base in a manner that may provide a special niche to the regions while interfacing with the mainstream economies. The special niche would emanate primarily from the region's relatively rich natural resource base, traditional knowledge, and social institutions.

Ideally, the policies should have worked in tandem with these inherent strengths where infrastructure and other developmental programmes could work as facilitators to build upon the inherent strengths of the people as well as regions. But, the 'mainstreaming' processes initiated by the various tribal development programmes happened to have put these communities at a relative disadvantage by imposing the norms of 'good performance' that are relevant for the mainstream economies. This in short is a description of a long drawn process of marginalisation and multiple discrimination faced by people in the forest based regions.

The Indian literature provides a good critique of this process, conceptual as well as empirical (Baviskar 2001; Dubey 1967; K. S. Singh 2002). While we do not get into the details of these well researched issues, the process of marginalisation has been summed up as a situation of 'geographical concentration and minority status' of tribal communities (Shah *et.al.* 1998). This takes the form of what is described as 'internal colonialism, resource emasculation, and subjugation of interlocked modes of exploitation wielded by a non-tribal axis of power'. According to the study, tribal population is getting more dispersed, either due to development related displacement or distress migration.

The result is intensification of minority status where a large number of tribal people are increasingly getting alienated from the process of governance and decision-making.

While this is a fairly comprehensive account of what has happened in most parts of the forest based regions, it is imperative to note that some of these areas and communities have undergone changes due to increased mobility and interaction with the mainstream economies. It is this transition, rather than the initial conditions of exploitation, that needs closer scrutiny in order to understand the dynamics of deprivation and poverty in these regions. Similarly, if there are pockets of forest based regions that have experienced positive changes, notwithstanding the state-monopoly of forests and the associated resource depletion as well as increased population pressure, such changes need to be assessed properly. The subsequent discussion focuses mainly on the literature that deals with some of these issues.

### *3.2 Areas with High Agronomic Potential: Irony of Floods and Droughts*

As noted earlier, a large part of the forest based regions are endowed with relatively favourable agronomic conditions, with moderate to high rainfall, better soil, and vegetative (or tree) cover. As a result, the average land productivity is almost double that of the low potential areas in dryland regions (Fan *et. al.* 2000; Table 6). Unfortunately, most of these high potential regions had lagged behind in technology based growth in agriculture mainly due to less conducive agrarian structure, low level of infrastructure and market development, and above all, a resource crunch for promoting public investment in land and/or water resources. Over time, some of these constraints seem to have been reduced, resulting in significant growth in agricultural production especially, food grain production, in some of the eastern regions like West Bengal, Assam, Madhya Pradesh, Orissa (S. Singh and G. S. Bhalla 1997). The studies examining agricultural performance during the post-eighties clearly suggest emergence of acceleration in output growth in most of the central-eastern states (Sawant and Achutan 1995). Overall, the increase in agricultural production in the high-potential areas has been attributed to a catching up effect in these lagging regions (Fan *et. al.* 2000).

What is however ironical is that most of these regions are either flood or drought affected. To a large extent, both are closely linked to depletion of forest resources resulting mainly from the faulty policies

noted above. Table 7 provides information about deforestation in some of the major states with a sizeable forest area. It is observed that between 1978-79 and 1999, all the major states with larger area under forest (except Bihar), had registered higher rate of deforestation as compared to the all India average. The decline in forest area was as high as 15 per cent in Himachal Pradesh and 13 per cent in Orissa, followed by Assam and Uttar Pradesh with a decline of about 6 per cent. There is evidence to suggest that by 1990, almost 60 per cent of the area under forest was degraded (in Shah *et. al.*). As a result, about half of the forest area in the country has a crown density of less than 40 per cent. This indicates the dismal status of forests, where a large proportion of India's poor live.

While we do not get into the details of what has caused large-scale deforestation in these regions, its impact on impoverishment is fairly clear. This is reflected in terms of increasing incidence of droughts in some of the forest regions in Madhya Pradesh, Orissa, Bihar, West Bengal, etc. Ironically, the impact of droughts is felt more severely in some of these forest based regions than in dryland regions like Gujarat, Maharashtra and Karnataka. Apart from the resource crunch faced by these poorer states in managing relief work programmes, the more acute impact of droughts in these regions is due to the fact that till recently, a substantial part of people's livelihoods depended on forests, which in certain areas have been almost completely depleted. While this sounds somewhat similar to that of ground water depletion in dryland regions, the basic difference between the two pertains to the property rights regimes. Whereas the former is governed by private property regimes, the latter has happened mainly under state monopoly. This might make the regeneration process more difficult in the case of forests, as the people depending on these resources, may have only a limited say in decision-making as well as management of these resources.

Excerpts from a report on the droughts in Kalahandi in Orissa sum up the dynamics of deprivation in a forest based region (Mahapatra 2001: 33-34).

"For over 100 years, the undivided districts of Kalahandi-Bolangir-Koraput popularly known as KBK region and now comprising nine districts have survived droughts. The current one is said to be the worst, affecting 90 per cent of the region. But the dark images ironically reflect how an imbecile system is smothering a population of one million into death and turning ecological prosperity into a catastrophe. Life was easier earlier: forests provided livelihood for six months and agriculture

the rest of the year. A few decades ago the entire landscape was green. A web of some 30,000 traditional water harvesting structures helped the Kalahandi region tide over some of its worst famines. It also made the region one of the richest in east India. It produced more rice than any other princely state. Despite the recurring droughts, farmers harvested so much rainwater in these structures that there was no water scarcity. Rain never failed Kalahandi. Mismanagement did. Like in the past, it still rains heavily, but the rainwater is not harvested. The tanks are still there, but silted up. A slight shortfall in rainfall now triggers a large-scale crop failure. So agriculture is a difficult prospect for survival for more than 50 per cent of the population. Kalahandi's poverty is amid plenty".

The other negative fall out of deforestation is floods and land slides in hilly areas within these regions. According to an estimate the population affected by floods, heavy rains, land slides and cyclones are significantly high in most of the forest based regions viz. Bihar, Uttar Pradesh, West Bengal and Assam located mainly in Brahmaputra and Gangetic basins. In fact, flood is a regular feature of most of these regions, and not only destroys the standing crop but, also damages the soil.

Thus, poised with the double disadvantages, people in the forest based regions can neither depend on forest resources nor on agriculture unless forests are regenerated and their traditional stakes in the resources are reinstated. The history of tribal movements in India thus depicts various forms of resistance over the issues of property rights and control over forest resources.

### *3.3 Tribal Resistance: A Way to Achieve Coping Strategies*

Tribal movements in India date back to the early eighties, where the main focus was to resist against intruders of different kinds. The post-colonial movements have been mainly for autonomy, cultural safeguards, and settlement of land rights, etc. More recently, the focus has shifted to the issue of control over forest resources (other than settlement of land for agriculture), identity, and ethnicity (K.S. Singh 1998). In fact, the growing concern for environment has given a new meaning to the tribal resistance, which assumes that reinstating the stakes of the people is a key to sustainable management of forest resources. In the absence of this, depletion will continue by various sections of the society - forest dwellers, industrialists, and the forest bureaucracy. To an extent, creation of Jharkhand as well as Chhatisgarh

is a manifestation of tribals' awareness of self-governance and control over the forest resources.

More recently, there has been a significant upsurge of resistance against displacement of tribal communities, associated with mining and other developmental projects in forest regions (Das and Vidya 1998). To a large extent, this is a continuum of the long sustained resistance against the various forms of alienation that took place through intrusion of non-tribals from within and outside India. In fact, the existing literature provides a rich documentation of how different rulers, at different points of time, had devised mechanisms to settle non-tribals who could practice better agriculture and thereby contribute more in terms of revenue to the state. Apparently, tribals also were benefited through clear titles, land-settlement and protection of the land-rights. But this took place as part of a larger process, which shifted the economic base from forest to agriculture, where tribals were at a relative disadvantage.

Moreover, the issue of faulty land records and lack of transparency remains a major stumbling block even now, in establishing clear entitlement to land resources. There still prevails a complex cobweb of exploitative institutions and agencies consisting of money-lenders, capitalist farmers, functionaries of Revenue Department, and other state supported developmental agencies. Together these forces reinforce the age-old practices of land alienation, which by no means has reduced over time (Karuppaiyan 2000).

On the other hand, having settled the titles for agricultural land, the state went on tightening the controls over remaining forest resources by establishing its monopoly ownership. As noted earlier, the process of alienation was invoked during the colonial period and has continued. Under the present regime, tribals do have their traditional rights, but these rights can be exercised only under the overarching management controls by the state. In that sense, tribals have been separated from what constituted their basic source of livelihood. In fact, Joint Forest Management is also a variant of the same device where people have been involved in management of forests in a manner that the basic rules of the game have been laid down, almost unilaterally by the state. Development of the various forms of participatory forest management since the post-eighties, should thus, be seen in the light of the basic anomaly in the forest policy. The real task therefore, is to break the vicious circle of 'lack of entitlement-degradation-poverty' in large parts of the forest based regions in India.

### *3.4 Emergence of Participatory Institutions*

Ever since the Forest Policy Statement of 1894, people living in forest based regions have been blamed for degradation of forest resources. While this might be partly true, the fact remains that degradation continues to persist even after the state has assumed legal control over these resources. Three sets of processes seem to be responsible for this. First, is exploitation by external agencies leading to perpetual poverty among local communities. Second, refers to failure of developmental programmes to provide sustainable livelihoods, based on forest-ecology, to the increasing size of population. And third, monopoly induced extraction of forest resources by the state functionaries, with and without involvement of the people. Hence, apart from the protected areas, forests became subject to more or less an open-access rather than a regulated-access regime of common property resources. Degradation is an obvious outcome under this situation, where passing on the blame between the foresters and the people is the name of the game!

Involving people in protection and thereby making them officially responsible for management of the forest emerged as an inevitable strategy to reduce degradation and/or reduce the state's share in the responsibility (or blame for) forest management. Joint Forest Management essentially is an outcome of this realisation, supported by a number of good examples of traditional practices and institutions for protection of forests by the communities. The Government policies, of late, have been to revive, promote, and strengthen some of these traditional institutions such as 'Van Panchayats' in different parts of the country especially, Uttar Pradesh, Orissa, West Bengal.

A number of studies have gone into examining the experience of JFM and other participatory initiatives in forest regions (Ballabh *et. al.* 1999; Khare 2000). To a large extent, these studies show a mixed outcome, especially in terms of their impact on the poor households, as noted in the case of participatory watershed management. What is however surprising is that experience from some of the traditional institutions like Van Panchayats in Uttar Pradesh is not clearly positive. To a large extent, this supports the earlier observation by Jodha (1990) regarding the declining relevance of some of the traditional institutions under the changing legal, administrative and political operating environment.

Upsurge of Panchayati Raj institutions is an important development characterising the changing environment. Similarly, presence of other institutions like cooperatives, and other channels for gaining economic and/or social power, may exert their influence on traditional institutions, especially the kinship-based centers of power. While it is difficult to get into the details of a wide range of initiatives in the field of participatory forest management, it is clear that the traditional institutions ought to get adapted to the new power equations. Unfortunately, the process of adaptation often proves self-destructive as it leads to overshadowing of the mainstream power structure, which is largely exploitative. Similarly, the reservation policy has also created a separate class of elites within the tribal communities. The dilemma of 'mainstreaming' thus continues (Mathur 2002).

### *3.5 Economic Diversification without Local Linkages*

Forest based regions also happen to be rich in mineral resources. This can be used for promoting diversification of economies, especially through development of mineral based industries and the associated activities like transport, etc. But this does not seem to be happening as seen from the composition of State Domestic Product (SDP) as well as workforce diversification at the state level (Table 8). For instance, primary sector is found to have a relatively larger share i.e. more than 36 per cent in most of the states comprising forest based regions except West Bengal. This is despite the fact that mineral based activities have a relatively larger share in SDP in the case of forest based states like Assam, Bihar, MP, and Orissa. This might be due to certain inherent features of mineral based industries that have limited forward linkages within the region (Shah and Hirway 2002). Similarly, the freight equalisation policy has also resulted in bypassing the home-economies where development of minerals or their processing had taken place. However more than these, the larger processes of political economy are responsible for what is often being described as 'internal colonialisation' (Harvey 1969).

Essentially the above characterisation of limited local linkages for economic development is part of a larger phenomenon often described as 'poverty in the midst of plenty'. The processes of internal colonialisation thus, get extended beyond forests and tribal communities, impinging on the overall development of the state economies. This brings us back to the initial characterisation where feudal systems in most parts of the forest based economies were seen as

a major source of sustained poverty, irrespective of the faulty policies of forest management. In fact, what one observes is an alliance of the erstwhile feudal power structure within these states with the mainstream polity at the national level, which reinforced the minority status among tribal communities. This is why the forest bureaucracy is found to be much more powerful in the forest based regions with a feudal background; and political pressure for promoting value addition activities based on rich natural resources within the regions has remained subdued.

### *3.6 Improved Connectivity, Capabilities, and Mobility*

Notwithstanding the structural constraints and the state patronage to them, developmental policies have played a positive role in improving the conditions of marginalised people within these regions. This has been reflected in a number of initiatives for improving social and physical infrastructure and also in indicators like literacy, mobility, and political representation. For instance, literacy rate among tribals has increased from a dismal level of around 8 per cent in 1961 to about 24 per cent in 1991. Similarly, connectivity through road and communication network has also increased substantially in a large number of districts within forest based regions. This, along with increasing population pressure, might have increased the stream of out-migration from these regions. In turn, a process of chain migration might have set in whereby those, who earlier, were non-migrants also find it not only necessary but also easy to move out. While a large part of this migration is likely to be distress-induced, it nevertheless opens up new options and avenues for some of those who would have liked to move but, could not do so because of lack of information, transport facilities, and financial as well as social capital.

The recent developments in terms of amendments in Panchayati Raj are also likely to provide larger space for tribals and other communities in these marginalised regions. Initial experiences suggest alignment of emerging leadership with the mainstream polity, especially along party lines. This would mean stratification and fragmentation within the communities, but is part of a larger process, which could hardly be wished away. Also, the classical image of a homogenous and equitable tribal society does not exist any longer. Rather the tribals, like all other communities, are undergoing a significant transition (Shah *et.al.* 1998) on various fronts - economic, social, and cultural. What is crucial in this context is that they should be able to use the increased political

space for consolidation of their collective interests by reviving and adapting certain traditional institutions, especially pertaining to their interface with land, forest, and water. This is a major task for those who try to organize the communities, based on issues rather than on party lines. The nuances of some of the major tribal movements in the recent period therefore, are important to gauge. The existing literature deals with this aspect by providing detailed profiles of tribal movements in different parts of the country (K.S. Singh 1998; G. Shah 2002; S. Singh 2002; Dubey 1967; Baviskar 2001). While we do not get into discussing the fairly rich literature on the theme, it is essential that analysis of chronic poverty in forest based regions reflects on some of the contemporary movements in the region.

## 4. Correlates of Poverty among Different Categories of Regions

This section examines correlates of poverty among different categories of regions. The analysis has been carried out in two stages. The first refers to a macro level exercise, examining correlates of poverty for all regions taken together. The second stage involves identification of the factors affecting poverty in dryland and forest based regions. The last category is likely to cover a large part of the irrigated and high potential rain-fed regions in various stages in the country.

Since the NSSO data do not provide estimates of poverty at district level, the analysis of correlates of poverty has been confined to regions for which the official estimates are available. The problem at the regional level however is that, the demarcation of dryland and forest based areas is somewhat crude. This has been done by using categorisation of districts and applying a thumb rule of majority to identify a region as dryland or forest based. Hence, if majority of the districts within a region falls into a particular category, the entire region has been classified under that. This procedure of course, has obvious limitations but we have followed it for want of a better alternative, given the data constraints. This exercise has been supplemented by an analysis of correlates of human capabilities represented by literacy and child mortality.

Correlates of poverty have been examined by using a number of variables representing natural, human, and physical assets along with economic development. While most of these variables are estimated at district level, we have used them to derive regional estimates by applying appropriate weights. This still leaves certain anomalies in estimation of

some of the critical variables pertaining to land use. The estimates obtained from the land-use statistics reflect the official categorisation rather than the actual status of land (Iyengar 1998). To an extent, these problems in land use data have also affected the classification of forest based regions. The problem has arisen, especially in the case of some of the forest based districts with higher (than the cut-off) proportion of area under forest. However, forests in many of these districts have been depleted so badly that the area does not have much resemblance to the forest-ecology in other parts of the country, where depletion is not so severe. In any case the data do not reflect the quality of land or forest etc. As a result, some of the districts/regions having higher proportion of forest area without much forest remaining may get classified as forest based areas, though, the actual status might be more closer to dryland areas. South-West Madhya Pradesh is a case in point, where a majority of the districts in the region are being considered as drought prone districts under DPAP.

Similarly, many of the dryland regions have higher proportion of irrigated area vis-à-vis areas with better rainfall. But, this irrigation is highly variable, dependent on rainfall, and hence non-sustainable, as we have discussed above. Also, depletion of ground water for irrigation might bring conflicting results in terms of increased land productivity on the one hand, and increased salinity (i.e. waste land) on the other. Using a somewhat lower cut-off (of say, about 25 per cent) in terms of proportion of irrigated area (as being done in the case of drought prone districts) might exclude many areas having greater resemblance of dryland regions but that actually get classified under the category of 'other'.

Given these limitations, we have tried to capture some broad patterns based on correlates of (a) income poverty; and (b) human capabilities like literacy and child mortality for which district level estimates were readily available. In what follows we present the main findings of the analysis of correlates for the two sets of indicators.

### *4.1 Income Poverty*

As noted earlier the factors explaining poverty and human capabilities have been categorised into four major groups viz. demographic, natural resource endowment, infrastructural development, and economic diversification. It is hypothesized that income poverty would be significantly influenced by natural resource endowment (like land, forest, irrigation) and access to physical infrastructure (like road,

electricity, communication, etc.). Demographic factors and economic diversification could get adapted to these basic sets of operating environment, whereas social and political empowerment might facilitate the process of adaptation. Of course, this is influenced by certain exogenous factors and processes like the property rights regime, macro level strategy for growth, and historically determined inequality of economic growth. Given this basic perspective, we have tried to identify the major factors influencing income poverty (in terms of HCR) across four sets of regions.

Table 9 presents the results of the correlation exercise. It is observed that at macro level, i.e. for all the regions taken together, poverty is significantly associated with natural resource endowment in terms of irrigation along with land and labour productivity on the one hand, and electricity, and infrastructural development on the other. Higher land and labour productivity in agriculture in turn, also induces rural (male) wages to rise, which in turn has a poverty reducing impact. To a large extent, this confirms the existing evidence on the critical role of agricultural growth in poverty reduction brought out through more sophisticated analyses at the all India level. Incidentally, rural poverty is found to be closely associated with urban poverty at regional level.

Subsequently we also tried to examine determinants of poverty using a multiple regression model. For dryland regions, the variables having significant impact on rural poverty are rural non-farm employment, rural wages, labour productivity and child mortality (Table 10) For forest based regions, the variables are rural non-farm employment and rural wages. We tried to use dummy variables for the two sets of regions treating 'other regions' as reference category. The results however were not significant for the regional dummies. This could be due to the difficulties in identifying regions strictly in terms of the three categories, and partly due to the impact of migration within and across regions. Since migration is one of the most important mediating factors influencing the spatial distribution of poverty, the analysis is likely to be incomplete in the absence of an appropriate variable capturing out-migration. What are correlates of agricultural productivity, which are significantly associated with rural poverty as shown in Table 3. Do the same dynamics operate in each of the RRAs viz. dryland and forest based regions?

The results in Table 9 suggest that the dynamics are somewhat different. For instance, within dryland regions, neither natural endowments like irrigation influences poverty, nor does infrastructure as

was observed at macro level. What is however unfolding is the dynamics of out-migration, especially from the areas having larger proportion of wasteland. Strangely wasteland is found to be negatively associated with poverty, which may suggest higher incidence of out-migration from these regions. This in turn gets reflected in terms of a positive correlation between rural and urban poverty within a region. Out-migration also results in reduced workforce in agriculture, thereby having a negative association with poverty. Together this may indicate lower poverty in areas with high incidence of wasteland and higher level of labour productivity presumably because of out-migration. As a result, a part of the rural poverty may get shifted to urban areas and eventually get evened out across the two. This phenomenon is likely to have been reflected by relatively higher rate of urbanization in the states with predominance of dryland region vis-à-vis forest based regions as seen in Table 2. While we do not have data by region to substantiate the migration-mediated impact on poverty, the existing literature does support this phenomenon at macro level (NIRD 2000), as well as state level (Shah 2002).

Compared to dryland region, the pattern in the forest based regions is different. Here, migration does not seem to be working as an important correlate of poverty since rural poverty does not have any significant association with urban poverty. Instead, what seems to be important is occupational diversification within rural areas. Similarly, access to electricity is also found to be important for reducing poverty in forest based regions. Labour productivity once again, turns out to be a significant correlate of rural poverty with an inverse relationship.

The remaining regions in the category of 'other' show a somewhat similar pattern to that observed at macro level. Here irrigation turns out to be an important correlate of poverty with electricity and labour productivity also having significant correlation. Urban poverty is also positively associated with rural poverty. To an extent, this might be due to the fact that many of the high potential rain-fed regions fall in this category, where incidence of both rural as well as urban poverty is high.

It may however be noted that regions with significantly high proportion of rural poverty i.e. 50 per cent or more, are found to be concentrated mainly in forest based regions. Nevertheless, pockets of widespread poverty like these exist in all the three categories of regions. To a large extent this could be attributed to the fact that the observed level of rural poverty is already mediated by population movements (say, from rural to urban and from dry to wet areas); and also through the

processes of economic diversification, determined by certain exogenous factors. What we observe therefore, is a net outcome after accounting for these two (and some other) mediating processes.

### *4.2 Human Capabilities*

The results presented in Table 9 do not indicate significant correlation between income poverty and the indicators of human capability viz. literacy especially among females, and child mortality. The only exception is a negative association between female literacy and poverty in forest based regions. For the rest, the level of poverty does not seem to have exerted any favourable impact on improving human capabilities captured through the above variables. This suggests absence of any significant association between income and capability poverty. To an extent, this is somewhat at variance with the larger picture of congruence between the head count poverty ratio and human development index at state level (Mehta and Shah 2001). There were however, major exceptions to this pattern in the case of Andhra Pradesh, Rajasthan, and Maharashtra and somewhat in Orissa and Uttar Pradesh besides Kerala, representing an extreme case. Since all the five states are covered under one of the two categories of RRAs, these states constitute a large proportion of poor in India, the pattern observed here is a better reflection of the actual scenario in some of the poorer areas in the country. It would therefore be useful to understand the factors explaining higher levels of human capabilities in the two sets of RRAs in India.

Table 11 presents the factors that are significantly correlated with female literacy. It is observed that female literacy, to a large extent, is influenced by rate of population growth, proportion of non-farm employment, electricity reflecting physical remoteness, land productivity, rural (male) wage rate, child mortality and post and telegraph facilities. Other significant factors are household size and medical facilities. To a large extent, this confirms the pattern observed at the all India level where higher productivity of land along with higher wage rates and better infrastructural support enhance female literacy, which in turn, reduces child mortality. On the other hand, high rate of growth of population and larger family size reduce the chances of female literacy. In dryland and forest based regions non-farm employment and electrification turn out to be significant factors with population growth also playing an important role in the case of dryland region.

Importantly, female literacy has exerted negative impact on child mortality in all the categories of areas. Nevertheless, the direct link with income poverty is found to be significant only in the case of all regions.

### *4.3 Correlates of Productivity*

As noted earlier, labour productivity in agriculture seems to have exerted a positive impact on poverty reduction (Table 9). Compared to this, land productivity did not appear to have significant impact on poverty except at macro level. Similarly impact of irrigation is also found at macro level but not on dryland or forest based regions. This is somewhat strange as it deviates from the generally observed phenomenon of poverty reducing impact of irrigation not only at the macro level, but also within dryland regions. It would therefore be useful to understand the correlates of some of these basic factors that may have significant bearing on poverty even within the two sets of RRAs viz. dryland and forest based regions.

Table 12(a) provides information about the factors having significant association with land productivity. It is observed that at the macro level, land productivity is positively influenced by proportion of area under irrigation, and negatively associated with proportion of wasteland. In turn, higher land productivity is associated with higher labour productivity as well as wages. A positive relationship between land and labour productivity is also found in the case of forest based regions but not in dryland regions. Similarly, irrigation does not show any systematic association with land productivity in dryland regions. This is surprising, especially because land productivity is generally found to be lower among DPAP vis-à-vis non-DPAP districts as already noted earlier in Table 3. Together these observations suggest positive impact of irrigation across all regions or districts taken together but not within dryland region or DPAP districts.

A weak association between irrigation and land productivity, especially within dryland region, might be attributed to the problem of specification. The irrigation variable, defined as proportion of irrigated area, reflects the extent rather than intensity and dependability of irrigation, which is particularly important under dryland conditions. It is likely that land productivity in a dryland region or a district is influenced more by intensity rather than the extent of irrigation, and more so if the rainfall had been sub-normal in the year for which data have been obtained. Ideally, a triennium

average should be taken to capture variations in productivity as well as irrigation across space. This however was not possible because of the non-existence of the readily available data at district level. The pattern is more or less similar in the case of labour productivity as seen from Table 12 (b).

Overall, the analysis of correlates reconfirms some of the existing patterns, especially at micro level. But, more importantly it highlights certain divergence from generally observed pattern of the impact of critical factors like population growth, irrigation, land productivity, infrastructural development, and work force diversification at regional or district levels. While a part of the divergence could be due to problems of specification of variables, and classification of regions/districts across the four categories of areas, the analysis presented above, may still provide broad indications of the differential dynamics of poverty reduction across different categories of areas. This is important for policy formulation, which should be preceded by a detailed enquiry into the two sets of RRAs, at the regional and sub-regional levels. Future enquiry into poverty in India's remote rural areas should therefore aim at finding out the dynamics that work at the margin, rather than capturing the average picture of the larger pattern that obtains at the macro level. In this context, the foregoing analysis may provide a basis for launching an enquiry, which would specifically focus on issues such as: What has changed in the RRAs over time? What has been the impact of these changes on people's livelihood and well being? And who benefited from these changes and why?

## 5. Summing Up

The foregoing analysis presents a review of the existing literature on poverty in remote rural areas, and also provides some fresh evidence on the correlates of poverty in different categories of areas. Considering the fact that not many studies have focused on 'remoteness' and its links with poverty, especially chronic poverty in India, the analysis had to adopt an 'area-cum-issues' approach for scanning and selecting the studies to be incorporated in the review. To a large extent, the literature selected for the review has encompassed analysis of economic development, with special reference to agriculture, and poverty or human capabilities in some of the marginalised areas, defined as 'backward regions'. Obviously this covers a huge amount of literature, given the size and diversity of the country, and also the ever increasing

academic community from different disciplines of social sciences working on the themes within and outside India. The strategy adopted therefore, was not only to be selective, but also thematic and issues-based.

Five aspects have been covered by the review. These are: (i) the debate on spatial or regional inequalities in Indian economy and the likely explanation for that. This set the stage for placing the specific constraints faced by RRAs in a larger context. (ii) Evolving a relevant definition of RRAs with respect to poverty in the light of the processes that have led to spatial inequalities or marginalisation. (iii) Providing a profile of the two sets of areas, defined as RRAs viz. dryland and forest based regions. (iv) A detailed discussion on the constraints faced, as well as coping strategies adopted by people in the two sets of regions. (v) Analysis of correlates of poverty in terms of income as well as human capabilities and the interface between the two. The paper therefore is a blend of a literature review along with an analysis of poverty dynamics in the two sets of RRAs. It however does not claim to be exhaustive in terms of the coverage of studies as well as the issues having special bearing on understanding the dynamics of chronic poverty in India's remote rural areas. Nevertheless, it is hoped that the review would provide a sufficiently large framework within which issues can be placed and the questions requiring further enquiry, could be raised.

Given this backdrop, this section summarises some of the major observations emerging from the review and identifies issues that need further probing in order to obtain a more context specific understanding of poverty, especially chronic poverty in India's remote rural areas.

## Major Observations

(i) Development of spatially marginalised areas has been an important feature of planning in India. Nevertheless, the growth imperatives superceded these concerns. As a result, poverty got concentrated in certain geographically contiguous areas in the central–east regions. To a large extent, these regions are characterised by adverse agrarian relations but with better natural capital especially, forest, minerals, and soil.

(ii) High incidence of poverty however is confined not only to the above set of regions. There are pockets of severe poverty even within relatively more developed states like Maharashtra,

Karnataka and Andhra Pradesh. Poverty in these regions is linked more closely to the low agronomic potential and frequent shocks like droughts. While poverty due to droughts is likely to be more transitory in nature, non-sustainability of natural resource use may lead to situations of endemic poverty in these regions.

(iii) Spatial poverty traps could be identified mainly in the two sets of regions, broadly classified as forest based and dryland. Whereas the former have high incidence of chronic poverty in duration sense, the latter may have more of transient poverty, which if unattended, could become chronic.

(iv) Given the basic differences in operating environment, coping mechanisms also vary across the two sets of regions. Ground water development, commercialisation of agriculture, economic diversification as well as the associated infrastructural development and migration, are the major features of coping mechanisms in dryland regions. Over depletion of ground water resources of late, is posing a major challenge to the coping mechanism in these regions. Notwithstanding these, ability to organise drought relief programmes due to better availability of financial resources and also political commitments may also help in the process of coping with frequent droughts.

The above features are relatively rare in most of the forest based regions. While migration is a common feature across the two, its dynamics is likely to be different as forest based regions may still provide some base for livelihood because of the relatively rich natural resources in the region. There are however, areas within forest based regions, which also have a fair amount of resemblance with dryland conditions, but without the other favourable features thereof. This happens because of the severe depletion of forest and the resultant frequent droughts. These areas thus face a situation of double disadvantage. The coping mechanism in the forest based regions therefore has to rest mainly on collective resistance and political representation particularly for reinstating people's stakes in management of the region's rich natural resources.

(v) The analysis of correlates of poverty reconfirmed some of the macro level processes such as critical importance of irrigation and

agricultural productivity along with development of non-farm activities. These, in turn, exert positive impact on human capabilities, though there is no direct link between income poverty and human capabilities.

There is however a significant variation in the pattern of correlates of poverty and human capability across the two sets of regions viz. dryland and forest based. The present analysis is severely constrained by availability of right kind of indicators at more disaggregated level i.e. for the region as well as districts. A more careful handling of some of the important variables like extent of dryness, quality of forests, severity of poverty might help in understanding the differential patterns of poverty across the two sets of regions. Supplementing these with carefully conducted micro studies therefore is essential for furthering the discourse on chronic poverty in India's remote rural areas.

The next stage of enquiry into chronic poverty in India's remote rural areas should focus more on the following aspects:

(i) Understanding the dynamics of poverty, especially long duration poverty in a region facing different levels of depletion of natural resources, especially ground water, pastures and forests.

(ii) Examining the impact of social and political capital on explaining poverty at regional as well as household levels and identification of critical minimum levels of some of the basic factors, including physical connectivity, for mitigating poverty on a sustained basis.

(iii) Understanding the interface between income and capability poverty and people's perception about how it operates.

(iv) Examining the pattern of migration in a comparative framework across the two sets of regions viz. dryland and forest based.

(v) Processes of collective resistance for gaining greater control as well as involvement in management of forest and other natural resources and their impact on empowerment among different categories of poor and on polity in the states with predominantly forest based regions.

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## Table 5: Environmental Sustainability Indicators Among Major States in India

| State | Area not under Forest as a % of Total Geographical Area (1996-97) | Percentage of Ground water Exploitation % of net draft to available Gr. Water resources (1992-93) | Percentage of Area under non-leguminous crops to total Gross cropped Area (1995-96) | Degraded Land as % Total Geographical Area (1996-97) |
|---|---|---|---|---|
| Andhra Pradesh | 82.80 | 23.64 | 70.54 | 38.79 |
| Assam | 68.80 | 4.48 | 100.00 | 35.23 |
| Bihar | 84.70 | 19.19 | 86.65 | 28.30 |
| Gujarat | 93.90 | 41.40 | 73.36 | 49.62 |
| Haryana | 98.80 | 83.88 | 92.52 | 75.68 |
| Himachal Pradesh | 76.30 | 18.04 | 99.98 | 27.50 |
| Karnataka | 83.10 | 31.26 | 76.4 | 39.20 |
| Kerala | 73.40 | 15.28 | 86.84 | 37.23 |
| Madhya Pradesh | 69.50 | 16.49 | 63.88 | 34.80 |
| Maharashtra | 85.70 | 30.39 | 78.42 | 28.89 |
| Orissa | 69.70 | 8.42 | 89.53 | 44.58 |
| Punjab | 97.30 | 93.85 | 98.56 | 42.93 |
| Rajasthan | 96.20 | 50.63 | 78.84 | 103.44 |
| Tamil Nadu | 86.40 | 60.44 | 75.32 | 14.21 |
| Uttar Pradesh | 88.50 | 37.66 | 88.32 | 29.77 |
| West Bengal | 90.80 | 24.18 | 97.23 | 42.66 |

***Source:*** *Food Insecurity Atlas of Rural India (Table 2.6).*

**For tables see Tables file**

**Table 7: Change in Forest Areas Among Selected States in India**

| States | Area Under Forest(%) | Area Under Forest(%) | Change(%) |
|---|---|---|---|
| Year | 1978-79 | 1999 | 1978-79 to 1999 |
| Assam | 36.47 | 30.20 | -6.27 |
| Bihar | 16.84 | 15.23 | -1.61 |
| Himachal Pradesh | 39.01 | 23.50 | -15.51 |
| Madhaya Pradesh | 34.64 | 29.73 | -4.91 |
| Orissa | 43.33 | 30.21 | -13.12 |
| Uttar Pradesh | 17.35 | 11.55 | -5.80 |
| West Bengal | 13.33 | 9.42 | -3.91 |
| INDIA | 22.73 | 19.39 | -3.34 |

***Source:*** *Statistical Abstract of India 1980 and 2000*

**Table 8: Sectoral Composition of Workforce and Net State Domestic Product (NSDP)- Selected States**

| State | % Share in | Primary | Secondary (Mining) | Tertiary |
|---|---|---|---|---|
| **Forest States** | | | | |
| Assam | NSDP | 39.34 | 15.29 (3.4) | 45.36 |
| | Workforce | 74 | 5.6 | 20.40 |
| Bihar | NSDP | 38.72 | 26.51 (4.2) | 34.77 |
| | Workforce | 82.4 | 4.6 | 13.00 |
| MP | NSDP | 43.96 | 24.42 (3.6) | 29.21 |
| | Workforce | 77.50 | 8.4 | 14.10 |
| Orissa | NSDP | 38.62 | 22.10 (4.5) | 39.27 |
| | Workforce | 75.80 | 7.5 | 16.70 |
| UP | NSDP | 42.58 | 19.57 (0.6) | 37.85 |
| | Workforce | 73.00 | 9 | 18.00 |
| West Bengal | NSDP | 33.13 | 25.49 (0.1) | 41.38 |
| | Workforce | 56.50 | 17.8 | 25.70 |
| **Dry States** | | | | |
| AP | NSDP | 35.54 | 18.00 (1.2) | 47.18 |
| | Workforce | 71.20 | 10.5 | 18.30 |
| Gujarat | NSDP | 25.55 | 39.74 (0.3) | 34.70 |
| | Workforce | 59.80 | 17.9 | 22.40 |
| Karnataka | NSDP | 35.59 | 22.87 (0.2) | 41.54 |

| State | % Share in | Primary | Secondary (Mining) | Tertiary |
|---|---|---|---|---|
| | Workforce | 67.40 | 13.2 | 19.50 |
| Maharashtra | NSDP | 17.77 | 34.94 (0.4) | 47.29 |
| | Workforce | 61.50 | 15.8 | 22.70 |
| Rajasthan | NSDP | 44.51 | 18.96 (1.9) | 34.48 |
| | Workforce | 71.60 | 9.9 | 18.50 |

*Note: % share of NSDP refer to1994-95; % share of workforce refer to1991. Figures in the brackets are % share of Mining and Quarrying in NSDP.*

***Source:*** *National Account Statistics of India 1950-51 to 1996-97, EPW Research Foundation.*

## Table 9: Correlates of Rural Poverty (HCR) Across NSS Regions in India: 1993-94

| Variables | All | Dry | Forest |
|---|---|---|---|
| **Poverty** | | | |
| OPL Rural(1987-88) | 0.761* | 0.687* | 0.730* |
| OPL Rural(1993-94) | 1.00 | 1.00 | 1.00 |
| OPL Urban(1987-88) | 0.331* | 0.329 | 0.130 |
| OPL Urban(1993-94) | 0.462** | 0.570* | 0.319 |
| **Demographic** | | | |
| Population Growth 1981-91 | 0.040 | -0.198 | 0.265 |
| Household Size 1991 | -0.103 | 0.012 | 0.063 |
| **Human Capabilities** | | | |
| Female Literacy (%) 1991 | -0.223 | 0.248 | -0.693* |
| Child Mortality 1991 | -0.083 | -0.291 | 0.026 |
| **Land** | | | |
| Land Productivity(Value in Rs.) 1994 | -0.274* | -0.051 | -0.469 |
| Rural Wage (Male) (Value in Rs.) 1995 | -0.289* | -0.052 | -0.392 |
| Waste Land 1991 | 0.121 | -0.590** | -0.054 |
| Labour Productivity(Value in Rs.) 1994 | -0.394** | -0.510* | -0.455*** |
| Gross Area Irrigated 1994 | -0.297* | 0.154 | -0.284 |
| **Economic Diversification** | | | |
| Rural Non Farm Workers (%) 1991 | -0.246*** | 0.029 | -0.544* |
| **Infrastructure** | | | |
| Electricity (% Households) 1991 | -0.485** | -0.203 | -0.558* |
| Safe Drinking Water (% Households) 1991 | -0.175 | -0.106 | -0.278 |
| Medical Facilities (% Villages) 1991 | -0.106 | -1.79 | -0.212 |
| Post & Telegraph (% Villages) 1991 | 0.386** | 0.601** | 0.507* |

*Note:* *OPL refers to the official norm and updated using disaggregated price adjustment suggested by Minhas et al (1988); Level of Significance: * 1 per cent; ** 5 Per cent; *** 10 per cent*

***Source:*** *(i) Counting the Poor, SARVEKSHNA Analytical Report Number 1, 1998; (ii) India Rural Development Report 1999, NIRD, Hyderabad, India. (iii) Wasteland Atlas of India Vol. II, National Afforestation and Eco-Development Board (NAEB), Ministry of Environment & Forest, Govt. of India, 1995.*

## Table 10: Determinants of Rural Poverty (1993-94) Across Different Categories of Regions (Regression Analysis)

| Variables | Dry Region | | Forest-Based Region | |
|---|---|---|---|---|
| | Coefficients | t-Value | Coefficients | t-Value |
| Population-Growth | 0.356 | 0.513 | -2.044 | -1.234 |
| Literacy-femal | 0.107 | 0.271 | 0.184 | 0.185 |
| Rural-wage | 2.145** | 2.559 | -1.197*** | -2.052 |
| Electricity | 0.132 | 0.370 | -0.346 | 0.818 |
| Non-form Worker Rural | -1.191** | -2.756 | -2.019*** | -2.111 |
| Labor Prod. | -0.006* | -4.099 | -0.003 | -1.489 |
| Irrigation | -0.439 | -1.438 | 0.032 | 0.07 |
| Child Mortality | -0.697*** | -1.999 | -0.095 | -0.178 |
| (Constant) | 54.303 | 2.018 | 166.693 | 3.767 |
| $R^2$ | 0.778 | | 0.819 | |
| F-Value | 3.946 | | 3.402 | |
| Number of Observations | 19 | | 18 | |

The regression model used for estimation is:
OPL (Rural 93-94) =f (Pop. Gr., Female Literacy, Rural Wages, Village Electrification, Rural Non-farm workers, Labour Productivity, Irrigation, Child Mortality). The variables are based on cross section data pertaining to estimates for rural regions in different categories.

*Note : Level of Significance : *1 per cent; ** 5 per cent; *** 10 per cent*

***Source :*** *(i) Counting the Poor, Sarvekshna, Analytical Report Number 1, 1998.*
*(ii) India Rural Development Report 1999, NIRD, Hyderabad, India.*

## Table 11: Correlates of Female Literacy Among NSS Regions in India

| Variables | All | Dry | Forest |
|---|---|---|---|
| **Poverty** | | | |
| OPL Rural(1987-88) | -0.254 | 0.099 | -0.688* |
| OPL Rural(1993-94) | -0.223 | 0.246 | -0.693* |
| OPL Urban(1987-88) | -0.186 | 0.262 | 0.363 |
| OPL Urban(1993-94) | -0.286** | 0.328 | -0.658* |
| **Demographic** | | | |
| Population Growth 1981-91 | -0.584** | -0.446 | -0.657* |
| Household Size 1991 | -0.306* | -0.328 | -0.100 |
| **Human Capabilities** | | | |
| Female Literacy (%) 1991 | 1.000 | 1.000 | 1.000 |
| Child Mortality 1991 | -0.377* | -0.326 | -0/304 |
| **Land** | | | |
| Land Productivity (Value in Rs.) 1994 | 0.431* | 0.385 | 0.457 |
| Rural Wage (Male) (Value in Rs.) 1995 | 0.440* | 0.264 | 0.131 |
| Waste Land 1991 | -0.244 | -0.352 | 0.367 |
| Labour Productivity (Value in Rs.) 1994 | 0.027 | 0.144 | 0.381 |
| Gross Area Irrigated 1994 | -0.099 | -0.212 | 0.178 |
| **Economic Diversification** | | | |
| Rural Non Farm Workers (%) 1991 | 0.627* | 0.486* | 0.769* |
| **Infrastructure** | | | |
| Electricity (% Households) 1991 | 0.472* | 0.560* | 0.683* |
| Safe Drinking Water (% Households) 1991 | -0.136 | 0.361 | 0.173 |
| Medical Facilities (% Villages) 1991 | 0.292** | 0.198 | 0.316 |
| Post & Telegraph (% Villages) 1991 | 0.480* | -0.055 | 0.608** |

*Note : Level of significance : * 1 per cent, ** 5 per cent.*
***Source:*** *Same as Table 10.*

## Table 12(a): Correlates of Land Productivity Among NSS Regions in India

| Variables | All | Dry | Forest |
|---|---|---|---|
| **Poverty** | | | |
| OPL Rural(1987-88) | -0.339* | 0.039 | -0.656* |
| OPL Rural(1993-94) | -0.274* | -0.051 | -0.469 |
| OPL Urban(1987-88) | -0.290* | 0.186 | -0.230 |
| OPL Urban(1993-94) | -0.420* | -0.076 | -0.288 |
| **Demographic** | | | |
| Population Growth 1981-91 | -0.146 | 0.053 | -0.452 |
| Household Size 1991 | 0.025 | -0.146 | -0.206 |
| **Human Capabilities** | | | |
| Female Literacy (%) 1991 | 0.431* | 0.385 | 0.457 |
| Child Mortality 1991 | 0.098 | 0.267 | 0.350 |
| **Land** | | | |
| Land Productivity (Value in Rs.) 1994 | 1.000 | 1.000 | 1.000 |
| Rural Wage (Male) (Value in Rs.) 1995 | 0.432* | 0.579** | 0.083 |
| Waste Land 1991 | -0.335** | -0.007 | -0.015 |
| Labour Productivity (Value in Rs.) 1994 | 0.506** | 0.300 | 0.609** |
| Gross Area Irrigated 1994 | 0.494* | 0.301 | 0.724* |
| **Economic Diversification** | | | |
| Rural Non Farm Workers (%) 1991 | 0.225 | 0.063 | 0.519** |
| **Infrastructure** | | | |
| Electricity (% Households) 1991 | 0.114 | 0.123 | 0.440 |
| Safe Drinking Water (% Households) 1991 | 0.328** | 0.498** | 0.130 |
| Medical Facilities (% Villages) 1991 | 0.364* | 0.300 | 0.370 |
| Post & Telegraph (% Villages) 1991 | 0.248 | 0.026 | 0.676* |

*Note:* *Same as Table 10.*
***Source:*** *Same as Table 10.*

## Table 12 (b): Correlates of Land Productivity-Across NSS Regions in India

| Variable | All | Dry | Forest |
|---|---|---|---|
| **Poverty** | | | |
| OPL Rural(1987-88) | -0.507* | -0.522** | -0.404 |
| OPL Rural(1993-94) | -0.394* | -0.510** | -0.455 |
| OPL Urban(1987-88) | -0.405* | -0.006 | -0.173 |
| OPL Urban(1993-94) | -0.426* | -0.177 | -0.246 |
| **Demographic** | | | |
| Population Growth 1981-91 | 0.066 | -0.017 | -0.123 |
| Household Size 1991 | 0.418* | 0.374 | 0.102 |
| **Human Capabilities** | | | |
| Female Literacy (%) 1991 | 0.027 | 0.144 | 0.381 |
| Child Mortality 1991 | -0.022 | -0.22 | 0.019 |
| **Land** | | | |
| Land Productivity (Value in Rs.) 1994 | 0.506* | 0.300 | 0.610** |
| Rural Wage (Male) (Value in Rs.) 1995 | 0.414* | 0.494** | -0.100 |
| Waste Land 1991 | -0.288** | 0.242 | -0.239 |
| Labour Productivity (Value in Rs.) 1994 | 1.000 | 1.000 | 1.000 |
| Gross Area Irrigated 1994 | 0.663* | -0.346 | 0.317 |
| **Economic Diversification** | | | |
| Rural Non Farm Workers (%) 1991 | -0.159 | -0.275 | 0.231 |
| **Infrastructure** | | | |
| Electricity (% Households) 1991 | 0.381* | 0.347 | 0.396 |
| Safe Drinking Water (% Households) 1991 | 0.495* | 0.121 | 0.270 |
| Medical Facilities (% Villages) 1991 | 0.149* | -0.520* | 0.587** |
| Post & Telegraph (% Villages) 1991 | -0.049 | 0.240 | 0.396 |

*Note:* *Same as Table 10.*
***Source:*** *Same as Table* 10

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