

ANNEX 1

HOUSEHOLD LIVELIHOOD AND COPING STRATEGIES IN SEMI-ARID INDIA: SYNTHESIS OF MACRO- AND MICRO- LEVEL FINDINGS

NRSP Project R7558

Ann Gordon

**with
Czech Conroy
Sudarshan Iyengar
Viren Lobo
Uma Rani
G.Bhaskara Rao**

May 2001

CONTENTS		Pages
Acknowledgements		3
1 INTRODUCTION		4
Research objectives		4
Components studies, research partners, field sites & methodology		4
Report layout	5	
2 RURAL POVERTY, LIVELIHOODS AND COPING STRATEGIES IN INDIA		6
Rural poverty in India		6
Economic growth and rural poverty		7
Household livelihood and coping strategies: concepts used in the literature		9
The literature on coping strategies in semi-arid India		13
3 THE SEMI-ARID AREAS OF INDIA – INSIGHTS FROM THE NATIONAL STATISTICS		14
Drought-prone states and demography, economy and employment		15
Land-use and agriculture in DP and NDP states		16
District-level analysis		17
Udaipur, Rajasthan		18
Anantapur, Andhra Pradesh		19
4 RESULTS OF FLIED STUDIES IN ANANTAPUR AND UDAIPUR		21
Overview of the research sites in Anantapur, Andhra Pradesh		21
Anantapur mandal (the more advantage of the two mandals)		22
Rayadurga mandal (the more disadvantage of the two mandals)		23
Overview of the research sites in Udaipur district, Rajasthan		24
Kotra, Udaipur		25
Pratapgarh, Udaipur		26
Jhadol, Undaipur		27
5 CONCLUSION		28
Livelihood strategies in DP areas as indicated by national data		29
Livelihood strategies in Anantapur		30
Livelihood strategies on Udaipur		32
Semi-arid areas: common themes amidst diverse livelihood strategies		34
Researchable options		35
ABBREVIATIONS		38
BIBLIOGRAPHY		39

Acknowledgements

Numerous people have made important contributions to this research project, in addition to the authors of this report. They include the staff of the five NGOs that undertook the survey work in 12 villages, and prepared profiles of the blocks in which they worked. In Udaipur District, they were: Astha (Kotra block), Prayas (Pratapgarh block, adjacent to Udaipur district in Chittorgarh district), Prayatna Samiti (Girwa) and Seva Mandir (Jhadol). In Anantapur District, the fieldwork was carried out by Mass Education Organisation Society. In addition, staff of SPWD's Udaipur office, Rajiv Kumar and Ajay Bhan Singh, prepared the district profile for Udaipur. We would like to thank them all for their hard work and valuable contributions. We would also like to thank the Department for International Development's Natural Resources Systems Programme for funding the project on which this report is based.

1. INTRODUCTION

Research objectives

The UK's Department for International Development (DFID) supports research that promotes poverty reduction. The study reported here was commissioned by DFID's Natural Resources Systems Programme (NRSP) - a research programme whose remit includes the development and promotion of "diverse coping strategies for poor rural households in semi-arid systems".

This project, Understanding Household Coping Strategies in Semi-arid India, has the following purpose:

- to gain a comprehensive and sound understanding of household livelihood and coping strategies in semi-arid India in general, and in two focus districts in particular

and specific objectives:

- information on macro-level trends and issues affecting semi-arid rural systems in different parts of India synthesised
- household livelihood and coping strategies described and analysed and key components identified, and
- explanations of changes in household livelihood and coping strategies developed, and researchable options identified.

The investigation and analysis of household strategies includes consideration of:

- allocation of family labour
- technical choices within crop, livestock or other enterprises
- choices between enterprises, including subsistence versus commercial production and off-farm work
- savings, investment and borrowing decisions
- management of natural resources, soil fertility in particular
- strategies to manage rainfall and other variable factors
- management of household consumption
- community activities and other social action

Although the household is the principal unit of analysis in this research, there is also consideration of intra-household and gender dimensions particularly in relation to division of labour, income and assets between family members.

Component studies, research partners, field sites and methodology

The research was led by the Natural Resources Institute and undertaken in collaboration with research partners in India (the Gujarat Institute of Development Research, GIDR, and the Society for the Promotion of Wastelands Development,

SPWD). NRI's role was largely one of co-ordination of and synthesis from the four component studies:

- (1) a review of national statistics, both at state and district-level, to identify key characteristics and trends affecting drought-prone areas, undertaken by GIDR (Iyengar, 2001)
- (2) a review of the empirical literature on household coping strategies in semi-arid areas of India, also by GIDR (Rani and Dodia, 2001)
- (3) field research in Udaipur district, Rajasthan, by SPWD (SPWD Udaipur Centre, 2001, and
- (4) field research in Anantapur district, Andhra Pradesh, by SPWD (Rao, 2001).

Field research involved review of secondary data as well as participatory research in selected communities in each district

Reports on the component studies are provided at Annexes 2, 3, and 4.

Report layout

This report summarises the research results. It is intended as a stand-alone document. However, readers with specific interest in certain detailed results are referred to the separate reports on each component study.

The remaining sections of this report are organised as follows:

- section 2 describes trends in rural poverty in India; it introduces some of the concepts that are relevant to the debate on rural economic growth and poverty, and livelihood and coping strategies; and provides a very brief synopsis of the Indian literature on household coping strategies
- section 3 presents selected statistics on poverty and rural livelihoods in semi-arid areas in India in general, and briefly reviews official data on the focus districts to set these in context
- section 4 presents the results from the field studies; it describes and analyses the livelihood strategies observed in the focus districts
- section 5 discusses these results in relation to general economic trends, providing a descriptive and analytical model of household livelihood strategies; it proposes areas of research that will contribute to an improvement in those strategies.

2. RURAL POVERTY, LIVELIHOODS AND COPING STRATEGIES IN INDIA

Rural poverty in India¹

The incidence of poverty in India is usually measured as the percentage of the population that falls below the poverty line (Rs 49 income/month at 1973/74 prices). The trend in rural poverty has been downwards since the mid-60s. Over a thirty year period the proportion of the rural population that is poor has fallen from two thirds to one third – though it temporarily increased (from roughly 36% to 46%) with the implementation of macro-economic policy reforms in the early 90s. Urban poverty has tended to follow a similar pattern, but with percentages generally 5-10% lower than rural poverty.

These trends conceal some important detail, however. Firstly, the fall in the poverty ratio leaves no room for complacency because absolute numbers of poor are increasing. Between 1960 and 1993, the rural population falling below the poverty line increased from 177 million to 278 million. Secondly, performance varies between states. Between 1957 and 1993, the poverty ratio declined in all states except Assam and Jammu and Kashmir. However some states saw more rapid declines (Andhra Pradesh, Kerala, Maharashtra, Punjab, Tamil Nadu and West Bengal) and others made slower progress (Bihar, Haryana and Rajasthan). Only Andhra Pradesh, Tamil Nadu and Kerala were able to reduce absolute numbers of poor². These different poverty outcomes suggest that an improved understanding of the different policies and circumstances pertaining in different states may yield important insights into poverty reduction.

Three main influences on rural poverty in India are identified in the literature:

- (1) growth in agricultural income
- (2) prices of commodities consumed by the rural poor, and
- (3) labour market effects (through increases in agricultural productivity, competition for labour from non-farm enterprise that pushes up farm wages, and labour-intensive public works programmes)

Fan *et al.*, 1999, use state-level data to investigate the importance of government spending. They find that different categories of expenditure have different impacts on rural poverty and growth in agricultural productivity. They identify two dominant “win-win” strategies:

- (1) government expenditure on roads has the largest impact on rural poverty reduction and also has a significant impact on agricultural growth; and

¹ This summary draws significantly on Fan *et al.*, 1999, *Linkages between government spending, growth and poverty in rural India*.

² Note the differences in performance between Rajasthan and Andhra Pradesh, which are revisited in sections 3 and 4.

- (2) government expenditure on agricultural research and extension has the largest impact on agricultural productivity growth and also has a significant impact on poverty.

They argue that agricultural growth is as important as poverty reduction, because it offers a means by which poverty reduction can be sustained.

What characterises India's rural poor? In 1993, two states, Bihar and Uttar Pradesh, accounted for 36.5% of India's rural poor. Together, Madhya Pradesh and Maharashtra accounted for a further 17.8%. Nationally, the poorest 20% of the rural population derive their incomes³ from cultivation (38% share of income), agricultural wage labour (16% of income) and non-farm sources (labouring, self-employment or regular employment) (32% of income) (Lanjouw and Shariff, 2000, using data from 1993/94). The corresponding shares for Bihar and Uttar Pradesh are 30%, 24%, 45% and 48%, 14%, 36% respectively. The landless, as well as the scheduled tribes and scheduled castes, feature prominently amongst the poor in India. Low education, social status and wealth restrict mobility and exacerbate attempts by India's poor to improve their livelihoods.

Economic growth and rural poverty

Lewis' widely accepted model of economic growth ascribes a key role to agriculture as the engine that:

- provides a surplus for investment in other sectors
- releases labour into non-agricultural employment
- provides a market for industrial outputs
- provides raw materials on which other industries are based
- assures a food supply to the industrial labour force.

Thus, as an economy grows, secondary (manufacturing) and tertiary (services) activities account for an increasing share of national income. A virtuous cycle of rural growth linkages is predicted whereby agricultural growth fuels the development of the non-farm economy, through forward and backward linkages (demand for agricultural inputs and downstream processing or handling activities), and consumption linkages (rural demand for consumption items that are unrelated to agriculture).

However, these processes need not be unremittingly positive in outcome, nor is it always the case that agriculture is the engine of growth. Some of the topics that have received particular attention are:

- unchecked urban growth, associated with a rapidly developing economy, can have negative social and environmental consequences

³ in cash and in-kind

- the benefits from this growth may not “trickle down” to the poor; indeed those policies that promote most growth are not necessarily those that are most effective in reducing poverty⁴
- even where benefits trickle down, there will be losers as well as winners
- the products of urban (or overseas) industry may be so cheap that they displace or stifle rural industrial employment
- agricultural output may not be able to keep pace with population growth, such that food prices rise, pushing up urban wages and choking off growth
- the pressure on natural resources may result in short-sighted production strategies that erode long-term sustainability
- mining, tourism, government expenditure or even remittances can provide alternative or competing engines of growth⁵

Studies based on macro-level economic statistics give little hint of the processes taking place at household-level that make up (or are hidden within) the broad trends. Within the rural economy, the presence and relative importance of a number of processes help determine the extent, depth and location of poverty: out-migration and employment in local towns; income distribution processes and “elite capture”; the effect of trade on traditional rural activities; changes in agricultural productivity; and pressure on the resource base.

As economies develop, the non-farm economy becomes more important. Ideally, it will draw labour from agriculture, attracted by higher returns in non-farm activities. However, the role of the non-farm economy in very poor rural areas is a subject of considerable debate, sometimes characterised by two different processes where:

- attractive wages *pull* farmers into the non-farm sector, or
- poor agricultural incomes (exacerbated by the failing natural resource base and declining farm size) *push* farmers into poorly paid low entry barrier non-farm activities.

In most situations, both processes are present and it is usually the more advantaged groups who are able to take-up the most remunerative non-farm activities (because of their contacts, social status and confidence, information, access to capital and education). In a more rapidly growing economy, “pull” factors are likely to be more prevalent, but where there is economic stagnation in the agriculture and non-farm economies “push” factors (and large numbers of people in low paid low status activities) will be present.

⁴ Section 3 illustrates this with some examples from India. E.g., Maharashtra has high per capita incomes and a relatively high incidence of poverty.

⁵ The effectiveness of these “engines” depends in part on the strength of the linkages they create. The non-agricultural engines all work by boosting rural incomes and hence demand for goods and services. In parts of Udaipur mining is important – but whilst it generates consumption linkages (through the workforce) mining rarely leads to strong linkages with other parts of the local economy.

In the Indian context, it is important to note that the Government has been very interventionist and tried to influence economic processes in favour of rural areas. Small-scale enterprise, co-operative enterprise, and “growth points” have all been favoured by policy (soft loans, tax breaks etc.) in an attempt to make these income opportunities accessible to lower income groups and to rural areas. It is widely argued now that these distortive policies have acted as brake on broader economic growth. The policy reforms of the early 90s seek to correct some of this imbalance.

A further general point to make in the context of rural growth and poverty debates concerns opposing processes of *specialisation* and *diversification*. In broad terms, specialisation tends to be viewed as a route to growth and higher incomes (through economies of scale and scope, and competitive advantage), whilst diversification can be viewed as a way to reduce risk. The more vulnerable and poor communities and households would therefore be expected to have more diversified livelihoods. There is a growing literature showing that rural people in developing countries do indeed have very diverse income sources – but less consensus on whether the trend is towards diversification or specialisation⁶. The competitive pressures associated with globalisation tend to encourage specialisation.

Household livelihood and coping strategies: concepts used in the literature

The livelihoods literature puts these micro-level issues in the spotlight. Most livelihood models use economic principles to explain household behaviour, whereby household assets are transformed by household activities into consumption outcomes. A widely quoted definition is that of Chambers and Conway (1992:7)

“A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living”.

Ellis (2000) emphasises the access of individuals and households to different types of capital, opportunities and services. Thus:

“a livelihood comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household”.

These ideas have attracted considerable attention in the development community in the last ten years. A livelihoods perspective has, for example, largely superseded the farming systems framework, partly because of increasing recognition that rural livelihoods often include significant non-farm activities.

Several types of livelihood models have been put forward (e.g., Sen (1981), Chambers (1988), Swift (1989), Kabeer (1991), Davies (1996), Carney (1998), and others such as Barratt and Reardon (2001)). Livelihood models focus on the relationship between assets (also capitals, factors), activities (also strategies, production, exchange etc) and

⁶ A point made in the literature (e.g., Ellis, 2000) is that failure to recognise this diversity in the past reflected both the the focus and methodology of the surveys conducted.

consumption outcomes (also entitlements, consumption bundles, well-being, utility, income) within a mediating environment. This is represented in Figure 2.1.

Figure 2.2 describes the framework adopted by DFID, which was also the reference framework used by the researchers in this study. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. DFID can promote sustainable livelihoods by (a) contributing to the robustness and increased number of opportunities available to the poor by building up their asset base, and (b) ensuring that the structures and processes that define people's options are working in favour of the poor. (Carney, 1998).

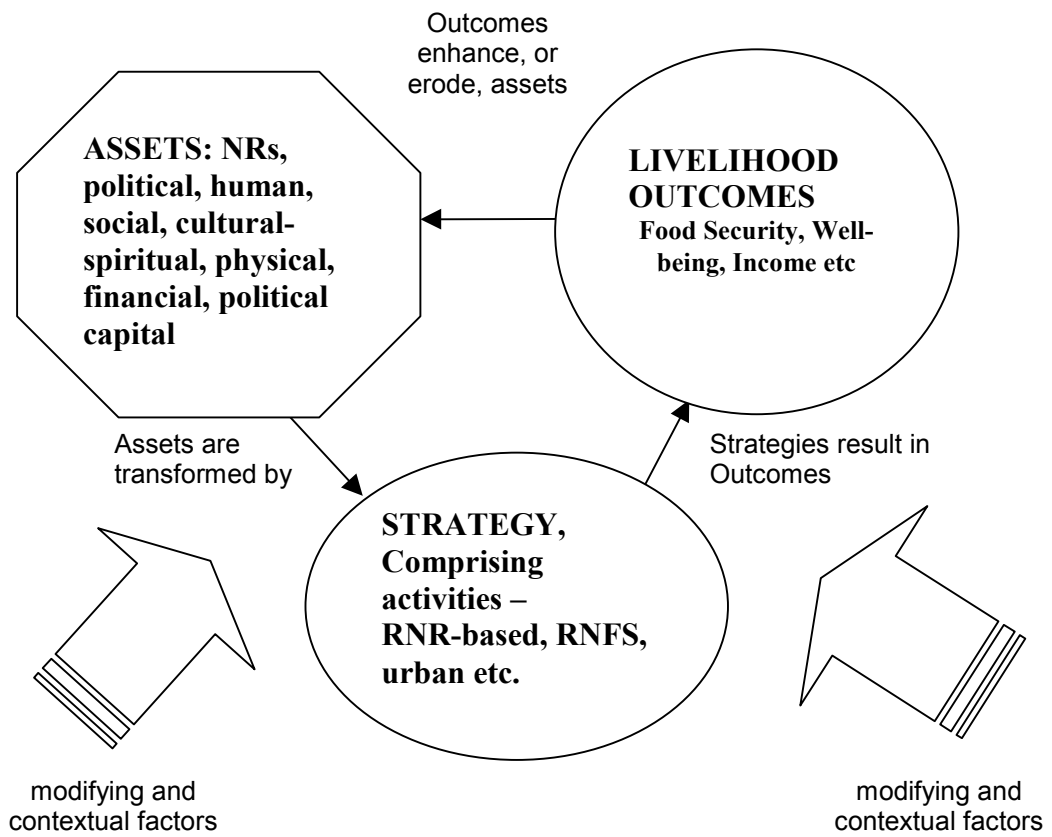
DFID's sustainable livelihoods (SL) framework places assets into the following five categories:

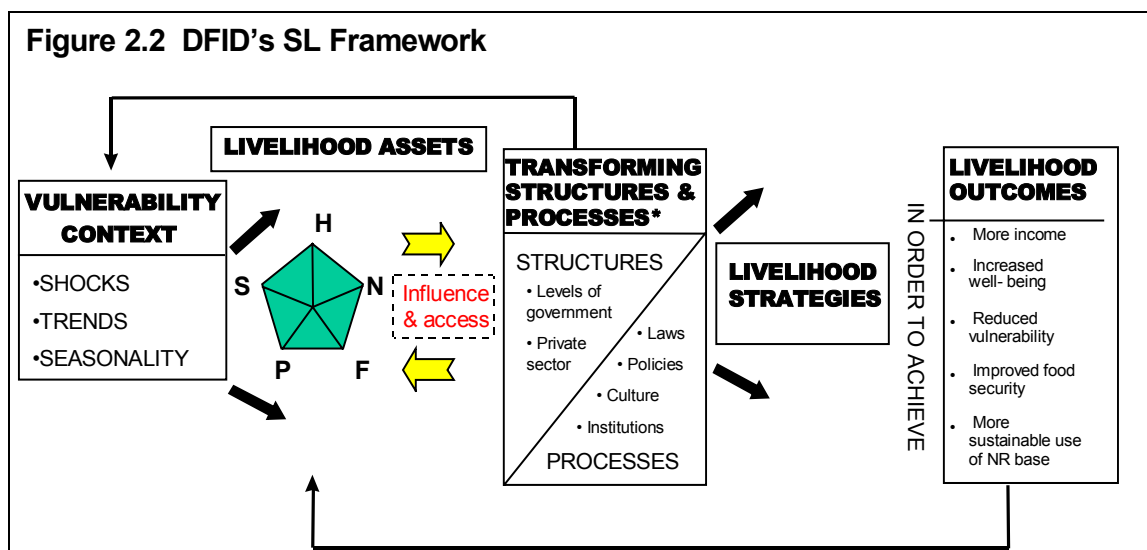
- Human capital (H): the skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies
- Physical capital (P): the basic infrastructure (transport, shelter, water, energy and communications) and the production equipment and means that enable people to pursue livelihoods
- Social capital (S): the social resources (networks, membership of groups, relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods
- Financial capital (F): the financial resources which are available to people (whether savings, supplies of credit or regular remittances or pensions) and which provide them with different livelihood options; and
- Natural capital (N): the natural resource stocks from which resource flows useful for livelihoods are derived (e.g. land, water, wildlife, biodiversity, environmental resources).

In section 4, the description of livelihood portfolios in Anantapur and Udaipur provides numerous examples of how rural people combine their use of these different assets to pursue different livelihoods. Roads and transport, for instance, clearly influence access to markets (enabling trade of a perishable rural product, such as milk, for instance) and facilitate daily or longer-term travel/migration to other employment.

The transforming structures and processes are the mediating influences external to the household. They include factors that are influenced by the state, such as government policies and programmes, and laws and regulations. Social and cultural institutions and norms also shape or limit the use of assets and the types of activities available. Transforming structures and processes can usefully be classified as operating at different levels, such as macro (e.g. national government policy), meso (e.g. state policies and programmes) and micro (e.g. local land-use plans). Markets also exert a major influence on livelihoods through changes in relative prices and terms of trade. Economic reforms may interact with market forces to reduce distortions and barriers.

Figure 2.1 A Generic Livelihoods Framework:





Source: Carney et al., 2000

Livelihood outcomes and objectives vary. They may include

- More income
- Increased well-being
- Reduced vulnerability
- Improved food security
- More sustainable use of NR base.

Note, however, that outcomes need to be distinguished from objectives. A household may have a particular outcome as its objective, but the actual outcome may differ from the objective. It is also important to recognise that households may have both short-term and long-term objectives. Household coping strategies may address short-term objectives, whilst adaptive livelihood strategies may respond to long-term objectives. It is important to distinguish between the objectives of a development

agency and the objectives of local people. Also, outcomes may have both positive and negative aspects, and these need to be clearly separated.

People's objectives are likely to vary, depending on their livelihood strategies and circumstances. However, there has been surprisingly little research in India into what people's objectives, or desired outcomes, actually are. In a review of the literature about five relevant studies were identified (Chambers et al, 1989). The reviewers postulated that for many people there is a hierarchy of three objectives or priorities, all of which can overlap and co-exist but, as the lower ones are more and more met, so the higher ones become more significant. They are:

- *Survival*, based on stable subsistence
- *Security*, based on assets and rights
- *Self-respect*, based on independence and choice.

Changes in the external environment can affect assets, activities or outcomes. The resultant changes in behaviour are known as coping strategies (if the event has a negative effect on entitlement) or accumulation strategies (if entitlement improves). If coping behaviour is constantly necessary, then the livelihood strategy becomes a survival strategy, leading to erosion of assets and destitution (ODI, 2000).

Poor households in risky environments adopt coping strategies to protect their livelihoods. Coping strategies include:

- (1) intensification of existing income activities
- (2) diversification into new activities, including migration
- (3) drawing on common property resources
- (4) drawing upon social relationships and informal credit networks
- (5) drawing on formal safety nets (e.g., through the state)
- (6) drawing upon assets (stores or, *in extremis*, productive assets)
- (7) adjusting consumption patterns (changing or reducing consumption).

The literature on coping strategies in semi-arid India⁷

Rani and Dodia's (2001) literature review considered the evidence on coping strategies in semi-arid rural India. It shows that one of the most favoured mechanisms is that of diversifying into non-farm activities and seasonally migrating to other areas. In the semi-arid areas diversification into non-farm activities is of a temporary and permanent nature depending upon the severity of the situation. The literature also very clearly shows that the households that are badly hit in the semi-arid areas are those of small, marginal farmers and landless households and those belonging to lower castes, who also diversify first. This phenomenon is not specific to any particular region but is observed in the semi-arid areas across the different countries.

Apart from diversifying into other income generating activities and seasonally migrating out, the households in the semi-arid areas also view common property resources as integral to their livelihoods. These resources act as a very important source of subsistence for poor households whose depend on CPR for fodder, fuel and grazing of livestock. This point comes across strongly in the literature. However, the studies also reveal that over the years there has been a decline in CPR, due to illegal encroachment, privatisation, government allocation of CPRs under various poverty schemes and auctioning of parts of CPRs.

In diversifying into non-farm activities, households simultaneously draw upon social relationships and informal credit networks. The social relationships and the traditional support system along caste lines continue to serve as a means of support in various ways, though these networks are weakening. Interest rates rise during droughts, making it very difficult for the poor households to borrow, though these networks continue to be effective during normal years.

The consumption needs of farmers during poor years are partially met by drawing upon the reserve assets, which they build up during peak seasons. These may take the form of savings in cash or in-kind (e.g., stored grains), productive assets (such as livestock or land), and non-productive assets (such as jewellery).

In drought years, households also reduce their food intake and expenditure on social and religious commitments. The reduction in food intake is more prominent among the women, and smaller farmers. Finally, the interventions made by the Government in the form of scarcity relief works play a crucial role in averting large-scale starvation and provide employment. However, in recent years there have been doubts about the effectiveness of these relief programmes and whether they reach the needy.

The existing literature provides important insights into coping strategies in different regions of India. The empirical evidence is based principally on village studies, and although the strategies can be categorised (for instance in relation to the seven groups identified in the previous sub-section) the activities that comprise those strategies differ between regions, reflecting heterogeneous opportunities and resources.

Notwithstanding this, some insights can be gained from national-level statistics and these are reviewed in the following section.

⁷ This overview comes from Rani and Dodia (2001).

3. THE SEMI-ARID AREAS OF INDIA – INSIGHTS FROM THE NATIONAL STATISTICS⁸

Comments on definitions, units of analysis and interpretation of the data

Data are available on states, districts and blocks that are drought-prone, though time series are incomplete for all except state data. A drought-prone state is one in which one third or more districts are drought-prone, so it is theoretically possible for a state defined as drought-prone to have a smaller area or fewer people “at risk” than a larger state that is not defined as drought-prone. This is an important consideration when interpreting some of the findings of the state-level analysis.

Definitions used to define drought-proneness have changed over time, but since the 1960s the responsibility has been with state governments to identify drought-prone areas using rainfall data and the historic incidence of scarcity. Of sixteen principal states (i.e., excluding the seven smallest states in the north-east, as well as Jammu and Kashmir, and Goa), seven are defined as drought-prone. Table 3.1 shows these, indicating the proportion of drought-prone districts in each state. For all these states taken as a group, roughly 30% of all districts are defined as drought-prone.

Table 3.1: drought-prone vs non drought-prone states (with drought-prone districts and total number of districts shown in parentheses)	
<i>Drought-prone</i>	<i>Non drought-prone</i>
Andhra Pradesh (8/23)	Assam (0/23)
Gujarat (12/19)	Bihar (6/42)
Haryana (5/16)	Himachal Pradesh (2/12)
Karnataka (15/20)	Kerala (0/14)
Maharashtra (10/30)	Madhya Pradesh (11/45)
Rajasthan (17/27)	Orissa (4/13)
Tamil Nadu (9/21)	Punjab (0/12)
	Uttar Pradesh (15/63)
	West Bengal (3/16)

Two further points about the state-level analysis are important. India’s main cities are enormous and their economic activities may distort or bias the findings for the entire state (or neighbouring states). Delhi falls in Uttar Pradesh, but is also close to the borders of Rajasthan and Haryana. Mumbai (formerly Bombay) falls in Maharashtra and Chennai (formerly Madras) in Tamil Nadu whilst being close to the border with Andhra Pradesh. Calcutta falls in West Bengal. Five of the seven drought-prone (DP) states, and two of the non drought-prone (NDP) states, may therefore be directly affected by the presence of these cities.

Finally, note that it appears that drought-prone states such as Haryana have been classified as drought-prone, even though the mitigating use of irrigation is widespread⁹.

⁸ Unless otherwise indicated, the results reported here are from Iyengar, 2001, GIDR Report No 1.

⁹ Moreover, Iyengar (2001) includes Haryana as DP although less than 1/3 of the districts are DP.

In sum, these points suggest that a robust interpretation of the state-level data is difficult because of the noise created by factors that are not fully explored in the analysis: the influence of the mega-cities (whose early growth can be attributed to strategic location and trading opportunities, rather than poor agricultural potential, and whose subsequent growth has built, at least in part, on the critical mass and comparative advantage previously established); the mitigating (and growth-promoting) effect of irrigation in some of the drought-prone states; the rather arbitrary classification of states (into drought-prone or not) based on the percentage of districts affected; and the manner in which state-level aggregates conceal the variation occurring at district-level, which is particularly problematic in the case of large states. Whilst the state-level findings provide pointers on some interesting issues, consideration of district-level data is likely to be more productive.

Drought-prone states and demography, economy and employment

Consideration of population growth shows no clear trends in the differences between DP and NDP states (Table 3.2). Although there was slower population growth in NDP states between 1961 and 1981, prior to this and after this there was relatively higher population growth than in the DP states, so that over the period 1951-1991 population growth was identical in both groups, at around 2.12% per annum.

	1951-61	1961-71	1971-81	1981-91
DP states	1.87%	2.28%	2.24%	2.09%
NDP states	2.01%	2.16%	2.19%	2.12%

There is some economic rationale to the argument that relative to non drought-prone states, drought-prone states may be: less populous; less densely populated; and more urbanised. Each of these could follow from relatively poor land productivity. Population *per se* is a fairly weak test of this argument because it takes no account of the size of each state. Consideration of population density and urbanisation is, however, very interesting. Drought-prone states are markedly more urbanised but overall less densely populated (see Table 3.3). Moreover, in the drought-prone states a smaller percentage of the population is employed in the primary sector (principally agriculture). Notwithstanding higher levels of urbanisation and non-primary sector employment, *a priori* those states with a less productive agricultural base might be expected to be poorer. Curiously, the data on per capita net state domestic product (NSDP) do not support this hypothesis. On the contrary, they show significantly, and sustained over time, higher incomes in the drought-prone group. Of the four states with the highest per capita NSDP in 1993-94 (Maharashtra, Punjab, Haryana and Gujarat), three are drought-prone. Moreover, of those states in which more than 30% of the population fall below the poverty line, only three are DP whilst six are NDP.

	<i>Drought-prone states</i>		<i>Non drought-prone states</i>	
	<i>1981</i>	<i>1991</i>	<i>1981</i>	<i>1991</i>
Population per km ²	218	267	333	402
Population urbanised	28%	29%	17%	19%
Primary sector workers		65%		71%
Per capita NSDP in Rs	1731	2340	1332	1732

In addition, the drought-prone states accounted for 42% of the total population in 1991 (of the sixteen principal states identified above), but only 37% of the rural poor¹⁰. Consideration of the incidence of poverty in rural and urban areas also reveals some interesting patterns. In drought-prone states as a whole, a lower percentage of the rural population is poor (24% falling below the poverty line compared with 44% in the non drought-prone states), and a higher percentage of the urban population is poor (35% compared with 28%¹¹). This could suggest the following scenarios:

- in areas of higher agricultural potential, the poor stay in rural areas because there are livelihood opportunities; in the drought-prone areas they are more likely to live in or move to towns
- the economic opportunities in agriculturally higher potential areas lead to concentrations of wealth and power, whilst trapping significant numbers in poverty¹²
- possibly stronger adherence to some of the more inequitable and regressive traditional institutions in areas where more of the population remains rural.

This does not explain why the rural poor in the poorer (but NDP) states stay in rural areas – unless it is because they are locked into rural livelihoods by a mixture of carrot and stick measures. (For instance, share-cropping arrangements are, at least somewhat forgiving in a poor year, whilst indebtedness may lock households into literally interminable debt repayment schedules, including labour obligations). An additional point is that the NDP areas have more forest cover, which provides an additional source of income (e.g., from NTFP collection) to poor rural populations¹³. Perhaps urban labouring and migration opportunities do not appear very attractive but in DP areas the rural population sees this as the only alternative to very poor agricultural livelihoods – and once migration becomes commonplace within such communities, it makes it easier for other members of the community to do the same.

Land-use and agriculture in DP and NDP states

Data from 1970/71, 1980/81 and 1993/94 show some consistent, though not necessarily large, differences in land-utilisation between DP and NDP states¹⁴. The most notable is a much higher percentage of area devoted to forest and tree crops in the NDP areas (27% compared with 15% in 1993/94). For all other land-use categories (not available for cultivation, pastures and grazing land, cultivatable waste,

¹⁰ The poverty data are drawn from Fan *et al.*, 1999, and are for 1993. Data for 1991 are not available.

¹¹ The urban differences are less significant: the mean difference is smaller and there is greater variation around the mean.

¹² Gini coefficients give some indication of wealth concentrations. Analysis of gini coefficients for land-holdings indicates a trend towards more unequal distribution of land in 4 of the 9 NDP states and no clear trend in the other five. Similarly, five of the DP states show a regressive trend, with unclear results in the other two. (Iyengar, 2001, p65). However, the relationship between NSDP, wealth concentrations and poverty is difficult to untangle. India's wealthiest state (in terms of per capita NSDP) is Maharashtra. It is drought-prone, and within the DP group it has the highest incidence of poverty. The next wealthiest state is Punjab, which is NDP and has markedly lower poverty than any other state in India.

¹³ This is the case in NDP Orissa, Bihar and Madhya Pradesh, for instance (pers. com, C Conroy)

¹⁴ All of the agricultural statistics should be treated cautiously, particularly where apparent differences are quite small, because of the well-known problems in regularly collecting and reliably reporting on crop areas, livestock numbers etc.

fallow, and net sown area) the shares are higher in the DP states than in the NDP states. Besides from forested area, the other categories of common land all enjoy a higher share of reported area in DP states than in NDP states.

A breakdown of the livestock herd also reveals some differences. Cattle are relatively more important in the NDP states, and sheep significantly more important in the DP states. There seems to be a relatively small difference in the herd share of goats, buffaloes and “others” between DP and NDP states, although the herd share of buffaloes seems to be gradually rising in DP states, whilst remaining static (or possibly declining) in NDP states. There are also some differences in milk yields – cows in DP states are apparently higher yielding on average, but buffalo yields are broadly similar in DP and NDP states.

Over the past 30 years the irrigation trend has been upward. In almost all states, the irrigated share of the net sown area has risen – though the irrigated share in DP states (18% in 1970/71 and 29% in 1993/94) has consistently remained lower than that in NDP states (27% in 1970/71 and 44% in 1993/94). Over this period, the contribution of wells to irrigation has increased, whilst that of tanks has declined.

Average land holding size has declined markedly in the DP states from 3.3 has in 1970/71 to 2.6 has in 1990/91. The decline in holding size in the NDP states has been less marked over this period (1.7 has to 1.5 has), probably because average holding size in NDP states is already much smaller. In the DP states there is a strong trend towards more unequal distribution of land. Gini coefficients show that amongst the DP states only Andhra Pradesh shows an improvement, and the results are mixed in Haryana. This is echoed in the NDP states, though here there are more mixed results.

Consideration of three crop categories (cereals, pulses and oilseeds) reveals that DP states devote a smaller percentage of area to cereals than the NDP states, a roughly equal share to pulses, and a higher share of area to oilseeds. Since 1971, oilseeds have gained area share from cereals in the DP states. Coarse grains such as sorghum and millet are markedly more important in the DP states.

District-level analysis

The district-level analysis compares the performance of DP districts with NDP districts, irrespective of whether they fall in designated DP states or not. This permits a sharper analysis because DP district performance can be assessed in relation to overall or NDP district performance in a particular state.

CMIE has constructed a development index that, on average, shows poorer results for the DP districts compared with the state as a whole. However, the index is potentially problematic because it is a composite index and hence difficult to interpret. Moreover, Iyengar (2001) points out that it is biased in favour of secondary and tertiary activities, and indeed 4 of the 9 main criteria relate to banking services. Consideration of the individual variables is needed.

Analysis of demographic data reveals negligible differences in population growth rates, generally higher population densities in the NDP districts, and in all states,

higher rates of urbanisation in the NDP districts. DP districts tend to show lower rates of literacy.

Forest cover is not consistently higher or lower in the DP districts relative to NDP districts. In most states, a higher share of area is sown in DP districts than in NDP districts. The irrigated share of cultivated area tends to be lower in DP districts. In all states, land holdings in DP districts are larger than in NDP districts. In most states, the DP districts use less chemical fertiliser/ha than the NDP districts. The exceptions are Bihar, Karnataka, Madhya Pradesh and Orissa. The amount of bank credit loaned to agriculture is generally less in the DP districts than in the NDP districts. The value of agricultural output per unit area tends to be lower in the DP districts.

The urbanisation findings are interesting and a little difficult to interpret. DP states are more urbanised than NDP states, but DP districts are less urbanised than NDP districts – implying migration to NDP districts from DP districts, and stronger development and urbanisation trends in the NDP districts. The trend towards urbanisation (principally urban areas in NDP districts) is apparently greater in DP states, presumably partly because of the exodus from DP districts¹⁵.

Udaipur, Rajasthan

Udaipur is one of seventeen drought-prone districts (out of a total of 23 districts) in Rajasthan. Average rainfall is 625 mm, and although very variable, there is a 75% probability that rainfall will be at least 500mm. It receives slightly more rainfall than the state average. Udaipur is less urbanised (17% in 1993) than Rajasthan state as a

¹⁵ In addition Iyengar (2001, pp31-34) presents some rather interesting comparisons of districts by dividing them into different rainfall categories (< 375mm, 375-750 mm, 750-1125 mm, and > 1125 mm). Some very strong patterns emerge:

- population growth rates decline with higher rainfall
- population density increases with higher rainfall
- urbanisation is inversely related to rainfall (partly explaining the higher population growth rates in the lowest rainfall areas)
- employment share of agriculture increases with higher rainfall
- the area share of forest and irrigation increases with higher rainfall
- average land holding size decreases with higher rainfall
- value of agricultural output per unit area increases with higher rainfall

Of these results, the most curious are the higher rates of population growth and urbanisation in those districts with the lowest rainfall. This could suggest that sharper trends towards urbanisation in low rainfall districts attract populations from the higher rainfall districts, or populations in low rainfall districts have higher population growth rates associated with higher rates of poverty. (District-level data on poverty are not available). However, this sits uncomfortably alongside the comparison of DP and NDP districts that shows higher rates of urbanisation in the NDP districts – a finding that is consistent with expectations based on agricultural productivity, rural incomes and consequent trends towards industrialisation and urbanisation. This apparently contradictory evidence merits further investigation. Pending clarification, the district and state data are probably more reliable than these data based on a new rainfall categorisation.

For all the districts, across all rainfall groups, population growth is slowing (1993 compared to 1985), and population density and urbanisation are increasing. Other variables were also considered (e.g., banking services, non-farm employment, Iyengar, 2001, pp 32-34) but no clear patterns emerged.

whole (21% or higher), but apparently more densely populated¹⁶. Forest area share is significantly higher than for the state as a whole, net sown area share less and irrigated area share higher. Land holdings are smaller than the state average, and value of agricultural output per unit area significantly higher¹⁷. The percentage of people employed in agriculture is slightly higher than the state average. These data tend to imply that the district is agriculturally relatively advantaged *vis a vis* a large part of the state- particularly if population density is higher or similar to the state average. Although this is consistent with higher rainfall experienced in Udaipur relative to the state average, some of the differences are quite large and may reflect data errors too¹⁸.

Iyengar's data suggest that agriculture has become markedly more intensive in the period 1985-1993, although the net sown area has also increased. For instance:

- holding size declined from 2.1 to 1.8 has
- irrigated percentage of gross cropped area increased from 21% to 27%
- use of fertiliser per unit area increased by 350% (volume)
- net sown area as a percentage of all area increased from 21% to 38%
- large increases in the use of HYVs for wheat, maize and sorghum
- significant increase in the value of bank loans and bank deposits

The rural share of Udaipur's population has gradually declined from 89% in 1961 to 83% in 1991. Scheduled castes and scheduled tribes represent 42% of the district population of 2.9 million (1993) Poverty data are not available for the district. At state-level, although poverty has declined (i.e., as a percentage of the total population), the decline has been very modest. Only Bihar and Assam (poverty actually increased in the latter) fared worse over the period 1951-1993 (Fan *et al.*, 1999).

Anantapur, Andhra Pradesh

With average rainfall of 544 mm., Anantapur is one of eight drought-prone districts (out of a total of 23 districts) in Andhra Pradesh. In common with the national-level findings, it has slightly lower rates of urbanisation and lower population density than the state as a whole. However, the population share employed in agriculture is apparently higher than for the state as a whole. Forest and irrigated area shares are less, and net sown area share more than the state average. Other district indicators of agricultural intensification (e.g., use of fertiliser, value of output per unit area, use of agricultural credit, per capita production of food grains) are all consistent with the expectation of a relatively less productive agricultural sector.

Notwithstanding its position relative to the rest of Andhra Pradesh, official data indicate that Anantapur's agricultural sector has become significantly more intensive

¹⁶ Iyengar, 2001, reports higher population density for Udaipur than for the rest of the state. However, comparison with other sources suggest that Iyengar's population density for all Rajasthan is too low. No comparative data were available for Udaipur district.

¹⁷ This presumably reflects a degree of intensification associated with the smaller holding size, and the fact that in there is more reliance on livestock in the more arid parts of the state.

¹⁸ SPWD note some changes to the district boundaries that may have caused some data aggregation problems.

in recent years, and there have been other notable changes. Between 1985 and 1993, the following are of note:

- net sown area share increase from 50% to 61%
- forest area share increase from 10% to 15%
- a fall in average holding size from 4.1 to 2.9 hectares
- increases in credit, chemical fertiliser and value of output per hectare¹⁹
- population density increase from 137 to 166 people/square kilometre
- increase in the literacy rate from 29% to 42%
- a significant increase in bank deposits and bank lending
- fall in population growth from 2.4% to 2.2% per annum
- a fall in the irrigated area share from 19% to 14%, and
- a small fall in per capita production of food grains.

The increased importance of groundnuts seems to have made a major contribution to these changes – explaining the evidence of agricultural intensification simultaneous with falling per capita production of food grains. General economic and social policies of the State Government must have also played an important role, since Andhra Pradesh is one of only three states that have managed to reduce absolute numbers of poor²⁰. Rao (2001, p4) notes four important changes that took place in Anantapur in the 1980s:

- increased political awareness, the emergence of a new political party and shifts in the “political and social balance”
- the introduction of bore wells
- strengthening of the public distribution system, with important effects for the poor and on the cropping pattern, and
- changes to the district administration system, bringing “governance closer to the people”.

Scheduled tribes and castes represent 18% of the population of 3.2 million (1991). Rao notes that poverty has fallen sharply since 1977/78, but poverty in Anantapur is still high relative to the rest of the state. State measures to foster development in rural areas have included: lowering land taxes, agricultural extension and subsidised inputs, subsidised credit, marketing interventions, land reforms, food subsidies, the provision of education and health services, and pressure on certain “social evils” such as dowries and untouchability (Rao, p2).

¹⁹ 200-400% change in index points

²⁰ This may also go some way to explaining a curious aspect of the report of the Anantapur fieldwork conducted by SPWD. The report’s authors stress that the downturn in the groundnut market had led to recent hardship and suicides, making the field work untimely and difficult, but the report nonetheless gives a strong impression of significant improvements in many aspects of rural life over the last twenty years.

4. RESULTS OF FIELD STUDIES IN ANANTAPUR AND UDAIPUR

Overview of the research sites in Anantapur, Andhra Pradesh

Two mandals falling in the hard-core drought prone central zone of the district were selected for study: Anantapur mandal, which is considered somewhat better-off, partly because of its proximity to Anantapur town and to an important silk saree market; and Rayadurga mandal, which is considered very remote, more DP and very poor. Within each, two villages were selected to represent relatively more and less remote places (reflecting proximity to towns and distance from the metalled road):

in Anantapur mandal, Manila is remote and Somaladoddi less remote;
in Rayadurga mandal, Mechiri is remote and Vadrhonnuru less remote.

Ironically three of the villages have similar poverty percentages (Vadrhonnuru at 84%, and Manila and Somaladoddi both 90%), whilst the fourth, which is also the more remote village in the more remote and allegedly poorer mandal, has only 47%.

Soils in this central zone are poor, the lands barren, and rainfall less than 525 mm. There are certain trends that form a common backdrop to rural livelihoods in each of the four villages studied. Firstly, there has been a phenomenal increase in groundnut area, from 19% of cropped area in 1962 to 72% in 1993/94 – an increase that is principally due to Government of India policies to promote oilseed production²¹. Groundnuts have taken land from coarse grains, other oilseeds and cotton. Secondly, recent trade liberalisation has led to a collapse in the groundnut market, as cheap palm oil has been imported from Malaysia. Around 45 suicides in Anantapur District during 2000 are attributed to the extreme strain these market changes have placed on groundnut farmers.

Although crop yields, input use and irrigated area are low compared to the rest of state, and animal draught still dominates, agriculture in Anantapur has nonetheless been subject to considerable change. Agriculture remains the most important source of income. Average holding size is declining. This and increased commercialisation (greater concentration on cash crops, notably groundnut, but also mulberry, sunflower, vegetables, flowers and fruits) has led to more intensive production (evidenced by agricultural credit, input, value of output and mechanisation indicators). Pests are considered an ever-increasing problem, whilst adulteration of pesticides is also widely alleged. There are no clear trends in livestock numbers – except a recent significant increase in the number of female buffalo and a strong increase in poultry numbers²². Compared with twenty years ago, livelihoods in the district have become more specialised and more monetised. There are fewer in-kind transactions, there is less subsistence production and less storage of food grains.

In the previous section it was noted that Andhra Pradesh has had considerable success in tackling rural poverty. This also forms an important backdrop to the work – because it goes some way to explain the widely reported improvements (in many

²¹ It is also alleged that there has been a delay in the onset of the rains, that has become a pattern, and that groundnuts do well under this regime.

²² The poultry trends are slightly muddled by what appears to be a factor of ten mistake in Rao's data for 1993 (p18) and missing data for 1987 (the previous observation).

aspects of village life) between 1980 and 2000, despite the immediate gloomy outlook attributed to the change in groundnut markets. Widespread improvements include:

- expansion of road network
- electrification and more school facilities
- pensions
- women's groups
- hand-pumped or piped drinking water
- housing improvements
- greater agricultural mechanisation

Most of the industry in the district seems to be agro-based: groundnut oil and by-products, silk yarn and saris, matches, beedies and handloom cloths. Textiles are an important medium/large-scale industry and cottage industry. The district also has some small engineering and quarrying enterprise.

Women's status seems to have improved considerably. Women are now more likely to be consulted on important issues (marriages, purchases, cropping decisions, village disputes); they are involved in a wider range of income generating activities; they are more likely to belong to self-help groups; awareness of financial issues and health matters has improved; and the differential with men's wage rates remains but has lessened.

Against this common backdrop, the differing features of the study villages are summarised in the following sections. The detail of the individual surveys is not reproduced here. Rather, the intention is to identify the main trends and "to tell the story" of the livelihood processes and changes taking place.

Anantapur mandal (the more advantaged of the two mandals)

The more remote village surveyed was *Manila*. The population of the village is 1839. Manila is 17 km from Anantapur town. The main crops are groundnut, paddy, redgram, sunflower, vegetables, oranges, grapes and mulberry. Orange and grape cultivation is apparently constrained by groundwater depletion and pest problems. Cattle (buffalo and cows) and small ruminants (especially sheep) are very important. Most small and marginal farmers own cows. About 80% of the milk output is sold through a milk co-operative with a collection centre in the village. At least 50% of the households are involved in non-traditional activities (taken-up over the last 25 years): weaving, dairying and quarrying. The poorest are excluded from weaving because of cost of the looms. Farmers with less than 2 hectares tend to do labouring as well – on other farms, at the quarry or on road construction (which requires migration). Interestingly there is less migration now than in the past. Only 20 people work as attached labour – one fifth of previous numbers.

Informal sources of credit still dominate but it seems that interest rates may be higher than in the past perhaps because some of the other more restrictive practices (and from the lender's point of view, risk-reducing practices) are now less prevalent. (These include attached labour arrangements, and agreements to sell crops at poor prices in return for loans).

Households keeping small ruminants have found this increasingly difficult, and as a consequence small ruminants can be sold easily to itinerant traders at good prices. Former grazing lands (and even paths) are now used for groundnut. Insufficient groundwater and disease problems also afflict the small ruminant herds. Those people who do keep small ruminants migrate 30-40 kms during the summer.

Somaladoddi is also in Anantapur mandal but is less remote than Manila. The population of the village is 2351. It is only 7km from Anantapur town and situated on a main road. The cropping patterns are similar to Manila but livestock numbers are much larger. Dairying is important but quarrying and weaving are not. 40 households are involved in organised industries (presumably in the town) and 50 people have migrated to Bangalore.

The size of landing holdings tends to be smaller here than in remoter Manila – presumably reflecting higher population densities in areas close to the town. Interestingly, despite this constraint, and despite proximity to urban employment, agriculture and livestock together are relatively more important livelihoods here than they are in Manila. (In Manila there is more non-farm labouring, and weaving). This may mean that market access is more important than resource endowment in determining livelihood patterns – though the Manila results may be distorted by the incidence of weaving. (Weaving became important there almost by accident – as a result of proximity to a traditional saree trading centre and members of the community who returned with newly acquired weaving skills which they were able to pass on). This scenario would also suggest that the non-farm labouring activities in Manila (quarrying and road construction) are activities into which the poor are pushed by low agricultural incomes, rather than drawn by the prospect of good incomes (as would be true of weaving).

Small ruminant rearing is considered very profitable – though 5 months migration is required and disease is a problem. Fifteen years ago, the small ruminant rearers did not have land but this was changed as a result of government action. This group now rears animals, cultivates land and work as wage labourers – apparently contributing to a significant improvement in their socio-economic status and aspirations.

Dairying is also an important activity in the village, with feed regimes including fodder and locally sourced purchased feeds (groundnut cake, rice bran etc). The use of purchased inputs, an active market in live animals and the involvement of more than half of the households in dairying suggest this is a vibrant commercial activity.

Rayadurga mandal (the more disadvantaged of the two mandals)

Rayadurga is considered very disadvantaged, falling in the lowest quintile of mandals in Andhra Pradesh. There is little irrigation here (12%). Rural non-farm employment is important – apparently largely for people being pushed out of agriculture (at least for part of the year). It has experienced the same switch to groundnuts seen elsewhere in Anantapur and recent changes in livestock composition. Sheep and female-buffalo have increased in importance. The presence of Rayadurga town lends the mandal some urban characteristics.

Mechiri is a remote village. It has a population of 2000 and is located 15 kms from Rayadurga town and 4 kms from a metalled road. This part of the state borders Karnataka – so important market towns for the village (which are all more than 45 kms away) include towns in Karnataka state.

An important characteristic of the village is serious pressure on water resources (and for the mandal as a whole, droughts almost once every two years on average). Only two open wells are still functioning and some of the bore wells have dried up too. Agriculture and livestock are the main sources of livelihood but roughly 20% of households migrate to do farm labouring in the irrigated areas of another district for three months/year. Migration is now a more important livelihood strategy than in the past. Around half the families are involved in traditional village trades (barber, cobbler, carpentry, blacksmith, washermen etc.)

Cattle populations have declined, apparently because of the squeeze on common lands. Sheep, however, have become more important – even though herders have to migrate to find adequate water and fodder.

Vadrahonnuru is less remote. It has a population of 1,400. It is located 7kms from Rayadurga town and only 1 km from the metalled road. Like *Mechiri*, the village's open wells have dried up. Proximity to the town and road means that daily employment in the town and seasonal migration to other parts of the district are fairly common (and becoming more so) – involving an estimated 50% of village households.

Livestock trends are similar to those in *Mechiri*. Likewise, the trends in agriculture towards cash crops (particularly groundnut), more intensive production, less food crop production and reliance on subsidised PDS rice, are similar to those seen in the Anantapur district in general.

Overview of the research sites in Udaipur District, Rajasthan

In Udaipur, four blocks (similar to a mandal) were covered by the field research:

- (1) Kotra was selected to include a block in which seasonal migration for agricultural labour is common; two villages were surveyed (Tulikahet and Hasreta)
- (2) Pratapgarh is distant from Udaipur City and actually in the neighbouring district (Chittaurgarh); two villages were surveyed (Mhendi Kheda, a forest village settled by people relocated from a dam site, and Haripura, closer to the town, with thin forest)
- (3) Girva block includes Udaipur city; two villages were surveyed (Patukheda and Sagatdi)
- (4) Jhadol block was selected to include an area in which there had been a significant shift to cash crops (particularly ginger) from food crops. Two villages were surveyed (Malpur and Goran).

Udaipur contrasts quite sharply with Anantapur in the respect that the field report gives markedly less sense of long-term improvements in livelihoods and wellbeing. To some extent this must reflect Rajasthan's poor performance in reducing poverty (it has been one of the nation's worse performers) relative to Andhra Pradesh (which has made significant strides in this area). This is the impression despite the fact that agriculturally Udaipur is probably relatively advantaged *vis a vis* most other districts in Rajasthan.

Some trends are common to the whole district. Agriculturally there is increased use of purchased inputs and HYVs, increased mechanisation and some crop shifts. The gross cropped area has declined from roughly 350,000 to 250,000 has (1971 to 1995). In terms of area share, grains and all oilseeds have remained roughly constant, whilst pulses and mustard have grown in importance. Curiously the data on land holdings imply a process of fragmentation between 1970 and 1980, which was reversed in the following decade – perhaps reflecting the strong rural-urban migration trends. The latter also explains the rise in women-farmed plots.

Kotra, Udaipur

Kotra's population is 86% tribal. Shifting cultivation was common until 1960 but with increasing population pressure, rotation periods have shortened and agricultural livelihoods have been under considerable pressure. Collection of *tendupatta* and other NTFPs are an important source of livelihood in the block, as is wage labour (in agriculture, industry and mining). Seasonal migration for agricultural labouring is widespread. The two villages surveyed fall in the part of Kotra considered the most backward.

In *Tulikahet* village agriculture seems to be viewed as quite hopeless, with only women and old people involved in agricultural production. There is little forest. The cultivated area is hilly and only 6% of area is irrigated. The main earning group (aged 21-45 years) work in nearby mines. Young people do not aspire to work in the agricultural sector, despite its formerly central and visible role in the village economy. They look to mining and factory work. Women here work in agriculture and NTFP collection, and spend many hours carrying water. They are not used to speaking out in public about their concerns and needs.

In *Hasreta* village there seem to be slightly better opportunities. There are cultivated plains and there is more forest, with improved potential for collection and trade of NTFPs. However, there was considerable commercial tree-felling after Independence, which led to conflict with the tribal peoples whose livelihoods depended partly on the forest. Many women are involved in agriculture, and NTFP and *tendupatta* collection. Women's groups are more common here and women seem to be more forthcoming in meetings. Some of the youths work in NTFP collection – but try to avoid agricultural and household activities, particularly if water and electricity are not available. Young people aspire to migration and wage labour.

As in *Tulikahet*, the main income-earning group does not consider agriculture a viable income source. For last 5-7 years, community members have sought work in Gujarat. They commute or migrate, and prefer regular employment (which amongst other

benefits makes repayment of loans easier). When they do return or farm village lands, they are more likely to adopt improved practices.

Pratapgarh, Udaipur

Pratapgarh has two distinct areas: a relatively more fertile and agriculturally rich area (with more irrigation), and a hilly area which is poor and settled by tribal people. Here, as in Anantapur, there is a strong sense of a shift to a more monetised and specialised economy – but (as noted above) less sense of overall improvements in rural livelihoods. Community members give the impression of droughts and water shortages whose consequences are getting worse²³. However, again in contrast with Anantapur, there is no mention of the public distribution system or an impression that the state will provide adequate compensation in times of hardship. One notable area of improvement though relates to education and more schools.

The poor in this area are marginal farmers, livestock specialists and NTFP collectors (especially *tendupatta*). Labouring is widespread, for e.g., migratory agricultural labour and construction. 69% of the tribal population live below the poverty line.

In *Haripura* there was a shift to more cash crops (cotton and dil) roughly 25 years ago. Now, with less cultivation of traditional food crops and less on-farm storage, the population is more dependent on government assistance if the rains fail. However, there is little confidence that the response would be adequate in the event of a very severe drought. Animal husbandry used to be much more common, when there was more grazing land. Forest resources have also declined. Wage labour has gradually become a normal activity, whether involving seasonal or permanent migration, or daily commuting.

Mhendi Kheda is a forest village (virtually the whole area is a declared protected forest area), whose principal resource is now threatened. There has also been some (rainfed) agricultural encroachment on the forest area. The men here still regard the forest as important, but women see cattle and government wage employment (previously there were labouring opportunities on a dam construction site) as offering more potential. For women, the forest is most useful if it provides water for the animals. In this village, the women engage in wage labour locally, whereas the men migrate long distances. This work tends to be casual, low status and one over which the villagers have little control – but clearly feel they have few other options.

Girwa, Udaipur

Girwa has an urban character largely because it includes Udaipur city. 53% of the population is urban (1991). In this block, the poorest members of the community are generally marginal farmers, livestock (especially goat) specialists and non-agricultural labourers.

Udaipur town provides a good market for dairy products and creates labouring opportunities in sand extraction (related to construction), dairies and industry. A zinc mine is also an important source of employment in the block. Over the last twenty

²³ Rainfall data do not support this, but certainly the consequences of low rainfall may be felt more acutely where deforestation has led to more rapid run-off and higher rates of evaporation.

years, maize, mustard, jute and *rabi* pulses have increased in importance, whilst barley, horsegram, chilli, sugar and minor millets. The wheat area has remained roughly constant. Buffalo numbers and poultry have increased significantly. Areas close to the town supply vegetables too but this is under pressure because of the falling water table.

In *Patukheda*, agriculture and livestock are the main livelihood sources, though most families have some members who have migrate (10-12% of the population apparently migrate) or are involved in casual labouring on a part-time, seasonal or irregular basis.

There is no daily commuting for wage labour, however. The nearest bus route is on the main road, three kms away. There is widespread use of HYVs and chemical fertiliser but villagers complain of an overall decline in agricultural productivity.

By contrast, *Sagatdi*, is well-connected. The main road passes through the villages and there are frequent buses to Udaipur town and other nearby markets. As a consequence, non-agricultural wage labour is important to these villagers (construction, public works, sand extraction, and truck and tractor driving). Migration has also increased dramatically in the last fifteen years. Livelihood portfolios tend to involve own agriculture, livestock and non-agricultural labouring – with seasonal variation in the importance of different activities.

Jhadol, Udaipur

In sharp contrast with Girwa, Jhadol is very rural. 71% of the population is tribal. 90% of the population depend on agriculture and forest resources for a living. There is little irrigation – rendering the block very dependent on low and erratic rainfall.

Agriculture here is still largely a subsistence operation (with maize and wheat the important food crops). In the last twelve years, there has been some introduction of ginger and other cash crops such as mulberry and soybean – but these crops do not seem to have taken on a major importance. The cattle population has declined (particularly since the 1987 drought) and goats are becoming more important. Agricultural productivity has improved over the last 20 years, apparently largely because of increased use of purchased inputs and HYVs. The tribal population is very dependent on the forest for a living – collecting fuelwood, timber, grass and NTFPs.

In *Malpur* agriculture provides the livelihood mainstay so long as rainfall is adequate. In drought years many people migrate for as long as six months, to take up non-agricultural and agricultural wage labour opportunities. Livestock were previously more important but successive droughts have concentrated the herd on goats, which fare better in dry areas. Forest products supplement incomes and subsistence requirements. Recently, however, there has been mounting pressure and conflict over forest resources (which abated for a period, with a programme of re-afforestation and community management), resulting in an acute shortage of animal fodder.

Agriculture is also dominant in *Goran*. Although some people have steady though modestly paid employment with NGOs, most people depend on agriculture (together with livestock) supplemented by wage labour (involving several months away from

the village each year) or village-based micro-enterprise (in generally traditional trades).

5. CONCLUSIONS

Overview of general livelihood trends in DP areas

Boxes 5.1-5.3 summarise key differences between the DP and NDP areas, as well as trends in the DP areas, and changes in livelihood and coping strategies in DP areas.

Box 5.1: How are DP areas different from NDP areas?
Lower population density Lower literacy Larger holding size Smaller share of the population employed in agriculture less urban (in the immediate area) agriculture less intensive smaller percentage of the rural population is poor higher percentage of urban population is poor higher migration rates (though much of it seasonal) less forest less irrigation higher percentage of area is cultivated (annual crops)

Box 5.2: What are the trends in DP areas?
Becoming more densely populated Holding size becoming smaller Agriculture becoming more intensive, more monetised and more market-oriented Agriculture becoming more specialised – less diversity in varieties and species Extreme pressure on groundwater resources Permanent or seasonal migration and daily commuting becoming more common Better road and transport links, facilitating migration, commuting and market access Less CPR and what is there has to be shared among more people More farms worked almost exclusively by women, elderly and children

Box 5.3: How are livelihood and coping strategies changing in DP areas?	
In the past	In the future
More subsistence and food crops Own storage of food crops Quasi-protective patron–client relations Reduce risk through crop diversification Low-yielding drought-tolerant species Use own stores and livestock as savings Credit from local lenders in community Low interest rates but other obligations More attached labour Migration an activity in crisis Less irrigation More groundwater More CPR to supplement livelihoods	More market-oriented and cash crops Purchase of food crops More dependence on the state and PDS Specialise to increase income More use of HYVs and purchased inputs Use cash savings, also land and home Wider choice of lenders including banks Higher interest rates but fewer conditions More wage labour and seasonal migration Migration a normal or preferred option More irrigation More pressure on water resources

Livelihood strategies in DP areas as indicated by national-level data

In the broadest terms, the national data point to less reliance on agriculture as a livelihood in DP areas and a greater tendency towards migration (rural-rural migration and rural-urban migration). This finding is principally based on:

- (a) lower population densities but higher rates of urbanisation in states where at least one third of the districts are DP; and
- (b) lower employment shares in agriculture in DP states.

Ironically, this “forced” economic diversification²⁴ appears to have had long-term benefits. The drought-prone states have lower poverty rates and higher per capita NSDP. Perversely, there is now a lower incidence of rural poverty in the DP states than in the NDP states, but higher urban poverty (though this difference is less marked than the rural poverty differential). However, DP districts have lower literacy rates than NDP districts.

A possible explanation of the better performance of the DP states in respect of rural poverty is that: the benefits of lower population densities and larger land holdings now outweigh the agro-ecological advantages of the more densely populated NDP states; rural communities in DP states enjoy better access (determined by the better rural services available in higher income states) to larger urban markets than rural communities in NDP states; migrants from DP areas send money back to families in DP rural areas; and NDP states, where agriculture offers a reliable if not particularly lucrative livelihood, and forests help provide an income supplement, have retained their poor rural populations much longer²⁵.

The national-level data also give some clues to agricultural strategies in DP areas relative to NDP areas. There is a smaller area share devoted to forest and tree crops in DP areas, and a higher percentage of area is sown. DP states devote a smaller share of area to cereals and a higher share to oilseeds. Coarse grains are much more important in DP states than NDP states. A smaller percentage of the cropped area is irrigated. Cattle are more important in NDP areas and sheep markedly more important in DP areas. Although agricultural production strategies are less intensive in the DP areas, there is nonetheless a clear trend towards intensification and greater use of purchased inputs.

Average land-holding size is falling particularly rapidly in DP areas (though holdings are almost twice as large as those in NDP areas). Worryingly, there is a much stronger trend towards less equal distribution of land in DP areas than in NDP areas.

²⁴ Forced in the sense that it seems that people are “pushed” out of agriculture because of low potential.

²⁵ In DP areas, severe but erratic droughts can lead to an uneven exodus. Moreover, once large numbers of DP community members have migrated (seasonally or more permanently), it is easier for others to follow. There are large numbers of poor in NDP areas but less incidence of crisis migration arising from a particularly severe drought.

There are several aspects in this analysis that give rise to concern over the future sustainability of rural livelihoods in DP areas:

- (a) on average, land holdings are rapidly becoming smaller, and this is accompanied by a trend towards more unequal distribution of land; it implies an increasing incidence of landlessness or near-landlessness;
- (b) the sown area share is already much higher than in NDP areas, so scope to increase production from increased area is becoming more limited
- (c) forest area is less in DP districts but judicious tree cover would contribute to improved water resource management in these water-scarce areas (limited forest cover also means less use of CPR as an income supplement)
- (d) groundwater is becoming particularly short; DP areas depend substantially on water from bore-wells
- (e) populations in DP districts are less literate than those in NDP districts – exacerbating their inability to access the more remunerative categories of non-farm employment²⁶

Analysis of experiences in Anantapur and Udaipur provides more detail on these livelihood strategies. It is important to analyse these separately because they do seem to be subject to quite different trends.

Livelihood strategies in Anantapur

Asides from the general information relating to the area characteristics, there are three important contextual features to the Anantapur study:

- (a) Andhra Pradesh has made significant inroads on poverty and this seems to partly explain very marked improvements in rural livelihoods in Anantapur over the last 20 years²⁷
- (b) Anantapur is suitable for groundnut cultivation, and as a result of GoI policies to encourage oilseed production, groundnut has become the dominant crop and significantly boosted incomes in the study area
- (c) the groundnut market has recently collapsed due to policy reform that permits the import of Malaysian oil palm; bar a policy reversal, a full recovery of the groundnut market seems extremely unlikely²⁸; this situation has placed Anantapur in a situation of crisis and uncertainty

Chambers *et al* (1989) identified three livelihood objectives: survival, security and self-respect. Once the first is achieved, people tend to pursue the second and third.

In the past in Anantapur (i.e., prior to the state-led poverty-reducing measures and the ascendancy of the groundnut crop), livelihood objectives were probably a mixture of

²⁶ However, Lanjouw and Shariff (2000) point to other important constraints on access to non-farm employment in India. Lower castes, even when educated, are under-represented in better paid work.

²⁷ In terms of the number of districts affected, Andhra Pradesh is less DP than Rajasthan. This may go some way to explaining capacity to tackle poverty, although it is undoubtedly only a partial explanation of the ability and will to implement more progressive social and economic policies in Andhra Pradesh.

²⁸ Some recovery may be possible, but analysis of the market conditions necessary falls outside the scope of this study

survival (based on stable subsistence) and security (based on assets and risks). Livelihood strategies were then characterised by risk reduction (e.g., through cultivation of drought-tolerant crops, traditional food crops, and a diverse range of crops) and insurance substitutes (with savings held as livestock and food stores). When survival was threatened (for instance, due to a severe drought), people migrated. (Some interviewees reported more migration in the past than presently).

For the larger farmers in Anantapur (i.e., those with more than 2 has), livelihood objectives now seem to straddle security and self-respect (based on independence and choice) whilst smaller farmers are still pursuing survival and security objectives. Intensification and concentration of agricultural activities (notably on groundnut, but also into other cash crops) has been a strategy of choice (facilitated by the *de facto* insurance provided by the state PDS). The corollary of this has been the decision by farmers *not* to migrate. Security is pursued through asset accumulation, including land, shelter and cash savings. Focus group discussions of changes in the community demonstrate the value attached to (and self-respect gained from) greater involvement in community and/or family decision-making. Agriculture is the dominant livelihood strategy and dairying is also important. These are activities of choice for many people.

This progression in livelihood objectives has been accompanied by greater monetisation and commercialisation of all transactions in the rural economy. There are fewer in-kind transactions; there is less on-farm storage of crops; there are more sources of credit; and credit repayment terms are now more likely to be reflected solely in the interest rate (with less use of other conditions such as attached labour or crop sale obligations, though the latter undoubtedly still occurs).

Rural non-farm rural activities and migration remain important, however. In areas with particularly poor market access, part of the rural population appears to be pushed into poorly paid labouring or migratory activities (construction, quarrying, migration to Bangalore, and seasonal migration to take-up agricultural labouring in irrigated areas). Agriculture and dairying in these areas seems to suffer as a result of poor market access. Agriculture seems to offer better livelihoods in areas close to town – notwithstanding the greater population density and smaller agricultural holdings in these areas. The low status casual labouring activities contrast with non-farm livelihood activities of choice such as dairying and weaving – where those concerned are able and willing to invest in looms in order to reap the higher returns from this activity²⁹.

Box 5.4 summarises selected aspects of the household livelihood strategies observed in Anantapur.

²⁹ That said, handloom is becoming less remunerative than in the past.

Box 5.4: selected aspects of household livelihood strategies in Anantapur	
Allocation of family labour	No clear patterns emerged, except men are more likely to migrate than women.
Technical choices between crops, livestock and other enterprise	Greater use of purchased inputs and mechanisation. Dominance of one crop (groundnuts). Sheep provide a good income source but most places report pressure on grazing lands. Market access an important factor affecting choice of farm activities
Enterprise choices: subsistence vs. commercial and off-farm work	Commercial agriculture is the dominant strategy (groundnuts and other cash crops) but supplemented by other income including off-farm labouring, dairying and other livestock. Populations with poor market access, and the poorest households, more likely to be pushed into poorly paid labouring and migratory work. Others exercise more choice
Savings, investment and borrowing decisions	Savings previously held as livestock and stored crops. Now held as land, shelter and cash (including banked savings). Wider variety of credit sources. Higher interest rates but some decline in other conditions e.g., attached labour obligations
Strategies to manage natural resources including soil fertility	Much less use of organic manure and substantially more dependence on chemical fertiliser. Long-term soil fertility decline. Scant reference to mulching, rotations, agro-forestry.
Strategies to manage rainfall and other variable factors	Greater dependence formal safety nets (state compensation and PDS). Ill-prepared to manage groundnut market collapse.
Management of household consumption	Overall, little impression that it is necessary to adjust consumption. However, compared with the past: less recourse to wild products during drought; less precautionary storage of own crops; and greater dependence on PDS.
Community activities and other social action	Marked improvements in women's empowerment and involvement in SHG. Community participation in local governance. Improved civil status and security for SC and ST.

Livelihood strategies in Udaipur

In sharp contrast to the situation in Anantapur, Rajasthan has a very poor track record in tackling poverty. The annual decline in the incidence of rural poverty over a forty year period starting in 1951 was less than 0.2% - i.e., the third worst performer in India. (Nationally, the aggregate reduction in poverty was 1.3% per year). Between 1960 and 1993, the rural population living in poverty in Rajasthan increased from 9.7 million to 17.6 million. (A fairer assessment might be against the 1990 figure of 13.5 million, before the economic reforms of the early 90s took their toll on the rural poor).

Udaipur contrasts with Anantapur in many other respects too. The field reports give a strong impression that in some parts of the district rural livelihoods are collapsing and that agriculture is not a livelihood of choice. This is especially true in areas with severe water problems and without electricity. In some villages surveyed, the young people aspire to migration, and to work in quarries and factories. Many people in the

main earning group (aged 21 to 45 years) migrate regularly on a seasonal basis. The farms are run by women and the elderly, with some help from children. Livelihood objectives for those that remain are predominantly survival objectives. Higher level objectives are largely pursued through migration and non-farm employment.

Box 5.5 summarises selected aspects of the household livelihood strategies observed in Udaipur.

Box 5.5 :selected aspects of household livelihood strategies in Udaipur	
Allocation of family labour	No consistent pattern of priorities in the four blocks studied. However, clear that women, children and elderly are more likely to be left running the farm – and men more likely to migrate. Women do, however, migrate for 1-2 months – though prefer nearby wage labouring opportunities if available
Technical choices between crops, livestock and other enterprise	In some areas, agriculture is no longer the occupation of choice. Mining, construction and factory work is common, even if it requires seasonal migration. In agriculture, there is a shift from traditional varieties and crop diversification to greater concentration on wheat, maize, and mustard. Shift to more goats (and fewer cattle). Widespread use of HYVs and purchased inputs. Forest products and off-farm labour (agricultural labouring and other labouring) widespread as a supplementary source of income to farm households
Enterprise choices: subsistence vs. commercial and off-farm work	Shift towards more commercial and input-intensive agriculture, but in tandem with retention of some subsistence practices as a safeguard in times of drought. Off-farm work is both a regular strategy and one to which more people resort during drought. Semi-skilled workers tend to migrate for longer periods (e.g., 10 months/year). Seasonal migration and daily commuting to urban areas is now very common in households in Udaipur.
Savings, investment and borrowing decisions	Tribal population hold savings mainly as jewellery and small stock. Tribal women can play an important role in financial decisions. Some use of SHGs but more reliance on traditional moneylenders here than in Anantapur – with traditional practices of interest rates plus other obligations.
Strategies to manage rainfall and other variable factors	Dependence on government compensation and public works employment – though doubtful of adequacy of this in severe drought. Tend to resort to increased migration and non-farm wage labour.
Management of natural resources, including soil fertility	Much less use of organic manure and substantially more dependence on chemical fertiliser. Long-term soil fertility decline. Scant reference to mulching, rotations, agro-forestry.
Management of household consumption	Talk of eating fewer meals or less nutritious meals. Reducing consumption of purchased items (oil, tea, clothes).
Community activities and other social action	Relatively few SHGs and women unaccustomed to speaking out in meetings. Community could be characterised as victims rather than by ability to marshal political resources to address their needs. Lack of confidence in adequacy of compensation in

the event of natural disaster

Semi-arid areas: common themes amidst diverse livelihood strategies

In sifting the micro-level data, it is clear that different households experience quite different pressures and opportunities. It is tempting to caution against generalisations, but certain generalisations are possible. However, it is particularly important that where further research to address related issues is undertaken, the underlying assumptions are questioned and investigated at the new research site. Their validity in any given location can certainly be affected by local-level factors.

Household livelihood strategies seem to comprise elements of: own farm and livestock production; local wage labouring in agriculture or other sectors (daily commuting or within the community); use of CPR; and migration (seasonal, shorter periods, longer periods). Within each of these categories there are a range of additional choices, e.g., use of purchased inputs and HYVs, more market-oriented or more subsistence oriented, relatively more or less dependence on livestock, etc. Broadly speaking though, it is possible to identify five categories of strategies (i.e., those four identified here, but dividing the first into modern agriculture (more concentrated, more intensive, more market-oriented) and traditional agriculture (more diversified, extensive and subsistence-oriented).

There are then a series of factors that influence those choices – some are “push” factors (negative influences that make a particular livelihood less attractive) and others are “pull” factors (positive factors that attract households into those livelihoods). Sometimes both are present, leading to indeterminate outcomes, reversals or simply dominance of one over the other.

Box 5.6 summarises the direction of change for those 5 components of rural livelihood portfolios and describes some of the positive and negative pressures to which they are subject.

Box 5.6: Components of rural livelihoods, direction and source of change			
	<i>Increasing/ Decreasing</i>	<i>Push factors (pressure for decline)</i>	<i>Pull factors (pressure for growth)</i>
<i>Modern agric</i>	I	Output market collapse Pesticide resistance Pesticide adulteration Severe drought	Improved market access Good income potential Credit more available
<i>Traditional agric</i>	D	Decline in farm size Decline in soil fertility Decline in traditional inputs (forest/livestock)	Reduce market risk
<i>Local labouring</i>	?	No work available	Want to work locally Good work available
<i>Migration</i>	I	Own farm profitable	Urban growth Transport/good links
<i>CPR</i>	D	Decline in CPR	Few other options

There are then factors at household-level (the assets described in section 2) that influence the choices made by households or individuals. For example, the wealthier members of the community are more likely to be involved in “modern” agriculture and more remunerative non-farm enterprise. Poorer households are more likely to be involved in low entry barrier labouring and migration, “traditional” agriculture and CPR-related activities.

This analysis underlines the squeeze on poor people’s livelihoods in semi-arid areas. Of the five livelihood components identified here, they are more likely to be involved in four (participation in “modern” agriculture, whilst undoubtedly occurring, is constrained in extent by inability to bear market risk, lack of working capital, landlessness or small farm size). Of these four, two are under inherent pressure to decline (extensive agriculture and CPR), whilst migration is increasing, and local labouring opportunities are determined by local-level factors (mining, public works, nearby and accessible areas of irrigated agriculture, transport links to nearby town etc.). Moreover, as women are less likely to migrate, it is apparent that their livelihoods are under particular pressure (though possibly supplemented by remittance income).

Researchable options are explored in the following section. However, it is worth noting here that other types of recommendations are also apparent. For instance, road improvements boost agriculture by improving market access and facilitating daily commuting or migration. An improvement in literacy in drought-prone areas would go some way to improving employment opportunities for those who migrate. Community-development and institutional strengthening activities (for instance working through self-help groups) would improve access to working capital and participation in “modern” agriculture.

Researchable options

Agricultural labouring in more intensive irrigated or NDP agricultural systems
Seasonal migration (and occasionally daily travel to nearby areas) to take-up agricultural labouring is an important livelihood activity for the poor in semi-arid areas. Agriculture and natural resources research that addresses poverty in semi-arid areas should not limit itself to the immediate area. Research that makes higher potential systems more productive and increases the demand for labour is also important – particularly where those systems are accessible (by dint of proximity or good communications or both) to large DP populations.

Semi-intensive agriculture in semi-arid areas

The poor are too risk-averse and constrained in other ways to fully engage in specialised, intensive agricultural production. Yet their traditional systems are insufficiently productive with declining fertility and declining farm size, and there is ample evidence that even the poor are “modernizing” to an extent. Marginal and small farmers need production strategies that fall in the middle ground – where they can reap some of the benefits of more productive modern systems, without over-exposure to market and crop risks associated with intensification and specialisation. Moreover, widespread pesticide resistance and pesticide adulteration lend wider

applicability to some elements of such a “middle ground” production strategy.

Elements of such a strategy (albeit familiar mantras) might include:

- selective use of HYVs
- improvements to soil nutrition through mulching, rotations, nitrogen-fixing crops, agro-forestry, organic manure and selective use of chemical fertiliser
- IPM
- crop range that addresses food and cash needs, but for the latter focusing on crops for which the market is more steady (rather than high value but volatile), and
- integration of tree crops and livestock into the farming system where possible.

Filling the gap left by groundnuts

If it is judged that the groundnut market is not likely to improve in India in the foreseeable future, then many farmers in India will face lower incomes. Marginal farmers and the landless working on those farms and in processing plants will also face a decline in livelihood possibilities. Anecdotal evidence (pers com., C. Conroy) suggests that farmers in Andhra Pradesh are at a loss to identify alternative production strategies – and the gap left by groundnuts is very significant because the cropping system in some areas had become very concentrated on the groundnut crop.

Farmers are likely to seek some of the following characteristics in any replacement for groundnuts:

- less concentration on a single crop
- a small number of cash crops which include some that double as cash and food crops, some that are steady earners and some higher value possibilities
- crops that can be grown under similar agro-ecological conditions (annuals, possibly offering some nitrogen fixation, suited to the rainfall and soils where groundnuts were grown, crops that fit in with other aspects of the crop calendar)
- crops that are equally or less capital-intensive (the groundnut crisis has probably increased risk-aversity)

Improved water management

A predictable and very obvious outcome from this study is evidence of acute and growing pressure on water resources in the semi-arid areas. To the extent that this is amenable to research, there is a need to address this. There is clearly scope to improve the management of water resources by addressing both demand (particular crops and varieties require different quantities and timing of water) and supply (run-off and evaporation, water capture etc.) Someone more familiar with these issues than the present author may be able to identify more specific researchable components.

Tree crops

Selective use of tree crops can contribute to improved soil and water management whilst also offering an alternative source of cash income, fodder, fuelwood, and CPR-substitute. Tree crops are often not attractive to the poor – because many lack land or sure property rights, and because tree crops rarely yield income in early years and

seedlings are relatively expensive. However, given the problems faced in the semi-arid areas (declining soil fertility, pressure on water resources and on CPR), research to investigate poor farmers interest in tree crops, and the desired attributes of tree crops would be useful.

CPR management revisited

This area also seems to demand more research although someone more familiar with this issue may be able to identify situations where more widespread promotion and application of existing “best practice” models is sufficient. Clearly though, in the study areas, there was evidence of growing pressure on CPR (be they grazing lands, paths, or forests) but differing community-level or government responses – a finding that is important to the poor, the landless and women, who depend disproportionately on these resources.

Livestock systems

Two main areas of livestock-related research can be identified. The first concerns the need for a clearer picture of influences and trends. For instance, small ruminants are very important in semi-arid areas and can be an important income source for small and landless farmers. Some communities reported no shortage of fodder whilst others complained of fewer grazing areas and remarked the need to migrate with their herds for several months per year. At the same time, marketing of small ruminants appears to be relatively easy (traders come to the village) and profitable. (This is consistent with increasing demand for meat products associated with growing urbanisation and rising incomes). Another area concerns poultry which received scant attention in the surveys – though is clearly subject to very rapid growth (presumably mostly in intensive systems). It would be useful to revisit these topics – to gain a clearer picture of production trends, production technology, and the structure of livestock ownership (poorer, wealthier, larger numbers, smaller numbers).

The second area is analogous to the recommendation on semi-intensive cropping systems – but dependent on a prior clarification of issues and trends (above). To what extent is it possible to intensify traditional systems of poultry and small ruminant production? What would it require in terms of fodder or supplements, and to whom would such livestock systems be accessible? Is there scope for greater exploitation of crop/livestock synergies in the farming system?

Women-run farms

The evidence on migration, and from the community surveys, underlines the growing incidence of women-run farms, and farms worked by the elderly and by children. These groups usually feature disproportionately amongst the poor. Moreover, this pattern emerges in situations where those with fewer constraints on their mobility have taken up other livelihoods. Two research recommendations follow from this: (a) research with those farmers who remain (women and the elderly) to identify particular issues of concern to them and (b) to make sure that more general NR systems research in semi-arid areas takes adequate account of this group’s needs in research identification, field-tests and dissemination.

Abbreviations

CMIE	Centre for the Management of the Indian Economy
CPR	Common property resources
DFID	Department for International Development, UK
DP	drought-prone
GIDR	Gujarat Institute for Development Research
HYV	high yielding variety
IPM	integrated pest management
NGO	non-governmental organisation
NDP	non drought-prone
NR	natural resources
NRSP	Natural Resources Systems Programme
NSDP	net state domestic product
NTFP	non timber forest product
ODI	Overseas Development Institute
PDS	Public Distribution System
SC	scheduled caste
SHG	self-help group
SL	sustainable livelihoods
SPWD	Society for the Promotion of Wastelands Development
ST	scheduled tribe

Bibliography

- Agarwal, A (1999) Social Security and the Family: Coping with Seasonality and Calamity in Rural India. In Ahmad, E., Dreze, J., Hills, J. and Sen, A. [Eds]: *Social Security in Developing Countries* (India Edition). New Delhi: Oxford University Press.
- Barrett, C. and Reardon, T. (2001) Asset, Activity, and Income Diversification Among African Agriculturalists: Some Practical Issues. *Food Policy* (forthcoming September 2001)
- Basant, R. (1991) *Diversification of Economic Activities in Rural Gujarat: Some Preliminary Results*. Mimeo. Ahmedabad: The Gujarat Institute of Area Planning.
- Baulch, B. (1996) The New Poverty Agenda: A Disputed Consensus, *IDS Bulletin*, Vol. 27, No. 1, pp. 1-10.
- Bayliss-Smith, T. (1991) Food Security and Agricultural Sustainability in the New Guinea Highlands: Vulnerable People, Vulnerable Places, *IDS Bulletin*, Vol. 22, No. 3, pp 5-11.
- Beck, T (1994), *The Experience of Poverty: Fighting for respect and resources in village India*. London: Intermediate Technology Publications.
- Bhaskara Rao, G., (1998) Harvesting Water: Irrigation Tanks in Anantapur, *Wastelands News*, February – April. New Delhi: SPWD.
- Birthal, P.S., Kumar, a. Ravishankar, A. and Pandey, U.K. (1999) *Sources of Growth in the Livestock Sector*. Policy Paper 9 New Delhi: National Centre for Agricultural Economics and Policy Research.
- Blaikie, P. and Brookfield, H. (1987) *Land Degradation and Society*, London: Methuen.
- Breman, J. (1979) *Patronage and Exploitation: Changing Agrarian Relations in South Gujarat*. Berkeley: University of California Press.
- Butcher, C. (2000) *Globalisation and Agricultural Trade and Investment: The Impact on Small-Scale Producers and Poor Food Consumers in Developing countries (First Draft)*. Mimeo. Swansea: Centre for Development Studies.
- Caldwell, J.C., Reddy P.H. and P. Caldwell (1986). 'Periodic High Risk as a Cause of Fertility Decline in a Changing Rural Environment: Survival Strategies in the 1980-1983 South Indian Drought' *Economic Development and Cultural Change*, 34.
- Capistrano, D. (2000) Non-timber Forest Product-Based Enterprise in Forest Conservation and Community Development: India's evolving institutional context. In: Krishnapillay *et al.*, (Eds), *Forests and Society: The Role of Research: XXI IUFRO World Congress, 7-12 August 2000, Sub-Plenary Sessions, Vol. 1*, pp 431-440.
- Carney, D. (1998) Implementing the Sustainable Livelihoods Approach. In: Carney, D. (Ed), *Sustainable Rural Livelihoods: What contribution can we make?* London: DFID.
- Carney D., Drinkwater, M., Rusinow, T. Neefjes, K., Wanmali, S. and Singh, N. (2000) *Livelihoods Approaches Compared (Draft): A brief comparison of the livelihoods approaches of the UK Department for International Development (DFID), CARE, Oxfam and the United Nations Development Programme (UNDP)*. Mimeo.
- Chambers, R. (1983) *Rural Development: Putting the Last First*. London: Longman.

- Chambers, R. (1988) Sustainable Livelihoods, Environment and Development: Putting Poor People First, *IDS Discussion Paper*, No 240.
- Chambers, R. (1989) Editorial introduction: Vulnerability, Coping and Policy, *IDS Bulletin*, Vol. 20, No. 2, pp. 1-7.
- Chambers, R. and Conway, G. (1992) Sustainable Rural Livelihoods: Practical Concepts for the 21st Century, *IDS Discussion Paper*, No. 296.
- Chambers, R., Saxena, N. C. and Shah, T. (1989) *To the Hands of the Poor: Water and Trees*. London: Intermediate Technology Publications.
- Chambers, R., Leach, M. and Conroy, C. (1993) *Trees as Savings and Security for the Rural Poor*. IIED Gatekeeper Series No. 3, London: IIED.
- Chandrasekhar, C. P. (1993) Agrarian Change and Occupational Diversification: Non-Agricultural Employment and Rural Development in West Bengal, *Journal of Peasant Studies*, Vol. 20, No. 2, pp 205-270.
- Chen, M. (1989) Women and Household Livelihood systems, *ARDA*, Vol 15, No 2-3. (Cited in Laier, J., Davies, S. Milward, K. and Kennan, J. (1996).)
- Chen, M (1991) *Coping with Seasonality and Drought*. New Delhi: Sage Publications.
- Chowdary et al. (Undated): *Suicides in Andhra Pradesh*, Aware Development Research Advisory Group, Hyderabad.
- Conroy, C., Mishra, A. and Rai, A. (1999) *Self-Initiated Community Forest Management in Orissa: Practices, Prospects and Policy Implications*. Chatham, UK: Natural Resources Institute.
- Conroy, C. (2000) *The Impact on Livestock of Silvopasture Development on Common Lands in Semi-Arid Rajasthan*. Paper presented at the International Conference on Small Holder Livestock Production Systems in Developing Countries, 24-27 November, 2000, Kerala.
- Conroy, C., Bausar, G., Jape, A. and Rangnekar, D.V. (2000) The Related Effects of Water Scarcity and Feed Scarcity: A Case Study from Bhavnagar District, Gujarat. P. 985. In: *7th International Conference on Goats: Proceedings, Tome II*.
- Davies, S. (1996) *Adaptable Livelihoods: Coping with Food Insecurity in the Malian Sahel*. Macmillan Press, Basingstoke.
- Davies, S. and Hossain, N. (1997), Livelihood Adaptation, Public Action and Civil Society: A Review of the Literature. *IDS Working Paper 57*. IDS, Brighton.
- DFID (1999) *Western India Rainfed Farming Project – Phase 2: Project Memorandum*. Mimeo. New Delhi: DFID.
- Dreze, J. and Sen, A. (1989) *Hunger and Public Action*, WIDER Studies in Development Economics Series. Oxford: Clarendon Press.
- Ellis, F. (2000) *Rural Livelihoods and Diversity in Developing Countries*. Oxford: OUP.

- Fan, S. and Hazell, P. (1999) Are Returns to Public Investment Lower in Less-Favored Rural Areas? An Empirical Analysis of India. *EPTD Discussion Paper No. 43*. Washington D.C.: IFPRI.
- Fan, S., Hazell, P. and Thorat, S. (1999) Linkages between Government Spending, Growth, and Poverty in Rural India. *Research Report 110*. Washington D.C.: IFPRI.
- Fisher, T., Mahajan, V., and Singha, A. (1997) *The Forgotten Sector: Non-Farm Employment and Enterprises in Rural India*. London: Intermediate Technology Publications.
- Galab, S. et al., 1997: *District Poverty Initiatives Project: Anantapur*, Centre for Economic and Social Studies, N. O. Campus, Begumpet, Hyderabad.
- Gordon, A. (1999) *Non-Farm Rural Livelihoods*, Policy Series 4. Chatham, UK: Natural Resources Institute.
- Government of Andhra Pradesh (2000): *Draft Report of the Rural Poverty Reduction Task Force*, Ministry of Rural Development, Hyderabad.
- Greenhalgh, P. and Kleih, U. (2000) Globalisation and the Liberalisation of Agricultural Trade: the Impact on Small Farmers in Developing Countries. Mimeo. Chatham: NRI.
- Haggblade, S. and Hazell, P. (1989) Agricultural Technology and Farm-Nonfarm Growth Linkages, *Agricultural Economics*, Vol. 3, pp. 345-364.
- Harris, B. (1987) Regional Growth Linkages from Agriculture and Resource flows in Non-Farm Economy, *Economic and Political Weekly*, Vol. XXII, No. 1 and No. 2.
- Hazell, P. and Haggblade, S. (1993) Farm-Nonfarm Growth Linkages and the Welfare of the Poor. In M. Lipton and J. van der Gaag (Eds), 'Including the Poor', *Proceedings of a Symposium Organised by the World Bank and IFPRI*. Washington, D.C.: World Bank.
- Hegde, D. M. and Kiresur V. (1999) Oilseeds: Changing Paradigms. In: *The Hindu Survey of Indian Agriculture 1999*. Chennai: The Hindu.
- Iyengar, S. (1989). 'Common Property Land Resources in Gujarat: Some Findings about Their Size and Use' *Economic and Political Weekly* 24 (25).
- Iyengar, S. and Shukla, N. (1999). "Regeneration and Management of Common Property Land Resources (CPLRs) In India: A Review" *Working Paper 110*, Gujarat Institute of Development Research, Ahmedabad.
- Jain, N. (2000) Case Study 2: Selu Pasture Land. In: Conroy, C. (Ed), *Silvipasture Management Case Studies by Seva Mandir. BAIF/NRI Goat Research Project Report No. 5*. BAIF and Natural Resources Institute, Chatham, Kent, UK.
- Jindal, R. (2000), Case Study 1: Barawa Village. In: Conroy, C. (Ed), *Silvipasture Management Case Studies by Seva Mandir. BAIF/NRI Goat Research Project Report No. 5*. BAIF and Natural Resources Institute, Chatham, Kent, UK.
- Jodha, N.S. (1978). 'Effectiveness of farmers' adjustments to risk', *Economic and Political Weekly*, 13 (25).
- Jodha, N.S. (1985). 'Population Growth and the Decline of Common Property Resources in Rajasthan', *Population and Development Review*, 11.

Jodha, N.S. (1986). 'Common Property Resources and the Rural Poor in Dry Regions of India', *Economic and Political Weekly*, 21 (27).

Jodha, N.S. (1991) Rural Common Property Resources: A Growing Crisis. *Gatekeeper Series No. 24*. London: IIED.

Joshi, N. (1998) *Impact of AKRSP(I) Intervention on Migration in Bharuch Programme Area*. Ahmedabad: AKRSP(I).

Kabeer, N (1991) Gender, Production and Well-Being: Rethinking the Household Economy, *IDS Discussion Paper 288*. Brighton: Institute of Development Studies.

Karant, G. K., 1991: *Farmers' Survival Strategies in a Drought Prone District: A Case Study of Village in Chitradurga District, Karnataka*, (Mimeograph), Agriculture Development and Rural Transformation (ARDT) Unit, Institute for Social and Economics Change (ISEC), Bangalore.

Laier, J., Davies, S. Milward, K. and Kennan, J. (1996) *Gender, Household Food Security and Coping Strategies: An Annotated Bibliography*. IDS, Brighton.

Leach, M., Mearns, R. and Scoones, I. (1997), Environmental Entitlements: A Framework for Understanding the Institutional Dynamics of Environmental Change. *IDS Discussion Paper 359*. IDS, Brighton.

Marsland, N. (1998) *Marketing of Rabi and Kharif Sorghum in Andhra Pradesh, Karnataka and Maharashtra, India*. Mimeo. Chatham, UK: NRI.

Matthewman, R. and Ashley, S. (1996) *The Generation, Assembly and Delivery of Information on Livestock Production: A Case Study of India*. Natural Resources Institute: Chatham.

McCorkle, M. Rangnekar, D.V. and Mathias, E. (1999) Whence and Whither ER&D? In: Mathias, E., Rangnekar, D.V. and McCorkle, M. (Eds) *Ethnoveterinary Medicine: Alternatives for Livestock Development, Proceedings of an international conference held in Pune, India, on 4-6 November 1997*. Pune, India: BAIF Development Research Foundation.

Menon, Parvathi (2000) Hungry in Anantapur, *Frontline*, July 7.

Naidu, A.S., Rao, K.S., Chandramouli, D. and Rao, Seshagiri (undated) *Marketing of Sheep and Goats*. Chennai: Central Leather Research Institute.

Pasha, S. (1992). 'Common Property Resources and Rural Poor: A Micro Level Analysis', *Economic and Political Weekly*, Nov. 14.

Prasad, N.P. and P. Venkat Rao (1997). 'Adaptations of Peasants in a Stress Environment' *Economic and Political Weekly*, Feb.1.

Rani, U. and Dodia, M. (2000) *Understanding Coping Strategies in Semi-Arid Areas: A Review of Empirical Literature*. Ahmedabad: GIDR.

Rathore, M.S. (1993) *Marketing of Goats in Rajasthan*. Indo-Swiss Goat Development and Fodder Production Project: Jaipur.

- Sagar, V. and Ahuja, K. (1993) *Economics of Goat Keeping in Rajasthan*. Indo-Swiss Goat Development and Fodder Production Project: Jaipur.
- Saigal, S., Agarwal, C. and Campbell, J. (1996) *Sustaining Forest Management: The Role of Non-Timber Forest Products*. Delhi: Society for the Promotion of Wastelands Development.
- Sainath, P. (1996) *Everybody Loves a Good Drought: Stories from India's Poorest Districts*. New Delhi: Penguin Books.
- Sankaran, V. Resource Management by the Bhils of Gujarat and Rajasthan, *The Indian Journal of Social Science*, Vol. 4, No. 4, pp. 548-566.
- Saxena, N. C. (1997) *The Saga of Participatory Forest Management in India*, Bogor: CIFOR.
- Scoones, I. (1998) Sustainable Rural Livelihoods: A Framework for Analysis. *IDS Working Paper 72*. IDS, Brighton.
- Sen, A. K. (1981) *Poverty and Famines: An Essay on Entitlements and Deprivation*, Oxford: Clarendon Press.
- Seva Mandir (2000a), *Farming Systems in Bichiwada: A Study by Seva Mandir*. Udaipur: Seva Mandir.
- Shukla, R.K. and Brahmankar, S.D. (1999) *Impact Evaluation of Operation Flood on Rural Dairy Sector*. New Delhi: National Council of Applied Economic Research.
- Shylendra, H S and Uma Rani (2000), Sustainable Rural Livelihoods in the Context of the Growing Occupational Diversification and Rural-Urban Linkages, *Mimeo*, Institute of Rural Management, Anand.
- SPWD (1998) *Understanding Livelihoods of the Rural Poor and Marginal Farmers: Proceedings of the Second Workshop on Marginal Agriculture*. New Delhi: SPWD.
- Subrahmanyam, S. *et al.* (1993) *District Plan: Anantapur* Centre for Economic and Social Studies, N. O. Campus, Begumpet, Hyderabad.
- Swift, J. (1989) Why are Rural People Vulnerable to Famine?, *IDS Bulletin*, Vol. 20, No. 2, pp. 8-15.
- Ubeshwar Vikas Mandal (undated) *Living Traditions 2: Local Agriculture Management Systems in the Bagdunda Region of the Mewad Aravallis*. Udaipur: Ubeshwar Vikas Mandal.
- Uma Rani and H S Shylendra (1999). Seasonal Migration and Rural - Urban Interface in Semi Arid Tropics of Gujarat: Study of a Tribal Village, *Working Paper 111*, Gujarat Institute of Development Research, Ahmedabad.
- Unni, J. (2000) *Sustainable Development and Social Security: Role of the Non-Farm Sector*. New Delhi: Vikas Publishing House.
- Vaidyanathan, A. (1988) *Bovine Economy in India*. Oxford and IBH Publishing Co., New Delhi, and Centre for Development Studies, Trivandrum.

Vardhan, M. (2000) Case Study 4: Salukhera Joint Forest Management Project – A Case of Differential Impact of Silvi-pasture Development Intervention on Livestock. In: Conroy, C (Ed), *Silvipasture Management Case Studies* by Seva Mandir. *BAIF/NRI Goat Research Project Report No. 5*. BAIF and Natural Resources Institute, Chatham, Kent, UK.

Virmani, S.M. (1999) Watershed Management for Sustainable Farming. In: *The Hindu Survey of Indian Agriculture 1999*. Chennai: The Hindu.

Visaria, P. and Basant, R. (1994), *Non-Agricultural Employment in India: Trends and Prospects*. New Delhi: Sage.

Vishwaraj (1997) Status report on ‘*Development of Small Ruminants in Andhra Pradesh*’, Report No. 97/12. Hyderabad: Indo Swiss Project Andhra Pradesh.

World Bank (1999) *India Livestock Sector Review: Enhancing Growth and Development*. New Delhi: World Bank.

World Bank (2000) *World Development Report 2000/1: Attacking Poverty*. Washington, D.C.: World Bank.