CHAPTER I
TERMS OF REFERRING, CONCEPTS AND APPROACH AND COVERAGE OF THE REPORT OF THE STUDY GROUP ON EMPLOYMENT GENERATION

1.1. The agreed terms of reference of the Study Group on Employment Generation were :

(i) To examine the rate of growth of employment of rural labour, and of its major components, agricultural and non-agricultural rural labour separately, during the past decade, at the all India and at the State level.

ii) To analyse changes in the wages and earnings of rural workers.

(iii) To identify the processes at work to accelerate or retard the employment, productivity and earnings growth of agricultural and other workers in rural areas.

(iv) To examine in the light of this evidence what kind of policies and programmes would be most effective in enhancing employment opportunities and earning capacity of rural workers.

(v) To assess, in this context, the suitability and effectiveness of existing employment schemes and programmes.

1.2. At an early stage in the work of the Group, questions were raised about appropriate conceptual categories, in particular the scope and coverage of the terms "rural labour" and "rural household". The definitions used by successive Rural Labour Enquiries were recommended[1] for possible adoption by National Commission on Rural Labour Study teams.

1.3. Rural Labour Enquiries focus on persons "living in rural areas", who do "manual labour" in return for cash or kind wages or salaries, and upon Rural Labour Households defined as those for which such work constitutes the main income source. However it was felt that the work of the Study Group on Employment Generation required a much wider canvas, partly because of the kinds of transitions which

have been taking place the livelihood structures of rural households in recent years. The shift from self-employed to employee status, for example, and concurrent changes in the workforce structure in favour of non-agricultural activities—shifts which in practice often involve labour migration from rural to urban locations—these are some of the essential dynamic elements which belong at the centre of any analysis of what is happening to rural labour today.

1.4. Moreover India is a country where rural labour markets are not yet fully formed. In some regions, the vast majority of those who do wage work at all, belong to households which possess production assets and work largely "for family gain"[2] along with other members of their households. part or most of the time. In such a context, it is inappropriate to define "rural labour" so narrowly as to include only those for whom paid work currently is the main income source.

1.5. Given the downward drift of cultivating households in the land area size class structure, the typical rural household today is increasingly engaged in a range of miscellaneous earning activities in effect, in whatever work becomes available—with some household members seeking off-farm paid agricultural or non-agricultural employment, seasonally, intermittently, or on a continuous basis, some commuting to jobs in nearby market towns; some engaged in petty off-farm self employment, part or full time, and some (or all) working at least part-time at family farm based activities.

1.6 Given also the demographic pressures in rural areas generally, non-cultivating rural households with an asset base which provides inadequate gainful employment, are quite commonly similarly placed. As Papola's work shows, many of them are earning on the average, bare subsistence incomes, and some of them take up wage employment in agriculture during th busy seasons.

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1 The question was discussed at the Second Meeting of Heads of Study Groups, held on 28 November, 1989.

2 This is the notion of work or employment in subsistence production used in the Revised CUND System of National Accounts (SNA), and adapted so as to cover subsistence production in the primary sector, including own account production of fixed assets.

3 See : T S. Papola, *The Rural Industrialisation : Approaches and Potential*, Bombay, Himalaya Publishing House, 1982; and the field work results reported in T.S. Papola "Rural Industrialisation and Agricultural Growth : A Case Study on India" in (ed.) Rizwanul Islam *"Rural Industrialisation and Employment in Asia*, ILO-ARTEP, New Delhi, 1987.

1.7. We know that in recent years in India the relative importance of such part time rural wage workers is increasing. Together, the self-employed marginal farmers, many of whom would take up wage paid work as a main occupation if they could get it, and the agricultural labourers, account of roughly 80 per cent of rural poverty and a similar share of (daily status) unemployment[4]. They, and the rural petty Self-employed constituted the poorest segments of the rural work force in the eighties.[5] It may be noted also that at the All-India level, members of agricultural labour households *alone* accounted for more than 60 per cent of all rural unemployment, as recently as 1977-78.

1.8. Thus in considering possible sources of additional employment for "rural labourers" as a set, one fact that needs to be remembered is that members of cultivating households are today entering the hired labour force in increasing numbers. This is true also of many self-employed non-agricultural household members—artisans, and those employed in traditional household industries, for example.

1.9. One result is that over time, the share of self-employed rural workers in all rural workers has been coming down (for both males and females), and the share of employees has been rising. *All* of the increase in the *employees'* share is due to the growing numbers of workers (both male and female) who are entering the ranks of the casual wage paid labourers.

1.10. Many of the new entrants to the casual labour work force are engaged in work other than agriculture. In recent years in fact, the highest growth rates have been recorded, by the workers in the unorganised sector in *non-agriculture,* and in wage labour generally.

1.11. Evidently, we have to plan for a large and growing set of low income rural wage workers, many of whom today are listed as self-employed, although their work adds very little to the output of their family's farm or non-farm enterprise. This means that we must include in our analysis the large set of low-income self-employed people. In the dynamics of the normal transition to "higher forms" of production they are, or will be, caught in a process which will land most of them sooner or later in the wage earners class. Only a few are destined for employer or managerial status in organised industry and services, or in capitalist agriculture.

1.12. Analytically also, the dynamics of the situation in which rural labour is placed, cannot be captured unless this broader view is taken.

1.13. The formation of rural labour markets is thus closely tied up with the empirical observation that rural petty self-employment is on its way out in many (but not all) parts of India, while the "employee" status rural work force is expanding. These phenomena are closely linked with other transitions in the occupational structure within rural areas, and with the pace of change in the employment structure of the economy as a whole.

1.14. The approach of the Study Group on Employment Generation to these developments is diagnostic; the aim is not merely to understand what has happened, but more importantly, to find out the reasons why the employment situation has evolved in the way that it has. The identification of the causes and consequences of high or low productivity employment, of rising real wage rates, and of declining elasticities of employment with respect to output and yields, constitute the core of the work. The description of potential conflicts of policy objectives, and of appropriate instruments for dealing with the problems identified, arises directly from the evidence.

1.15. The approach of the Group is also positive, in the sense that the focus is on the sources of rural employment growth, the causes of superior levels of living, and the constructive possibilities open to policymakers. The report therefore does not go into the details of the incidence of unemployment, but concentrates instead on highlighting ways to enhance the employment generating capacity of the Indian economy.

1.16. An account of rural work force transitions constitutes the focus of attention in Chapter Two of this report, which sets the stage for subsequent analytical chapters.

1.17. Chapter three is devoted to a statewise analysis of the quality of recent rural employment growth. Has rural occupational diversification taken place in response to "push factors", or is it the result of rising demand for non-farm labour in rural areas ? This investigation is followed by Chapter Four, which links rising real wages to labour productivity and the shift to non-farm employment.

1.18. The key to much of what is happening on the rural employment front however, is to be found in the recent changes in labour absorption in field crop production. Questions of labour saving technology, factor substitution adverse to labour, and the sources of farm-employment growth are examined in Chapter Five. Chapter Six deals with unemployment, seasonality and year-to-year swings in employment and with low productivity employment. Chapter Seven summarises the findings of the study.

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4 These results are cited, in Raj Krishna "The Growth of Aggregate Unemployment in India: Trends, Sources and Macro Policy Options", *Indian Journal of Labour Economics,* April—July 1985, p. 13, and are from a paper by K. Sundaram and S.D. Tendulkar "Towards an Explanation of Interregional Variations in Poverty and Unemployment in Rural India" (DSE Working Paper No. 237), University of Delhi, August 1983.

5 See Abhijit Sen, "A Note on Employment and Living Standards in the Unorganised Sector", *Social Scientist,* February 1988.

CHAPTER 2

EMPLOYMENT STRUCTURE AND EMPLOYMENT GROWTH: THE MAJOD TRANSTIONS

Introduction :

2.1 Looking back over the Past thirty years or so, we can now see that one of the principal features of employment growth and occupational change in recent decades, has been the gradual evolution of the workforce structure towards the patterns characteristic of more developed countries. Rural household industry has tended to be replaced by more efficient rural or urban units making the same products, or close substitutes at lower costs, using more purchased intermediate inputs, more hired labour and proportionately fewer family workers. Households have shifted from self-employment in agriculture, or in traditional household industries and services, to wage and salary employment in the production of non-farm goods and services. And the process of decline in the relative importance of agricultural occupations has been associated with a shift to the towns and cities.

2.2 One consequence is that the character of the household structure in rural areas has changed. It used to be dominated by cultivators, of course, but second in relative importance were the non-farm labour households, not the agricultural labourers. This tends to be forgotten now, particularly following the late sixties and early seventies, which witnessed a surge of self-employed cultivating and non-farm rural labour into the hired farm labour force.

2.3 This influx into the hired farm labour force produced the now familiar situation where agricultural labour households constitute a substantial fraction of the rural household structure, and where the relative importance of rural non-farm labour households has dwindled to a much lower share. However, in recent years in several states this trend is being reversed.

2.4 While this report is primarily concerned with employment generation for the rural labour set, it would be wholly out of place to ignore what has been happening to the self-employed workers, in agriculture in particular. They have been shifting, and will continue to shift, very likely at accelerating rates, into non-farm occupations and services, with the result that we are already very close to a zero rate of growth of the farm and farm labour workforce.

The Rural to Urban Shift, and the changing share of Rural Workers in all the Workers in Specific Industrial Categories :

2.5 In the past two decades occupational diversification in India has gone hand in hand with rural to urban migration. While many of the migrants to urban centres have failed to get secure jobs, we are not concerned directly in this report with their situation in the city. What is important in the present context is that their passage has relieved the pressure unemployment in the village.

2.6 Since the early 1970's, in effect, rural areas have been exporting their unemployment along with their working population, to urban areas. This was not the case in the 1960's, when the share of rural areas in unempoyment was well above their share in the labour force. Then the unemployed piled up in rural areas, pushing rural areas share in unemployment as high as 90 per cent during the 1960's. But once the process of labour force migration got well under way a disproportionately large part of it ended up among the urban weekly status unemployed. Now, the share of rural areas in weekly status unemployment stands substantially, below rural areas' share in the labour force. The incidence of rural daily status unemployment in the total, however, corresponds closely to their share in the total labour force. (See Table 2.1), Rural areas thus appear to be losing their most seriously unemployed people to the towns and cities, and retaining their share of relatively short duration intermittently unemployed workers, together with a substantial subset who may work hard but remain poor, that is, those who are unemployed by the income criterion. Thus the character of rural unemployment as a whole at the all India level, has tended to change.

TABLE 2.1

Share of Rural Areas in the Labour Force and in Unemployment 1960-61 to 1982

Year and NSS Status Approach	Labour force (%)	Unemployment (%)
1	2	3
Weekly Status		
1960-61	4.72	89.80
1964-65	84.12	86.13
1966-67	84.46	90.30
1972-73	82.61	73.76
1977-78	79.84	65.38
1983.	78.62	67.77

1	2	3
Daily Status		
1972-73	82.21	80.84
1977-78	79.42	74.18
1983	78.34	75.08

Sources (a) *For* 1960-61 *to* 1977-78 inclusive, Table 7, p. 26, Raj Krishna "The Growth of Aggregate Unemployment in India" : Trends, Sources and Macro Policy Options: *Indian Journal of Labour Economies* April-July 1985.

(b) *For* 1983 : Computed from Table 26, Table 27 *Sarvekshana* Vol. XI, No. 4, April 1988.

Note : The 1983 figures are based on corrected population estimates: the 1977-78 Raj Krishna figures are based on population projection figures (from the 1971 Census base), which turned out to be under estimates.

2.7 At the same time , regional diversity characterises state level employment scenarios and the underlying dynamics of regional trends. In Karnataka. West Bengal and Himachal Pradesh, the share of the rural weekly status labour force has gone up, instead of down. Moreover, in recent years the share of rural areas in unemployment has shown a tendency to rise in Punjab and Haryana, as well as in Tamil Nadu, West Bengal, Kerala and Himachal. However, rural areas share of unemployment remains well below their share in the labour force even in these six states. Thus the unemployment problem, on a daily status or weekly status basis remains relatively less serious in rural areas than in urban ones.

2.8 At the all India level, the share of rural areas in the total work force continues to slide down; so also do the rural shares of workers belonging to most of the individual industrial categories. The shares of construction and transport in rural areas, however, are on the rise. It may be noted also, that aside from agriculture, and mining and quarrying which will continue to be predominantly rural, manufacturing also has been located as much in rural areas as in urban ones. The share of rural workers in all manufacturing workers, however, exhibits a gradual declining trend, so that it now stands at almost exactly one half. If rural and market town infrastructure could be upgraded, the slow drift of manufacturing to the large urban areas could perhaps be halted, or

even reversed. The other important activity which is predominantly rural, is construction.

2.9 The decline in the share of rural areas in the workforce appears also in each state taken separately, but the shift of manufacturing to the cities may not be taking place in all regions. It is difficult to be sure, because of the obvious problems created by a small number of observations in industrial categories accounting for only 5 to 10 per cent of the rural workforce, but the NSS data suggests an increase in the share of rural areas in the manufacturing workforce in Gujarat, Tamil Nadu, West Bengal and Assam, and perhaps roughly constant shares in Rajasthan, Madhya Pradesh and Himachal. On the other hand, in the industrially more developed states the share of rural areas in the manufacturing workforce tends to be low, and in most of them the falling trend is unmistakeable.

Growth and Structure of the Workforce Within Rural Areas

2.10 Only NSS data provides information for the most recent period 1977-78 to 1987-88, ...but growth rates calculated for individual NSS industrial categories, produce peculiar results in several states where the number of cases which appeared in the sample was small. Census figures for 1971 and 1981 generate sensible growth rates, but are out-of-date. The discussion below is conducted in terms of the NSS results, which are summed up, more reliably at the aggregated all India level, in table 2.2.

2.11 The rate of growth of the agricultural work force has slowed down to a crawl, while the rate of growth of the non-agricultural segments has accelerated in the past 5 years to levels far above those in agriculture. We can now anticipate that in the coming decade or so, the farm workforce growth rate will fall to zero and perhaps become negative. If this happens, the present demographic pressure on land will get relieved. man-land ratios will fall and the prospects for raising per capita earnings and consumption levels among farm households will greatly improve. This fair prospect is however contingent upon the continued rapid growth of non-farm employment opportunities in both rural and urban areas.

TABLE 2.2

Growth Rates of the Rural and Urban Workforce, by Industrial Category (NSS) 1977-78 to 1987-88; 1977-78 to 1983; and 1983 to 1987-88

Industrial Category	Rural Workforce Growth			Urban Workforce Growth		
	1977-78 to 1987-88	1977-78 to 1983	1983 to 1987-88	1977-78 to 1987-88	1977-78 to 1983	1983 to 1987-88
1	2	3	4	5	6	7
1. Agriculture .	0.52	0.13	1.33	3.18	3.55	2.73
2. Mining	4.87	5.95	3.56	8.63	13.75	2.68
3. Manufacturing . . .	3.06	2.85	3.31	4.31	4.40	4.20
4. Electricity, Gas & Water . .	5.68	2.27	9.99	6.69	7.76	5.39
5. Construction	11.05	9.86	12.53	8.87	9.74	7.81
6. Trade	3.45	2.14	5.06	5.15	3.84	6.76
7. Transport	6.55	7.44	5.48	5.01	5.92	3.91
8. Services	2.65	2.88	2.38	5.44	5.06	5.91
9. Total	1.26	0.59	2.09	5.02	4.84	5.24

2.12 In at least three states a decline in the absolute numbers of workers engaged in agriculture has already taken place : Punjab, Gujarat, and Orissa. It is possible that the same thing has happened in Haryana too, in the most recent five year period. Madhya Pradesh, Tamil Nadu and Himachal also report negligible rates of growth of the farm workforce of less than 0.2 per cent over the decade. The only state with positive agricultural work force growth at a rate above 1 per cent is in fact, Uttar Pradesh. Thus it is not far fetched to visualise the beginning of an absolute decline in the farm work force, at the all India level within he next decade or so. To achieve this, however, very high rates of growth of rural non-agricultural job opportunities are required ......of the order of those recorded in states where the decline in the farm labour has recently gotten underway—namely 4 to 11 per cent. Judging by the experience of the states where the farm workforce has already contracted, this will have to be accompanied by migration, mostly to urban jobs within each state, but partly also by migration to other regions.

2.13 In the state where a fall in the absolute number of farm sector workers has been recorded, the exceptionally high growth of rural manufacturing employment should be noted. All these states also report relatively high rates of growth of employment in the transport industry. On the other hand, in Uttar Pradesh, where the process of siphoning off surplus labour from agriculture has scarcely begun, the rural job seeker also faces low workforce growth rates in manufacturing and in transport. The combinations of circumstances are highly suggestive. The reasons for them are analysed in later chapters.

The Number of Days Work Available in Rural Areas

2.14 In all states the rural workforce grew at positive rates in the ten years up to 1983. So also did the agricultural and non agricultural work forces taken separately. But in several states, over the same period the number of days work available fell, and in several more the workforce grew faster than the number of days work available.

2.15 The figures in table 2.3 reveal that in at least four states, the absolute number of days work available in rural areas actually fell. In all cases, a contraction in the number of days of employment in agriculture caused the decline in all rural persondays, despite the positive growth of days work available in rural areas outside of agriculture. But in two states where more work could be had within agriculture, the number of non-agriculture persondays employment went down.

2.16 The result is that in many states where the overall rural workforce growth rates look comfortably large, in fact the employment situation is bad. More and more rural workers have each been doing fewer and fewer days work per year. This is, by itself, not a disaster, provided that labour productivity and earnings are sufficiently high and growing fast enough to support rising per capita incomes and improved standards of living. In Punjab this is precisely what has happened. But elsewhere, for many rural people who find fewer days of work now than a decade ago, the contraction of employment opportunities stated in terms of days available per person may imply severe distress.

TABLE 2.3

Compound Growth Rates : Rural Persondays: Total Agricultural and Non-Agricultural, by State 1972-73 to 1983 (NSS data for age group 15-59)

State	Compound Growth : 1972-73 to 1983		
	All Rural Person-days	Agricultural Person-days	Non-Agricultural Person-days
1	2	3	4
1. Punjab	—0.01	—0.04	0.07
2. Haryana	3.56	2.45	7.21
3. Uttar Pradesh	—0.03	—0.21	0.68
4. Andhra Pradesh	2.15	1.73	3.56
5. Gujarat	1.00	1.09	0.64
6. Maharashtra	0.61	2.05	-3.2
7. Karnataka	1.30	1.17	1.81
8. Rajasthan	0.84	1.16	0.63
9. Madhya Pradesh	0.29	0.10	1.74
10. Orissa	0.66	0.32	1.68
11. Tamil Nadu	—0.93	—2.45	3.17
12. West Bengal	1.51	0.71	3.23
13. Bihar	—0.00	—0.16	0.64
14. All India	0.60	0.44	1.18

Notes: 1. Zero figures mean a value less than 0.005.

Source: 1. *All India Sarvekshna* Vol XI Issue No 35, table 35, April 1989.

2. *States*: NSS Report 341/n, where n stands for states in alphabetical order, table 35.

CHAPTER 3
THE QUALITY OF EMPLOYMENT GROWTH AND RURAL OCCUPATIONAL DIVERSIFICATION

Introduction

3.1 It is widely believed that the recent proportionate shift of rural (and total) workers into non-agricultural occupations is the consequence of "push factors" in at least some states. Hence the recorded growth of non-agricultural employment, in rural areas in particular, tends to be viewed with skepticism, as possibly the outcome of distress diversification of a previously largely self-employed farm and non-farm labour force, now displaced by a combination of demographic pressure, labour saving innovation, and in the case of artisans and household industry. competition from cheaper factory made products.

3.2 Recent data, however, suggests that the true story is somewhat different. It tends to show that even in the poorest states, rural households belonging to the expanding non-agricultural labour set are typically far better off than their agricultural labour counterparts. The implication of this for rural employment policy are considerable.

3.3 Part One of this chapter sets out the results of the analysis which leads to these conclusions. This part of the work aims to establish a factual basis for assessing the quality of the rural employment growth which has taken place at the state level, as well as that of the occupational diversification which has accompanied this growth. "Quality" there is assessed in terms of the levels of living of rural households mainly dependent on earnings from specified kinds of work, and in terms of the incidence and severity of poverty among them. The first step in this exercise is thus to find out which categories of rural households (defined broadly by main RLE income source categories or more narrowly by principle industry groups) are poor.

3.4 The second purpose of this chapter is to identify, at least tentatively, the kinds of factors which account for wide interstate contrasts in the levels of living of households belonging to the same broad occupational and industrial groups. The question is first looked at in terms of the characteristics of rural household enterprises—the value of their assets, farm labour and land productivity—and secondly in terms of the level of rural and total infrastructure development in each region.

3.5 Thus, beyond assessing the quality of recent employment growth, and shifts in the livelihood structures of rural households, the results reported in this chapter also indicate what policies might be instrumental in reducing the large numbers of persons in some states who work but earn below poverty line incomes—a category of earners described by Raj Krishna (1973) as unemployed by the income criterion-1. A substantial segment of them, in most states, currently belongs to the potential wage paid labour force—self employed cultivators in particular, who, failing swift improvements in on-farm labour productivity, are likely to take up paid jobs as and when such employment opportunities materialise. The view taken by the present study group is that, for them, as much as for those recorded by the NSS as unemployed and underemployed by the NSS time criteria, (stated in terms of the number of days or hours of work put in per reference week), productive employment is to be generated. Indeed, the latent demand for paid work from this hidden back log of underemployed people may be the single largest factor with which a viable employment policy has to contend.

Part One : The Quality of Employment Growth : Levels of Living, Poverty and Inequality Among Rural Households by Main Income (RLE) and Principal Industry Group (NSS).

Introduction :

3.6 This section begins with an overview of levels living, poverty and inequality among two major categories of rural households defined by the Rural Labour Enquiries in terms of their main income source : (i) households selfemployed in agriculture and (ii) rural labour households. Using RLE data, the rural labour household set can be studied in terms of its two sub-categories : (a) agricultural labour and (b) non-agricultural labour households. However, this list does not exhaust the larger set of all rural households. A mixed residual category consisting of persons self-employed in non-agriculture, non-manual employees, and households deriving income from non-gainful sources has been omitted.

3.7 Most of the members of the residual category, are captured in the more elaborate NSS classification by household principal industry group, which supplies information by monthly per capita expenditure classes for eight industrial categories : (i) agriculture, (ii) mining and quarrying (iii) manufacturing, (iv) electricity, gas and water supply, (v) construction, (vi) trade, (vii) transport and (viii) services-2.

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1 Raj Krishna (1973), "Unemployment in India" *Economic and Political Weekly* Vol. VIII No. 9 March 3 1973 pp. '475-484, based this criterion on the argument by V.M. Dandekar and N. Rath (1971) "Poverty in India" *EPW* Vol. VI No. 1, and Vol. No. 2 January 2 and January 9, 1971, who contended that "an adequate level of employment must be defined in terms of its capacity to provide minimum living to the population", (page 138 of) January 9th piece.

2 It is not clear what has hapxened to the set of households deriving income from non-gainful sources in the NSS 1983 (38th Round) data. In 1977-78 (32nd Round), they appear to have been put in the category "others".

3.8 Together the RLE and NSS data sets for 1983 (both NSS 38th Round), make it possible to lay down a strong base, first, for assessing the quality of recent employment growth and occupational diversification in rural India, and second for estimating the size, geographical location and present occupational characteristics of the latent hired labour force The potential wage workers we need to worry about is the large set, currently self employed in low productivity household farm or non-farm enterprises, who, because of poverty, are likely to shift into the hired labour force as soon as suitable off farm work becomes available

3.9 The set of such potential wage workers is extremely large, first because persons belonging to the self-employed cultivators set constitute the mjaoiity in most states (See table 3 1), and second, because roughly 21 per cent of such households report consumption expenditures below the poverty line (See table 3 2) Assuming a rough correspondence between the share of poverty stricken self-employed agriculturalists (usual status, age 5 and above) and the head count poverty ratio for households belonging to this main income source category, currently 20,870.475[3] self-employed agricultural workers already have strong motives for seeking paid off farm work.

3 10 Their regional distribution is far from even Three states alone account for more than half of them (55.68 per cent) They are · Uttar Pradesh, Madhya Pradesh and Bihar In Orissa and Rajasthan also, a very high proportion of all usual status self-employed agricultural workers must be counted as part of the latent hired labour force Proportionately they are most important in Orissa, where the incidence of poverty among self-employed cultivators is the highest in India—more than 41 per cent of all self-employed agricultural workers The figures in column 4 of table 3 2 tell the story for each of the 17 states for which the complementary data is adequate These workers together constitute most of the backlog of the unemployed and underemployed by the Rai Krishna 'income criterion At the all India level they accounted for nearly 5 per cent of the entire rural population in the age group 5 and above and 9 per cent of the usual status rural labour force in 1983 This compares with the rural chronic unemployment rate for that year of under 2 per cent, and the "full unemployment" rate of about 4 per cent of the entire rural labour force The size and regional location of this substantial latent hired labour force needs to be kept in mind in planning for jobs for rural people

TABLE 3 1

Persons in Self Employed Agricultural and in Rural Labour Households as Percentage of Persons in all Rural Households, and Persons in Agricultural Labour Households as Percentage of Persons in Rural Labour Households 1983

State	Persons in self employed in agriculture households as percent of persons in all rural households	Persons in rural labour households as percent of persons in all rural households	Persons in agricultural labour households as percent of persons in all rural labour households
1	2	3	4
1 Punjab .	46 73	28 04	80 66
2 Haryana ,	44 09	28 40	62 87
3 Uttar Pradesh	60 74	19 44	81 35
4 Andhra Pradesh	33 86	44 94	85 53
5 Gujarat	46 24	34 00	81 0
6 Maharashtra	41 24	42 25	84 59
7 Karnataka	45 16	40 47	84 98
8 Rajasthan	68 64	14 72	64 89
9. Madhya Pradesh	59 38	28 89	90 02
10 Orissa	36 14	37 44	89 07
11 Tamil Nadu	26 68	49 04	80 19
12 West Bengal	34 02	41 47	83 39
13 Bihar	42 24	35 37	93 22
14 Kerala .	23 39	45 46	63 31
15 Assam	56 46	24 62	65 09
16 Tripura	32 56	31 99	38 30
17. Himachal Pradesh	75 99	6 79	30 85
18 Jammu & Kashmir	65 59	15 71	37 39
19 Manipur	55 19	9 30	90 42
20 Meghalaya	50 36	20 77	85 58
21. Sikkim			70 65

Notes (1) For absolute figures see appendix table 3 2
(2) For comparable tables on households, see table 2 3

(3) Columns 2 and 3 do not add o 100 percent because of the residual category of persons belonging to households self-employed in non-agriculture, non-manual employees, and household deriving income from non gainful sources

Source· Derived from data in *Rural Labour Enquiry Report on Consumption Expenditure of Rural Labour Households* (38th Round on NSS) 1983 Labour Bureau, Ministry of Labour, Government of India, Chandigarh/Shimla 1990 and *Sarvekshana* Volume XIII Issue No 40 July-September 1989

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3 Computed as share of persons in households below the poverty line (Head Count Ratio) times usual status self-employed agriculturalists (persons) in 1983

4 The chronic, or usual status, unemployment rate is defined in terms of a majority of 365 days time criterion during which the person was unemployed and seeking or available for work The unemployed person, counted in the "full unemployment" rate must have been unemployed for all the days in the reference week The "full unemployment" figure is taken from Table 1, Satya Paul "Unemployment and Underemployment in Rural India" (mim o) Paper presented at the Silver Jubilee Conference of the Indian Econometric Society Bangalore January 1988

TABLE 3.2

Rural Persons Usually Self Employed in Agriculture Belonging to Households Below the Poverty Line

State	Numbers	State number as per cent of all India number	Poor usual status rural workers self-employed in agriculture as percent of all such workers in the state
1	2	3	4
1. Punjab	24,860	0.12	1.22
2. Haryana	87,796	0.42	3.43
3. Uttar Pradesh	5,323,825	25.51	27.82
4. Andhra Pradesh	618,219	2.96	8 03
5. Gujarat	301,078	1.44	6 08
6. Maharashtra	1,396,200	6 69	16 32
7. Karnataka	918,469	4 40	16.95
8. Rajasthan	1,319,452	6.32	24.35
9. Madhya Pradesh	3,280,816	15.72	28.11
10. Orissa	1,509,117	7.23	41.52
11. Tamil Nadu	811,818	3 89	18.22
12. West Bengal	471,000	2.26	11.15
13. Bihar	3,017,056	14.46	37.71
14. Kerala	117,201	0.56	9.12
15. Assam	78,655	0.38	4.29
16. Himachal Pradesh	105,641	0.51	7.31
17. Jammu & Kashmir	151,131	0.72	16.54
18. All India	20,870.475	100.00	21 34

Notes 1 Source :

1.—Usually self employed persons.

(i) *All India: Sarvekshana Vol. XI* No. 4 Issue 35 April 1988 (Table 47).

(ii) States : *NSS Report* 341/*n* (n = 1 to 17) for States 1983 (38th Round) Table 47 Usual status self employed persons relate to persons age 5 and above.

2. Column 2 uses RLE data to estimate share of persons in mainly self employed agricultural households below the poverty line (head count ratio) and applies this ratio to NSS usual status persons self-employed in agriculture

3.11 The poverty ratios (head count measure) could also be used to estimate unemployment by the income criterion, for other categories of workers. This is discussed in Part III of this chapter.

The Quality of Rural Employment Growth :

3.12 The aim of this section is to assess the quality of rural employment growth in terms of levels of living and the incidence of poverty among specified categories of rural households The analysis is conducted at two levels of aggregation The first involves three groups of households, distinguished on the basis of broad main income source criteria The

RLE reports provide the data. The second deals with eight household "principal industry" groups as defined by the National Sample Survey.

3.13 Slow growth characterised the set of households mainly dependent on self-employment in agriculture in the twenty year period ending in 1983. During the first of these two decades the number of agricultural labour households grew the fastest; simultaneously the numbers of non-agricultural labour households fell. In the more recent decade the growth rate of non-agricultural labour households outstripped the rise in the number of households mainly dependent on income from agricultural labour.

3.14 While wide inter-state contrasts characterise levels of living, the incidence of poverty and the degree of inequality among these three basic sets of rural households, it is the distinct differences in standards of living of different segments of the rural population which stand out.

3.15 In general, the members of self-employed cultivating households are far better off than people from the combined set of rural labour households. But among labour households the condition of the fastest growing non-agricultural labour subset is decidedly superior to that of persons mainly dependent on agricultural labour. NSS data also shows that people belonging to the residual category "other households" typically enjoy a standard of living roughly at par with that of the households self-employed in agriculture-5. This is interesting and important, because it tends to contradict the widespread impression that the recent rise in the share of non-agricultural occupations in the villages is largely the outcome of "push" factors. This it seems, is not the case, either for the typical non-agricultural household or for members of households mainly dependent on non-manual work or self-employment outside of agriculture. Even in Bihar, the widespread apprehension that push factors predominate in the dynamics of the accelerated growth of non-agricultural occupations recorded by successive National Sample Surveys seems to be misplaced.

3.16 However, inequality among the non-agricultural labour set is commonly greater, (in 10 out of 14 plains states), than among members of agricultural labour households. Thus despite relatively high average levels of living, some people belonging to the non-agricultural labour household category could be as poor, or even poorer, than members of the agricultural labour household group. But this is not the usual picture.

5. See Table 2, page 51 Sarvekshana Vol. XIII Issue No. 40 July—September 1989.

TABLE 3.3

Growth of the Work Force, Agricultural and Non-Agricultural 1971 to 1981 by Industrial Category and State (Census Main Workers)

State	Agriculture	Non-Agriculture	Mining	Manufacturing	Electricity gas and Water Supply	Construction	Trade	Transport	Services	Total
1	2	3	4	5	6	7	8	9	10	11
1. Punjab	1.39	2.78	0.62	2.67	8.68	1.72	3.61	7.87	1.22	1.69
2. Haryana	2.39	3.62	(—)5.75	4.14	8.90	5.11	0.87	8.32	1.65	2.67
3. Uttar Pradesh	1.13	1.96	6.44	2.94	3.73	5.79	0.45	7.95	0.26	1.23
4. Andhra Pradesh	2.07	1.76	(—)1.20	2.66	0.38	0.04	2.38	4.14	0.31	2.02
5. Gujarat	1.88	4.49	0.55	5.65	6.00	6.11	2.97	6.02	3.23	2.28
6. Maharashtra	2.41	4.22	4.64	3.96	10.42	8.24	4.42	6.60	2.60	2.66
7. Karnataka	2.63	2.50	2.80	4.30	5.20	2.20	3.35	5.44	(—)1.24	2.61
8. Rajasthan	1.86	4.18	9.56	5.11	23.34	7.41	4.02	6.26	1.17	2.17
9. Madhya Pradesh	2.25	3.88	8.31	3.68	15.47	11.37	38.20	5.18	1.33	2.42
10. Orissa	1.92	2.68	3.11	3.07	8.89	8.64	4.79	4.02	0.75	2.04
11. Tamil Nadu	2.49	2.46	(—)2.20	3.74	3.41	2.70	3.35	4.55	(—)0.39	2.48
12. West Bengal	1.67	4.25	1.96	6.01	2.19	6.64	5.79	4.12	2.00	2.18
13. Bihar	1.28	3.45	3.89	4.02	3.37	6.86	4.02	4.12	1.87	1.53
14. All States	1.87	3.05	2.76	3.86	6.82	5.24	3.36	5.54	0.97	2.05

Source : Census of India 1971
(i) Vol I, Part II—A(ii) Union Primary Census Abstract
(ii) Series-I; Part II-B (iii) General Economic Tables Table B-IV

Census of India 1981
(i) Series-I; Part II B(i) Union Primary Census Abstract, Statement-9.
(ii) Series-I, Part III: B(i) General Economic Tables Table B-12.

3.17 In the assessment of the quality of recent rural workforce diversification, the Census workforce growth rates were adopted for the disaggregated state level industrial category wise analysis.

3.18 In India as a whole in both urban and rural areas the highest rate of growth in the workforce is recorded by electricity, gas and water supply. Construction stands second in the rural and urban areas combined, but third in rural areas alone. It is transport which usurps second place in rural areas. In rural plus urban areas combined the manufacturing growth rate ranks third, but it places fourth in rural areas. Trade comes fifth in both contexts. The slow growth of the workforce engaged in rural services is noteworthy in general, and in a couple of states, (Tamil Nadu and Karnataka) the workforce growth rate in services is actually negative. For ready reference, Census workforce growth figures are given in table 3.3, for rural areas.

3.19 The question to be answered now is: are high rates of growth of non-farm workforce categories associated with rural poverty, or is it the other way round ? On the face of it, it is not an easy question to answer. Agriculture, with a low workforce growth rate has the lowest mean monthly per capita consumption expenditure at the all-India level of aggregation, but households mainly dependent on construction, a category which has expanded at relatively rapid rates, are equally poor by the mean monthly per capita consumption expenditure standard. On the other hand electricity, gas and 1589 Labour/91—3.

water supply records both the highest levels of living and the highest workforce growth rates, while services, charactrised by very slow growth enjoys the second highest average level of living.

3.20 It is concluded tentatively, therefore, that the quality of recent rural non-farm employment growth has been relatively high, compared to agriculture for most, if not all, industrial categories. There are indications however, that rural construction work in particular, may be an exception to this otherwise general proposition. This implies that the recent expansion of non-farm work opportunities has been predominantly demand induced, rather than the product of 'push' factors. Factors associated with a high or low, degree of regional or industrial category poverty, are examined in Part II of this chapter, subsequently. The detailed findings on the incidence and severity of poverty, by industrial category, follow immediately below.

Agriculturalists and construction workers have the lowest levels of living and households belonging to the electricity, gas and water supply, and the services category typically enjoy the highest standards of living. Inter-state variations in levels of living for the electricity category are, however, extremely high.

3.21 At the all India level, the incidence of poverty, (head count ratio), is greatest among agricultural households, followed closely by mining and construction. Regional variations in the incidence

of poverty are in all cases a multiple of the corresponding interstate variations in per capita consumption levels. The electricity, gas and water supply category is conspicuous for having the lowest incidence of povetry.

3.22 For each of the eight household industrial categories, the inter-state variations in the severity of poverty, measured by the Sen index, are the widest of all. The most severe poverty is found in agriculture, followed by mining and construction, in that order.

3.23 But this is true only at the aggregated all-states level. At the individual state level the picture is considerably more complex. In 8 out of 17 states it is the households which depend upon the construction industry which suffer the lowest per capita consumption levels. In only 4 states—Tamil Nadu, West Bengal, Bihar and Assam are the farm households the worst off by this criterion. In three states, households engaged in mining and quarrying come at the bottom, and in one state each, it is manufacturing or transport. The prevalence of relatively low levels of living among constuction households confirms that this category holds a position inferior to agriculture in most states—11 out of the 17 studied.

3.24 Notwithstanding the high incidence of poverty among households engaged in construction work, the common perception that almost everybody is better off than those in agriculture holds in most plains states, judging bv both the head count ratio and the Sen poverty index. Another common notion, that those engaged in manufacturing are distinctly better off than those in agriculture does not stand up so well, however, in rural areas, those involved in manufacturing are generally better placed, it is true, but the contrasts in many states are not marked.

3.25 Finally a word about inequalities. At the all-states level. they arc greatest in services, followed bv agriculture, mining and transport. State level statistics confirm that inequalities tend to be highest in services in most states.

3.26 One feature which is noticeable is that the extent of poverty in agriculture seems to be associated with poverty in other occupations at the state level. Two arguments may supply the casual link between agriculture, poverty and poverty in other sectors. First a high incidence of poverty in agriculture in a state may imply a low level of rural demand for non-agricultural goods and services which might be supplied locally. In better off states where most farm incomes stand well above the poverty line, on the other hand, the demand by agricultural households for such goods would be much greater. In poor agricultural states, therefore, there is less derived demand for the labour of workers in rural non-farm

occupations, and hence their earnings tend to be relatively low. This logic operates from the demand for labour side. Secondly, the acceptable earnings of alternative non-farm work, as seen by members of self cultivating or agricultural labour households, will be much lower if agricultural workers themselves are typically poor. If on farm work produces much below poverty line incomes, workers will tend to shift to available off-farm jobs, even if such non-farm work promises only slightly better earnings. This argument describes the set of responses from the labour supply side.

3.27 The results of our exercises indicate that agricultural poverty heavily conditions the severity of poverty in other segments of the rural economy except (i) mining and quarrying, and (ii) electricity gas and water supply, which are affected to a much lower degree. These two industrial categories appear to have other, more important determinants of household consumption levels, although even in their case inter state variations in poverty among self-employed cultivators is significantly related.

3.28 Manufacturing is subject to the greatest impact from levels of economic welfare among agriculturalists. The severity of agricultural poverty also explains a high proportion of the inerstate variations in trade, construction, transport and services in that order.

Part II : Determinants of the Quality of Rural Employment in Specified Industrial Categories.

3.29 Work done for a study on Rural Labour Markets and the Incidence of Poverty demonstrated that the value of cultivating households assets was the key to relatively high regional standards of living not only among those self-employed in agriculture, but also among members of rural non agricultural labour households. For self-employed cultivating households, labour productivity accounted for the largest part of regional variations in the head count and Sen poverty indicators, but since it was the value of assets, (and not land productivity), which mainly determined labour productivity, the crucial role of investment in reducing rural poverty was underlined. Even more important from the point of view of rural labour, the mean value of assets of rural households and of cultivating households, both accounted for a much larger part of the inter-state variations in poverty among rural labour households than it did among households self-employed in agriculture.

3.30 The resent study extends the analysis to eight separate household categories, defined in terms of their main source of income. They are : (i) agriculture, (ii) mining and quarrying, (iii) manufacturing, (iv) electricity, gas and water supply, (v) construction, (vi) trade, (vii) transport, and (viii) services. The necessary consumption data for 1983 was

supplied by the National Sample Survey Organisation, for rural households belonging to each of these eight industrial categories. The question to be answered is, what factors account for the inter-state variations in the levels of living and extent of poverty, among each of these sets of households ? Special interest attaches to the results for the members of the non-agricultural set, which has been growing the fastest in recent years.

3.31 This question is first looked at in terms of the possible impact of land and labour productivity, in the dominant rural economic activity—field crop production. The underlying logic is that cross-section contrasts in land and labour productivity affect the quality of employment in most and possibly all, other industrial categories in rural areas, via the generation of varying levels of demand for non-farm goods and services.

3.32 However, we already know that interstate contrasts in land and labour productivity, are in large part traceable to differences in the amount of public and private productive capital accumulated in rural areas. Quite aside from the effect, on the rural demand structure of high or low productivity levels in agriculture, regional variations in the value of rural household assets may be expected to affect household earning capacity directly. Similarly, contrasting levels of rural infrastructure development may be expected to produce corresponding variations in levels of living among households engaged in different kinds of non-agricultural employment in rural areas.

3.33 In brief, the purpose of the exercise is to identify the factors having the strongest favourable impact on rural farm and non-farm household living standards, for each household industrial category separately.

3.34 As in the earlier study, land productivity proved to be of strictly limited value in explaining variations in levels of living among agricultural hold-holds and way of no significance at all in accounting for regional contrasts in the incidence and severity of poverty. What really matters is field crop labour productivity and the value of cultivating households, assets. Since variations in clutivating households assets appear to be the source of most of the observed interstate differences in labour productivity, investment to strengthen the farm household asset base emerges as the most likely key to improving the earning capacity and reducing poverty among this majority rural household category. The cross-section evidence suggests however that enhancing labour productivity by encouraging farm household asset formation, may not exert quite as strongly a favourable effect on poverty as it does on average levels of living. Rural infrastructure development is the other major and highly significant determinant of interstate contrasts in levels of living among farm and farm labour households.

3.35 Households employed in the construction industry are better off in regions where labour productivity in agriculture is relatively high, and vice

versa. The value of all rural household assets and of cultivating household assets also both account for a significant part of the inter-state contrasts in the incidence of poverty among construction households. Variations in the degree of development of rural infrastructure also make a significant difference, but the explanatory power of the infrastructure index is considerably lower. This suggests the dominance of demand factors originating in the agricultural sector in the determination of the economic condition of rural households mainly dependent on construction work for a living.

3.36 Regional variations in the levels of living of households engaged in activities in the services category are also accounted for, significantly so, by variations in agricultural labour productivity, although there is no significant impact on the incidence or severity of poverty among members of the service households category. On the other hand for households belonging to the trade category, inter-regional variations in farm labour productivity constitute a significant explanation for both the extent and the severity of poverty Inter-state variations in the degree of rural or overall infrastructure development, on the other hand make no significant difference to levels of living or poverty indicators for households belonging to the services and trade categories.

3.37 On the basis of the cross section evidence, it can be concluded tentatively, that services and trade activities in rural areas depend most heavily on the demand generated by agricultural activities.

3.38 The factors behind inter-regional variations in levels of living and poverty among rural manufacturing households appear to be more complex. Farm labour productivity, and all rural and cultivating household asset levels, account for a part of the inter-state variations in levels of living, in the incidence poverty and in its severity, suggesting that demand factors are at work in this case also. But the level of development of rural and urban infra-tructure combined has almost equal explanatory power, and is much more important than rural infrastructure alone. The improvement of the conditions of those engaged in rural manufacturing in infrastructurally backward states would thus appear to hinge on overall infrastructure development at the state level, not just in rural areas, but generally. This may be related to non-rural sources of demand for their products, to non rural input supplies, or to the overall levels of development of transport, communications and banking networks. The economic conditions of rural households mainly dependent on transport, or on electricity, gas and water supply activities are also significantly contingent upon general levels of infrastructure development in the region. But a part of this is a spurious correlation, since both transport related and power related components entered into the construction of the infrastructure indices. There is no relation whatever between variations in land or farm labour productivity. or in rural household asset levels, and standards of living or poverty levels among transport or electricity etc. workers households.

3.39 The orphan among industrial activities is mining and quarrying. Although the incident of poverty among households engaged in these activities is relatively high in several states, none of the potential explanatory variables tested showed any capacity to explain the inter-state variations in the economic conditions of households mainly engaged in mining activities.

Part III : The Quality of Employment at the State and Sectoral Level

3.40 The quality of employment at the state level is indicated by the size of the set which usually works, but is unemployed by the income criterion. In the average, for the 17 states for which head count poverty estimates could be made, roughly one out of every four rural workers fails to earn the minimum "poverty line" income. These are the unemployed by the income criterion. Nearly half of them live and work in only three states, Uttar Pradesh, Madhya Pradesh and Bihar——but there are substantial numbers also in Maharashtra and Orissa.

3.41 The incidence of substandard quality employment is highest in Bihar where half of the entire usual principal status workforce belongs to households existing at below poverty line consumption levels. In Orissa 47 per cent of rural workers suffer the same fate. In Madhya Pradesh, Uttar Pradesh and West Bengal the figure is roughly 30 per cent. Evidently low productivity employment is the dominant problem in rural areas, in these and in most other states, rather than unemployment as usually measured, in turns of the personday unemployment rate. In 14 out of 17 states, the problem of unemployment by the income criterion is greater than the personday unemployment rate, in most cases by a very wide margin.

3.42 In all states, the bulk of this unacceptably low productivity employment is in agriculture, mainly because agricultural workers constitute by far the single largest segment of the rural workforce. How-ever, in 12 out of the 17 states, it is also the case that the incidence of low productivity employment is higher in agriculture, than in most other sectors of the rural economy, with the result that a disproportionately large share of those unemployed by the income criterion belong to agricultural households. For both reasons, therefore, programmes to improve the quality of rural employment need to begin with agriculture. The only other potential target sector, where substantial numbers are involved, is manufacturing

3.43 As Part II of this chapter demonstrated, the adequacy of earnings in rural construction, services and trade depends significantly on labour productivity in agriculture, which in turn is related to the value of farm households productive assets, and on the development of rural infrastructure. Thus what improves the productivity of agricultural employment will tend to reduce the incidence of rural unemployment by the income criterion in construction, services and trade as well.

3.44 It will also help the rural workers engaged in manufacturing, somewhat. But a direct attack on the problem of low productivity in the manufacturing segment is also called for, since, as was brought out in Part II, levels of living among rural households mainly dependent upon manufacturing are determined also by the overall level of infrastructure in each state.

3.45 Thus to tackle rural unemployment by the income criterion the policy instruments indicated are general and rural infrastructure upgradation and the stimulation of private farm and non-farm productive investment in rural areas.

3.46 The results of further analytical explorations involving field crop labour productivity as a factor explaining poverty, among rural labour households in particular, are reported in chapter six. These results are consistent with the findings reported here.

CHAPTER FOUR
Agricultural Wages, Labour Productivity and the
Shift to Non-Farm Employment

4.1 This chapter con titutes the key piece in a jab-saw puzzles in small piece that links together the shift from farm to non-farm occupat'on, with the emergence of low, and even negative elasticities of employment with respect to yield. The link is rising real wages rate . (Lmployment elasticities are discussed in Chapter Five).

4.2 If real wages rise, largely because surplus labour is being siphoned off into non-farm activities, and if sub equently cultivators react to these rising real wage rates by cutting down on labour inputs, then we have a chain of events in which the prime mover is occupational diversification. In this scenario, increases in the productivity of labour may play only an enabling role, by allowing real wages to go up. Since, in the past, major improvements in labour productivity conspicuously failed to raise real wage rates, the operative factor now may be the new one ......the recent proportionate shift of workers to non farm occupations. Recent evidence suggests that it is Acharya and Paanek (1989) for example found that occupational diver ification had a greater positive effect on wages than increases in land productivity. The present chapter seeks to verify this important finding, using a different data set[3] on field crop wage rates and a simpler model.

4.3 The fact that real agricultural wage rates have risen in India in recent years is confirmed by a number of studies[4] Moreover, although wage levels differ widely from state to state, they tend to move up and down together, reflecting, apparently, year to year forces which operate nation-wide rather than local ones. Real wage rates plummeted in 1974-75 in all states except West Bengal (where the through came in 1977-78), and hit on all time peak a few years later in most states.

4.4 If the Farm Harvest Price index for the dominant foodgrain in each state is used (in tead of the CPIAL), a somewhat different picture emerges, with a conspicuous upward trend. However dip in 1974-75 remains.

4.5 The distinctive difference between the two real wage series lies in the fact that the trend rate of growth of real wage rates computed using the dominant crop deflator are far above those using the conventional CPIAL. The question is : which real wage rate series is 'better' ? This is a question that can be answered in at least two ways.

4.6 First, it can be argued that the CPIAL is a bad indicator of cost of living changes because it fails to take into account the fact that during the past 25 years, major changes in the relative cost of different components of the consumption basket have led to corresponding changes in the composition of the consumption basket itself. These changes have been in favour of the superior cereals, wheat and rice, whose relative prices have fallen, and against coarse cereals, barely and gram. The result, as Tyagi arguese[5] ,is that the CPIAL which is still based on the 1956-57 consumption pattern may substantially overestimate the rise in the real prices of the basket of goods which agricultural labour actually buys. The dominant foodgrains deflator may reflect better the changes in the cost of living raced by people at the bottom end of the income scale.

1 See for example, Rohini Nayyar "Wages, Employment and Standard of living of Agricultural labourers in Uttar Pradesh" in, *Poverty and Landlessness in Rural Asia*. ILO Geneva 1977.

2. Acharya, Sarthi and Papanek, Gostav F "Agricultural wages and Poverty in India A Model of Rural Labour Markets" Asian Centre Discussion Paper— 39, July 15, 1989 Centre for Asian Development Studies Boston University. Their male wages data was drawn from the monthly series underlying the annual *Agricultural Wages in India* published by the Directorate of Economics and Statistics, Ministry of Agriculture, G.O.I.

3 The wage data is derived from the *Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India* made available through the Directorate of Economics and Statistics Ministry of Agriculture . The Series was put into the form in which it is used here for the study titled Rural Labour Market and the Incidence of Poverty" sponsored by the Ministry of Finance Deptt. of Economic Affairs on the recommendation of the Expert Advisory Committee headed by DT Lakadawala.

4 Including Acharya and Papanek (1989) *op. cit.* and A.V. Jose "Agricultural Wages in India" (1988) Asian Employment Programme Working Papers ARTEP-ILO, New Delhi.

5 D.S. Tyagi "How Valid are the Estimates of Trends in Poverty?" *Economic and Political Weekly*, Nov. 26, Review of Agriculture June 1982. See especially pages A-59 and A-60.

4.7 From the cultivators' point of view, changes in a real wage defined in terms of the dominant crop deflator may initiate changes his labour demand behaviour. Similar changes in the CPIAL deflated wages rate do not have this direct impact. If the price of, say, wheat, rises more slowly than the prices of other things, then the wheat growers' wage costs, as a proportion of the value of output go up, provided that 'true' real wages stay the same and that the same number of labour days is put in. Thus when the product wage paid in the dominant foodgrain crop in the region rises, the cultivators' response to the situation may be to try to cut down labour costs by reducing labour inputs. A real wage rate defined in terms of the dominant foodgrain deflator captures the forces behind such factor substitution better than real wages derived using the CPIAL deflator. This gives us a second kind of answer to the question : which real wage rate series is better? The answer is :—that wage series is better whose magnitudes are most closely associated with the behavioural variables we are interested in : for example, factor substitution adverse to labour absorption, or the demand for and supply of labour. The dominant crop

deflated wage rate therefore, on both counts may be better.

4.8 To sum up : first, the CPIAL deflated wage rate gives a distorted picture of the purchasing power of wages; and second, the dominant crop deflated wage series may well work better in analysis which seeks to determine cause and effect sequences. In this chapter, the causes of the observed rise in real wage rates constitutes the focus of attention. Towards the end of the next chapter, the impact of product wage rate changes on labour absorption in field crop production will be examined in detail.

4.9 Using the CPIAL deflator on CSS money wage data generates wage series which rise slowly over time. The positive trend growth rates in table 4.1 are really significant only in the case of Maharashtra. A negative, (and insignificant) growth rate emerges for Haryana. By way of contrast, if the dominant foodgrain deflator is used a set of handsome positive trend growth rates in real wages is recorded. Real wage rate growth is not only positive in all states, it is significant in most. The 'true' real wage trends, which lie somewhere in between, are undoubtedly positive in most states, with the possible exception of Haryana.

TABLE 4.1

Trend Rates of Growth in Real Wage Rates of Casual Labour 1971-72 to 1983-84 by State, using CPIAL Deflator and Dominant Foodgrain Deflator (1980-81-100)

	Using CPIAL Deflator			Using Dominant Foodgrain Deflator			
	R.O.G.	t	Sig.	Dominant Foodgrains	R.O.G.	t	Sig.
1	2	3	4	5	6	7	8
1. Punjab	0.51	0.95	nil	Wheat	2.41	3.53	***
2. Haryana	—1.05	—1.02	nil	Wheat	0.79	0.85	nil
3. Uttar Pradesh	0.38	0.32	nil	Wheat	2.76	1.88	*
4. Andhra Pradesh	1.83	2.11	*	Rice	3.07	3.14	***
5. Gujarat	0.57	0.49	nil	Wheat	2.09	1.44	nil
6. Maharashtra	3.23	3.46	***	Rice	4.88	4.87	***
7. Karnataka	1.47	1.82	*	Rice	3.61	3.01	***
8. Rajasthan	2.29	1.69	nil	Wheat	4.65	2.95	***
9. Madhya Pradesh	1.51	1.73	nil	Rice	3.34	2.94	***
10. Orissa	0.93	0.89	nil	Rice	4.63	2.91	***
11. Tamil Nadu	1.12	1.55	nil	Rice	0.55	0.74	nil
12. West Bengal	0.66	0.54	nil	Rice	3.95	3.14	***
13. Bihar	1.15	0.75	nil	Rice	2.87	1.49	nil

Notes: (1) The underlying money wage rates are based on comprehensive scheme data, for individual crops in each state, weighted by the number of mandays worked on each crop in each state. The exercise was done for a project on *Rural Labour Markets and the Incidence of Poverty* sponsored by the Ministry of Finance Department of Economic Affairs on the recommendation of the high level Advisory Group of Experts chaired by Prof. D.T. Lakadawala.

(2) The Dominant Foodgrain is defined in terms of evidence on consumption patterns of rural labour given in the *Report of the Rural Labour Enquiries*. The index is computed using Farm Harvest Prices. (See Appendix)

(3) Levels of significance are indicated by stars as follows:*** 2.5 percent or better,** 5 percent or better* 10 percent

(4) "All States" means the weighted average of these 13 states, where casual mandays worked are the weights.

The question to be addressed now is : why did real wage rates rise ?

4.10 In principle we know that, in the absence of endemic surplus labour, rising labour productivity, (defined here as NVA per manday), tends to push wages up. So also does the availability of alternative non-agricultural employment. Further, over time, the impact of inflation on both money and real wage rates is well documented : real wage rates get pushed down in years when prices rise and tend to bounce back up again only in the following year (or years), when money wage rates get adjusted upwards to compensate for the rise in the cost of living. On the other hand, in principle, among mainly self-employed cultivating households, low on-farm returns to labour tend to depress the going wage rate paid in the hired labour market. This happens because the working members of such households constitute a set of potential entrants into the hired labour force who may well be prepared to supply their labour at substandard rates.[6] They can be thought of as persons whose reserve price for their own labour is low.

4.11 A simple model was developed to test the relative importance of these factors in determining real wage rates, first in cross section (13 states) for 1982-83, and then using time-series data for each of the 13 states for the period 1971-72 to 1983-84.

The Cross-Section Results

The results show that in India in the early 1980's, inter-state differences in real wage rates are best explained by inter-state contrasts in labour productivity on the one hand, and the proportion of poor people among the set of households whose main income comes from self employment in agriculture, on the other hand. Net value added per manday pushes up ral wage rates, and poverty among self-employed cultivators pulls wage rate down.

The Time Series Results

4.12 At the state level over time, the dominant factors in most states have been the availability of non-farm work, first and foremost, and the cost of living regardless of whether it has been defined in terms of the CPIAL or the relevant Farm Harvest Price index. Labour productivity does not seem to have played a significant role in any state, except in Uttar Pradesh, in the case of the conventional (CPIAL deflated) real wage rate series. For the wage series deflated by the Farm Harvest Prices of the dominant food crop, the availability of non-farm work is a significant factor in every state.

TABLE 4.6

Compound Growth Rates of Rural Non-agricultural Person-days ; by State 1972-73 to 1983

State	Rate of Growth
1	2
1. Punjab	0.0688
2. Haryana	7.2124
3. Uttar Pradesh	0.6678
4. Andhra Pradesh	3.5552
5. Gujarat	0.6359
6. Maharashtra	—3.2581
7. Karnataka	1.8088
8. Rajasthan	—0.6300
9. Madhya Pradesh	1.7402
10. Orissa	1.6832
11. Tamil Nadu	3.1744
12. West Bengal	3.2339
13. Bihar	0.6413
14. All India	1.1820

Source: *Sarvekshana* Vol. III No. 3 January 1980 for 1972-73 data and Vol. XI No. 4 April 1988 for All India 1983.

4.13 However, in all states except Gujarat, Maharashtra, and Rajasthan, increased opportunities for non-farm work have tended to push up real wage rates. The cost of living, however measured, everywhere depresses real wage rates in years of rising prices.

4.14 The fact that real wage rates go up even in states where non-agricultural labour days are falling, when the non-farm work force grows, suggests strongly that it is the withdrawal of persons from the agricultural labour force that does the trick, and not the number of days work they get. Since we already know that the people in non-farm jobs are generally better off than farm labour (with the exception of some rural construction workers), the fact that they are getting fewer days work now than more than a decade ago, has no impact on real agricultural wages. The important thing, apparently, is that they are not competing with agricultural labourers for paid farm work.

4.15 In the long term rise of real wage rates in India in the seventies and early eighties, the prime mover in all states seems to have been occupational diversification, rather than growing labour productivity. This finding, based on CSS data, validates the conclusions reached by other studies using AWI data and is consistent with the results of Chapter Three, on the quality of recent changes in the structure of the workforce. On a year to year basis, increase in the cost of living depress real wage rates, however measured, significantly so in most states. The exceptions are Punjab, Maharashtra, and West Bengal. Finally, real wage rates probably rose considerably faster than the rates suggested on the basis of CPIAL deflators. The impact of this last fact, on factor substitution adverse to labour, is examined towards the end of Chapter Five.

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6 Logically persons from poor self employed cultivating households may be prepared to accept wages below the local market rate, as long as these wages exceed what they could earn by putting in additional days work on their own holdings. For a discussion, see Sheila Bhalla "A Theoretical Framework for a Study of Rural Labour Markets", Indian Journal of Labour Economics, Vol. 33, No. 2, April-June 1990.

CHAPTER FIVE

TRENDS IN EMPLOYMENT IN FIELD CROP AGRICULTURE AND THE PROCESSES AT WORK

INTRODUCTION AND PLAN OF THIS CHAPTER

5 1 Field crop production provides the single largest chunk of employment available in rural areas. In 1983, it accounted for roughly 57 per cent of all rural person days employment, and for about 77 per cent of all agricultural person days The state level figures given in table 5 1 reveal that the share of field crop agriculture in rural employment ranges from a low of 42 per cent in Haryana to as high as 77 per cent in Madhya Pradesh.

5 2 In view of its pre-eminent position in the rural employment structure, the dynamics of field crop employment generation in recent years deserves detailed analytical attention The empirical basis for the analysis of this chapter, is the data from the Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India, (CSS data, henceforth), made available through the Directorate of Economics and Statistics of the Ministry of Agriculture In recent years, it has been published in

highly aggregated form, at the back of the reports of the Commission for Agricultural Costs and Prices. It may be noted that CSS estimates of field crop employment are lower than those published by the National Sample Survey. (Compare columns 7 and 8 of table 5 1 with columns 3 and 4) Qualitatively, in terms of employment trends for example, the two data sets generate the same sort of results For the analysis of the causal factors that lie behind observed trends, however, only the CSS provides the necessary complementary data Hence the analytical parts of this chapter, rely almost exclusively on CSS data

5 3 The Plan of this chapter is as follows :

Part One presents the evidence on field crop employment growth and labour productivity growth in the wider context of recent changes in the rural employment structure The results of this exercise make it clear that field crop production in particular, and agriculture in general can no longer be relied upon

TABLE 5 1

Structure of Rural Employment 1983 (Persondays 00 for age groups 5 and above)

Sl No	State	All Rural Persondays (age group 5 and above)	NSS Field Crop Persondays as		NSS Agricultural Persondays as	NSS Non-Agricultural Persondays as	CSS Field Crop Persondays as	
			Percent of Agricultural Persondays	Percent of All Rural Persondays	Percent of All Rural Persondays	Percent of All Rural Persondays	Percent of NSS Field Crop Persondays	Percent of NSS Agricultural Persondays
	1	2	3	4	5	6	7	8
1	Punjab	13859062 19	64 58	49 21	76 19	23 81	62 89	40 62
2	Haryana	15080962 11	57 37	42 40	73 90	26 10	49 51	28 40
3	Uttar Pradesh	104826078 28	80 95	64 68	79 90	20 10	32 54	26 34
4	Andhra Pradesh	64515497 19	74 53	56 38	75 64	24 36	45 54	33 94
5	Gujarat	30430854 21	71 39	59.05	82 71	17 29	44 92	32 07
6.	Maharashtra	57281151 59	75 96	60 62	79 82	20 18	53 54	40 67
7	Karnataka	36745126 19	79 33	64 07	80 75	19 25	42 98	34 10
8	Rajasthan	42432120 45	75 22	64 15	85 28	14 72	28 46	21 41
9	Madhya Pradesh	62432781 34	88 27	77 34	87 62	12 38	26 46	23 36
10	Orissa	29642907 28	80 53	59 90	74 38	25 62	62 18	50 07
11	Tamil Nadu	41985272 38	71 53	48 57	67 90	32 10	47 08	33 67
12.	West Bengal	41669722 76	74 09	49 44	66 73	33 27	54 69	40 52
13.	Bihar	62056421 51	76 97	61 81	80 30	19 70	28 49	21 92
14.	Assam	13334082 76	86 33	67 55	78 24	21 76	n.a.	n a.
15	Himachal Pradesh	5554123 72	64 31	53 65	83 42	16 58	n a	n a.
16	Kerala	16313257 29	59 80	30 88	51 63	48 36	n a.	n.a.
17	All States (1 to 13)	602957957 48	77 28	60 74	78 60	21 40	42 55	32 88
18.	All States (1 to 16)	649104650 62	77 19	60 00	77 74	22 26	n a	n a

Note   Persondays by current activity status have been multiplied by 365 to derive total persondays
Source·   Sarvekshana, Volume XI, No 4 Issue No 35, 1988 for all India, and Table 49, Report No 341/n for state level data, wheren stands for states numbered in alphabetical order

to act as the residual claimant of labour force growth, absorbing somehow, all of the workers who do not get jobs outside of agriculture, at acceptable levels of income This evidence leads to the development of a model of the options before us These options are stated in terms of complementary target rates of growth of non-agricultural employment on the one hand considered together with corresponding target rates of growth of net value added per capita in field crop production on the other.

5.4 Part Two deals with the sources of the field crop employment growth which has taken place in each state. It answers the following questions How much of the observed change in field crop employment in recent decades is due to changes in labour intensity ? (i.e to changes in mandays per hectare under specified crops in specified states) How much is traceable to cropping pattern shifts ? And how much is accounted for by the expansion (or contraction, in the case of certain states) of gross cropped area ? The unambiguous answers have strong field crop employment policy implications

5 5 Since heretofore, reliance has been placed on increasing yields and farm output in order to enhance the employment potential of agriculture as well as to sustain or raise the income levels of people mainly engaged in agricultural pursuits, it is important to know how much employment increases in response to improvments in yield in total output and in value added Employment elasticities with respect to yield, output and net value added are the focus of Part Three of this chapter The finding that for some crops yield growth has been associated with negative employment elasticities indicates that widespread factor substitution adverse to labour absorption prospects has taken place

5 6 Part Four examines the extent to which the emergence of negative employment elasticities is associated with technical progress non-constant returns to scale and the spread of labour saving technology.

5 7 Part Five sets out the implications for employment policy of the findings reported in this chapter

Part I . Trends in Labour Absorption and Labour Productivity in Field Crop Agriculture

5 8 As the analysis of Part Two demonstrates, almost all of the employment growth which has taken place in field crop agriculture in India has to be credited to the extension of gross cropped area However, the resulting growth rate of employment (measured in mandays) is well under one per cent per annum which is less than half the rate of growth of the agricultural workforce over the period Evidently field crop activities today provide fewer days of work per person engaged in agriculture than it did in the early seventies

5 9 Nonetheless at least the employment growth rate for field crop agriculture is positive for the country as a whole, and above the rate of growth of persondays employment in all agriculture (See Table 5.2)

5 10 Corresponding state level figures for all agriculture and field crop agriculture are given in Table 5 3 and 5.4 respectively In most, but not all states, it can be seen that there is a rough correspondence in the sign and magnitude of total agricultural and field crop employment growth rates But the exceptions are worth noting In Gujarat and Orissa apparently field crop employment expanded at far higher rates than did agricultural emlpoyment as a whole In Rajasthan and Madhya Pradesh on the other hand the positive growth of employment in non-field crop farm activities may have compensated for the fall in field crop employment In Tamil Nadu the decline in non-field crop employment in agriculture seems to have been even greater than the negative growth recorded in field crop activities In West Bengal as well there may have been a decline in non-field crop activities which offset a substantial increase in labour absorption in the field crop segment of agriculture

5 11 When all is said and done however the overall rural employment position is really comfortable only in Haryana and Andhra Pradesh—in both cases because of very substantial increases in non-agricultural employment combined with respectable agricultural (and field crop) employment growth rates Tamil Nadu and West Bengal also recorded handsome non-agricultural employment growth but low and negative on farm employment growth pulls the all

TABLE 5 2

Employment Growth in Rural India: Field Crop Agriculture (CSS), All Agriculture and Non-agriculture (NSS Persondays)

S N	Segment	Compound Rate of Growth	Growth Rate Measure		
			Trend Rate of Growth (1971-72 to 1983-84)		
			R O G	R²	t
1	Field Crop Agriculture (CSS) (Triennium Basis)				
	(i) Mandays per Hectare	0 0058	0 0390	0 0012	0 1156
	(ii) Total Mandays	0 6203	0 6774	0 2559	1 9452¹
2	All Agriculture (NSS Persondays Age Group 15-59)	0 4360			
3	Non-Agriculture (NSS Persondays Age Group 15-59)	1 1820			
4	All Persondays (NSS Age Group 15-59)	0 6040			
5	Agricultural Work Force (NSS Usual Status)	0 4350			
6	Non-Agricultural Work Force (NSS Usual Status)	3 7240			
7	Total Work Force (NSS Usual Status)	0 9828			

1 The t value is significant only at the 10 percent level of confidence

Note The CSS data is for 13 plains states: Punjab, Haryana, Uttar Pradesh, Andhra Pradesh, Gujarat, Maharashtra, Karnataka, Madhya Pradesh, Orissa, Tamil Nadu, West Bengal and Bihar The NSS data is for the same 13 states

TABLE 5 3

State wise Employment Growth Rates Agriculture and Non Agriculture: NSS Persondays (Age group 15 59), 1972 -73 to 1983

S. No. State	Compound Rates of Growth of Persondays: 1972-73 to 1983		
	Rural Person days	Agricultural Persondays	Non-Agricultural Person-days
1	2	3	4
1. Punjab	---0.0145	—0.0424	0.0688
2. Haryana	3.5646	2 4517	7.2124
3. Uttar Pradesh	---0.0333	-0.2130	0.6678
4. Andhra Pradesh	2.1564	1.7251	3.5552
5. Gujarat	1 0030	1 0892	0.6359
6. Maharashtra	0 6101	2 0538	-3 2581
7. Karnataka	1.2961	1 1689	1.8088
8. Rajasthan	0.8453	1 1638	-0.6300
9. Madhya Pradesh	0.2856	0.0982	1.7402
10. Orissa	0.6644	0 3248	1 6832
11 Tamil Nadu	—0.9278	—2.4514	3.1744
12. West Bengal	1.5071	0.7196	3.2339
13. Bihar	—0.0003	-0 1639	0.6413

Source: For 1972-73: Sarvekshana Vol. III No. 3, January 1983

For 1983: All India; Sarvekshana Vol. XI No. 4 (Issue No. 35) April 1988, Table 35.

For States : NSS Report 341/n, table number 35 (where a stands for states numbered in alphabetical order).

Note: The estimated number of persondays (00) for ages 15 to 59 by current activity status has been used.   These figures are *not* strictly comparable to those in table 5., which relates to the age group 5 and above.

TABLE 5.4

Statewise Employment Growth Rates in Field Crop Agriculture CSS Mandays per Hectare and Total Mandays: 1972-73 to 1983-84

S. No. State	Mandays per Hectare			
	Compound R. O.G. Trie-nnium Basis	Trend R.O.G.	R-	Sig of t-values
1	2	3	4	5
1. Punjab	---1.4608	—1.4870	0.4879	***
2. Haryana	1.6592	1.8808	0 4383	***
3. Uttar Pradesh	—1.3706	--1.5086	0.2031	insig
4. Andhra Pradesh	1.9971	2.1775	0.6287	***
5. Gujarat	3.9041	4.4112	0.7174	***
6. Maharashtra	0.4091	0.3820	0.0194	insig
7. Karnataka	0.8034	0.8171	0.0689	insig
8. Rajasthan	- -1.4544	—1.5639	0.2224	insig
9. Madhya Pradesh	—2.2482	--2.6326	0 4058	***
10. Orissa	0.3796	0 5840	0 1402	insig
11. Tamil Nadu	0.1059	0 3859	0 0474	insig
12. West Bengal	2.1722	2.0853	0 4613	
13. Bihar	—0.4459	0.2439	0 0040	insig

S. No.	State	Total Mandays			
		Compound R.O.G. Triennium Basis	Trend R.O.G.	R^2	Sig of t-values
	1	2	3	4	5
1.	Punjab	0.1720	0.1874	0 0157	insig
2.	Haryana	2.5308	2.7240	0 6290	***
3.	Uttar Pradesh	—0.5983	—0 6925	0.0537	insig
4.	Andhra Pradesh	2.2392	2.3030	0.5622	***
5.	Gujarat	3.9910	4.8052	0.6505	***
6.	Maharashtra	1.5580	1.4597	0 2142	insig
7.	Karnataka	1.2150	1.0980	0.1117	insig
8.	Rajasthsn	—0.5807	—0.6191	0 0363	insig
9.	Madhya Pradesh	—1.6877	—2.0735	0 2754	insig
10.	Orissa	2.7765	3.0913	0.7719	***
11.	Tamil Nadu	—1.2830	—0.6677	0.0564	insig
12.	West Bengal	2.3823	2.1573	0.4414	***
13.	Bihar	—0.8704	—0.1668	0.0015	insig

Stars (*) indicate levels of significance as follows; * 2.5 per cent level or better,
** 5 percent level, *** 10 per cent level.

rural persondays growth rates down. Given the present small share of non-agricultual employment in the total, even handsome rates of non-farm employment growth are not sufficient to offset poor labour absorption in the dominant agricultural sector of the rural economy.

5.12 In seven states out of the thirteen for which the data is adequate to form a judgement, the rate of growth of total employment in field crop agriculture is negative or not significantly different from zero. Positive trend growth rates, at acceptable levels of significance, are observed only in five states ; Haryana, Andhra Pradesh, Gujarat, Orissa and West Bengal. In all of these five states, mandays of employment has grown at rates above the workforce growth rates. But there are more days work available per worker only in these five states. In Maharashtra, work force growth and trends in field crop employment roughly correspond.

5.13 Yet these figures need to be interpreted with caution. In particular, it has to be remembered that this "employment" includes, as an important component, the unpaid family labour of cultivating households, a great deal of which in some regions, may be producing next to nothing in terms of the additional output their labour brings forth. This "employment" is thus not even roughly equivalent to demand for labour as it would have been in a labour market where all workers are hired workers. In a world where people had to produce at least the value equivalent of their own wages, much of the unpaid family labour recorded here would not have been offered employment at all.

5.14 On per hectare employment basis, the tally of negative or no growth regions is even higher—nine out of 13 states. The figures suggest that it is area extension that saved the day in at least three states : Orissa, Maharashtra and Punjab In the Punjab case, the extension of gross cropped area transformed a

negative per hectare manday growth figure into an (insignificant) positive one for total mandays. Even then, the number of days work available per usual status worker went down.

5.15 On the other hand, in most states, field crop labour productivity (per manday worked) grew at handsome positive rates, far above work force growth rates. But of the nine states which enjoyed high (above 2 per cent) growth rates in labour productivity over the period, only three experienced substantial growth of employment : Andhra Pradesh, Gujarat and Orissa. In general high labour productivity growth and high employment growth have not gone together. The other six states which recorded substantial improvements in labour productivity suffered low, negligible or negative rates of field crop labour absorption Moreover, Bihar and Uttar Pradesh data generate positive but not significant labour productivity growth combined with negative employment growth rates Haryana and West Bengal on the other hand, record high employment growth rates while labour productivity stagnates or declines. (See table 5 5)

5.16 In short, in recent Indian experience, it is high output (or NVA) growth which has led to substantial gains in labour productivity, and this high output growth more often than not,has been accompanied by slow or declining labour absorption. In several states falling employment has contributed a good deal to rising labour productivity. And when field crop labour absorption stagnates or declines while output rises, as in Punjab, Rajasthan and Madhya Pradesh, labour productivity growth rates well over 4 per cent compound emerge.

5.17 This suggests a pair of 'polar-case' policy alternatives. The first involves the growth of the rural non-farm sector's share in employment (or work force) sufficient to maintain those remaining in agriculture at stable or rising levels of mandays employ-

TABLE 5.5

Growth of Labour Productivity (Value of Output or Net Value Added per Mandays) 1971-72 to 1983-84 (Value in Constant 1980-81 Farm Harvest Prices)

S. No.	State	Value of Output/Mandays				Net Value Added/Mandays			
		Compound R.O.G. Triennium Basis	Trend R.O.G.	R^2	Sig	Compound R.O.G. Triennium Basis	Trend R.O.G.	R^2	Sig
	1	2	3	4	5	6	7	8	9
1.	Punjab	4.59	4.333	0.699	***	4.11	3.711	0.472	***
2.	Haryana	0.53	—0.118	0.001	insig	—0.26	—1.131	0.078	insig
3.	Uttar Pradesh	2.44	2.446	0.320	*	1.94	1.919	0.211	insig
4.	Andhra Pradesh	2.25	2.114	0.482	***	2.10	2.047	0.313	*
5.	Gujarat	2.39	2.430	0.277	insig	2.65	2.801	0.171	insig
6.	Maharashtra	2.18	2.306	0.368	*	0.80	0.901	0.046	insig
7.	Karnataka	2.62	2.999	0.382	**	2.19	2.709	0.310	*
8.	Rajasthan	4.85	4.999	0.546	***	5.30	4.810	0.583	***
9.	Madhya Pradesh	4.45	4.449	0.610	***	4.33	4.400	0.587	***
10.	Orissa	4.31	3.863	0.567	***	4.01	3.704	0.585	***
11.	Tamil Nadu	2.60	2.409	0.570	***	2.96	2.766	0.631	***
12.	West Bengal	1.70	1.514	0.298	insig	0.91	0.742	0.059	insig
13.	Bihar	1.65	1.239	0.049	insig	2.07	1.417	0.050	insig
14.	All States (1 to 13)	2.95	2.824	0.582	***	2.71	2.552	0.557	***

Notes: (1) *indicate levels of significance for slope as follows: *** 1 per cent, ** 2—5 per cent, * 5 per cent.

(2) It may be noted that the NVA labour productivity growth rates for Maharashtra (in columns 6 to 7) are much below the value of output per

ment per person, given the assumption that present low growth rates of mandays employment continue. At the other extreme, one can visualise a future situation in which NVA grows so fast that even if the entire population born into agricultural or agricultural labour households stays on to work in agriculture, NVA per capita continues to rise. The farm and farm labour population would however get fewer days work per person, or, possibly, those who do work would (out of their Nurksean virtual savings) support their non-working family members at levels of living at least no worse than those at present. This is of course consistent with the withdrawal of women from field crop activities, and the on-farm support, possibly at rising standards of living, of frustrated young adults unable to find acceptable non-agricultural jobs. The relevance of this second scenario to the Punjab rural employment situation ; evident.

5.18 In practice, of course, both things have been happening, to varying degrees, at once. NVA in most states has been rising faster than population and, at the same time, the share of non-agriculture in the

work force has been expanding, both in rural areas specifically, and in the combined rural-plus-urban areas of each state. The rise in the share of the work force in non-agriculture has in practice been associated with urbanisation.

5.19 But in many states, the rate of growth of non-agricultural employment has not been enough. Either per capita NVA has gone down, or the number of days work available in agriculture has contracted, or both. There are only 4 states (out of 13) which have enjoyed both growing NVA per capita and expanding employment per capita. (See table 5.6).

5.20 The rate of growth of employment days per capita in agriculture has been negative in seven out of 13 states, and negative for all 13 states combined. Thus the number of days of field crop employment available per worker born into farm and farm labour households in India as a whole has been going down. It is rising in some states however, Andhra Pradesh, Gujarat, Maharashtra (barely), Orissa and West Bengal.

TABLE 5 6

Rates of Growth of Per Capita Net Value Added and Per Capita Mandays Work Available in Field Crop Agriculture 1971-72 to 1983-84

Scenario	States	ROG Per capita NVA in field crop Agriculture	ROG Per capita manday work in field crop Agriculture
1	2	3	4
I Growing NVA per capita expanding employment per capita	Andhra Pradesh	2 28	0.39
	Gujarat	5.82	3.84
	Orissa	4 89	1.74
	West Bengal	1 23	0 51
II Growing NVA per capita contracting employment per capita	Karnataka	1.16	0 72
	Punjab	2 34	—1 03
	Rajasthan	2 21	—2.91
	"All India" [1]	0 36	-1 19
III Falling NVA per capita expanding employment per capita	Haryana	—0 92	1.59
	Maharashtra	–0 02	0 03
IV Falling NVA per capita contracting Employment	Bihar	-0 09	—2.15
	Madhya Pradesh	—0.12	—3 82
	Tamil Nadu	—0.37	—1.54
	Uttar Pradesh	—0.11	—2 78

1. All India is defined here by the 13 states for which the required data were available.

5.21 Moreover, the rate of growth of per capita value added is negative in six states. Of these six, four (Bihar, Madhya Pradesh, Tamil Nadu and Uttar Pradesh) combine the decline in per capita value added with contracting per capita work availability. Two states, Haryana and Maharashtra witnessed a fall in NVA per capita in agriculture together with a rise in days work available. Finally, three states combined growing per capita NVA with declining work availability. They were · Karnataka, Punjab and Rajasthan. At the all India level positive growth in NVA per capita was associated with falling employment. The four scenarios are summarised in table 5.6.

5.22 Throughout the 1950's and sixties, and in the early phase of the green revolution, policy makers correctly counted on employment gains from virtually every increase in farm productivity. This is still appropriate in a number of states, but it is no longer so in Uttar Pradesh, Rajasthan, Madhya Pradesh, Tamil Nadu and Bihar. In these five states, when farm output and NVA go up. farm employment goes down, with the result that higher and higher rates of growth of non-farm employment are required to stabilise the

per capita days work available to people who fail to get non-agricultural jobs. In other words, the number of days work available in agriculture falls as NVA rises and hence more and more people either have find jobs outside of agriculture. or work in agriculture for fewer and fewer days in each successive years.

What precisely it in the underlying conditions, that has changed ?

5.23 First of all, in the decades before the mid-sixties, the main source of agricultural growth was the extension of net sown area. This being the case, there could be no conflict between farm output and income growth goals on the one hand and rural employment objectives on the other. Whatever pushed up total cropped area was instrumental in expanding employment. In the last twenty years, however, increasing yields have become by far the most important source of farm ouput growth; area expansion has been relegated to minor role. One result is that we must now operate in a world in which food policy and farm income goals can best be achieved by pushing up yields, and to a much lesser extent, by extending gross cropped area.

5.24 Secondly, in the past, when real wages were more or less constant, and the new technology involved mainly a new biochemical input combination—seeds, water, and chemical fertilizer--increases in yield were associated with larger labour inputs per hectare, that is with increasing employment. Now that is no longer so. The negative employment elasticities with respect to yields which have appeared in most states, have greatly complicated the situation. However, by themselves such negative employment elasticities are not a disaster. As long as they are combind with cropping pattern shifts which favour labour absorption or with compensating increases in gross cropped area, total farm employment still may rise. But in several staes these potential compensating factors are either absent altogether, or two weak to offset declining labour intensity (labour inputs per hectare) in the production of one or more crops. The result is that we now have five populous states in which agricultural output growth and employment growth objectives come into direct conflict, unless deliberate steps are taken either to change the relative importance in farm output growth, of yield and GCA extension, in favour of expanding gross cropped area or to encourage the production of those particular crops which use relatively more labour per hectare and/or record positive elasticities of employment with respect to yield.

5.25 That is, an agricultural output growth policy consistent with employment goals must be much more finely turned to the specific conditions of each state than has been the case in the past.

5.26 To sum up : the combined model brings home the hard fact that agricultural output growth does not everywhere, automatically, induce on-farm employment growth Far from it. This in practice means, first of all, that agriculture in general can no longer be relied upon to act as the residual claimant of that part of the workforce that cannot find non-farm jobs. Indeed, in several states active policies to generate

non-farm jobs are essential to prevent a further contraction in days work available to the people who have stayed on in agriculture. Thus, in most states today, a two pronged employment policy is needed to sustain even existing levels of employment, one set of instruments focussed on agriculture and another on non-agriculture. But in some states even this will not prevent employment per capita in agriculture from falling. Second : the agricultural employment policy interventions themselves have to become more sophisticated. Simply accelerating farm output growth rates may worsen the on-farm employment situation unless deliberate steps are taken to avoid this result. Moreover, even if all steps as are feasible are taken, it may not be possible to avoid reducing the number of agricultural work days available per capita, when efforts are made to raise farm output and incomes. This reality needs to be faced squarely. Finally, farm output growth policies, to be as consistent as is possible with employment objectives, must differentiate as between regions. What will work well for one state may be an unmitigated disaster in another. To meet the specific requirements of diverse region-level situations, farm production and employment programmes need not only to be coordinated, they must also be highly discriminating, careful, and purposively selective in the choice of policy instruments.

Part II : Sources of Employment Growth in Field Crop Agriculture

5.27 This part reports the results of an attempt to quantify the sources of employment growth in field crops agriculture over the period spanned by the triennium 1971-72, 1972-73, and 1973-74 to the triennium 1981-82, 1982-83 and 1983-84.

5.28 The exercise was carried out at three levels. In ascending order of aggregation, they are :

(i) the individual crop level, in each of 13 states separately;

(ii) the level of "all crops" in each state separately; and

(iii) the "all-India" level for all crops combined in all of the 13 states combined.

5.29 At the all-India level, practically all of the very modest growth, in field crop employment has been due to the extension of gross cropped area (Table 5.7). Nothing else really matters. There is a marginal decline in employment, caused by reduced labour intensity, and a two and a half per cent rise in labour absorption due to the very small net favourable impact on labour absorption of cropping pattern shifts.

5.30 It is worth noting that this pattern of labour absorption changes by cause, in field crop produc-
tion, parallel

sector over the same period. In industry total employment has risen slowly, due to the expansion of the

TABLE 5.7

Levels and Growth of Employment in Field Crop Agriculture by Source: Triennium Ended 1973-74 to Triennium Ended 1983-84: All India (13 States)

Description	Employment in Mandays (000)	As Per cent of Total Employment (%)	As Percent of Increase in Employment (%)
1	2	3	4
1. Total Field Crop Employment (Triennium ending 1984)	14075361 90	100	..
2. Increase in Employment (Triennium ending 1984 over triennium ending 1974) . .	792990 02	5.97	100
3. Increase in Employment by Source:			
(a) Due to Labour intensity change	—3216.25	—0 02	—0 41
(b) Due to cropping pattern shifts . .	19713 00	0 14	2 49
(c) Due to change in gross cropped area	776493 27	5 52	97 92

industrial sector as a whole, but labour intensity has fallen within individual industry groups, due to technological change, just as it has in agriculture with respect to particular crops. Moreover, in industry 'structural changes' (defined as shifts in the relative importance of different segments of industry) did not have much impact on employment levels, over the same period, because the employment effects of such shifts are negative in some industries and positive in others (Papela 1988). So also in agriculture, cropping pattern shifts have led to a negligible improvement in labour absorption at the all India level because, while in some regions, cropping pattern changes have improved matters, in others they have made the employment situation worse. It thus appears that at least some of the forces work in field crop agriculture in recent years are not so very different from the forces at work in industry. At least the immediate causes of the decline in the labour absorption capacity of Indian agriculture are of the same order of relative importance as those in industry.

5.31 At the state level, the cropping pattern shift effect is negative for all crops combined in 4 states out of the 13 for which adequate data was available : Bihar, Gujarat, Madhya Pradesh and Orissa. In Gujarat and Orissa the declines were substantial but offset in labour

1 Papola, T.S. (1988) Restructuring in Indian Industry, Implications for Employment and Industrial Relations (Study prepared

absorption due to increases in labour intensity, (that is, increases in mandays put in per hectare). In two states, Bihar and Tamil Nadu, gross cropped area actually went down, so decisively in Tamil Nadu, that the modest employment gains attributable to favourable labour intensity and cropping pattern changes, were wiped out. However, it is the very substantial declines in employment per hectare in Punjab, Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar, which hold the key to the general decline in the labour absorptive capacity of field crop agriculture in the country as a whole This decline in per hectare labour intensity reflects the adoption of labour saving methods of production, in response to some combination of technical change and changes in labour costs relative to the costs of other inputs into the production process. (The technology factor is discussed in Part Four of this Chapter).

5.32 The final outcome is that employment in field crop production has actually declined in Bihar, Madhya Pradesh, Rajasthan, Tamil Nadu and Uttar Pradesh, In Punjab the situation is saved, just, by a combination of very rapid growth in GCA, plus the positive impact of cropping pattern shifts there. In a number of other states, negative per hectare employment elasticities with respect to yield emerge for particular crops noteably wheat but these are compensated for by increases in labour use per hectare for other crops.

5.33 These results point, unambiguously to one key fact : that in recent years the crucial factor in the maintenance and modest growth of employment in field crop agriculture has been the extension of double cropping Such increases in GCA can be sustained only by accelerated investment, in irrigation in particular, but perhaps also in flood control and drainage in parts of Bihar and specified areas of other states Working in the opposite direction are the forces behind factor substitution—technological change and rising rural wages rates in some regions. Present trends suggest that in future, reliance on GCA extension is likely to become more and more essential to the maintenance of employment levels in agriculture, as other states shift (as they eventually will) from labour using to labour displacing input packages.

5.34 The cropwise decomposition of total employment change into labour intensity and area change effects, reveals that the big positive contributions to field crop employment have been made by paddy, cotton, jowar and soyabean in that order. The big negative effects have come from the contraction of employmen in the production of gram, mustard and barley.

5.35 However, certain crops recording a relatively small decline in employment need special mention, in particular wheat and sugarcane Both of these crops registered truly gigantic reductions in employment due

to labour intensity changes The impact of this on labour absorption was largely offset by the effect of large increases in the area under wheat and sugarcane. Many other crops also record large reductions in employment due to a fall in labour intensity, defined as labour days put in per hectare. Besides wheat and sugarcane, this set includes : maize, barley, moong, gram, groundnut soyabean, mustard, jute and tobacco. In the cases of moong, soyabean and jute, the decline in labour inputs per hectare was more than compensated for by the extension of area under these crops.

5.36 But there are crops which at the combined. states level, have been characterised by increasing labour intensity. By far the most important of these is paddy followed by cotton, bajra and jowar. However, it should be noticed that for all crops except arhar, the phenomenon of declining per hectare labour use is present in at least one state. Even in the case of paddy with its massive labour intensity gains, the states of Punjab, UP and Karnataka report declines in per hectare labour absorption Similarly in the case of cotton, the substantial net gain in labour intensity (in Gujarat Karnataka, Andhra Pradesh and Haryana) took place despite the reduction in labour use per hectare in Punjab, Maharashtra, Madhya Pradesh and Tamil Nadu. Evidently the forces behind factor substitution in favour of, or against, labour absorption differ from state to state even for the same crop. Wheat is the only important exception. In wheat production, in all states, labour intensity change is adverse to labour, while in all states but one, for wheat GCA change has a positive impact.

5.37 The results of the cropwise decomposition exercise are reflected in the employment elasticities presented in the section following. The question of technical change is dealt with subsequently.

Part III : The Responsivenss of Employment to Changes in Yield and in Production

Background and Method :

5.38 An earlier study combined CSS employment data with CSO yield estimates to generate elasticity figures by the tiennium o triennium growth rate method illustrated as formulation 3 in column 1 of table 5.15. The present exercise relies on the CSS estimates for both labour days data and yield. Since CSS based yield[3] growth rates are typically higher than their CSO counterparts in 9 out of the 13 states covered (compare table 5.8 columns 4 and 5), the resulting elasticity estimates are generally lower in the present case. The area estimates used to blow up CSS per hectare mandays and both CSS and CSO yield figures come from the Directorate of Economics and Statistics, Ministry of Agriculture Document Area and Production of Principal Crops in India

2 Reported in Sheila Bhalla (1987) "Trends in Employment in Indian Agriculture. Land and Asset Distribution". *Indian Journal of Agricultural Economics* October-December 1987

3 It may be noted that there need be no presumption that the CSO yield figures are better. Indeed here is evidence that some CSO yield figures are underestimates. Paddy procurement in Punjab for example, exceeds CSO paddy production estimates for several consecutive years. (See *Bulletin in Food Statistics* (various years) (Tables 9.1 and 11.0) Directorate of Economics and Statistics, Ministry of Agriculture.

Table 5.8

"All India" Employment Elasticity Estimates Using Alternative Elasticity Formulations—Value of Output (CSS and CSO),
Gross and Net Value Added (CSS); All Crops Combined (Values at Constant 1980-81 Farm Harvest Prices)

Elasticity Formulation		Per Hectare Employment Elasticities With Respect to		Total Employment Elasticites With Respect to		Total Employment Elasticities With Respect to	
		CSS Yield	CSO Yield	CSS value of Output	CSO value of Output	CSS gross Value Added	CSS Net Value Added
1		2	3	4	5	6	7
£ 1.	(dy/dx) x (x/y)	–.0.1074	–0.1263	0.1231	0.1777	0.1507	0.1527
£ 2.	log y = α + β log x	–0 1075	–0 1211	0.1199	0.1786	0 1526	0.1551
£ 3.	Compund Rate of Growth of Mandays/Compound Rate of Growth of Production for Triennium Ended 1973-74 to Triennium Ended 1983-84	0 0020	0 0035	0 1770	0 2723	0.1967	0.1961
£ 4.	$\left(\dfrac{dy/dt}{dx/dt}\right)\dfrac{x}{y}$	0.0067@	0.0116@	0.1976 a	0.2992@	0 2187@	0.2183 @

Notes:
1. The sign @ indicates that t-value for the slope of dx/dt are significant at the 5 per cent level or better.
2. At the "All-India" level, t values for the slope of dy/dt are not significant, with 11 degrees of freedom, in the case of mardays per hectare t =0.0527. In the case of total employment, the t value of 1.8798 is significant only at the 10 per cent level.
3. At the "All India" level, t values for slope, in the cases of the first two formulations are not significant

Table 5 9

Statewise and "All India" Per Hectare Employment Elasticities with Respect to Yield (CSS Data Using Alternative Elasticity Formulations All Crops Combined (Values at Constant 1980-81 Farm Harvest Prices)

State		Per Hectare Employment Elasticity wsith repsect to CSS Yield				(dy/dt/dx/dt)x (x/y)
		(dy/dx) x (x/y)	log y = α + β log x	Compound Rate of Growth of Mandays / Compound Rate of Growth of Yield for Triennium Ended 1973-74 to Triennium Ended 1983-84		
				CSS Based	CSO Based	
	1	2	3	4	5	6
1.	Punjab	–0.3838*	–0.3945*	–0.4796	(–0.6086)	–0.5193@
2.	Haryana	0.4258	0.4331	0.6970	(0.5034)	1.0800
3.	Uttar Pradesh	–0.1357	–0.0248	–1.0683	(–1.0471)	–1.7185
4.	Andhra Pradesh	0.4499**	0.4619**	0.4605	(1.0404)	0.4900@ *
5.	Gujarat	0.5527**	0.5354**	0 6194	(1.9141)	0.6605@*
6.	Maharashtra	0.3207	0.2998	0.1580	(0.0695)	0.1379@
7.	Karnataka	0.1546	0.1344	0 2267	(16.9494)	0.2158@ A²
8.	Rajasthan	–0.3170	–0.2917	–0.4041	(–0.3692)	–0.5797@
9.	Madhya Pradesh	–0.0041	0.0171	–1.0148	(–1.4127)	–1.5827*
10.	Orissa	0.1608*	0.1617*	0.0813	(0.3018)	0.1322@
11.	Tamil Nadu	0.2709	0.2666*	0 0385	(–0.3944)	0.1490@
12.	West Bengal	0.5086**	0.5304**	0.5564	(6.5055)	0.5094@*
13.	Bihar	–0.4696	–0.4557	–0.2527	(143.8387)	–0.0051)
	All India	–0.1074	–0.1075	0.0020	(0.0035)	0.0067@

NOTES:
1. Stars (*) indicate levels of significance of t values for slope in formulations ‡ 1 and T 2 as follows * 5 per cent, ** 1 per cent or better.
2. Figures in (brackets) in column 5 are the equivalent elasticities derived using CSO figures on yeild instead of CSS figures.
3. Compound growth rates underlying column 4 are given in Appendix Table 4.
4. For the formulation 4 (in column 6) @ indicates that t values for slope of (dy/dt) are significant at the 5 per cent level or better. (dy/dt) and (*) indicate that t values for slope of (dx/dt) are significant at 5 per cent or better. A² indicates that a² segment lin arc equation gives the best fit with significant t values for y/ it for the second half of the period.

The Results :

5.39 At the 'all India' all crops level, it is found that in recent years increases in yield have had virtually no impact on employment. Moreover the CSS data suggests that a 10 per cent increase in the total value of output, (total output is measured as the yield times the area under each crop), generates something like a 2 per cent rise in field crop employment. This is a much smaller employment response in relation to output growth than any estimated earlier. With respect to value added, employment elasticities are perhaps a little higher, but all said and done, the story that comes out from these figures is a sobering one. At the all India level in recent years agricultural growth *per se* has generated proportionately very little by way of additional days work Indeed, it is clear that no conceivably feasible field crop output growth rate is going to provide employment to any but a small proportion of workers born into cultivating and agricultural labour households.

5.40 Table 5.9 gives estimates of elasticity of employment with respect to yield at the state level, for all crops combined in each state. We can say with considerable confidence the following :

(1) increases in yield in Punjab have been associated with decreases in employment per hectare, that is labour intensity falls when yield rises. One per cent rise in yield leads to decline in mandays of just under one half of one per cent.

(2) Andhra Pradesh and Gujarat still enjoy relatively strong positive employment responses to increases in yield. Gujarat records the highest employment elasticity with respect to yield in the country.

(3) Orissa and Tamil Nadu farm workers can expect very small expansions in emplov-

ment, when yields rise, but West Bengal workers can look forward to improvements of the order of 0.5 per cent for every 1 per cent increase in yield.

With considerably less confidence we can also say that :

(1) Employment elasticities in Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar are probably negative, with respect to the value of output per hectare.

(2) In Haryana, Maharashtra, and Karnataka, employment has gone up when yields improved, but the link between labour absorption and yield increases is weak, except perhaps for very recent years in Karnataka.

5.41 In short at the state level we have a mixed picture, with negative employment responses to yield increases recorded in 5 states out of 13, and unambiguous positive and substantial responses recorded in only 3 states. Table 5.9 gives the detail. With respect to production growth, however substantial employment gains are recorded in Haryana, Andhra Pradesh, Gujarat, Maharashtra, Orissa, Tamil Nadu and West Bengal, and low, negligible, uncertain, or negative gains in Punjab, Uttar Pradesh, Karnataka, Rajasthan, Madhya Pradesh and Bihar. (See table 5.10).

5.42 In short a policy focussed on yield improvement alone has a weak and uncertain pay off in term of employment generation, while one focussed more widely on the expansion of production is likely to produce clear employment gains. However the increase in employment in response to a 1 per cent increase in production will be modest by the standards of one or two decades ago, even in those favoured states where the positive employment response is relatively large by todays standards

TABLE 5.10

Statewise and "All India" Employment Elasticities with Respect to Total Value of Output (CSS Production data): Three Alternative

Elasticity Formulations : All Crops Combined (Values at Constant 1980-81 Farm Harvest Prices)

State	Employment Elasticities with Respect to Total Value of Output				
	(dy/dx) x (x/y)	log y =α+β log x	Compound Rate of Growth of Mandays/Compound Rate of Growth of Production for Triennium Ended 1973-74 to Trinnium Ended 1983-84	(dy/dt/dx/dt) x (x/y)
1	2	3	4	5	6
1. Punjab	—0.0043	—0.0084	0 0361	(0 0420)	0.0408@*
2. Haryana	0.5601**	0.5638*	0.7715	(0.6027)	1.0469@*
3. Uttar Pradesh	—0.0679	0.0063*	—0.2880	—(0.2842)	—0.4301@

I	2	3	4	5	6
4. Andhra Pradesh	0 4952**	0 5026**	0 4887	(1 0344)	0 5015@*
5. Gujarat	0 5899**	0 5762**	0 6259	(1 8616)	0 6816*
6. Maharashtra	0 4131*	0 4078*	0 4101	(0 2202)	0 3858@
7. Karnataka	0.2672	0 2345	0 3042	(2 5584)	0 2752@
8. Rajasthan	—0.0602	—0 0258	—0.1266	—(0 1178)	—0 1885@
9. Madhya Pradesh	—0 0805	0 0539	—0 6008	(—0 7692)	—0 9210
10. Orissa	0 4040**	0 3956**	0.3833	(0 7465)	0 4521*@
11. Tamil Nadu	0 4242*	0 4452*	—0 9516	(0 7723)	—0 3354
12. West Bengal	0 5267**	0 5433**	0.5700	(4 0399)	0.5722
13. Bihar	—0.1794	—0 1742	—0 6396	(2 0833)	—0.3306
All India	0.1231	0 1199	0 1770	(0 2723)	0.1976@

Notes:

1. Stars (*) indicate levels of significance of t values for slope in formulation, in columns (2) and (3) as follows. * 5 per cent ** 1 per cent or better.

2. Figures in brackets in columns 5 are the equivalent elasticities derived using CSO figures on yield instead of CSS figures.

3. Compound growth rates underlying column 4 are given in Appendix Table 4.

4. For the formulation in column 6@ indicates that t values for the slope of dx/dt are significant at the 5 per cent level and a star (*) indicates that t values for the slope of dy/dt are significant at the 5 per cent level or better.

5.43 At the level of individual crops (aggregated across the thirteen states studied), highly significant large positive employment responses to yield increases are found for Soyabean, Sunflower and Cotton. The elasticity estimates are : Soyabean 0 83 to 0.84, Sunflower 0.67 and Cotton 0 50 to 0 56. High employment elasticities also emerge for Mustard (0.71 to 087) and possibly Urad (0 90). The more modest (0.20 to 0.26) employment elasticity with respect to Paddy yield is highly significant.

5.44 The biggest negative elasticities are recorded by wheat (-0.67 to -0.70) and Barley (-1 2 to -1 4). The Sugarcane data generates highly significant negative elasticities for the period as a whole, but year to year employment variability does not correspond well to year to year yield variability The elasticities by conventional year to year methods are in the range -0 38 to -0.43. In the cases of groundnut and gram all four elasticity estimates are negative, but no measure generates significant t-values.

5.45 Conceptually, however the most satisfactory elasticities are those for individual crop in each state taken separately. The text below relates only to the outstanding features of the employment elasticities with respect to yield.

5.46 At the state-cum-crop level the generally high positive elasticities with respect to yield for oilseeds other than groundnut are confirmed For soyabean, sunflower and and mustard crops, state level elasticities typically range from 0.60 to 0 95. Groundnut

figures are equally high in Madhya Pradesh and Orissa, a bit lower in Andhra Pradesh (0 46 to 0 55), but much lower in some of the major producing states, such as Gujarat (0.24).

5.47 Employment in cotton production is generally also sensitive to yield improvements with substantial positive elasticities (in the range 0.40 to 0 90 in seven out of the eight states for which CSS data is available. In Punjab alone employment elasticities with respect to cotton yields appear to be negative or negligible on the year to year variation basis.

For urad, high employment elasticities are recorded everywhere, in the range of 0 7 upwards.

5.48 Among foodgrains, paddy is the most successful for the employment point of view, but in only three states does the data generate really handsome employment elasticities with respect to yield. They are Andhra Pradesh, West Bengal and Haryana. For most other states the elasticities are low (below 0 35) but positive. At the discouraging end of the scale, the employment elasticities are negative with respect to yield in both Uttar Pradesh and Punjab.

5 49 Wheat yield increases over the period 1970-71 to 1983-84 have generally been associated with substantial reductions in per hectare labour inputs, although on a year-to-year basis, variations in yield in several states are associated directly and positively with year-to-year variations in mandays per hectare employed.

5.50 In Andhra Pradesh, Maharashtra and Uttar Pradesh also, the data generates substantial negative employment elasticities with respect to yield for sugarcane when trends for the entire period are taken into account. At the other extreme Haryana and Karnataka data indicates substantial increases in labour absorption with respect to yield growtn.

5.51 Gram and Maize are both crops characterised by long period declines in the labour absorptive capacity of increases in yield, combined with small or modest positive elasticities when year-to-year variations rather than long term trends are taken into account.

5.52 For field crop employment forecasting purposes it is these long term trend elasticity figures which need to be taken most seriously. On a long term basis we can conclude that, among individual crops, yield increases in oilseeds, cotton, urad and paddy are most likely to favour increased labour absorption in field crop agriculture. For most other crops, significant yield improvements may well be associated with reduction in the labour absorp'ive capacity of field crop agriculture in the coming decade.

5.53 However, technical progress in the sense of significant growth in total factor productivity over the period may be working against us, in relation to the future employment potential of field crop agriculture. This possibility is examined in Part four of this chapter.

Part IV : Technical Progress, Return to Scale, and the Emergence of Labour Saving Technology.

Technical Progress :

5.54 Patial productivity measures, such as labour productivity or yield are familiar indicators, well understood and widely used. They measure output per unit of single input, or of a set of input lap one at a time. Multi-Factor productivity indicators seek to measure output per unit of two or more inputs considered together. Such "total factor productivity" measures are treated as indicators of technical progress, usually in the form of an index of output per unit of labour and capital combined. If, over time, the index increases significantly it is said that technical progress has taken place.

5.55 Kendrick's arithmetic measure[4] and Solow's geometric index[5] are the two indices most commonly adopted. Both of them measure changes in total factor productivity as a residual: "the residual between the increase in output actually observed during a given period and that which would have been expected due to an increase of factor inputs alone".[6] When base year weights are used, the Kendrick index measures "the shift of the production function unaffected by changes in the capital labour ratio".[7] In calculating the Solow measures, the restricted form[8] of the Cobb-Douglas production function is adopted, which presupposes constant returns to scale ; and neutral technical progress. If this is in fact the real situation, then for small changes in the quantity of inputs and outputs, Solow's measure is equivalent to Kendrick's.

5.56 Reference to table 5.11 reveals that both total factor productivity indices for most crop in most states recorded positive trend rates of growth from 1971-72 to 1983-84. This tends to suggest generally increasing efficiency in input use rather than the reverse. But technical progress can be said to have taken place only for some crops in specified states during the thirteen years period ending 1983-84—thirty three cases of technical progress out of the 79 State-crop combinations for which data was available.

TABLE 5.11

Trend Rates of Growth in Kendrick and Solow Total Factor Productivity Indices, by State and Crop : 1972-73 to 1983-84

State/Crop	Trend Rate of Growth : Kendrick Index			Trend Rate of Growth: Solow Index		
	Rate of Growth	T-value	Sig.	Rate of Growth	T-Value	Sig.
1	2	3	4	5	6	7
Andhra Pradash						
1. Paddy	3.1427	1 3005	—	—0.7106	—0.6204	—
2. Jowar	5.0730	4 2141	***	1.0883	0.8252	—
3. Moong	0.1953	0.1295	—	0.2091	0.1387	—
4. Urad	—0.0095	—0.0063	—	1.6680	1.7111	—
5. Groundnut	3.7581	1.4209	—	0.2215	0.1192	—
6. Cotton	2.6014	1.5212	—	2.9950	1.8596	*
7. Sugarcane	8.3531	7.6308	***	7.0397	6.0873	***
8. Tobacco	3.0562	1.0917	..	1.3995	0.5070	—

4. See J. Kendrick *Productivity Trends in the United States* Princeton University Press NBER 1961.

5. See R. Solow "Technical Change and the aggregate Production Function" *Review of Economics and Statistics* Aug. 1957, 39 (3) pp. 312.20.

6. E. Kleiman, N. Halevi and D. Levhari "The Relationship Between Two Measures of Total Productivity *Review of Economics and Statistics* August 1966 p. 345.

7. E. Kleiman, N. Halevi and D. Levhari "The Relationship Between Two Measures of Total Productivity *Review of Economics and Statistics* August 1966 p. 345.

8 In the restricted form β the share of capital is equal to (1—α), or one minus the share of labour. See the subsection following on non-constant returns to scale, for details.

1	2	3	4	5	6	7
BIHAR						
9. Paddy	2.3541	1.5250	—	0.6602	0.4348	—
10. Maize	10.7395	3.1293	***	10.5706	3.1687	***
11. Wheat	8.6223	4.4390	***	6.3635	2.7009	**
12. Jute	5.7251	3.2016	***	1.5097	0.9667	—
13. Sugarcane	14.0914	4.5282	***	0.4273	0.2274	—
GUJARAT						
14. Jowar	12.3510	5.3576	***	11.2616	4.2181	***
15. Bajra	7.0346	3.3378	***	0.2740	0.1869	—
16. Groundnut	7.9838	1.4446	—	2.2196	0.4030	—
17. Cotton	4.2663	1.8206	*	2.4493	1.0890	—
HARYANA						
18. Paddy	3.4544	2.8914	**	2.9108	3.6480	***
19. Bajra	2.0200	0.8428	—	0.5194	0.1983	—
20. Wheat	—0.1900	—0.0623	—	1.6388	1.0231	—
22. Mustard.	11.5628	2.7413	**	—0.8061	—0.5779	—
23. Cotton	1.6970	1.3961	—	—0.8602	—0.9519	—
24. Sugarcane	—7.7644	—1.3772	—	0.0362	0.0182	—
KARNATAKA						
25. Paddy	3.6451	3.3584	***	3.8960	3.7248	***
26. Jowar	2.3443	1.2621	—	1.3943	1.1798	—
27. Arhar	—0 8885	—0.5367	—	—1.6374	—1.1036	—
28. Groundnut	2.4973	1.1029	—	2.9019	1.3387	—
29. Sunflower	—2.9818	—1.7924	—	—2.5049	—1.4293	—
30. Cotton	13.7424	3.9905	***	2.9115	1.5240	—
31. Sugarcane	5.1120	2.2036	**	3.3799	1.9827	*
MADHYA PRADESH						
32. Paddy	2.3168	0.8273	—	4.3545	1.9191	*
33. Jowar	2.3751	1.1622	—	3.2267	1.7425	—
34. Maize	3.6029	2.4001	**	0.9929	0.6809	—
35. Wheat	1.5514	1.0331	—	3.1475	3.3005	***
36. Arhar	—1.2343	—0.7182	—	—1.1613	—0.7139	—
37. Moong	5.4239	1.9844	*	0.9472	0.4172	—
38. Urad	3.0636	1.8836	*	2.4297	1.4532	*
39. Gram	7.1613	2.4193	**	7.8553	2.8210	**
40. Groundnut	—0.1725	—0.1337	—	0.3592	0.3083	—
41. Soyabean	3.7978	1.1505	—	2.5746	1.6794	—
42. Cotton	—4.7655	—1.7916	—	—1.9485	—1.2630	—
MAHARASHTRA						
43. Jowar	2.5329	0.7690	—	3.7929	3.1814	***
44. Sunflower	—5.4293	—2.3400	*	—5.8175	—2.9008	**
45. Cotton	—3.5785	—1.1556	—	—3.8219	—1.2787	—
46. Sugarcane	—0.8629	—0.3282	—	2.0301	1.2471	—
ORISSA						
47. Paddy	3.2197	2.3707	**	3.5624	3.5256	***
48. Moong	—1.0958	—0.5184	—	—0.3543	—0.1735	—
49. Urad	—4.6955	—1.2819	—	—0.6305	—0.2258	—
50. Groundnut	0.9988	0.6344	—	1.2175	0.7937	—
51. Jute	6.1554	1.6499	—	7.5081	2.2683	**

1	2	3	4	5	6	7
PUNJAB						
52. Paddy	0.0943	3.5622	***	8.2728	2.9705	**
53. Wheat	2.3562	1.3364	—	3.8043	3.9708	***
54. Cotton	—2.0329	—1.0149	—	—2.4399	—1.3036	
RAJASTHAN						—
55. Bajra	5.8749	2.1966	*	5 5762	2.1981	*
56. Maize	10.3858	3.4249	***	—0.2448	—0.1207	—
57. Wheat	7.5109	2.8710	**	8.0921	4.3614	***
58. Barley	6.7856	3.5136	***	6 2674	3 2483	***
59. Moong	0.8940	0 4610	—	1.7970	1.0075	—
60. Gram	0.9089	0.6305	—	0.5690	0.4050	—
61. Mustard	4.1326	2.2793	**	3.7668	2.0179	*
TAMIL NADU						
62. Paddy	4.5216	2.3390	**	0.9993	1.1525	—
63. Urad	4.7212	2.6014	**	1.9807	1.1311	—
64. Groundnut	4.3921	2.1429	**	4.1987	2.0438	*
65. Cotton	2.1878	0.9330	—	3.8962	2.2186	**
66. Sugarcane	7.4228	2.4215	**	3.0333	2.5301	**
UTTAR PRADESH						
67. Paddy	5.5866	1.5722	—	3.9851	1.9462	*
68. Wheat	—0.5451	—0.6243	—	—0.2085	—0.2491	—
69. Arhar	—1.3003	—0.8452	—	—1.6062	—1.0678	—
70. Urad	0.4106	0.3747	—	—0.6585	—0.6698	—
71. Gram	0.7422	0.4248	—	0.6728	0.3830	—
72. Soyabean	5.9677	3.4664	***	1.5275	0.8404	—
73. Mustard	1.0057	0 6160	——	0.5509	0 3416	—
74. Sugarcane	4.7552	2 9137	**	4.9260	3.1275	***
75. Bajra	2 8895	1.9643	*	3.0612	2.1956	*
WEST BENGAL						
76. Paddy	2.2920	1.7186	—	0.3868	0.4092	—
77. Wheat	3.5378	2.0622	*	3.4131	1.9984	*
78. Urad	0.8549	0.7786	—	0.5522	0.5060	—
79. Jute	4.0895	1.9019	*	1.6314	1.3497	—

Stars (*) Indicate levels of significance as follows: *** 1 per cent, ** 5 per cent and * 10 per cent level of significance.

5.57. On the face of it, no *general* statement can be made about technical progress in field crop production being associated *either* with negative, or with positive, employment elasticities. But for wheat, maize and barley, and possibly gram, it appears that technical progress has been associated with negative employment elasticities. Significant technical progress in cotton on the other hand, is unambiguously associated with substantial positive employment elasticities. For sugarcane, jowar, bajra and paddy the picture is mixed.

5.58. The outstanding feature of technical progress in field crop production in recent years has been its non-neutral character. In all cases, except West Bengal wheat, recent technical change has been *either* labour saving *or* labour using. In most cases the results tally with the signs of the trend employment elasticities reported earlier. What emerges is that about 60 per cent of the cases of non-neutral technical change are labour saving. It is confirmed that technical change in wheat production has been labour saving, and that in cotton it has probably been labour using. For other important crops : Jowar, Bajra and Sugarcane, the labour using or labour saving character of technical change appears to be state specific.

5.59. In short although technical progress has certainly tended to be non-neutral it has been labour saving in only 11 cases out of the 79 crop-state combinations studied. This means that, in general, labour saving technological change cannot be blamed for most of the negative employment elasticities which now prevail. Some other forces, discussed in the next sub-section, are at work.

The Phenomenon of Factor Substitution Adverse to Labour

5.60. Why has employment per hectare gone down for so many crops where yield is rising ? Given that non-neutral technological change which is labour saving has taken place in only 11 or 12 cases[9], how can you account for the negative employment elasti-

9. The labour saving technological change cases are:
Jowar : Andhra Pradesh, Madhya Pradesh
Wheat : Bihar, Haryana, Uttar Pradesh, and possibly West Bengal
Paddy : Haryana, Punjab
Bajra : Haryana
Maize : Madhya Pradesh
Gram : Rajasthan, and
Sugarcane : Uttar Pradesh.

cities which appear for as many as 30 crop-cum-state combinations ?

5.61. To anticipate a little, the answer appears to be, factor substitution adverse to labour, in response to rising real wage rates. In principle, as indicated in Chapter Four, a rise in the product wage [10] may induce factor substitution adverse to labour. The cultivators' response to a rise in real wages may be to cut down labour costs by reducing labour inputs, regardless of whether or not a new technology is available. This effort to economise on labour is likely to be associated with an increased use of some other inputs machinery, equipment and modern intermediate inputs such as hired machine labour, fertilizers, pesticides and weedicides whose positive impact on yields may compensate for the decline in labour use per hectare. The employment model of this section is designed to find out whether or not this is in fact what has happened.

5.62. The model takes a form in which mandays employment per hectare depends on three explanatory variable : capital per hectare[11], the product wage, and net value added (NVA) per hectare in constant Farm Harvest Prices. The results follow.

5.63. In more than 90 per cent of the cases studied, a rise in the product wage induces a fall in employment, when nothing else changes. In 70 per cent of these cases, the results are statistically significant, and there is no case where a rise in the product wage is significantly linked with an *increase* in employment.

5.64 Increases in the use of capital, by itself, (modern intermediate inputs and depreciation included), leads to higher employment in 26 significant cases[12]. But in half of these cases, the negative impact of rising product wages swamped the positive impact of increased capital, leading to the observed negative employment elasticities with respect of yield. In the remaining 13 cases, employment rose, in 11 of them *despite* the negative impact of rising product wages. In effect, the positive impact of the increasing use of capital, including modern intermediate inputs, more than compensated for the depressing influence of rising wages, in these 11 cases. In Madhya Pradesh *Moong,* increase in capital per hectare and increases in wages reduced employment significantly but rising NVA per hectare counteracted their downward pressure.

5.65. Rising NVA per hectare, by itself, usually[13] produces a favourable impact on employment, a significant one roughly two thirds of the time.

5.66. It can be concluded at least tentatively, that the rise in real wages has been the single most important cause of falling mandays employment per hectare. Although technological change has been adverse to employment in 15 per cent of all cases, it has, by itself, been favourable in about 10 per cent of all cases. Where significant technological change has not taken place, (about 75 per cent of all cases, according to the structural break test), a rise in the use of machinery, equipment and modern inputs like fertilizers and pesticides has tended to improve the employment situation. In many such cases, however, the negative real wage rate effect overwhelms the positive capital per hectare effect, with the result that labour absorption per hectare goes down.

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10 A product wage is a kind of real wage. A constant product wage in this analysis is the wage which will buy the same amount of output of the crop in question even though farm harvest prices may be rising. It is computed as the money wage deflated by the FHP index for the relevant crop.

11 Capital is defined as depreciation plus modern intermediate costs which covers machine labour costs, fertilizers, pesticides, weedicides and irrigation costs, all at constant 1980-1981 prices.

12 The geographic location of these cases is given below: Andhra Pradesh : 5 cases; Bihar: 3 cases; Gujarat: 2 cases; Karnataka: 4 cases; Madhya Pradesh: 3 cases; Maharashtra: 2 cases; Rajasthan: 3 cases; Tamil Nadu: 1 case; Uttar Pradesh: 2 cases; West Bengal: 1 case.

13 In 80 per cent of cases.

Non-Constant Returns to Scale

5.67 Finally the question of scale economies was tackled. Three exercises were carried out in an effort to identify cases where non-constant returns to scale prevail, using the published CSS data.

5.68. The question of scale is important because rural employment problems can be created, indirectly, by the emergence of increasing returns to scale in field crop production. Where scale economies emerge, the twin processes of concentration of operational holdings and proletarianisation of small farm operators are likely to get accelerated. To the extent that members of marginal farm households find themselves pushed into the hired agricultural labour force, or into rural construction activities, their prospects for regular employment at above-poverty line incomes could deteriorate, as the evidence of Chapter Three indicates. Constant or decreasing returns to scale, on the other hand, tend to favour the persistence of small holdings, and the retention of family workers on them, *other things remaining the same.*

5.69. Unexpectedly, paddy turns out to be a crop distinguished by increasing returns to scale in the recent period, in several important states : Haryana, Orissa, Tamil Nadu and West Bengal. There are, however, three states where paddy production has been characterised by significant decreasing returns to scale. They are : Bihar, Karnataka and Uttar Pradesh.

5.70. As anticipated, evidence that increasing returns to scale in wheat production have emerged in Punjab and Haryana also turns up. But not elsewhere. In Bihar, Madhya Pradesh, Uttar Pradesh and West Bengal, on the contrary, significant decreasing returns to scale are recorded.

5.71. For other crops, the region specific character of technology is clear. In Andhra Pradesh, increasing returns to scale characterise production technologies for two crops, Jowar, and Tobacco. But Jowar in Karnataka and Madhya Pradesh is produced under conditions of decreasing returns to scale.

5.72 Increasing returns to scale also appear for Karnataka Sunflower and Gujarat Cotton, although cotton in a number of other states, (Maharashtra, may be, and Haryana, Punjab and Tamil Nadu more definitely), is characterised by decreasing returns to scale.

5.73 Bajra, all pulses, groundnut and mustard and sugarcane production generally, tend to be characterised by decreasing returns to scale.

5.74 Thus it is in major cereals production, paddy and in the 'high-tech' regions, wheat, that increasing returns to scale have emerged or are emerging. Cotton in Gujarat is another decisive case.

7.75 Since increasing returns to scale implies that the relatively small cultivators operate under conditions which make their costs of production per unit of output higher than the per cent costs of the bigger operators, they will tend to find it increasingly difficult to 'pull on'. hus we may be in for a period of increasing pressure on the mainly self employed small cultivators to get out of agriculture and into the non-farm labour force, and to lea e out or sell their holdings to bigger cultivators.

Part V : The Main Findings of This Chapter and Implications for Employment Policy.

5.76 The key results of ths chapter are presented in point form below.

1. Field crop production in particular, and agriculture in general can no longer be relied upon to act as the residual claimant of labour force growth, absorbing workers who do not get jobs outside of agriculture at acceptable level of income.

2. The overall rural employment position is really comfortable only in Haryana and Andhra Pradesh. In other states even handsome rates of non-farm employment growth have not been sufficient to offset poor lobour absorption in the dominant agricultural sector of the rural economy.

3. In recent years, it is high output growth which has led to substantial gains in labour productivity, and this high output growth, more often than not, has been accompanied by slow or declining labour absorption. Falling employment has contributed a good deal to rising labour productivity in several states.

4. The rate of growth of per capita employment days in rural areas has been negative in seven states, and in India as a whole. Moreover the rate of growth of per capita value added in agriculture is negative in six states.

5 To achieve the desirable combination of rising NVA per capita together with more employment per person is not eacy. In a number of states, under present conditions, there exists a conflict of objectives between raising per capita NVA in agriculture on the one hand, and mantaining even present evels of per capita employment on the other.

This conflict among policy objectives is a new phenomenon : it simply did not arise twenty years ago. Because of the emergence of negative elasticities of employment with respect to NVA, farm output growth does not every, automatically, induce on farm employment growth : one consequence is that a two pronged employment policy is needed to sustain even existing levels of employment with one set of policy instruments focused on agriculture and another on non-agriculture. The farm employment policy interventions themselves have to be more sophisticated, and explicitly designed to meet the specific requirements of diverse region level situations.

6. Almost all of the very growth in field crop employment in India in recent years has been due to the extension of gross cropped area. At the all-India level there is a marginal decline in employment caused by reduced labour intensity, and a two and a half per

cent rise due to a small net favourable impact on labour absorption of cropping pattern shifts. At the state level the picture is diverse.

7. The big positive contribution to employment have been made by paddy, cotton, jowar and soyabean, in that order. Wheat and sugarcane registered gigantic reductions in employment due to the decline in labour use per hectare, has the extension of area under these crops almost compensated for the reduction in labour intensity.

8. Among alternative measures of the responsiveness of employment to changes in yield, production and Net Value Added, the one which measures the loan term responsivecess of employment to long term changes in yield, etc. was chosen as the most appropriate for the analytical purposes at hand. At the crop level, some of these trend elasticities have become negative, while others remain high and are possibly rising, indicating that a lively process of factor substitution has been going on, sometimes in favour of labour and sometimes against it. The observed effects appear to be crop specific and region specific.

9. At the "all India', all crops level of aggregation, in recent years increases in yield have had virtually no impact on employment. But a 10 per cent increase in the total value of output (measured as yield times the area under each crop), generates roughly a 2 per cent rise in employment. This is a much smaller response in relation to output growth than any estimated earlier. Although employment elasticies with respect to value added are a little higher, the upshot of the analysis is that at the all India level in recent years, agricultural growth per se has generated proportionately very little by way of additional days work.

10. At the state level, with respect to production growth, substantial gains are recorded in Haryana, Andhra Pradesh, Gujarat, Maharashtra, Orissa, Tamil Nadu and West Bengal and low, negligible, uncertain or negative gains in Punjab, Uttar Pradesh, Karnataka, Rajasthan, Madhya Pradesh and Bihar.

11. At the level of individual crops, it is found that yield increases in oilseeds, cotton, urad and paddy are most likely to favour increased labour absorption. For most other crops, significant yield increases may well be associated with a reduction in the labour absorptive

capacity of field crop agriculture in the coming decades.

12. Kendrick and Solow measures of total factor productivity suggest generally increasing efficiency in input use in agriculture rather than the reverse. Trend rates of growth of total factor productivity indicate that roughly 40 per cent of the 79 statecrop combinations studied registered significant technical progress.

13. A more sophistcated seres of tests for non-neutral technologcal change gave the following important results Technological change which is labour saving is a rther rare phenomenon in India. Only 19 cases of non-neutral technological progress turned up in the total of 79 crop-state combinations studied. Of these only 11 were cases of labour saving technological change; the rest involved labour using technological changes. This means that at the all India level, labour saving technological change cannot be blamed for most of the negative employment elasticities which now prevail. Some other forces at work.

14. The rise in real wages turned out to be the single most impotant cause of falling employment per hectare. A rise in the product wage, by itself, induced a fall in empoyment in more than 90 per cent of the cases studied. Increases in the use of machinery, equipment and modern inputs like fertiliers and pesticides tend to improve the employment situation. In many such cases however, the negative real wage effect swamps the positive capital effect, with the result that labour absorption goes down. A rise in NVA by itself tends to favour greater labour absorption, but it has of course, no taken place in isolation.

15. Increasing returns to scale were found in major cereals production in several states, most notable paddy in Haryana, Orissa, Tamil Nadu and West Bengal and in wheat production in Punjab and Haryana. Gujarat cotton production is also characterised by increasing returns to scale. In Andhra Pradesh the same is true for Jowar and Tobacco. Since this implies that the costs of small scale cultivators will be higher than those of bigger farm operators, we may be in for a period of increasing pressure on the mainiy self employed small cultivators to get out of agriculture and into the non-farm labour force. This has long-term implications for employment planning.

CHAPTER SIX

UNEMPLOYMENT, EMPLOYMFNT VARIABILITY AND LOW PRODUCTIVITY EMPLOYMENT INTRODUCTION ·

6.1 Regional diversity characterises state level employment scenarios and the underlying dynamics of recent trends. To the extent that the nature of the employment problem is state-specific, so also ameliorative programmes need to be designed state by state, to match particular regional requirements. The factual basis for adopting this stand point was established in previous chapters.

6.2 In devising appropriate anti-poverty and rural employment programmes in particular, it is useful to distinguish between two distinct categories of employment problems. First there is the problem of chronic rural under-employment, low productivity employment, and open unemployment, which tends to be associated with a relatively high incidence of poverty among both the self-employed cultivators and among rural labourers. Secondly, there is the quite different problem of employment variability, which calls for different treatment. The basic distinction between the rural under-employment, low productivity employment problem and the employment variability problem constitutes the starting point of this chapter. The analysis focuses on the extent, causes and consequences of employment variability in particular. This is followed by a closer look, at the crop level, at the sources of year to year employment variability at the state level.

Unemployment, Low Productivity Employment, Seasonality and Year-to-Year Employment Variability

6.3 Reported rural personday unemployment rates ranged from under two and a half per cent of Labour force persondays (in Madhya Pradesh) to roughly 35 per cent in Kerala, in 1983. The seasonality of unemployment displays equally large inter-regional contrasts. However much of India's unemployment—the unemployment by the income criterion—is not reflected in either of these two measures. Moreover, seasonal variations in employment are not the only kind of employment variability.

6.4 Employment variability takes two forms. One is the seasonal unemployment problem mainly associated with alternating slack and busy seasons of the crop year. The seasonal employment problem may be great even in states where average unemployment rates are low for the year taken as a whole. The wide year-to-years swings in unemployment (and employment) from which certain states suffer, constitute a second kind of employment variability problem, which conceivably may be more devastating in its impact on rural levels of living than simple seasonality. Some states with major seasonal unemployment problems do not suffer much from year-to-year variability while others do.

States can be grouped according to the nature of the unemployment problems they face, as in table 6.1 which gives an overview.

6.5 Four groups of states are defined, first, in terms of their average levels of unemployment and the severity of the seasonality problems if any. Seven states fall in the group characterised by both low unemployment rates and low seasonality. But three of them suffer from severe low productivity employment problems in the key agricultural sector : Uttar Pradesh, Orissa and Bihar. There the incidence of poverty among self-employed cultivators is so high, that a substantial chunk of them must be treated as a part of the latent hired labour force—people who will leave their on farm self employment for paid jobs, should suitable openings become available. In addition four of these states suffer from severe year-to-year swings in the number of field crop days work put in : Uttar Pradesh, Gujarat, Maharashtra and Bihar. One of these had no other problem. Guarat, with low poverty, low seasonality and low overall unemployment, nevertheless suffers from high year-to-year employment variability. At the other end of the scale, Andhra Pradesh and West Bengal, with high unemployment and a serious seasonality problem, enjoy small year-to year employment fluctuations and a relatively low incidence of poverty among the self employed. Details can be seen in table 6.1.

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TABLE 6.1

Overview : Character of State Level Unemployment Problems

Basic employment/unemployment characteristics (NSS data)	State	Unemployed by the income criterion: (Incidence of poverty among self-employed agricultural workers) (NSS data)	Year-to-year variability of field crop employment (CSS data)	Coefficient of variation of year-to-year index. (yi/yi) x 100
1	2	3	4	5
Low unemployment, ...	Punjab	1.22	Low	(5.67)
Low seasonality	Haryana	3.43	Low	(7.67)
	Uttar Pradesh	27.82	High	(11.29)
	Gujarat	6.08	High	(13.24)
	Maharashtra	16.32	High	(14.21)
	Orissa	41.52	Low	(6.46)
	Bihar	37.71	High	(16.60)
Low unemployment, ...	Karnataka	16.95	High	(12.28)
High seasonality	Rajasthan	24.35	High	(11.77)
	Madhya Pradesh	28.11	High	(10.40)
	Assam	4.29	Not available	
	Jammu & Kashmir	16.54	Not available	
High unemployment, ...	Tamil Nadu	18.22	High	(10.64)
Low seasonality	Kerala	9.12	Not available	
High unemployment, ...	Andhra Pradesh	8.03	Low	(7.23)
High seasonality	West Bengal	11.15	Low	(8.82)

1. *High unemployment* is defined in terms of personday rates above ten per cent in at least two out of the following three years: 1972-73, 1977-78 and 1983.

   High sesonality is defined in terms of coefficient of variation of four NSS subround unemployment rates of 20.00 or more in at least two out of the three years mentioned above.

2. See Chapter three, table 3.2 for details. The numbers entered here are the number of poor usual status self-employed workers in agriculture as a per cent of all such workers.

3. *High* year-to-year variability is defined in terms of a coefficient of variation exceeding 10.00 for the variability index. The coefficient of variation is given in brackets. It is computed as follows:

   In the equation $yi = a + b \, ti + u$, t refers to the time period for years $i = 1$ to 13.

   Regressing, we get, estimated y_i, $\overset{\wedge}{yi} = a + bti$

   (yi/yi) x 100 is the variability index, which reflects the extent to which actualy varies from estimated y. The coefficient of variation of this index has the necessary virtue that the degree of year-to-year variability in employment, output or NVA can be compared across states displaying widely differing levels of employment (or output etc.) and contasting long term rising, constant or falling trends.

6.6 What is intuitively apparent from the figures in table 6.1 is that there are no common combinations of employment characteristics. Each state has its own distinctive unemployment profile. This was not anticipated. On the contrary, one tends to think that year-to-year employment variabiliy, seasonality, high unemployment rates, and poverty among the self employed agriculturalists would go together. They do no.t This underscores the basic facts set out in the preceding chapter. The causes and contours of the employment situation in each state are different.

The magnitude of year-to-year variability, of employment, output, value added and labour productivity is set out in Table 6.2.

6.7 The lowest per hectare year-to- year employment variability is found in Orissa, Punjab, Andhra Pradesh and Tamil Nadu; the highest in Bihar, Maharashtra, Karnataka and Uttar Pradesh. Total employment variability is lowest in Punjab followed by Orissa, Andhra Pradesh and Haryana. In most states total employment variability is greater than per hec-

tare employment variability, indicating that area changes have a greater impact on employment variability than changes in labour intensity per hectare. Punjab, Haryana and Uttar Pradesh are three exceptions. There total employment varies less from year-to-year than does per hectare employment. This is intriguing because the total value of output, in all cases varies more than does yield (in value terms). Moreover the total value of output in 9 cases out of 13 varies more from year-to-year than does employ-

ment. But employment varies more than output in U.P., Karnataka, Rajasthan and Bihar. Everywhere, except in Orissa, Net Value Added varies more than the value of output.

6.8 Labour productivity generally varies much more than employment does, (Tamil Nadu is the sole exception), and usually varies more than does the value of output. (Exceptions are Orissa, Tamil Nadu and West Bengal).

TABLE 6.2

Year-to-year Variability of Field Crop Employment, Output Value added and Net Value Added per Personday (Labour Productivity) by State : 1972-72 to 1983-84 (Coefficients of Variation of Yearwise (Expected Value/Actual Value X 100)

State	Employment		Value of Output (in Constant 1980-81 Farm Harvest Prices)				Gross Value Added (CSS)	Net Value Added (CSS)	Labour Productivity (NVA Personday) (CSS)
	Per hectare	Total	Per hectare		Total				
			CSS	CSO	CSS	CSO			
1	2	3	4	5	6	7	8	9	10
1. Punjab	5.78	5.67	7.92	5.35	8.37	6.20	12.34	12.72	15.80
2. Haryana	8.09	7.67	10.13	9.13	11.78	11.01	14.66	14.56	15.54
3. Uttar Pradesh	11.66	11.29	9.64	10.41	10.36	11.10	12.32	12.56	13.66
4. Andhra Pradesh	6.04	7.23	8.23	5.84	10.95	8.57	13.85	14.55	11.45
5. Gujarat	10.13	13.24	19.41	24.34	22.28	28.59	30.54	31.17	23.14
6. Maharashtra	13.30	14.21	13.40	13.02	14.22	14.25	14.96	15.31	15.63
7. Karnataka	12.20	12.28	8.05	7.84	10.97	8.90	11.56	11.57	14.97
8. Rajasthan	10.89	11.77	10.07	12.77	11.65	14.94	12.90	12.94	13.58
9. Madhya Pradesh	10.07	10.40	11.58	14.23	11.47	15.17	14.48	15.02	13.71
10. Orissa	5.44	6.46	14.98	14.83	16.31	17.92	15.82	15.87	12.22
11. Tamil Nadu	6.43	10.64	9.72	6.57	14.85	11.21	15.03	15.07	7.77
12. West Bengal	8.45	8.82	14.59	13.75	16.22	16.73	17.84	17.86	11.36
13. Bihar	14.89	16.60	9.61	8.47	11.05	11.61	13.25	13.45	22.70

6.9 In short, in most states, employment is more stable than output. It is the productivity of that employment which is subject to very large swings— larger even than the variations in the value of output in most cases.

6.10 An attempt was made to find out what factors are associated with a high or low degree of variability

in employment. It was anticipated that weather induced variations in output and value added would be reflected in variations in employment. Nothing of the sort was found. In cross-section the coefficient of variation of the employment index was totally unrelated to the corresponding coefficients for output and value added.

TABLE 6.6

Results of Regression of Seasonal and Year-to-Year Employment Variability and the Irrigation Ratio

Statistics	Dependent Variable	
	Employ-ment	Year-to-year Variability of Employment
1	2	3
1. R	0 0895	0 2417
2. t coefficient . .	—0 1544	—0 0708
3. Standard error of coefficient	0 1485	0 0378
4. t value . .	—1 0398	—1 8722

6.11 We can conclude, first, that irrigation does not have a significant impact on the seasonality of employment. While there are states, such as Haryana and Punjab, where a very high irrigation ratio is associated with low employment variability, there are other states, like Orissa which also enjoy relative stability of employment despite low irrigation ratios. Year to year variations in employment are, however, reduced by more irrigation, although, other factors also matter : the reliability of rainfall is obviously one of them.

The Welfare Consequences of Unemployment and Employment Variability

6.12 Why do we worry about seasonal or year-to-year employment instability ' Primarily, it is because we suspect that a high degree of employment instability is likely to cause a high incidence of poverty.

6.13 This proposition was tested, first, using the Head Count measure of the incidence of poverty. The first conclusion was that neither year-to-year employment variability, nor year-to-year variations in the value of farm output were related to the regional incidence of poverty. The larger set of all rural labour households as well as among all agricultural households. Labour productivity does not explain the degree of poverty among mainly self employed cultivating households.

6.14 The implications of these findings for both rural employment and poverty alleviation programmes are tremendous. These are discussed in the final section of this chapter.

A Word About Employment and Labour Productivity.

6.15 Over time, employment, (measured here as persondays worked in field crop production), has in fact been negatively related with labour productivity in a number of states, significantly so in 5 or 6 out of 13 of them. In several states also, the reduction of labour inputs accounts for more than half the improvement in labour productivity. These include Bihar and Madhya Pradesh, as well as Punjab, Rajasthan and Uttar Pradesh.

6.16 What this means is that in these states in recent years, labour productivity has been rising largly because persondays worked has been falling, and not merely because output and NVA has been rising. Thus we run up against the same conflict of objectives—that between accelerating farm output growth and expanding employment, discussed in Chapter five—in another form. Again the conflict has emerged in some states, but not yet in all of them. It is a conflict which is best faced squarely. We want increased efficiency in agriculture and rising levels of labour productivity. These provide the bases not only for an enhanced supply of farm products at reasonable costs, but also the source of the increased demand for non-farm goods and services which generates the non-farm jobs which must be the ultimate destination of most of those displaced from agriculture. In the more immediate sense, rising labour productivity is undoubtedly the enabling factor in the recent obesrved rise in real farm wage rates. Further economising on the use of labour, among other inputs, must be anticipated in future as well. It needs also to be noted that rising NVA per day worked may well be associated with falling NVA per worker. if employment declines too rapidly. Thus while improving labour productivity must constitute one strand of a sustainable rural employment policy, the transitional difficulties of those who fail to get sufficient work in the process remain, and must constitute a second focus of rural employment programmes. In short, the relationships revealed by the analysis of this section underline the need to combine concern about employment with concern about the productivity of that work.

Sources of Year-to-year Employment Variability at the Crop Level

6.17 While year-to-year employment swings may not be linked directly with poverty among rural

labourers, employment instability still is an affliction which should be mitigated if possible. Aside from irrigation, which helps to reduce variability in certain regions, cropping patterns may contribute to high or low year-to year employment variability. This section explores the sources of variability at the crop level.

6.18 In general, the two main food grains crops lend stability to the employment picture throughout the main paddy and wheat growing regions of the country. Sugarcane also in Andhra and Maharashtra is a stabilising crop, but in most other regions this crop destablises the year-to-year employment situation. Dryland crops, including inferior cereals, pulses and oilseeds, and above all the "new" oilseeds...... sunflower and soyabean...... are characterised by wide year-to-year swings in per hectare and total manday worked.

6.19 Year-to-year employment instability in the aggregate, (for "all crops" at both the per hectare and total employment levels), is below that for any of the individual crops in 8 states, (Punjab, Haryana, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu and West Bengal), and below all but one individual crop in the remaining five states. This suggests that the cropping pattern adjustments that take place from year-to-year moderate the adverse impact on employment of unstable year-to-year labour absorption in the production of each of the crops taken separately. This dampening effect is considerably more marked in the case of employment than it is in the case of variations in the value of output. Only four states had lower coefficients of variation for yield and total value of output for "all crops combined" than for each and every particular crop. (They were : Punjab, Haryana, Tamil Nadu and Bihar).

Conclusions :

6.20 In rural India the seriousness of the low productivity employment porblem is far greater than that of any kind of unemployment. Low labour productivity (of the days actually worked) is associated with a high incidence of poverty, especially among rural labour houshoulds and agricultural labour households in particular. Unemployment, seasonality of employment and year-to year variations in employment, are by comparison lesser evils, with no significant association with rural poverty.

6.21 But these evils have to be dealt with, especially in states where they are relatively severe. And clearly the kind of programme required to deal effectively with the low productivity employment problem, is quite different from the sort of scheme best suited for ameliorating the distress created by year-to-year and seasonal variations in employment Employment guarantee type schemes are best needed in regions subject to wide year to year swing such as Maharashtra, which already has such a scheme, and Bihar, which does not. It should be no cause for worry if in some years there are no takers; it is in the very nature of schemes designed to mitigate the impact of employment variability, that, in the 'good' years, the scheme will not be required. But a shelf of possible projects for all sub-regions within such states should be kept in readiness, to be put into action in the bad years.

6.22 For the endemic under employment and low productivity employment problems, one needs to rely on a concerning substantial programme of infrastructure upgradation in rural areas including the market towns. A major part of such infrastructure development investment should be aimed at making non-farm enterprise viable, with a view to accelerating the process of syphoning off surplus workers from agriculture. A significant share of rural infrastructure expenditure, however, has to be allocated to measures to accelerate on-farm land and labour productivity growth, not merely for the sake of those who remain in agriculture, but also keeping in view the importance of sustaining a growing demand base for the goods and services produced by the non-agricultural sectors.

CHAPTER-7

THE CONCLUSIONS

7. The main results of the work of the Study Group on Employment Generation are presented in point form below.

7.1 In recent decades in rural India employment growth rates and occupational structures have evolved towards the patterns characteristic of more developed countries. Rural household industry has tended to be replaced by rural or urban units making the same products, or close substitutes at lower costs, using more purchased intermediate inputs, more hired labour and proportionately fewer family workers. Household have shifted from self-employment in agriculture or in traditional household industries and services, to wage and salary employment in the production non-farm goods and services.

7.2 In the coming decade the farm workforce growth rate may well fall to zero. This is one of the most important changes to take place in recent decades. In at least three states a decline in the absolute number of workers engaged in agriculture has already occurred : Punjab, Gujarat and Orissa. The same thing may have happened in Haryana too, in the most recent five year period. Three more states record negligible rates of growth of the farm workforce, of less than 0.2 per cent over the decade ended 1987-88.

7.3 Simultaneously the rate of growth of the non-agricultural segments has accelerated to levels far above those in agriculture.

7.4 These developments within rural areas have gone hand in hand with rural to urban migration. Since the early 1970s, in effect, rural areas have been exporting their unemployment along with their working population to urban areas.

7.5 Within rural areas, positive workforce growth rates have been accompanied in several states by a contraction of employment opportunities stated in terms of days available per worker. Most of this was caused by a decline in the persondays worked in agriculture.

7.6 Rural Households belonging to the expanding non-agricultural labour set are typically far better off than their agricultural labour counterparts, and members of self employed cultivating households typically enjoy better standards of living than the combined set of rural labour households.

7.7 While the non-agricultural households are much better of as a group than agricultural households, and in a few states some workers in mining or poor or poorer than farm and farm labour house| holds and in a few states some workers in mining or trade are relatively badly off.

7.8 Thus while there is no evidence of generalised "distress diversification" into rural non-farm jobs, in most states one or two workforce categories may be acting as sumps into which low income workers move when they fail to secure adequate support in their ancestral occupations. In several states construction employment seems to play this role.

7.9 Regionally, agricultural poverty heavily condition the severity of poverty in most other segments of the rural economy.

7.10 Demand factors originating in the agricultural sector largely determine the economic condition of rural households mainly dependent on construction work for a living. Services and trade activities also depend to a significant degree on the demand generated by agricultural activities.

7.11 The value of cultivating households assets constitutes the key to regional variations in labour productivity and in levels of living among agricultural households. Rural infrastructure development is the other major and highly significant determinant of interstate contract in levels of living among them. Land productivity, on the other hand, proved to be of strictly limited value in explaining regional variations in living standards among farm and farm labour households.

7.12 The factors behind regional variations in levels of living and poverty among rural manufacturing households are more complex. Farm labour productivity, and rural and cultivating household asset levels account for a part of the interstate variations, but the level of development of rural and urban infrastructure combined has almost equal explanatory power and is much more important than rural infrastructure alone. The economic condition of rural households mainly dependent on transport, or on electricity, gas and water supply are also contingent upon general levels of infrastructure development in a region.

7.13 Unemployment by the "income criterion" affects roughly one out of every four rural workers. Nearly half of them live and work in only three states: Uttar Pradesh, Madhya Pradesh and Bihar. But there are substantial numbers also in Maharashtra and Orissa, and in West Bengal also the incidence of substandard quality employment is high.

7.14 Low productivity employment is the dominant problem rather than unemployment as usually measured, in terms of the personday unemployment rate. In 14 out of 17 states, the problem of unemployment by the income criterion is greater than the personday unemployment rate, in most cases by a very wide margin.

7.15 Real agricultural wage rates have risen in India, at considerably faster rates than those suggested on the basis of CPIAL deflators. Underlying these observations is the fact that technological change in agriculture over the past three decades has made foodgrains costs rise more slowly than the prices of the basket of goods on which the CPIAL deflator is based.

7.16 Interstate differences in real wages are best explained by contrasts in labour productivity on the one hand, and the proportion of poor people among the set of households whose main income comes from agriculture, on the other hand. In cross section higher value added per manday pushes up real wage rates, and poverty among the self-employed cultivators pulls real wage rates down. In the long term rise of real wage rates however, the prime mover in all states seems to have been the shift of workers to better paying non-farm jobs, rather than growing labour productivity within agriculture.

7.17 Field crop production in particular, and agriculture in general can no longer be relied upon to act as the residual claimant of labour force growth, absorbing workers who do not get jobs outside of agriculture at acceptable levels of income. Even if you assume the highest rates of growth of non-farm jobs so far achieved, persondays work available per capita in agriculture will decline.

7.18 The overall rural employment position is really comfortable only in Haryana and Andhra Pradesh In other states even handsome rates of non-farm employment growth have not been sufficient to offset poor labour absorption in the dominant agricultural sector of the rural economy.

7.19 In recent years, it is high output growth which has led to substantial gains in labour productivity, and this high output growth, more often than not, has been accompanied by slow or declining labour absorption. Falling employment has contributed a good deal to rising labour productivity in several states.

7.20 The rate of growth of percapita employment days in rural areas has been negative in seven states and in India as a whole Moreover the rate of growth of per capita value added in agriculture is negative in six states.

7.21 To achieve the desirable combination of rising NVA per capita together with more employment per person is not easy. In a number of states, under present conditions, there exists a conflict of objectives between raising per capita NVA in agriculture on the one hand, and maintaining even present levels of per capita employment on the other.

This conflict among policy objectives is a new phenomenon : it simply did not arise twenty years ago. Because of the emergence of negative elasticities of employment with respect to NVA, farm output growth does not everywhere, automatically, induce

on farm employment growth : one consequence is that a two pronged employment policy is needed to sustain even existing levels of employment with one set of policy instruments focused on agriculture and another on non-agriculture. The farm employment policy interventions themselves have to be more sophisticated, and explicitly designed to meet the specific requirements of diverse region-level situations.

7.22 Almost all of the very modest growth in field crop employment in India in recent years has been due to the extension of gross cropped area. At the all-India level there is a marginal decline in employment caused by reduced labour-intensity, and a two and a half per cent rise due to a small net favourable impact on labour absorption of cropping pattern shifts. At the state level the picture is diverse.

7.23 The big positive contributions to employment have been made by paddy, cotton, jowar and soyabean, in that order. Wheat and sugarcane registered gigantic reductions in employment due to the decline in labour use per hectare, but the extension of area under these crops almost compensated for the reduction in labour intensity.

7.24 Among alternative measures of the responsiveness of employment to changes in yield, production and Net Value Added, the one which measures the long term responsiveness of employment to long term changes in yield, etc. was chosen as the most appropriate for the analytical purposes at hand. At the crop level, some of these trend elasticities have become negative, while others remain high and are possibly rising, indicating that a lively process of factor substitution has been going on, sometimes in favour of labour and sometimes against it. The observed effects appear to be crop specific and region specific.

7.25 At the 'all India', all crops level of aggregation, in recent years increases in yield have had virtually no impact on employment. But a 10 per cent increase in the total value of output (measured as yield times the area under each crop), generates roughly a 2 per cent rise in employment. This is a much smaller response in relation to output growth than any estimated earlier. Although employment elasticities with respect to value added are a little higher, the upshot of the analysis is that at the all India level in recent years, Agricultural growth per se has generated proportionately very little by way of additional days work.

7.26 At the state level, with respect to production growth, substantial gains are recorded in Haryana, Andhra Pradesh, Gujarat, Maharashtra, Orissa, Tamil Nadu and West Bengal and low, negligible, uncertain or negative gains in Punjab, Uttar Pradesh, Karnataka, Rajasthan, Madhya Pradesh and Bihar.

7.27 At the level of individual crops, it is found that yield increases in oilseeds, cotton, urad and paddy are most likely to favour increased labour absorption. For most other crops, significant yield in-

creases may well be associated with a reduction in the labour absorptive capacity of field crop agriculture in the coming decades.

7.28 Kendrick and Solow measures of total factor rates of growth of total factor productivity indicate productivity suggest generally increasing efficiency in input use in agriculture rather than the reverse Trend that roughly 40 per cent of the 79 state-crop combinations studied registered significant technical progress.

7.29 A more sophisticated series of tests for non-neutral technological change gave the following important results. Technological change wh ch is labour saving is a rather rare phenomenon in India. Only 19 cases of non-neutral technological progress turned up in the total of 79 crop-state combinations studied. Of these only 11 were cases of labour saving technological change, the rest involved labour using technological change. This means that at the all India level, labour saving technological change cannot be blamed for most of the negative employment elasticities which now prevail. Some other forces are at work.

7.30 The rise in real wages turned out to be the single most important cause of falling employment per hectare. A rise in the product wage, by itself, induced a fall in employment in more than 90 per cent of the cases studied. Increases in the use of machinery, equipment and modern inputs like fertilisers and pesticides tend to improve the employment situation. In many such cases however, the negative real wage effect swamps the positive capital effect, with the result that labour absorption goes down. A rise in NVA by itself tends to favour greater labour absorption but it has of course, not taken place in isolation.

7.31 Increasing returns to scale were found in major cereals production in several states, most not-

ably paddy in Haryana, Orissa, Tamil Nadu and West Bengal, and in wheat production in Punjab and Haryana. Gujarat cotton production is also characterised by increasing returns to scale In Andhra Pradesh the same is true for Jowar and Tobacco. Since this implies that the costs of small scale cultivators will be higher than those of bigger farm operators, we may be in for a period of increasing pressure on the mainly self-employed small cultivators to get out of agriculture and into the non-farm labour force. This has long-term implications for employment planning.

7.32 In devising appropriate anti-poverty and rural employment programmes, it is necessary to distinguish between the chronic underemployment, low productivity employment problem, and the problem of seasonal and year-to-year employment variability, which calls for quite different treatment Year-to-year employment variability, seasonality, high unemployment rates, and poverty among cultivators do not all go together. The contours of the employment problems in each state are different. Specific regional requirements therefore need to be kept in view in the design of employment programmes.

7.33 Year-to-year employment variability is greatest in Bihar, Maharashtra, Karnataka and Uttar Pradesh; and lowest in Punjab, followed by Orissa, Andhra Pradesh and Haryana. Labour productivity tends to vary from year to year much more than employment does, and usually varies more than does the value of output.

7.34 Low labour productivity (of the days actually worked) is associated regionally with a high incidence of poverty, especially among rural labour households. Unemployment, seansonality of employment, and year to year variations in employment, are by comparison lesser evils, with no significant association with rural poverty.