AGRARIAN CRISIS AND EMPLOYMENT DIVERSIFICATION IN ANDHRA PRADESH: A STATE AND DISTRICT LEVEL ANALYSIS

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CHAPTER 1
BACKGROUND

1.1 INTRODUCTION

The genesis of the discourse on *economic development* primarily subsumes the principal practices of capital accumulation in the name of industrialization. This outlined the premise to stimulate sufficient income by the creation of new job opportunities; thus potentially helps in poverty eradication. Most of the developing countries in South and South East Asia categorized by the simultaneous coexistence of vast traditional agriculture sector along with tiny industrial fragmentation gradually reconciled with the phenomenal evidence of increasing labour force with no gainful employment. Thus, failure to address the issue of rural poverty alleviation became prominent problem in developing and transition economies. The non-capitalistic modes of agrarian process in these dual economies were confronted with the existence of surplus labor having diminishing or almost zero marginal productivity. The only alternative path to sustain the practice of creating employment opportunities perceived a paradigmatic shift in the policy directives in several developing countries. This policy fundamentally endeavored to alter existing stagnation of labour absorption in agriculture. The idea was that, these avenues of promoting modern and capital-intensive industries could absorb increasing labor reserves of agriculture in industries. India was no exception. From the inception of the planning periods, the major emphasis positioned on this massive industrialization that can be thought of as only developmental path to combat the growing unemployment and income poverty. Agriculture only remained as a bargain sector in which output growth could be accelerated without much investment. Agriculture was left with continuous source of supplying raw material and labor with suitable institutional adjustments only. These policy directives formulated in Mahalanobis model led to a large scale migration of rural people from agriculture to industry.

During the decade of food crisis of sixties Indian agriculture witnessed a momentous breakthrough in productivity. The green revolution package consisting of modern inputs and irrigation required more labor than the traditional method. But the employment growth in response to this output growth was inadequate with the increasing population pressure on land. The institutional reform failed in major part as the fragmentation of

landholding in highly populated remote areas failed to provide employment in agriculture to small farmers and landless labourers through limited distributive capacity of land reform. It caused a structural change in the composition of rural labour force towards alternative path of rural non farm activities. The intersectoral linkages between farm and non-farm sector bring about this alternative rural livelihood. During the decades of import substitutions and export-oriented strategy in 50s and 60s, identified rural non farm sectors as a low productivity sectors producing inferior goods. But the growing evidence of failure of industrialization and urbanization to succumb the rural labor force migration, Vis-a Vis persistent productive functioning of small-scale industries. Until in recent years of eighties, the employment diversification gathered a momentum in rural non farm activities attracting much importance to policy makers. Thus at least four arguments can be put forwarded favoring the promotion of rural employment diversification- firstly, it would provide employment to increasing labor force, secondly restrict the rural-urban migrations, thirdly help to control urban congestion and pollution, and most importantly, ensure equality of income and poverty alleviation.

The employment diversification from traditional agriculture to non agricultural activities is an outcome of intersectoral linkages manifested in production and consumption linkages generate employment in non farm activities, hence ensuring income of rural poor. This intimate relation between two sectors was first observed by John Mellor in the early 70s, who corroborated the virtuous cycle magnified by multiple sectoral linkages with non farm sectors. Evidences from Asia, Africa and Latin America suggest that the adoption of green revolution technology stimulating agricultural growth enhanced the rural non farm economy in terms of sizeable income and employment in a way of multiplier effect through the network of linkages. The substantive literature revealing the nature of agricultural development and rural non farm growth broadly centered around growth linkage theory of Mellor (1976). The theory emphasizes that; an advancement of green revolution technology would lead to an increase in productivity and augmenting income in agriculture, culminating a demand led growth in non-agricultural sector. This process will stimulate a virtuous circle of growth in both sectors through multiple linkages. Five different linkages are identified, two in factor market and three in product market. Factor market linkages consist of (i) capital flows between agriculture and non-

farm enterprises and (ii) labor flows between agriculture and non farm enterprises. Product market linkages consists of (iii) backward production linkages from agriculture to rural input suppliers; (iv) forward production linkages from agriculture to processors and (iv) consumers' demand linkages generated as a result of rising incomes(consumption linkages) [Haggblade, Hazell, and Brown (1989)].

The RNFS occupies a significant position in rural employment. According to 1991 census data, the RNFS accommodated 40 million workers which constitute about 17.7% of total rural workforce of 222 million. The composition of rural employment has undergone some significant changes over the decades. The growing phenomenal evidence of employment diversification is strongly captured in different empirical studies over the period; while the national employment declined from 82% in 1977-78 to 78% in 1987-88, the contribution of RNFS increased from 14% to 17% during the same period at the rate of 5.4 percent per annum. This was mainly concerted in labour intensive jobs, causing a shift from wage employment to self-employment in rural areas. [Papola 1986, 1988, 1992].

The study by Papola (1992), using the NSS data finds that, RNF employment grew at 5% per annum between 1977-78 and 1987-88; the share of non farm employment rose from 19.9 percent to 23.4 percent in rural employment in total rural employment, providing majority of rural employment in 1980s (Sen 1994). This can be further confirmed by the study of Chadha (1993), using census data confirmed that, between 1981-91, a growth rate of 2.8% per annum, among which 1.6 % for cultivators and 2.8 percent among agricultural labourers; suggesting that a cultivators are moving into other two categories.

The other analysis based on NSSO survey of 55th round (1999-2000) clearly concluded that, the decade of seventies, specifically, from 1972-73 to 1987-78, the pace of employment diversification grew rapidly from14.3 % to 21.7% in this period. This became stagnant (21.4%) between 1987-88 and 1993-94. The situation gradually improved from the mid nineties to1999-2000 (23.8 %). the absolute number of non-farm workers at this respective phases also validated the above empirical fact at our chosen point of time (Bhaumik, 2002). So the decades of nineties dismal the pace of employment diversification (Acharya and Mitra 2000), [Bhalla 1997]

The structural Adjustment Programme [SAP], instigated in the prognosis of New Economic Reforms has remarkably embarked upon a paradigmatic shift in policy persuasions, encapsulating a change from import- substituting development strategy of a closed economy to export orienting development strategy of an open economy. The rationale of this development discourse fundamentally works through strong intersectoral linkages in all sectors, presupposed to be integrated with the global market. The consequences in the employment market witnessed significant characteristic alteration over the last decades. The employment prospect has been persistently skewed towards more skill full, educated and trained labourers of high productivity, along with shrinking opportunity for the workers of low productivity. The remaining rural counter part is also no exception. The rural employment scenario of last decades has been portrayed in several empirical studied in recent times. Employment in agriculture as we mentioned was appallingly low (0.06%) and insignificant during 90s, where it was witnessed a satisfactory growth (1.1%) in decade of 80s. fascinatingly, agricultural income during 90s is higher than in 80s, implying a jobless growth in agriculture. This augmentation in income in this sector is principally caused by the value-addition in agriculture. As the employment is largely manifested through rise in cropping area; but these indices depicted a fall in this period. Therefore, the consequence of falling employment is thus an obvious phenomenon in post reform period [Jha 2006]. The report of Planning Commissions Task force study showed the fact that labour force participation rates have declined sharply compared with position in 1993-94 along with a sharp deceleration in the growth of labour force from 2.29% in the period 1987-88 to 1993-94 to only 1.03 % in the period 1993-94 to 1999-2000. The decline in the absolute number of persons employed in agriculture from 68.5% in 1983 to 64.8 % ten years later, declined more sharply to 59.8% in the next six years accomplishing the fact that, the growth rate of employment is less than the growth rate of the labour force indicating an increase in the unemployment rate. This comes up with the question whether the decline in agricultural employment has taken place at the cost of advancement in non farm sector in post reform decade, or it is due to the simultaneous satiation in agricultural front in terms of employment expansion irrespective of the performance in non-farm sector. This issue has a relevant connotation in relation to the contemporary crisis in Indian agriculture to see

whether the shrinkage in agriculture employment pushed out these large numbers out of agricultUre and□endIng in loW productive non-farm activities as a relief to survival strateGy.

1.2 CONTEMPORARY SCENARIOS OF AGRARIAN CRISIS: SOME SNAPSHOTS

The contemporary phenomena of agrarian crisis have its multifaceted unfolded characteristics. The rapid commercialization of Indian agriculture in the name of "progressive" Agriculture forces Indian farmers to get exposed in global market scenario. The increasing vulnevability of farming community in the open market takes new silhouette every day in the form of farmers' suicides in the several parts of the country. The states like Andhra Pradesh, Punjab, Karnataka, Kerela, and Maharashtra that are supposed to be agriculturally rich have witnessed these grievous and unfortunate incidents repetitively in recent times. The readily identifiable major cause of farmers' suicide turns out to be huge debt burden among the farming community who are unable to repay the credit due to failure of investment in agriculture. This bulk amount of investment is necessary to incur the rising cost of cultivation. The increasing divergence betweeN the expectation of higher return and lower profitability of cultivation are evident in the recent farmers' distress. These arguments are confronted with three major aspects– (i) increasinf cost of cultivation, (Ii) anticipation of high return, (iii) deteriorating f%atura of proditability of cultivation.

(i) Increasing cost of cultivation: the r!tionale of□this argument is culminated in the inCidence of higher cost of inputs, which is predominantly affected by spread of modern technology and the relative prices of different inputs. Inputs like Fertilizers insecticides, mechanical power and improved seeds manifest a significant positIon in input structure. Th% replacEment of organic manures, animal power□and farmer-retained seeds resulted in growing share of expenditure /f input- purchase ouT of total cash expeNditure. The recent intervening of Multinational corporations (MNCs) in the sphere of domestic inpUt market with highly expensive genetically engineered And modi&ie$ Seeds carrying a promise of higher yield and productivity aggravated the need for credit further.

(i) Expectation of high return: The socio-cultural profile has been changing rapidly during last decades leading to an incReasing cost of survival. These costs are over and

above the standard expenses of Lifecycle events. With the stagnation in iNcome generation from traditional cultivation, the exPerimental attitudes towards income-anhancing new seeds, and inputs they borrow and invest with high returns.

(iii) Profitability of cultivation: the latest data on profitability of cultivation in NSSO report 497 "Income, Expenditure, and Productive Assets of farmer Households, 2003" trace out that monthly income from all sources (cultivation, animal farming, non-farm business) taken together, failed to meet monthly consumption expenditure of a record 96% of farming families at all India level; only 4% of all households generated a surplus over consumption. The overall position of deficit in farming sector has been tuned to Rs 655/- per month. Therefore, increasing borrowings is followed by asset transfer to finance deficit is the result.

The other macroeconomic dimensions

a. Globalization and Indian agriculture

The liberalization of Indian agriculture with the advent of WTO regime encompasses the gradual withdrawal of subsidy syndrome from Indian farmers in the name of eliminating "deceptive comparative advantage in the international trade". Parallelly, the decade of late '80s international prices started falling. The volatile price fluctuation of food grains in global market scenario jeopardized the stability of income of farming class., leading to a shift in the cropping pattern, towards more profitable crops, mostly non-food grains. This diversification readily recognizes the intensive cultivation of more cash crops, like-cotton, floriculture, horticulture etc. within the crop-sub sector. This trend was increasing in favour of non-food crops from early 80s to 1998-99. Nevertheless, after that the degree of diversification gradually became weakened because of non-sustaining support of allied sectors of agriculture in terms of their growth rate. As the growth rate of output of fruits, vegetables, fisheries, livestock, non-horticultural crops, and cereal groups registered a deteriorating growth rate after 1996-97 [GOI, 2005]. Therefore, up to this phase regionally, southern region achieved highest degree of diversification toward towards high value non-food crops, followed by northern region, marginally diversified toward non-cereal commodities. Only, the eastern region was the least achiever in non food grains, mainly restricting to rice. From 1996-97 onwards the states like Tamil Nadu,

Maharashtra, and Rajasthan shifted from cash crops to low value crops, unable to cope with the present agrarian distress.

The risks and vulnerability involved in production of these typical commercial crops get magnified substantially coupled with the export-oriented profile of Indian farmers. Contracts are made for export, fulfilling the prescription of seed-fertilizers and pesticides, given by the purchasing farms (Contract farming).

b. Contraction of institutional credit

As cost of cultivation is high for these types of crops the farmers took large cash credit advances from traders and commission agents and loan from banks to meet the extra seed and input costs. The continuing desertion of institutional credit functioning clear the smooth run way of high cost private credit to take off in terms of its reliability on farmers. The recent NSSO survey reveals that, the share of institutional credit agencies in the total outstanding cash dues of the rural households declined by 7% points between 1991 and 2002 and was 57% in 2002 that traced a reverse trend in this decade as this share gradually increased in each decennium. The adverse impact of the financial sector reform can be depicted as a fraction of total bank credit of commercial banks; that decreased from 15% in 1990-91 to 9.9% in 1999-2000. And further it declined to 9.6% during 2001-01.this story of progressive decline in rural credit is magnified by the severe closure of rural branches in the name of unavailability and lack of profitability, as the percentage share of total rural braches declined from 58.2 in 1989-90 to 51.7 in 1994-95 and further to 44.48 in 2005-06.

c. Reduction in Government expenditure

Sluggish Government investment in the form of public investment and subsidies for inputs is proved to be an exclusive reason for this crisis. Increase of govt. expenditure by one unit will cause an increase by 104 units in value of agriculture value (at 1993-94 prices). The fertilizer subsidy in nominal terms has declined after 2000-01 by 20.18%, accompanied by a reduction in electricity subsidy by in 2002-03, which was lower than the nominal value of 1996-97. Incase of irrigation subsidy, it is lesser in 2002-03 than in 2000-01. Remaining subsidies registering highest during 1996-97, were almost halved in

the last three years, Compared to 1999-2000. The total subsidy also reduction is also evident from the successive plan-documents during last decade. The trend of government gross fixed capital formation (GFCF) as a share of total GFCF in agriculture has also witnessed a steady decline over time. The proportion of public investment to total investment being 32.3% during 1993-94 at constant prices, further deteriorated to 23.6% during 2003-04. A downward trend continued to 2000-01, although slightly improved in subsequent years.

d. Unfavorable terms of trade

In addition, the Minimum Support Price (MSP) has been proved insufficient to protect the farmers from global price shock. In some states, it is even lower than the recommendation prescribed by Commissions for Agricultural Costs and Prices [CACP]. In this context, agricultural terms of trade (TOT) played a significant role in determining MSPs, which has degraded over the last decade. The index of TOT with base TE 1990-91 deteriorated from 106.6 in 1994-95 to 102.7 in 1999-2000. The index of intermediate consumption rose to 259.1 as against the index of prices received by the farmers, 254.9 in 2003-04. Complementarily, intersectoral terms of trade has been stagnant in favour of agriculture the index of TOT with base TE1990-91 decreased from 106.6 in 1994-95 to 102.5 in 2003-04. The discrepancy between the growth of the price index paid by the farmers (final consumption, intermediate consumption, and capital formation) and index of prices received by the farmers are evident in years.

e. Distribution of land holdings

This distress has led to very striking changes in the distribution of land operated-the actual units in which land is cultivated. At all India level the percentage of landless households, operating nil land has distinctly augmented from 19.8% to 31.2% over the last decade. The state wise data shows a sharper than average rise in all states (specifically, Andhra Pradesh, Kerala, Punjab) affected by acute farmers distress. For example, in Kerela, the rural households with no land holdings arose from only 5.8% to a record 38.6%.

1.3 Agrarian Crisis in Andhra Pradesh

The extreme rural distress in Andhra Pradesh have raised much social concern in public domain especially aftermath of the suicides of farmers in large numbers in recent past. The present government in the state has also realized the severity of the problems in the countryside and therefore has made agricultural regeneration the most important priority. It is becoming increasingly evident that the difficulties confronting agriculture in Andhra Pradesh are compl%x and multifarious, and will in fact require a complete reversal of the□earliEr economic strateGy followed)n the state, if these problems ape to be adequately addressed. Phe past experiEnce in Andhra Pradesh desErves even grea4ar national attention. This is because what has already happened in very acute form in this state is occurring□in many (even most) other parts of rural India. Even the same symptoms -□farmers' sqicides, hunger deaths in the midst of production surpluses, distress migration under stark conditions - are exhibiting themselves in regions as disparate as Vidarbha in Maharashtra and southwestern Rajasthan. The causes, also, are broadly the same, with the shift towards increasingly unreliable cash crops, the decline in institutional credit, the problems with input supplies and crop marketing, and the lack of alternative non-agricultural income opportunities, all contributing to the generalized agrarian crisis. This severity lies in the fact that Andhra Pradesh is the only state in India that deliberately proliferate the process of Structural Adjustment Programmes by inviting the direct intervention of World Bank in early 1990s. The state had become almost a laboratory for every extreme form of neoliberal economic experiment, with a massive shift towards relying on incentives for private agents as opposed to state intervention and regulation of private activity, in virtually all areas. Ironically, this decline in the state's role took place at the same time that the state government was incurring massive external debts from bilateral and multilateral external agencies. Many of the problems in the economy of the state - in agriculture as well as in non-agriculture - can be traced to this reduction of the government's positive role and the collapse of a wide range of public institutions affecting the conditions facing producers.

The problem of farmers' suicides, which is probably the most dogmatic sign of extreme despair, hopelessness and disruption of agriculture in Andhra Pradesh, and close to starvation deaths as the most barefaced indicator of the extent of agrarian devastation.

The contiguous causality of such suicides is usually the inability to cope with the burden of debt, which farmers find themselves unable to repay. In most cases, the debt was contracted to private moneylenders, as the massive decline in agricultural credit from banks and co-operatives has reduced access especially of small cultivators to institutional credit

But the debt burden itself is only a symptom of the wider malaise. Cultivation itself has become less and less viable over time, as input prices in Andhra Pradesh especially have sky-rocketed, and farmers have gone in for cash crops with uncertain harvests and even more uncertain output markets. The opening up of agricultural trade has forced farmers to cope with the vagaries and volatility of international market prices, even while the most minimal protection earlier afforded to cultivators has been removed.

Public agricultural extension services have all but disappeared, leaving farmers to the mercy of private dealers of seed and other inputs such as fertilizer and pesticides who function without adequate regulation, creating problems of wrong crop choices, excessively high input prices, spurious inputs and extortion. Public crop marketing services have also declined in spread and scope, and marketing margins imposed by private traders have therefore increased. All this happened over a period when farmers were actively encouraged to shift to cash crops, away from subsistence crops which involved less monetized inputs and could ensure at least consumption survival of peasant households.

The crisis in water and irrigation sources can also be traced to these cultivation patterns. Over-use of groundwater - once again resulting from the absence of public regulation or even advice, as well as the shift to more water-using crops - has caused water tables to fall across the state. Declining public investment, inadequate maintenance and the regionally uneven pattern of spending, have all made surface water access also problematic. In consequence, there are now real problems with respect to even the current economic viability of farming as a productive activity in most parts of rural Andhra Pradesh no to mention its sustainability over time.

Other factors have added to debt burdens that become unbearable over time. Production loans dominate in current rural indebtedness. But among the non-productive loans incurred by rural households, those taken for paying for medical expenses are the most

significant. The deterioration of public health services and the promotion of private medical care have dramatically increased the financial costs of sheer physical survival and well-being, even among the relatively poor.

This entire process is sometimes presented as a situation in which rural people have been "left out" of the process of globalization, or have been "marginalized" or "excluded". But nothing could be further from the truth. The problem is not at all that cultivators and workers in this state have been "left out"; rather, they have been forced into market relations that are intrinsically loaded against them. They have not been marginalized and excluded; instead, they have been incorporated and integrated into market systems in which their lack of assets, poor protection through regulation and low bargaining power have operated to make their material conditions more adverse.

1.4 OBJECTIVE OF THE STUDY

Given the above backdrop of contemporary scenario of agrarian crisis in India as well as her state Andhra Pradesh, we would be therefore interested in looking into the extent of rural distress from the perspective of employment generation in farm and non farm activities in India as well as in Andhra Pradesh. More specifically this study would attempt to examine the nature of employment diversification in major states of India and Andhra Pradesh using the district level data gathered from the secondary sources. It seeks to identify the determinants of inter-district variations within the state Andhra Pradesh and interstate variation in the shares and growth of RNFE and thus employment diversifications across a cross-section of different categories of employment for different districts in Andhra Pradesh as well as states of India. The basic objective is to test the hypothesis of 'distress diversification' against 'agricultural growth linkages' in order to explain the propensity of rural people to be involved in the employment diversification. Our study will test a wider development linkage/ distress diversification hypothesis. This overall development linkage will cause fast growing development indicators inducing more employment diversity. The reverse distress driven diversification arguments would be discernible in lower values of the development indicators, causing higher non farm employment share. Econometric models have been used to explain the district level variation in the RNFE by using the data for1991 and 2001 for various sub-sectors. The

analysis will reveal that variations in irrigation, farm size, literacy, urbanization, commercialization, infrastructure and poverty are significant determinants of employment diversification.

1.5 RESEARCH QUESTIONS

The relevance of the employment diversification trends in recent decade of new economic reforms needs to be scrutinized with special reference to present agrarian crisis in several parts of India. The major concern of our study boils downs to the fact that, if green revolution could lead to a virtuous cycle of linkages, could the agrarian crisis lead to either involution or a push towards distress diversification or both. Thus, our study would attempt to find out the following—

1. What have been the incidence and growth patterns of rural non-farm employment in Andhra Pradesh as well as in her districts?
2. How far the observed growth patterns confirm the real tendency of employment diversification towards non farm employment in rural Andhra Pradesh?
3. What is the extent of employment generation in agriculture and non-agricultural activities? In other words, what has been the extent of marginalisation of rural non-farm employment in Andhra Pradesh as well as her districts in the post reform era of agricultural crisis?
4. How have the rural non farm workers in Andhra Pradesh as well in the districts been distributed across different sub sectors? Which are the emerging sub sector(s) in rural non farm employment that can absorb the additional rural non farm workers in the reference period of 1991 and 2001?
5. What are the contributing *developmental push factors* and *distress driven pull factors* on the growth of RNFS in the era of globalization? In this context, we would identify several factors that are likely to affect the incidence of employment diversification.

We would broadly include the farm related variables- (i) commercialization of agriculture, (ii) Irrigational facilities, (iii) land holding size, and the non farm related variables are (iv) level of urbanization, (v) incidence of poverty, (vi) levels of literacy, (vii) road infrastructure and (viii) financial infrastructure

A major issue is to look whether share of employment diversification in traditional non-agricultural sector is associated to lower literacy and distress diversification while employment share in modern non-agriculture would be associated to high literacy and growth linkages from agriculture.

This present study primarily presumes to identify the determinants of shares and growth of rural non farm employment in Andhra Pradesh with special reference to contemporary crisis in agricultural front during the post reform period. The broad focus of our study would be to relate the present status of agricultural growth in Andhra Pradesh with the pattern of district-level employment diversification between 1991 and 2001. We would analyze the growth and incidence of both main and marginal workforce deployed in farm and non-farm sector between this reference. We would consider the changes between this two reference time points and seek to identify some of the factors associated across the districts over the time with relatively larger rural non-farm employment over the time. A study of determinants of rural non farm employment in relation to the current stagnation in agriculture in Andhra Pradesh can facilitate to understand the composition and performance of the labour market during the post reform period. This paper attempted to recognize these determinants and their interrelationship with the help of the district level data in Andhra Pradesh. It is also important from the perspective of employment policy formulation to analyze the reasons for large variation in intra district variation in rural non farm employment.

The essential thrust of the study is therefore to examine the agricultural growth linkage hypothesis against distress driven diversification as an explanation of employment intensity of the rural people to be absorbed in rural non farm employment during the post reform period. The strict agricultural growth linkage hypothesis states that, better performance in agricultural sector in terms of income/employment/output would foster the demand and supply led rural non farm employment. The distress driven hypothesis on the other hand would cause the increase in rural non farm activities out of agrarian distress. We would also test the over all development driven hypothesis that states that, higher development indicators like literacy, urbanization, bank branches in rural areas, would induce more expansion of rural non farm employment. The overall distress driven

diversification evolves around the poor performance of the development indicators pertaining to a specific region.

We would broadly categorize the rural non farm employment into two categories- (i) traditional rural non farm employment activities and (ii) modern rural non farm employment activities. The traditional non-farm activities comprises activities such as black smithy, carpentry, pottery, weaving, washing, toddy tapping, barbering, cobbling, shepherd rearing and cotton cording) continue even though today some are declining. These activities may be grouped under seven headings: crafts, processing of crops, non-factory textiles, traditional forms of transportation and trade/commerce, personal services, repair and construction in homes and fields. The second category consists of modern manufacturing and processing, including sugar and textile factories, oil and grain mills, small factories producing engineering goods, shoes, paper, furniture, soap, matches and small scale quarries. A newly emerging third category consists of rural white-collar workers: public services, health and extension services, credit and marketing agencies, and public works construction.

The hypothesis examined in our study that, high share of non farm employment in traditional non farm sector is associated with lower level of literacy and distress diversification, while the share of employment in modern sector is associated with low level of literacy and rural growth linkages from agriculture. This is explored by using cross sectional study of industrial categories IV to IX for 22 rural districts of Andhra Pradesh.

Our analysis also hinges on the significance of non farm employment relative to agricultural farm employment. We use the percentage share of RNFE to the total employment for both main and marginal workforce as the dependent variable and Also by contrast, we have analysed RNFE in a disaggregated manner using all IV to IX categories (divisions) of RNFE for 1991 and for 2001.

1.6 DATABASE AND METHODOLOGY

The study would use the secondary data for building a complete understanding of the process of occupational diversification in Rural Farm and Non Farm Sector, with special reference to present agrarian crisis in post reform era of Andhra Pradesh. As the areas of high agrarian distress are confined within few pockets of India, this study could not be limited to state level study only. Besides, within a state there could be considerable disparities `etween the districts. Therefore, we souhd qse Census district level data mf workforce diversification of 1991 and 2001. Regarding the data of determIning factors we have gathered the variables from different sources.

We would conceive an econometric model that would be used to carry out the log linear regression (except in the growth equation), separately for Main workforce and Total non-farm work force, by taking Main and Marginal workers together at these two points of time 1991 and 2001. At first round, the percentage share of non-farm workers to total rural employment would used as the dependent variables to estimate the parameters of the explanatory variables used in the model. In second round, we would treat the decadal compound growth rate of non farm employment to be the dependent variable in the model. Proceeding in the similar way, we apply these two round analyses for all sub sectors; fell within the territory of non farm activities. Thus, these sets of regression exercise would possibly be directed to investigate the causation between the non farm employment and the determining pull and push factors at two point of time 1991 and 2001, separately for main and marginal workforce. Thus we aim to explain (i) the level of employment diversification across the district level and (ii) the growth of non farm employment in the post reform period with the presence of severe crisis of agriculture. This is based on the key assumptions. We have checked about the violation of the assumptions.

As preliminary steps we would test the mean and standard deviations of all the variables and't'- test were used to compare the differences in means between 1991 and 2001. For all categories of rural non farm employment as well as some of the independent variables.

The study is organized into five chapters. This first chapter of introduction would gradually develop a thorough understanding of the issue of employment generation by describing the importance of employment diversification in terms of policy documentation and quantitative contribution. Here we have attempted to relate this notion of work force diversification with present status of Indian agriculture drawing much attention to severe agrarian distress in Andhra Pradesh. Accordingly we frame our research questions, objectives and methodology of our study. .

The second chapter would give a brief account of the existing literature on employment diversification. Starting from theoretical arguments of Mellor's growth linkage hypothesis we have reviewed the significant empirical case studies revealing the occupational diversification in India. There is an extensive literature investigating linkages between agricultural development and the non-agricultural economy. The majority of literature on the workforce diversification searched to identify the principle determining factors of growth (or lack of) in the non-agricultural sector. While, other literature has endorsed to categorize supplementary key factors, or 'prime movers', notably rural infrastructure, urbanization and government rural development schemes. Following Vaidyanathan (1986), a further debate in the literature has arisen as to whether growth in rural non-farm employment is a consequence of distress diversification, or because it is responding to demand as the rural economy develops. Acknowledgement of the diversification of the RNFE and thus the existence of multiple growth factors has helped to resolve the debate.

Our third chapter examines the incidence as well as growth patterns of rural non farm employment in India as well as in the states. We would be interested to know that how far the observed growth pattern of non farm employment would claim itself to be the real tendency towards occupational diversification in rural India. This analysis would also reflect the extent employment generation in rural sector, i.e. the extent of marginalization of rural non farm employment in India and in her states. It would also describe how the rural non farm workers in all India and in states have been distributed across different sectors and trace out the sector(s) appeared to be prominent in accommodating the rural

non farm labour force and the emerging sub sectors absorbing additional non farm workers between the period 1991 and 2001.

In fourth chapter we would describe the incidence and growth patterns of rural non-farm employment in Andhra Pradesh as well as in her districts and analyze the interstate structural variation and trends during the post reform period. This would enhance to capture the real tendency of workforce diversification among the main and marginal workforce during the reference period. Besides, the analysis would highlight the important sub sectors in providing rural non farm employment and the emerging sub sector(s) having the potential to absorb the incremental numbers of non farm workers during the decade.

Chapter five summarizes the hypothesis abut the inter district variations in share of rural non farm employment, the variable used in the subsequent empirical analysis, their specifications and expected relationships. The model, which we use to explain causation of non farm employment across the districts, is also specified here in this section. This would also include the summary of the changes in the explanatory variables used in the model between 1991 and 2001. Then we present the empirical results of the model and relate these results with alternative hypothesis (distress diversification and growth linkages). The chapter concludes with summary of findings and conclusion.

CHAPTER 2

A BRIEF SURVEY OF LITERATURE

2.1 Agricultural Growth Linkage theories in India

In recent times, incisive attention is being aroused in the notion of employment diversification in recognising its role to frame the development strategy in successive planning documents. These conceived a prognosis of diversified income portfolios from different source of non-farm activities; thus enhancing rural livelihoods and mitigate the risks from fluctuations in agricultural income by distributing income into different occupational trajectories. This would act as a potential motor for economic growth performing through diversified employment horizon. In late 1960s, Hymer and Resnick (1969) made the initial attempt in a model. This model aims toward analyzing the dynamic role of non-farm activities. They elucidated the mechanism of gradual of non-farm activities under colonialism. The model envisaged a self-sufficient closed economy consisting of predominant agricultural sector and the traditional non-farm sector, i.e. Z-good sector, fulfilling the local consumption demands for goods and services. Now with the advent of colonial dominance, local consumption of goods and services would be substituted by the import of cheap manufactured product from outside; parallelly, the potential natural resource base and cash crop sector will be exploited in export market competition. Consequently, a gradual labour withdrawal from Z-good sector to commercial cash crop sector would take place. This in turn, resulted in a severe retrogression in non-farm activities. Ranis and Stewart (1993) segregated this Z-good sector in two parts-(i) sector producing traditional goods and services in households and villages, and the its counterpart includes modern activities , located in towns. Due to this heterogeneous decomposition in non-farm employment, the dynamic potential of employment diversification will be concentrated in isolation, not for whole scenario of employment perspective [Ranis & Stewart (1993)]

At this juncture, in order to understand the dynamic pace of employment diversification we must acknowledge the Agricultural Growth Linkage Theory of Mellor (1976). The theory of linkages primarily hinges on an integrated approach of rural development through virtuous cycle of multiple linkages between agriculture and non-agriculture. The core argument is based upon the productivity rise in agricultural front thrived by the adoption of Green revolution technology. This productivity rise in low yielding agriculture would enhance sufficient income

endowment for rural people, generating demand for non-agricultural consumption goods, mostly produced in small scale, labour intensive enterprises through consumption linkages. In supply side, high-productive agriculture would be confronted with rapid usage of domestic inputs, produced in locally, aggravating a demand for inputs through backward production linkages. While the agricultural products can parallelly be used as inputs in producing final agro-processing activities in non-farm sector. This virtuous chain of food production and employment through multiple linkages stimulate rural development in a sustained process of self-mechanism of demand led growth [Mellor 1976]. Later some observers specified the nature and magnitudes of such growth linkages empirically with concrete classification of five categories of linkages; two of them in factor markets and rest of three types of linkages are perceptible in product markets. Factor markets envisaged the linkage in terms of capital flow from agriculture to non-farm sector that is reverse than the in outflow from non-farm sector to agriculture. The surplus extracted from agriculture to diversified nonfarm employment activities is more substantial than the from non-farm activities to agriculture. This is evident in most of the African countries that, this surplus appropriation takes place in form of fiscal, crop pricing, and trade policies and also due to favourable structure of government expenditure, private investors channelized the surplus from agriculture to non-farm sector. The second type of linkages occur the labor markets, when the substantial seasonal labor flows between agriculture and non farm activities in a contra-cyclical manner fulfilling the demands of labor in peak season following agricultural calendar. This labor-flow amounts to be 20 percent to 40 percent of total rural labor force in both the agricultural and non-agricultural employment. The production linkages centres around analogically with the theory of growth linkages of Mellor, highlighting the forward production linkages in promoting agro processing units in small scale industries by usage of agricultural inputs; especially food processing accomplished most prominent role in employment diversity. After food processing distribution of agricultural products generate second largest of the forward linkages from agriculture. In addition, backward production linkages work in the course of enticing the demand for local inputs and services required by farmers. The type and magnitudes of backward linkages depend upon agricultural technology, size of holding type of crop and whether production is irrigated or not. Consumption links are followed by the gradual rise in per capita income that facilitates the demand for local services, housing durables, horticultural products. These varieties of demands

outweigh the demand for foodgrains. The Asian experiences intended to explain that the production of these services and commodities is more labour intensive, spawning rural employment in the non-food sector, boosting the potential base for diversified employment pattern, with rapid increase in per capita farm incomes [Haggblade, Hazell and Brown (1989)]. The other noteworthy dimension in analyzing the thrust for employment diversification is originated in a distinctive literature of "*demand pull*" and "*distress push diversification*" these theories essentially evolve around two different scenarios; in terms of different socio-economic parametric constraints. In the presence of adverse socio- economic hindrances like risks, uncertainty of farmers, market imperfection, disguised unemployment in agricultural front, the rural households are engaged in such economic activities, which are less productive and less income generating than agriculture on a full employment basis, in order to avoid further deterioration in their downstream income trajectory. This could be explicated in the areas of geographical isolation, low quality of physical infrastructure and low return to human capital. The incidence of *demand pull diversification* is compatible within a given favourable market structure in support of expanding technological innovation within or outside agriculture; intensifying the links with the market outside the local economy[Efstratoglou-Todoulo, (1990), Reardon, (1999); Ellis (2000 b)]. The nature of economic activities is thus very different in these two situations. In distress driven diversification mostly a larger share of the income of poor household comes from wage employment; while demand driven pull factors induce the opportunity of self-employment in non-agricultural activities, as the richer households are entitled with sufficient capital to enter with their own independent enterprises. In a region of high income inequality both of these employment activities can be perceptible with in the people of respective income strata following a bimodal distribution over household incomes. If push factors dominates over pull factors, the lower returns form non-agricultural activities continues in a vicious circle of the rural poor people. In addition, if contrary happens then the lager income returns would be accrued to the richer households. These induced effects realized in pattern of employment diversification carried economic significance in evaluating the role of RNFE in many developing and transition economies. . [Davis, Bezemer (2004)].Samal (1997) emphasizes that, inequality in rural income and assets are not a prerequisite for growth linkages between farm and non-farm; rather, the development of capitalist structure with technological advancement that can ensure growth linkages between the sectors.

There are considerable numbers of literature based on Indian case studies, suggesting the growth of agriculture is a necessary precondition for employment diversification in non farm activities [Hazell & Haggblade (1991), Bhalla (1993), Dev (1990), Papola(1992), Shukla (1991, 1992), Unni (1991, 1994)]

Fisher and others' study, using census 1991 data, reveal that, the states like Punjab, Haryana, and West Bengal with developed agriculture will suffice more prominent diversified employment pattern, amounting more than 25 percent of rural workforce to be in non-farm activities. Contrastingly, the states with poor agricultural growth like Madhya Pradesh, Bihar have ensured lower diversification. Hence they conclude, "Growth in RNF sector is clearly boosted by a thriving agricultural economy" (1997: 206)

In district level data analysis, Hazell & Haggblade (1991) established the linkages hypothesis by saying that the decisive role of agricultural growth is crucial for employment diversity. Both consumption and production linkages have stimulated by the same magnitudes as a consequences of growing agricultural income and increasing use of agricultural inputs. However, Shukla (1991, 1992) refuted the argument and claimed that consumption linkages are two time strong than all production linkages. Shukla's study is primarily built on econometric modeling using the data from Maharashtra. Though the study presumed forward linkages are substantially strong than backward linkages; but if the consumption effect is absent then agricultural production had diminutive impact on the growth of non-farm activities.

Vaidyanathan (1986) demonstrated a direct relationship between per capita agricultural crop output and non-farm employment. At the same time, Dev (1990) found a correlation between agricultural productivity and employment diversification, which is more concrete at disaggregated level. Both of these studies undoubtedly identified the inverse relationship between inequality in the distribution of land holdings and rural non-farm employment. Papola (1994) specifically, mentioned about the rural industrial sector as a component of employment diversification, which hold a direct proportionality with agricultural output and productivity.

This analysis of agriculture- industry linkages was also evident in the study of Nachane et al (1989). Instead of forward and backward linkages, their findings thoroughly traces out

the correlation between agriculture and growth in employment in nonfarm activities, with special emphasis to the agro-industries that is more likely to be boosted up by agriculture than other employment activities in tertiary sector.

In search of linkages, Chadha (1994), in a micro level study of 18 villages of three states Bihar, Andhra Pradesh and UP, selected in terms of different levels of development. The backward region of Bihar with low level of employment diversification, AP with developed agriculture but a little diversification and UP which is advanced in both agriculture and nonfarm employment. The study came across with a comprehensive result that, the region with rapidly growing productive agriculture, would promote a well-developed non-farm employment diversification within the village itself. Further, these sectoral linkages between agriculture and non-agricultural activities cannot be presumed to be given as datum. As the economy develops, the diversified employment pattern would be concentrated in poorer households.

Sufficing the quantifiable significance of the linkages between agriculture led growth and employment diversification, Harris (1987, 1991) emphasized that, agricultural growth is a necessary condition for non-farm employment but it cannot be sufficient within itself. This argument is based on a study in Tami Nadu and surrounding server villages identifying a political economy of monopoly concentration of wealth and power among richer households thus dampening the linkage effect between agriculture and non-agricultural activities.

The other Indian case studies broadly conjecture this phenomenon of linkages. Basant (1994) observed that growth in per capita income, agricultural productivity and non-food crops have significantly impacted on growth of diversified employment in taluk and districts of Gujarat. In a study, Chandrasekhar (1993) found that, the rise in agriculture productivity in the state like West Bengal triggered the withdrawal of male workforce from non-farm activities. Another study in UP could be evidence for the similar diagnosis where rise in agricultural productivity broadened the potential base for more labour to be absorbed in agriculture from non-farm activities [Singh (1994)].

2.3 Agricultural growth Linkages versus the Residual Sector Hypothesis

The origin of the debate on 'distress induced growth' hypothesis in India was initiated in the study of Vaidyanathan (1986) in sixteen major states. This investigated whether this prevalence of employment diversifications is a corollary of the agriculture-centric rural development or it is a consequence of the capacity constraint in agriculture forcing the surplus labour to be absorbed in non-farm activities. The study address to measure the impact of non-farm employment on farming income, income distribution, unemployment rate and cash crops by estimating a regression exercise. He established a strong positive association between non-farm employment and the rate of unemployment. Where agriculture is unable to provide widespread unemployment. This debate was contextualized by the evidences of policy initiatives to be delinked from disseminating the perspective of employment diversity [Basu & Kashyap (1992)]

The phenomenon of labor absorption in agriculture is documented in several empirical studies using census and district level data. Basu and Kashyap (1992) & Vaidyanathan (1986) cited the Bhalla's study [Bhalla (1987, 1989, and 1990)] that showed the process of labour absorption is strained by the agricultural sector. These studied the regional disparity among different states in India in terms of the labour absorption. The regions where green revolution ushered namely Punjab, Haryana, and western U.P have succeeded in reducing labor intensity with high labor displacing technology, but these regions also experienced a rise in gross cropped area. Contrastingly, in West Bengal, Bihar, Orissa, Tamil Nadu agricultural growth also induced the rising labour intensity. Other states such as Rajasthan and Madhya Pradesh have mixed result showing unsatisfactory growth in labour intensity though they adopted the labour saving mechanism of productivity growth. Only in Andhra Pradesh, Maharashtra and Gujarat, both high rate of labour productivity and labour absorption have simultaneously taken place.

Following the footprints of Vaidyanathan study (1986), several authors identified the distress driven factors, which have a cumulative effect on employment diversification. These principal factors include poverty, unemployment and population pressure, having spatial incongruity over the different regions. These act like push factors, which compelled rural households to go out of agriculture and engage in non-agricultural

activities. In search of the validity of distress induced diversification argument Epan (1995) in Kerala with census data found a strong interrelation of non-farm employment with land man ratio and the ratio of marginal holdings to total land holdings. These two ratios were treated as proxy variables for push factors reflecting inverse relationships with diversified employment in non-agriculture, both in 1981 and 1991. Similarly, on a work in eastern India, Singh (1994) vindicated the dynamic forces of distress phenomena elucidating the non-farm activities as the residual economy of rural eastern India. Bhalla (1990) [cited in Basu and Kashyap (1992)] clarify two kinds the distress driven forces plummeting employment diversification to only residual labor force- those who have no major source of income engaged in subsidiary non farm activities supplementing income, and those with main livelihood also affianced in subsidiary non farm diversification.

Contrastingly, opposing the arguments of residual sector hypothesis, Unni (1991) find no correlation between rural poverty and non-farm employment, not even the associations of non-farm employment with proportion of landless households was traced out. The argument was initially addressed lack of effective demand in these regions of rural distress sufficing non-agricultural growth. Visaria (1995) argues that, it is indeed methodologically problematic to examine the residual sector hypothesis of Vaidyanathan, following the relationship between unemployment rate and non-farm employment. Because, the argument was, the agricultural wage rate has also been increase in gradually in mid1970s and 1980s in the phase of growing employment diversification. Infact, Mukherjee (1995) argued that, this growth in non-farm employment is primarily accountable for rise in agricultural wages; adding to this stuff Sen (1997) commented that non-farm employment diversifications is conscientious for the reduction in poverty levels.

Basu & Kashyap (1992) first pointed out the genuine problem of examining residual sector hypothesis through these positive nexus between unemployment rate and non-agricultural sector. Because unemployment rate are "likely to be associated with relative agricultural prosperity and outcome of job expectation.....and better reporting about employment status" (1992: A-180). The common practice of unleashing the relationship of non-farm employment with unemployment rate or population pressure on land obscured the function of agricultural processes that can be varying degree of limitation in

different regions of India. This agricultural process sharply diverges across spatial element and heterogeneous agro-climatic conditions in terms of agriculture, productivity of land, cropping pattern; nurturing the agricultural process. Besides, the persuasive forces like population pressure on land, agricultural stagnation, and exogenous factors, like rural urban continuum and infrastructure would hold back the growth of agricultural process.

Fisher et al (1997) & Unni (1998) gave much importance to these heterogeneous activities within the non-farm employment. These diversified activities necessitate different entry qualifications. They argue that, this recognition of heterogeneity was absent from the earlier literature. In this context, Bhalla (1994) pointed out the employment diversity in agriculture, mining and construction; that are endowed with largest proportion of poorer households. These employment activities can also be regarded as low entry barrier activities, because high degree of casualisation of labor takes place within the purview of such employment activities. Therefore, these phenomena may be foreclosed as residual sector, performing as a sucker of excess labor of agriculture who cannot sustain their livelihood from cultivation. Fisher et al (1997) specified about the services like retail trading, household manufacturing and personal services that can maneuver as labor absorbers due to the wage differential in these sectors, as these offers a slightly higher wage than in agriculture. In addition the other employment activities in manufacturing other than in households, transport and a number of services give much more return and capture the "more productive and dynamic part of the rural non farm sector"(1997:40). These types of employment are responsive towards demand factors. In contrast, the regions suffered from agricultural setback have experienced the incidence of employment diversification as a safety net in the survival strategy of rural livelihood in slack season of agricultural employment. Nevertheless, in other region, agricultural growth can be an impetus to this rapid employment diversification. By supplying raw materials for processing industries, with concurrent inducement to demands for agricultural inputs, this would fuel income thus designing the effective demand for non-agricultural commodities and services and inputs. According to Papola (1992), this shift from self-cultivation in agriculture to higher waged employment activities may perhaps cause casualisation of rural labor redundant.

In addressing the underlying multiple causal factors accountable for employment diversification, Singh & Tripathi (1995) in a micro study captured three classes of farmers-- large, medium and marginal, in Allahabad district of UP. They assessed the factors causing occupational shift from agriculture to non-agricultural activities, primarily hinted towards the motivating purpose of different class presentation of framers in non-farm employment. For large farmers, the factors like enhancement in per capita income, educational attainment are positive determinant in explaining the occupational varieties; while the shrinkage in per capita availability of land was come out to be significant unfavorable on occupational mobility of this large farmer households. The small farmers were intended for employment diversification because of risk and uncertainty involved in income from cultivation. Apart from the limitations in poor agricultural conditions like low payment or seasonality etc the propelling force for marginal farmers that move them into diversified activities were mechanization, industrialization and urbanization;. These small and tiny industries in rural areas provide substitute sources of employment. Therefore, their study fundamentally put stress on the need for small-scale industries. Eventually the rural youth with good educational background, unwilling to participate in agricultural employment can be absorbed in these rural industries.

According to Shylendra and Thomas (1995), the growth in non-farm employment can be corroborated in the course of both pull factors of developmental linkages and the distress driven push factors. In certain cases, these two factors can be reinforcing each other. Their study was based on Gujarat that had 90 percent of the households, engaged in non-farm activities. They acknowledged two processes that have different impacts on two different categories of non-farm employment. Firstly, employment diversification towards 'non farm proper' sub sector, comprising "artisans, trade, business, white collar, and other jobs" [1995: 413] is responsive to the developmental pull factors. They recognized the increased demand for goods and services and expansionary effects of government policies to be the pull factors; other positive factors include agricultural modernization, and commercialization, increasing demand for non food good and services, urbanization and growing literacy and welfare oriented policy interventions. This segment of employment activities contain a wide range of diversified activities in quantitative terms; out of which artisans/service activities, commonly seasonal in nature

occupied 41 percent and most female labor are attach to these activities. On the other hand, trade and business jobs that carried out through out the year accommodated the share of 21 percent of the total status of diversified employment. The people with educational qualification opted job in formal sector outside the locality. The second category of employment diversification involves "*non-farm migratory*" activities. This typology of non-farm activity in large extent captured the seasonal migrations of unskilled labour to urban areas as a sequential effect of phenomenal distress driven by push factors like poverty, unemployment, and underemployment in rural areas.

The argument of Samal (1997b) tried to conclude about the distinctive category of diversified employment activities. He emphasized that; different employment in non-farm sector should have experienced different impacts of agricultural growth. For example, the traditional non-farm employments like barbers, washer-men may not be affected; but as the traditional agriculture demands local inputs, this could lead to a genuine increase in local manufacturing sectors. Nevertheless, agricultural growth has a negative impact especially on artisans. But the agriculture, which can be depicted by rapid modernization, may not necessarily utilize inputs produced locally. Growth in agriculture does not always correspond to the increase demand in local inputs [Chandrasekhar (1993), Vaidyanathan (1994)]. So, as a resultant effect, a gradual decline has been evident in traditional non-farm employment across the states like Orissa, H.P, Gujarat [Samal (1997b), Basant (1994), Singh (1994)].

2.3 Principal movers outside agriculture

Let us now turn to the factors apart from agricultural growth that can be arrested as the effective instruments promoting employment diversification. This is a response to attempt the empirical substantiation of growth linkage hypothesis, grabbing much attention to these additional fundamental impetuses outside agricultural sector [Unni (1998)].

1. Urbanization: In several case studies, the role of urban centers was prominent in deciding the non-farm employment activities. Bhalla (1993, 1997) exemplified the

importance of proximity to urban centers for work force diversification. Assessing district level data of Census, she showed that, urban manufactured products are more preferable to induce growth in non-farm employment in agriculturally developed districts. Papola (1992) findings relate that, the productivity and income from employment diversification is higher in the region, which can have close proximity to urban towns or evenly spread compared to the regions having few concentrated settlements. This phenomenon is responsible booster of forward and backward linkages. In addition, the rural town having population in between 20,000-50,000 had highest growth of workforce diversification between 1971 and 1981. The new worker prominently came from rural areas. Apart from rural urban migration, several other studies like Shukla (1991-92) in Gujarat, Eapen (1995) in study of agricultural employment in Kerala find positive influence of Urbanization on employment diversification. Using quinquennial data of NSSO data in 1999-2000, Srivastrava and Dubey (2002) found a high degree of correlation between level of urbanisation and level of rural non-farm employment over the decade of 1983 to 1999-2000.

2. *Market Size*: The study of Visaria (1995), using 1991 Census district level data concluded the patterns in the nature of the activities of non-farm workers who are responsive to the existing market size. In his study, both the share of cultivators and agricultural labourers in total workforce are positively associated with market size of the village. The argument indeed hinted to the fact that, a certain population is required for the development of labor, production and service markets before some worker can specialize in non-farm activities.

3. *Infrastructure:* In their analysis of growth linkages, Hazell and Haggblade (1991) emphasized that the rural infrastructure has role in magnifying the multiplicative effect of agricultural growth to non-farm employment. Jayaraj (1994) pointed out this similar contributory performance of transport infrastructure for non-farm employment opportunities. Singh (1994) traced the imperative functioning of rural electrification. Harris (1991) also felt the emerging thrust of rural infrastructure to grab the maximum rural growth linkage. In similar tone, Shukla (1992) accomplished that the development of road infrastructure could be a driving force for trading and non-household

manufacturing in particular, although the household manufacturing slided to disadvantageous position.

4. *Education level:* the role of literacy was justified in the study of Eapen (1994). His study found a momentous prevalence of literacy and education that shifted the rural households from agricultural employment to diversified non-farm activities in Kerala. This positive association between literacy and non-farm employment was also evident in Tamil Nadu [Jayaraj (1994)], Orissa [Samal (1997b)], and Gujarat [Basant (1993)]. Education is also found tobe strongly associated to employment diversify in a study of Lanjouw and Shariff (2004) .Their findings suggested that rural households with no educational training are more inclined to be engaged as agricultural wage labours rather than as cultivator or salaried employee on a regular basis. More or less, it can be postulated that people with primary education are more likely to join non-farm occupational categories in comparison to agricultural wage employment. Their estimated figure indicated that educational enhancements significantly push an individual towards diversified employment or in cultivation, rather than being remained as agricultural labour. In a study in 22 districts of rural areas based on Andhra Pradesh, Mercharla (2002) accredited the role of education in employment diversification, as " literacy supports the wide/overall "development linkages" (ODL) that traditional RNFE shares with lower level of literacy''.

5. Government expenditure: the component of Government expenditure in development programmes was already consummated as an influencing phenomenon in promoting employment diversification. Sen (1997) accomplished a positive role of Government in encouraging non-agricultural employment. In the era 1980s, agricultural growth was slow and an adjunct to the reduction in poverty and increasing wages. According to Sen (1997) and Ghosh (1995) this phenomena is attributed to a rapid growth in nonfarm employment as a consequence of large government expenditure; though lower agricultural income prevailed during this period, but due to the government -sponsored rural development schemes the demands for non-agricultural goods were sustained. While agricultural were maintained through import and depletion of national stocks. Unni (1998) grasped the attention to the varieties in the nature of government spending and was skeptic about the specific causality between employment diversification and government expenditure.

Contrastingly, Ghosh (1995) repetitively blamed the Structural Adjustment Programmes (SAP) of the economy, which was initiated in 1991, necessarily encapsulated a reduction in government expenditure and public spending. This in turn implied a withdrawal of funds like from rural development programmes, employment schemes, fertilizer subsidies, magnifying rural poverty further. Further, the case studies in Orissa (Samal 1997 b) and Kerala [Eapen (1994)] found a positive role of administration, development and social services in generating diversified employment activities in both direct manner within the sector and indirectly as a linkages to these activities.

6. *Agricultural wages*: the study of Lanjouw and Shariff (2004), based on NCAER data of 32,000 households, concluded that, the effect of agricultural wages on non-farm employment could be considerable in an indirect behavior. It is particularly prominent in the subsector like construction work activities that resemble a strong and positive association to agricultural wages. This relational nexus between agricultural wages and the share of construction workers in total in agricultural employment control agrarian productivity and population density. Their result showed that, 1 percent increase of employment in construction sector raised agricultural wages by three rupees and five rupees for sowing and harvesting respectively though construction works is not highly skillful jobs. The reason lies in high preferences for construction activities rather than agricultural jobs that induce diversification in non-agricultural employment, construction in particular. The ensuing effect is the draining off the labour from agriculture to diversified employment, leading to a resultant increase of wages in agriculture. Besides, in recent years, the change in the structure of rural non-farm sector has contributed to rapidly growing higher wage employment opportunities responsive towards non-manual employment in the non-agricultural sector. This has an implication to the formation of human and physical capital of the poor who can be beneficiaries from employment diversification. This has further connected with poverty and thus non-farm employment. The region with "better off" conditions in poverty has much higher agricultural wages equalizing with non-farm wages. Contrastingly, in the poorer region wages in both agriculture and diversified non-farm activities would be lower. This would again validate a demand driven employment diversification in "better off" region and a distress diversification is ensuing in poorer regions [Srivastrava and Dubey (2002)].

6.Credit facilities: credit availability has been reckoned as the "critical input" in the advancement of employment diversification. Because, the infrastructural mechanism of institutional credit would enhance the viability and sustainability of the rural non-farm activities by facilitating adequate forward and backward linkages and support training and availability of credit. Nevertheless, institutional credit suffered from the problems like arduous practice of documentation, delays in sanctioning loans etc. In certain instances, working capital advanced as cash credit limits were not improved as business grew over time. Therefore, government interventions in the form of Rural Financial Institutions (RFIs) are essential to extend and promote employment activities within non farm sector [Badatya (2002)]. In this context, we should mention the study of Kulkarni and Samantara (2002) that was endeavored to capture the relationship between investment and employment in non-farm sector in eight districts of UP, Tamil Nadu, Orissa and Gujarat. They emphasized the role of RFIs through liberal bank financing to be solution to the problem of rural unemployment following the grater effectiveness in expansion of non-farm activities; thus encouraging spatial spreading and rural dynamism of diversified employment activities.

A number of studies identify several other factors coming together to persuade the growth of the RNFE. For example, Eapen (1994, 1995) in his extensive research in Kerala proposed that a high degree of commercialization of agriculture, strong rural-urban linkages, declining land to man ratios, increase in the proportion of marginal landholdings, overall rural prosperity, the flow of remittances to rural areas and the growing level of literacy have played important parts in growth of the RNFE in the state. Other identified determinants incorporated irrigational facilities, number of banks branches in a village, farm size, changes in the taste of rural consumers and levels of rural and extra-local demand (Mecharla (2002);Harris, 1991; Samal, 1997b, Vaidyanathan, 1994), competition from factory sector (Visaria and Basant, 1994) and landlessness (Basant, 1993).

Chandrasekhar (1993) in a study in West Bengal clearly demonstrated the logic that explained the absence of any one to one correspondence between agricultural growth and employment diversification. The study illuminated three phases with three different

relationships between these two sectors that portray an inverted "U" shaped curve when per capita output was plotted against share of non-farm employment.

(i) In the pre green revolution era, the demand for labour intensive manufacturing goods and services was inadequate and share of non-agricultural workers was low.

(ii) With the advent of green revolution age, the stimulating local demand for agricultural labour dampened the elasticity demand for rural non-farm sector.

(iii) In final stage, as the agricultural sector reached to its maturity, the increased demand for more specified goods of higher quality augment the proportional share of non-farm employment, with some of demand met by urban-based production.

Chandrasekhar argued that, India is yet to reach phase three or it is in primitive stage that traced low participation in non-farm sector employment in certain regions of India.

2.4 SUMMARY AND CONCLUSION

The majority of literature on the RNFE in India seeks to identify the principle determining factors of growth (or lack of) in the sector. There is a considerable amount of literature investigating linkages between agricultural development and the non-agricultural economy. This largely refers to Mellor's growth linkage theory (1976) which argues for a virtuous circle of demand led-growth through production and consumption linkages as a result of increased agricultural productivity. While agriculture-led growth is acknowledged, other literature has identified additional important factors, or 'prime movers', notably rural infrastructure, urbanisation and government rural development schemes. Following Vaidyanathan (1986), a further debate in the literature has arisen as to whether growth in rural non-farm employment is a consequence of distress diversification, or because it is responding to demand as the rural economy develops. Acknowledgement of the diversity of the RNFE and thus the existence of multiple growth factors has helped to resolve the debate. Patterns of consumer demand and the influence of markets beyond the local have been identified in explaining the growth of RNF sub-sectors. Fisher *et al.* argue that many governmental promotional resources have been wasted in the face of market demand trends. Macro-economic policies of structural adjustment in the early 1990s has also been found to have a significant impact on the RNFE, increasing the demand for casual, intermittent, low remunerative and urban labour.

CHAPTER 3

EMPLOYMENT DIVERSIFICATION IN RURAL INDIA: A STATE LEVEL ANALYSIS

In this chapter, we would begin by investigating the incidence of farm and non-farm employment at our two chosen point of time in all India as well as fifteen major states. Before we present our observation in this context we would like to evoke the main highlights of the past researchers examining the increasing trend of rural non-farm employment during the period 1972-73 through 1987-88, which stops in early 1990s. For example Vaidyanathan (1986) revealed a clear tendency of employment diversification in rural India between the periods 1972-73 to 1983. Several other studies also inveterate this tendency towards employment diversification in rural India (Visaria and Basant, 1994). Other studies hypothesized that since the early 1990s, the expansion of rural non-farm employment has not been significant. Analyzing post1991 developments Bhalla (1997) observed that, rural areas in India have been suffering from a "structural retrogression" in as much as non-farm employment declined sharply during this period. Acharya and Mitra (2000) also observed that positive non-farm employment trends that were visible during 1980s were no longer in evidence during 1990s.

3.1 ALL-INDIA SCENARIO

We look afresh into the incidence of rural non-farm employment in all India at these two different points of time, namely 1991 and 2001. It is clear from the table that, for Main workers, the incidence of non-farm employment, combining male and female, on all India basis increased rapidly between 1991 and 2001. The table shows that the incidence of total non-farm employment in all India increased from 33.2 percent in 1991 to 47.07 percent in 2001. For rural India the share of rural non-farm employment has expanded significantly from 17.7 per cent in 1991 to 27.9 percent by the year 2001 with a change in 10 percentage points between the periods. The share of non-farm activities for main workers in urban areas has been accentuated from 88.4 percent to almost 99.34 percent between 1991 and 2001, the decade of economic reforms. It thus appeared that, another

upturn with regard to the incidence of non-farm employment in India has occurred by the decadal reform period.

An alternative way to comprehend this progress of non-farm employment in India is to look at the growth of absolute numbers of non-farm main workers at these two points of time. Table gives information about the growth of 3.6 percent in absolute numbers of non-farm employment in the reform period. In rural India the growth of non-farm activities is 4.0 percent, higher compared to growth figure in urban areas, i.e. 3.4 percent during the decade.

Table 3.1: Percentage of non-farm workers to total workers in all India

	Main workers			*Total (Main+Marginal) workers*		
Year	**Total**	**Rural**	**Urban**	**Total**	**Rural**	**Urban**
1991	**33.2**	**17.7**	**86.7**	**30.8**	**16.4**	**85.8**
2001	**47.1**	**27.9**	**99.3**	**38.3**	**22.8**	**90.5**
Growth (%)	**3.6%**	**4.01%**	**3.40%**	**4.70%**	**5.60%**	**4.10%**

If we look at the incidence of non-farm employment in all India by taking Main and Marginal workforce together, it can be clearly observed that, though the increase in the share of non-farm employment for Total workers is evident between the two point of time, from 30.8 percent in 1991 to 38.3 percent, but the increase in non-farm employment has been more pronounced in urban areas compared to rural India. The share in non-farm occupation for Total workforce in rural India rose from 16.4 percent in 1991 to 22.8 percent in 2001, whereas in urban areas the share of non farm employment among Total workforce has increased from 85.8 percent to 90.5 percent during this reference period. But the growth of urban non farm employment is much more pronounced among main workers.

Now by looking at the absolute numbers of Total non-farm workers, consisting of Main and Marginal workforce at our chosen point of time we observed that, these numbers of Total workforce engaged in non-farm employment at all India level has witnessed a massive 1.6 fold increase from 9.7 crores in 1991 to 15.4 crores in 2001. However, the increase in numbers found in non-farm employment among Main workforce also expanded rapidly from 9.5 crores to 13.5 crores during this post reform period.

Table 3.2: States Arranged in Descending Order of Percentage of rural non-farm workers to Total workers (Main + Marginal)

% of RNF workers	1991	% Share	2001	% Share
	Kerala	42.0	Punjab	35.2
High	West Bengal	25.9	West Bengal	36.5
(Above 25.0			Kerala	56.4
			Assam	29.2
Medium	Andhra Pradesh	16.7	Haryana	27.2
	Assam	16.3	Tamil Nadu	27.3
(15.0 to 25.0)	Bihar	10.9		
	Gujarat	16.4	Andhra Pradesh	22.1
	Haryana	24.0	Bihar	15.9
	Orissa	16.1	Gujarat	21.9
	Punjab	24.9	Karnataka	20.5
	Tamil Nadu	19.7	Maharashtra	17.3
			Orissa	24.4
			Rajasthan	18.4
			Uttar Pradesh	20.3
Low	Karnataka	14.9	Madhya Pradesh	12.4
(Below 15.0)	Maharashtra	14.3		
	Madhya Pradesh	9.8		
	Uttar Pradesh	14.1		
	Rajasthan	12.6		

3.2 STATE LEVEL SCENARIO IN INDIA

In order to understand the incidence of non-farm employment in the states we have arranged the states in a descending order of percentage of total rural non-farm workers to total workers employed in different farm and non-farm activities for both main and marginal category at these two point of time , namely 1991 and 2001. Here we would adopt the classification of Chadha and Sahu (2002) that clearly categorize states into three-principle distribution on the basis of the incidence of rural non-farm employment. These three categories are: (i) states with *high* incidence of rural non-farm employment (where percentage of rural non-farm workers total workers exceed 25.0), (ii) States with *medium* incidence of rural non-farm employment (where percentage of rural non-farm workers total workers being in the range of 15.1 to 25.0) and states with *low* incidence of rural non-farm employment (the percentage of non-farm workers to total workers being less than or equal to 15.0). Table gives information as regards to incidence of rural non-farm employment for both main and Total (taking main and marginal together) workers in the states. The main observation can be noted from the following:

(i) As regards to total workers, it is observed that the incidence of non-farm employment was highest in Kerala and lowest position is shared by Madhya Pradesh through out this post reform period. In the year 2001, 56.4 percent of total rural workforce was engaged in non-farm activities in Kerala, while in Madhya Pradesh the corresponding figure has been 12.4 percent. In 1991 the lowest figure were 9.8 percent in Madhya Pradesh., while Kerala had secured 42 per cent of total workers engaged in rural non-farm sector.

(ii) During post reform phase between 1991 and 2001, states like Punjab and West Bengal have emerged as high incidence of non-farm employment for total rural workforce. These states have registered a high increase in the incidence of non-farm employment, notably Punjab that posited in medium category in 1991 has shown considerable increase (35.2 percent) during the decade. The other three states namely Assam, Haryana and Tamil Nadu have also emerged in the list of high incidence of rural non-farm employment during this reference period, notably Assam and Tamil Nadu secured a big

jump from 16.3 per cent and 19.7 per cent respectively in 1991 to 29.2 per cent and 27.3 per cent respectively in 2001.

Table 3.3: States Arranged in Descending Order of Percentage of rural non-farm workers to total Main workers

% of RNF Workers	1991	% Share	2001	% Share
	Kerala	(43.9)	Assam	(32.47)
High	Haryana	(26.2)	Haryana	(32.39)
(Above 25.0)	Punjab	(25.8)	Kerala	(60.16)
	West Bengal	(26.5)	Orissa	(29.09)
			Punjab	(35.88)
			Tamil Nadu	(29.86)
			West Bengal	(40.17)
Medium	Assam	(18.64)	Andhra Pradesh	(23.89)
(15.0 to25.0)	Gujarat	(19.64)	Bihar	(17.24)
	Karnataka	(16.09)	Karnataka	(22.63)
	Maharashtra	(15.47)	Maharashtra	(18.67)
	Orissa	(17.52)	Rajasthan	(21.92)
	Rajasthan	(15.55)	Uttar Pradesh	(22.14)
	Tamil Nadu	(20.63)		
	Andhra Pradesh	(17.14)		
Low	Bihar	(11.68)	Madhya Pradesh	(14.41)
(Below 15.0)	Madhya Pradesh	(10.73)		
	Uttar Pradesh	(14.95)		

(iii) The four major states like Karnataka, Maharashtra, UP and Rajasthan have witnessed significant expansion of rural non-farm employment during this

period of reforms. Contrary to the trends in 1991 in all these four states the incidence of non-farm employment turned out to be medium in 2001. The only remaining state Madhya Pradesh continued to remain in low category of non-farm employment in 2001.

(iv) The year 2001 seems to have brought about some recovery as regards the incidence of non-farm employment in the states of India. During this year, out of 15, as many 14 states have fallen in the category of high and medium incidence of non-farm rural employment for total rural workers. The only remaining state MP fell in the low category as regard non-farm employment for Total workers. However the situation does not appear to be favorable for Total workers in this state as it still remains in the same category over the decade.

(v) Comparing the situation at these two points of time, it is evident that in almost all the state, non-farm occupation has become a significant alternative avenue of employment for total rural workforce as a whole. Most of the states have shown an upsurge in rural non-farm employment during this post reform episode. While in pre reform 1991, the major five states out of 15 states fell in the low category of incidence in non-farm employment, the scenario improved as fourteen states come under high and medium category with regard to the incidence of rural non-farm employment for marginal workers.

(vi) As regards main workers, it is observed that, the incidence of rural non-farm employment was highest in Kerala and lowest in Madhya Pradesh all through the period, 1991 to 2001. In the year 2001, 60.2 percent of total main workers were engaged in non-farm employment in Kerala, while in Madhya Pradesh the corresponding figure has been 14.4 percent.

(vii) During the post reform period many of the states have witnessed the emerging high incidence in non-farm employment for the main workers. The states like Assam, Orissa, Tamil Nadu, and Gujarat, have come up in the category of high incidence of RNFE.

(viii) In an over all assessment, it appears that, in the post reform period, fourteen out of fifteen states fell in the category representing high and medium

incidence of non-farm employment in the case of main workers. These states in descending order are Kerala, West Bengal, Punjab, Assam, Haryana, Tamil Nadu, Andhra Pradesh, Karnataka, UP, Rajasthan, Maharashtra and Bihar.

3.3: GROWTH RATES OF NON-FARM WORKERS IN THE STATES

We have computed the growth rate of rural non-farm workers separately for marginal and main workers for all India as well as 15 major states. Table presents the compound annual growth rates, which have been computed by using absolute members of rural non-farm workers. The important point emerging as follows:

(i) For all India, the annual growth rates of total rural workers in non-farm employment appear to be impressive; that is 5.6 percent during the period, 1991 to 2001. The highest growth in non-farm activities for total workers was observed in Assam (7.5 percent), and the lowest growth in non-farm employment was evident in Madhya Pradesh (1.1 percent). In states like Haryana (6.3 percent), Madhya Pradesh (7.2 percent), Punjab (7.2 percent) and Rajasthan (7.3 percent) the post reform decadal growth rates were considerably higher than all India level. In this context, we must point out the fact that, Madhya Pradesh and Rajasthan were posited in the lower category of incidence of non-farm employment in pre reform 1991, but during the post reform period, the total rural workforce in these states have shifted significantly towards non agricultural activities.

Table 3.4: State wise Annual Growth Rate (%) of Rural Non-farm Workers for Main and Total (Main+ Marginal) Workers

States	*Total Rural non workers (in Lakh)* (Main +Marginal)		*Annual compound Growth rate*
	1991	2001	*(In percentage)*
Andhra Pradesh	4094375	6230710	4.29%
Assam	1189784	2445290	7.47%
Bihar	2727776	4097945	4.15%
Gujarat	2015293	3290285	5.02%
Haryana	947674	1745970	6.30%
Karnataka	2152388	3515305	5.03%
Kerala	2888796	4333105	4.14%
Maharashtra	3428130	4709820	3.23%
Madhya Pradesh	2342003	2600345	1.05 %
Orissa	1713378	3049910	5.94%
Punjab	1112642	2225675	7.18%
Rajasthan	1803671	3644085	7.29%
Tamil Nadu	3511797	4784345	3.14%
Uttar Pradesh	5254907	9053045	5.59%
West Bengal	4238137	8003305	6.56%
All India	40964881	70566237	5.59%

(Table continued)

States	Total Rural non workers (in Lakh) (Main Category)		Annual compound Growth rate (in percentage)
	1991	2001	
Andhra Pradesh	3947375	5488545	3.35%
Assam	1162811	1961095	5.37%
Bihar	2666188	3296180	2.14%
Gujarat	1942203	2836540	3.86%
Haryana	939352	1450790	4.44%
Karnataka	2079679	3046715	3.89%
Kerala	2713161	3611310	2.90%
Maharashtra	3308300	4077845	2.11%
Madhya Pradesh	2202425	2129640	-0.34%
Orissa	1603821	2332835	3.82%
Punjab	1108854	1871910	5.38%
Rajasthan	1739309	3057075	5.80%
Tamil Nadu	3421445	4262390	2.22%
Uttar Pradesh	5086768	6908755	3.11%
West Bengal	4001342	6471410	4.93%
All India	39441778	57653507	3.87%

(ii) The states like Orissa, West Bengal, and Uttar Pradesh maintained an all India average during this period. But the states like Andhra Pradesh, Bihar, Kerala and Tamil Nadu registered a minimal increase in absolute number of total non-farm workers in this period. Though Kerala secured the highest incidence of total rural non-farm employment through out the period, but the rate of growth of RNFE remained much lower than the all India level

(iii) The annual growth in absolute number of Main workforce engaged in RNFE at all India level is around 4 percent. The states like Rajasthan registered the highest annual growth during the period; the lowest growth rate in non-farm employment among main workers was appeared in Maharashtra (2.11 percent), which also remained in the low category of incidence of rural non-farm employment through out the post reform period. The only state Madhya Pradesh, out of fifteen states witnessed a negative growth of main workers in non-agricultural sectors during 1991 and 2001.

(iv) The state like Assam, Haryana, Punjab and West Bengal demonstrate considerably higher growth rate of RNFE among main workforce compare to the all India level; while in the backward state like Bihar, advance states like Kerala, Maharashtra, and Tamil Nadu the participation pf main workforce in RNFE was minimal compared to most of the other states during the reference period.

(v) Over all it appears that, the growth rate of RNFE among total rural workforce, consisting of both main and marginal category of workers is much higher than the growth of RNFE among main workforce. In other words, in a vast majority of the states in India, the absolute number of Total workers in the rural non-farm sector expanded more steadily during the decade of reform compared to the expansion of RNFE among Main workforce. This implies that, a significant number of marginal workforces are getting absorbed in rural non-farm employment during this time. Assam, Haryana, Punjab, Rajasthan, and West Bengal have been identified as the states where the expansion of RNFE as a whole has been prominent during this time.

Table 3.5: Percentage Distribution of Total Rural workers into Different sectors

State	Year	% of Total (Main+Marginal) workers in Cultivation	Agricultural Laborers	Agricultural Allied activities	Mining & Quarrying	household manufacturing
Andhra Pradesh	1991	33.1	48.3	1.9	0.6	3.3
	2001	27.6	47.6	2.8	0.8	4.4
Assam	1991	60.0	13.7	10.0	0.4	0.9
	2001	44.3	15.0	11.5	0.4	3.6
Bihar	1991	47.8	41.0	0.3	0.6	1.6
	2001	31.3	51.0	1.8	0.1	3.8
Gujarat	1991	44.2	34.7	4.7	0.3	1.4
	2001	38.0	33.2	6.9	0.4	1.8
Haryana	1991	51.4	23.9	0.8	0.1	1.2
	2001	46.2	19.1	7.5	0.4	2.1
Karnataka	1991	44.5	36.6	4.0	0.6	1.6
	2001	39.0	34.5	6.0	0.6	3.5
Kerala	1991	16.1	31.7	10.2	1.1	2.6
	2001	9.0	19.6	14.9	1.1	3.6
Madhya Pradesh	1991	60.4	28.6	1.2	0.5	2.1
	2001	51.4	34.1	2.1	0.5	3.4
Maharashtra	1991	46.7	37.4	1.6	0.2	1.5
	2001	42.5	37.8	2.4	0.3	2.2
Orissa	1991	46.6	35.7	1.5	0.7	3.3
	2001	33.6	39.4	2.7	1.0	5.0
Punjab	1991	42.8	31.6	0.7	0.0	1.2
	2001	31.6	22.0	11.2	0.0	3.4
Rajasthan	1991	71.2	14.6	1.6	0.8	1.4
	2001	65.1	12.3	4.3	1.0	2.2
Tamil Nadu	1991	32.4	46.1	1.8	0.3	3.1
	2001	27.2	43.0	2.5	0.6	4.8
Uttar Pradesh	1991	62.7	22.6	0.6	0.1	1.8
	2001	48.8	29.0	2.0	0.1	4.8
West Bengal	1991	38.4	32.3	3.5	0.4	4.6
	2001	25.5	33.0	5.1	0.4	7.9
All India	1991	48.7	32.7	2.2	0.4	2.2
	2001	40.3	33.1	3.9	0.5	3.9

(Table ...continued)

State	Year	% of Total (Main+Marginal) Category of workers in non-household manufacturing	Construction	Wholesale & Retail trade	Transport storage etc	other services
Andhra Pradesh	1991	2.9	0.7	3.3	1	4.9
	2001	3.6	2.1	3.7	1.6	6.0
Assam	1991	1.8	0.9	3.6	1.2	7.5
	2001	3.0	2.4	5.6	2.2	12.0
Bihar	1991	1.1	0.4	2.0	0.7	4.6
	2001	2.2	1.0	3.2	1.2	4.5
Gujarat	1991	5.9	0.8	2.7	1.4	4.0
	2001	5.9	2.1	4.3	1.9	5.6
Haryana	1991	4.6	1.8	3.2	2.1	11.0
	2001	6.8	3.6	3.9	2.2	8.3
Karnataka	1991	3.7	1.0	3.1	0.9	4.1
	2001	3.4	2.1	3.3	1.6	6.1
Kerala	1991	9.4	3.2	9.3	4.4	12.2
	2001	10.8	8.6	9.5	7.5	15.3
Madhya Pradesh	1991	1.6	0.6	1.5	0.4	3.2
	2001	1.4	1.2	1.6	0.6	3.7
Maharashtra	1991	3.5	1.0	2.5	1.0	4.5
	2001	3.5	1.7	2.6	1.6	5.3
Orissa	1991	1.9	0.4	3.1	0.8	6.0
	2001	2.9	3.1	3.6	1.3	7.5
Punjab	1991	5.3	1.8	4.0	2.5	10.2
	2001	7.4	4.3	5.1	2.7	12.3
Rajasthan	1991	1.9	1.1	2.2	0.9	4.4
	2001	3.1	3.1	2.9	1.6	4.5
Tamil Nadu	1991	5.0	1.0	3.4	1.3	5.6
	2001	6.6	2.4	3.5	1.8	7.6
Uttar Pradesh	1991	2.6	0.7	2.3	0.8	5.8
	2001	3.7	1.8	3.1	1.2	5.5
West Bengal	1991	6.2	1.2	5.6	2.0	5.9
	2001	7.2	2.8	7.0	2.9	8.3
All India	1991	3.3	0.9	3.0	1.1	5.5
	2001	4.1	2.3	3.6	1.7	6.6

3.4: SECTORAL COMPOSITION OF FARM AND NON-FARM WORKERS

In this section, we seek to examine the percentage shares of different sectors in the total rural employment during the period 1991-92 to 2001-02. This will help in identifying the major sub sectors within rural farm and non-farm sector that are relatively more important from point view of generating both farm as well as non-farm employment. The table presents data on the distribution of rural farm and non-farm workers for Total workers into different sectors in all India as well as in 15 major states. The main points are emerging here are the following:

(i) In all India level as regards the employment of Total rural workers, though there is a significant reduction of employment in cultivation over the decade of post reform, accompanied by a marginal increase in the share of agricultural labourers, the share of employment in manufacturing sector, comprising of both household and non household manufacturing registered the highest share among all category of non-farm employment in rural areas followed by other services, retail and wholesale trade and construction activities respectively.

(ii) When we examine the percentage shares of different sectors (consisting of both agriculture and non agricultural activities) in the total number of workers, taking main and marginal workforce together in the states, it is observed that, in 2001, though the major shares in employment were occupied by agriculture and agriculture-allied activities, namely cultivations, agricultural labour and employment involving other agriculture-related activities, but the post reform period witnessed a substantial shrinkage in cultivation and a simultaneous increase in share of agricultural labor in almost all states. Rajasthan has maintained highest share in cultivation through out the period and Kerala remained as the state witnessing the lowest incidence of cultivators through out the period.

(iii) The incidence of agricultural labour in pre reform 1991 was highest in Andhra Pradesh (48.3 percent), much above the all India level and lowest figure was evident in Assam. During reformatory episode in Indian economy, the highest share in employment of agricultural labour was evident in Bihar-one of the agriculturally backward states in post reform period, which accounts for more than half total rural workforce in this category. The lowest figure was appeared in Rajasthan (12.3 percent). Interestingly, the nature of states remained unchanged during this period as Assam and Rajasthan, both supposed to be two conventional states.

(iv) The agriculture allied activities like fishing, hunting, planting, livestock, i.e. the employment in diversified activities within agriculture have shown a stable and increasing trend in all states. In the states like Haryana, Kerala, Gujarat, Assam, Punjab and West Bengal, this sector absorbs an increasing share of total workers during post reform period. Kerala registered highest share of employment in this sector (14.9 percent) across the states and the lowest intensity of labour absorption in this category was manifested in Bihar only 0.3 percent of total workers were accommodated in agro-related activities.

(v) In examining the percentage shares of different sectors in non-farm employment, it is observed that, in 2001, the rural manufacturing sector alone absorbed more than 7 percent of Total workers at all India level. In the states of Assam, Kerala, Orissa, Punjab, Tamil Nadu and West Bengal, i.e. seven out of fifteen states the rural manufacturing sector absorbs almost 8 percent of total rural workers in 2001, especially, Kerala, Punjab, Tamil Nadu and West Bengal registered more than 10 percent of Total rural workers to be engaged in households and non non-household manufacturing during post reform period. Services accounts for the second largest share among Rural Non-farm sector at all India level. Among the major states Kerala has the highest concentration of non-farm employment in service sector (15.3 per cent) in

2001, while Madhya Pradesh has the lowest incidence of employment in services through out the period. The states like Assam, Haryana, Punjab, west Bengal more than 8 percent of total rural workforce were absorbed in services.

(vi) The other two important sector construction and wholesale and retail trade are emerging as the important sector during the decade. In all the states the percentage share of employment in these two categories has increased marginally. The states like Kerala, Punjab and West Bengal have shown considerable increase in the share of employment for Total workers in post reform era. Though the share in transport, storage and communication was infinitesimal small in total employment of rural workers, but still this sector witnessed an increase share in percentage of employment in 2001. Total workers in Kerala recorded highest percentage of share in this activity across all major states through out the period.

(vii) In all India, as regards main workers, the share of employment in cultivation remained the dominating sector among main workers, though there is some reduction in its percentage share during the decade of reforms. During the decade, the highest percentage share in cultivation was in Rajasthan and the lowest figure was maintained by Kerala.

(viii) The employment share in agricultural labour was highest in Andhra Pradesh and lowest in Rajasthan during the post reform period. The states like Assam, Haryana, Kerala, Punjab, and Uttar Pradesh registered a low percentage share in employment of agricultural laborer below the national average of 26.4 percent in 2001.

Table 3.6: Percentage Distribution of Rural Main workers into Different sectors

State	*Year*	*Cultivation*	*% of Main Workers in Agricultural Labourer*	*Agricultural Allied activities*	*Mining & Quarrying*	*Household Manufacturing*
Andhra	1991	33.5	47.5	1.9	0.7	3.2
Pradesh	2001	31.8	41.4	2.9	0.9	4.4
Assam	1991	56.6	13.3	11	0.4	0.8
	2001	44.1	10.4	13	0.5	2.6
Bihar	1991	47.8	40.2	0.3	0.7	1.6
	2001	34.9	46.2	1.7	0.1	3.4
Gujarat	1991	46.1	30.7	3.6	0.3	1.4
	2001	41.6	26.3	6.6	0.5	1.7
Haryana	1991	49.6	23.4	0.8	0.1	1.3
	2001	48.5	12.9	6.2	0.5	2.0
Karnataka	1991	43.8	35.9	4.2	0.6	1.6
	2001	44.6	26.4	6.4	0.7	3.6
Kerala	1991	15.1	30.6	10	1.1	2.5
	2001	9.4	15.8	15	1.1	3.3
Madhya	1991	46.3	36.6	1.7	0.3	1.5
Pradesh	2001	58.5	25.2	1.9	0.6	3.2
Maharashtra	1991	61	27	1.2	0.5	2.1
	2001	45.6	33.3	2.4	0.4	2
Orissa	1991	49.4	31.4	1.7	0.8	3.2
	2001	42.3	25.6	3	1.3	4.3
Punjab	1991	42.8	30.7	0.7	0	1.2
	2001	35.1	18.9	10	0	2.7
Rajasthan	1991	71	11.5	1.9	0.9	1.6
	2001	67.5	6.9	3.7	1.2	2.3
Tamil Nadu	1991	32.8	44.7	1.9	0.3	3.1
	2001	30.9	36.4	2.8	0.7	4.9
Uttar	1991	63	21.5	0.6	0.1	1.8
Pradesh	2001	58	18.2	1.7	0.1	4.5
West	1991	38	32.2	3.3	0.4	4.2
Bengal	2001	27.9	27.6	4.3	0.5	6.7
All India	1991	48.4	31.6	2.2	0.5	2.2
	2001	44.3	26.4	3.8	0.6	3.6

(Table ...continued)

State	Year	% Of Main Workers in				
		Non-household Manufacturing	Construction	Wholesale & Retail trade	Transport Storage etc	Services
Andhra Pradesh	1991	3.0	0.8	3.3	1.0	5.1
	2001	3.9	2.1	4.0	1.8	6.8
Assam	1991	2.0	1.1	4.2	1.4	8.7
	2001	3.3	2.8	6.8	2.8	13.7
Bihar	1991	1.2	0.4	2.1	0.7	5.0
	2001	2.5	1.1	3.7	1.4	5.1
Gujarat	1991	7.2	1.0	3.2	1.7	4.8
	2001	7.4	2.2	4.9	2.5	6.4
Haryana	1991	5.0	1.9	3.6	2.3	12.1
	2001	7.7	3.7	4.9	2.9	10.7
Karnataka	1991	4.0	1.1	3.4	0.9	4.5
	2001	3.8	2.3	3.6	1.9	6.7
Kerala	1991	9.4	3.3	10	4.6	13
	2001	11.0	8.6	11	8.3	17.3
Madhya Pradesh	1991	3.9	1.1	2.7	1.2	3.6
	2001	1.7	1.3	2.0	0.8	4.8
Maharashtra	1991	1.7	0.7	1.6	0.5	4.8
	2001	3.8	1.8	2.9	1.8	6.0
Orissa	1991	2.0	0.5	3.4	0.9	6.8
	2001	3.5	3.5	4.7	1.8	10.0
Punjab	1991	5.5	1.9	4.1	2.6	10.6
	2001	7.5	4.3	5.5	3.0	12.9
Rajasthan	1991	2.3	1.3	2.7	1.1	5.5
	2001	3.8	3.4	3.6	2.1	5.7
Tamil Nadu	1991	5.3	1.1	3.6	1.3	5.9
	2001	7.4	2.6	3.9	2.1	8.4
Uttar Pradesh	1991	2.8	0.8	2.5	0.9	6.1
	2001	4.1	1.8	3.7	1.5	6.4
West Bengal	1991	6.2	1.2	6	2.2	6.2
	2001	8.1	3.2	8.5	3.7	9.5
All India	1991	3.6	1	3.3	1.2	6
	2001	4.6	2.5	4.3	2.1	7.8

(ix) At all India level 2.2 percentages of total main workers were engaged in 1991 in agriculture-allied activities that has increased to 3.8 percent in 2001. Only in three states like Assam, Kerala, and Punjab the percentage share in this category accentuated in the post reform period as these states registered more than 10 percent share in agriculture allied activities. The other two states Gujarat and Haryana have also shown considerable augmentation of percentage share in this employment category.

(x) Among various activities in rural non-farm sector employment rural manufacturing sector constitutes more than 8 percentage shares of main workers at all India level. All the major 15 states have shown similar trend in gaining momentum in this employment category both within household and non-household sectors. In the states like Gujarat, Haryana, Kerala, Punjab, Tamil Nadu and West Bengal, the total share of manufacturing increased substantially, occupying more than 9 percent in total employment of main workers during post reform period, 1991 to 2001. On the contrary, Bihar, Madhya Pradesh, and Maharashtra registered low percentage share of employment in this sector.

(xi) The services sector has the second largest contribution of almost 8 per cent to rural non-farm employment at all India level. Almost all the major states registered an increase in the share of employment to this sector. Kerala secured the largest share of non-farm employment in this sector through out the period, being the share of 17.3 per cent in 2001; while Madhya Pradesh has the lowest share in services. The states like Assam, Haryana, Punjab and Orissa have considerably higher share of more than 10 per cent in 2001.

(xii) The other three main category of non-farm employment, namely construction, whole sale and retail trade and transport-storage-communication at all India level, absorbed nearly nine percent of total rural labour force of main workers in 2001, while the share of these sectors together constituted about 5.6 percent employment in 1991. The states like Assam, Haryana, Kerala, Orissa, Punjab and West Bengal engaged more than 10 percent of their main workforce in

these non-farm sectors. Out of these three sectors, wholesale and retail trade has been emerging as a major provider of employment for main workers, especially in two states Kerala and West Bengal the percentage share of employment in trade activities registered the highest figure among all non agricultural activities in rural areas during 1991 to 2001.

3.5 IDENTIFICATION OF EMERGING SUB SECTORS

We have computed a change (increase/decrease) in absolute numbers of rural non-farm workers, separately for Main and Total workforce between the years 1991 to 2001and worked out the shares of different sectors therein. This has enabled us to identify the emerging sub sectors within the rural non-farm sector during the period under study. Table 3.7 and 3.8 provide our results. The main points to be noted here as follows:

(i) During the period 1991 to 2001, in all India, additional 189.72-lakh workers have been added to the army of rural main workers in non-farm employment. Among these additional non-farm main workers, nearly about 20 percent have been absorbed in the sector representing rural household manufacturing and services etc while the other sector that contributed significantly towards employment generation are: construction (18.6 percent), non household manufacturing and services (14.9 percent), and trade and commerce (13.9 percent). It appears that, for main workers in rural India, the emerging and promising too sectors have been household manufacturing services where the fresh entrants in the non-farm sector have been largely attracted to get absorbed.

Table 3.7: Percentage share of Different Sectors in total Change in rural Non-Farm Workers for Main category of workers between 1991 and 2001

States	*Change in non farm workers (in Lakh)*	*Percentage share of*								
		Mining & Quarrying	*household manufacturing*	*non household manufacturing*	*Construction*	*Secondary sector*	*Trade and Commerce*	*Transport-Storage-Communication*	*Other Services*	*Tertiary Sector*
Andhra Pradesh	1541170	3.2	18.0	12.7	20.0	54.0	10.0	11.8	24.2	46.0
Assam	798284	0.2	13.1	9.6	12.7	35.7	18.7	10.5	35.2	64.3
Bihar	629992	-21.6	46.5	32.9	17.7	75.5	35.1	16.4	-27.0	24.5
Gujarat	894337	2.7	5.7	11.8	17.1	37.3	25.1	11.8	25.8	62.7
Haryana	511438	3.7	8.9	32.2	19.1	63.9	17.9	8.8	9.5	36.1
Karnataka	967036	1.4	28.5	-0.3	17.6	47.3	5.6	13.5	33.6	52.7
Kerela	898149	-0.3	5.3	8.5	34.9	48.4	1.6	24.0	26.0	51.6
Madhya Pradesh	-72785	34.0	-65.3	135.3	-70.5	33.6	58.7	-37.8	45.5	66.4
Maharashtra	769545	3.1	16.1	0.5	18.4	38.3	5.4	19.9	36.5	61.7
Orissa	729014	3.9	7.4	13.6	32.0	56.9	9.0	9.3	24.8	43.1
Punjab	763056	0.1	12.2	20.2	18.6	51.1	14.4	6.4	28.2	48.9
Rajasthan	1317766	4.4	10.0	20.1	24.2	58.8	15.2	12.5	13.5	41.2
Tamil Nadu	840945	5.8	22.0	20.8	22.4	71.0	-5.9	8.3	26.5	29.0
Uttar Pradesh	1821987	0.8	43.0	19.1	17.2	80.1	15.5	9.6	-5.2	19.9
West Bengal	2470068	0.3	17.9	14.9	13.5	46.6	18.8	10.9	23.6	53.4
All India	18972099	1.8	18.5	14.1	17.5	51.9	13.2	11.3	23.7	48.1

Table 3.8: Percentage share of Different Sectors in total Change in rural Non-Farm Workers for Total Rural Workers (Main+Marginal) between 1991 and 2001

	Change in non farm workers (in Lakh)	*Percentage share of*								
		Mining & Quarrying	*household manufacturing*	*non household manufacturing*	*Construction*	*Secondary sector*	*Trade and Commerce*	*Transport-Storage-Communication*	*Other Services*	*Tertiary Sector*
Andhra Pradesh	2136335	3.0	20.0	14.2	18.9	56.1	11.1	9.7	23.1	43.9
Assam	1255506	0.4	19.2	9.6	10.8	40.0	16.5	7.6	36.0	60.0
Bihar	1370169	-9.7	43.0	21.0	11.8	66.1	23.6	9.7	0.7	33.9
Gujarat	1274992	2.4	7.9	12.0	16.7	39.0	25.1	9.2	26.8	61.0
Haryana	798296	2.8	11.0	31.9	20.1	65.8	15.0	7.0	12.3	34.2
Karnataka	1362917	1.6	27.2	3.0	16.0	47.7	8.0	11.1	33.2	52.3
Kerela	1444309	0.8	7.2	12.3	30.6	51.0	6.2	19.4	23.3	49.0
Madhya Pradesh	258642	-6.5	80.7	-28.9	42.6	87.9	-4.6	14.9	1.8	12.1
Maharashtra	1281690	2.8	20.5	7.9	17.1	48.2	8.2	14.1	29.5	51.8
Orissa	1336532	3.4	20.6	11.9	25.2	61.1	9.6	6.3	23.0	38.9
Punjab	1113033	0.1	15.0	20.7	17.0	52.8	13.0	5.2	29.0	47.2
Rajasthan	1840414	4.4	13.2	18.7	25.6	62.1	14.1	10.3	13.5	37.9
Tamil Nadu	1272548	4.5	23.2	20.2	18.8	66.7	-0.1	7.1	26.2	33.3
Uttar Pradesh	3798138	0.6	38.7	18.2	14.7	72.1	13.2	6.6	8.1	27.9
West Bengal	3765168	0.4	26.2	15.1	11.2	53.0	16.2	8.1	22.8	47.0
All India	29601356	1.7	22.7	14.6	16.2	55.3	12.7	8.7	23.3	44.7

(ii) The table shows a wide variation among the states of India as regards the absorption of additional non-farm workers in to different sectors. As regard main workforces, more than one fourth of additional non-farm workers have been employed in the household manufacturing sector in Bihar, Karnataka, and Uttar Pradesh, during the reform period 1991 to 2001; especially in Bihar and Uttar Pradesh registered more than 40 percent of additional rural non-farm workers in this sector. While the non household manufacturing sector absorbed one third or more of additional main workers in Bihar, Haryana, and Madhya Pradesh during the period. Employment in other services constituted a significant portion of total Rural non-farm employment generated among Main workforce; especially in the states like Assam, Madhya Pradesh, Karnataka, Maharashtra the concentration of non-farm employment in this sector was more than 30 per cent of the additional rural non-farm main workers during the period. On the other hand, trade, consisting of whole sale and retail trade has been intensified as an absorber of additional non-farm main workers in Bihar, Gujarat, Madhya Pradesh, and west Bengal (20 percent or more of total additional non-farm employment. The transport-storage and communication sector assumes a significant role as an absorber of additional main non-farm workers is visible in Bihar, Kerala and Maharashtra where 15 percent or more have been provided employment in this sector.

(iii) For Total rural workers, during the period, 1991 to 2001, in all India, an additional 2.96 crores have been added to the army of non-farm workers. among these additional Total workers, nearly 24 percent have been absorbed in the sector representing other services while the other sectors that contributed significantly to employment generation are : household manufacturing services(22.7 percent), construction(16.2 percent) , non

household industries (14.6 percent), trade activities(12.7 percent), and transport, storage etc (8.7 percent). It is evident that, similar to the case of main workers in rural areas of India , the emerging sector have been rural manufacturing sector, comprising of both household and non household manufacturing and repairing services that constituted nearly 40 percent of the additional rural non-farm labour during post reform period.

(iv) Among the states of India, spatial variation in employment of additional non-farm workers into different sectors. As regards total workers, following the all India trend more than 35 per cent of additional non-farm workers have been engaged in rural household manufacturing sector in Bihar, Madhya Pradesh and Uttar Pradesh during the period. For example, in MP the share was 80.7 per cent during the decade. While the manufacturing sector outside household sector, i.e. non-household manufacturing sector absorbed nearly 20 percent or more of additional workers in Bihar, Haryana, Punjab and Tamil Nadu during the period. Interestingly, Madhya Pradesh is the only state which has witnessed a decline of 28.9 per cent share in non household industries. On the other hand, trade (whole and retail trade) has become very important as the absorber of additional total non-farm workers in Bihar, Gujarat, Assam, Haryana, and West Bengal (employing 16 percent or more additional non-farm workers). In transport, storage and communication sector, Kerala registered the highest proportion of almost 20 percent share in total additional non-farm employment. After Kerala, Madhya Pradesh, Maharashtra, and Rajasthan secured more than 10 percent of total rural non-farm workers in this sector during this period. In construction sector, almost all the states have performed satisfactorily through out the period. In the state of Madhya Pradesh 42.6 per cent of additional total rural non-farm workforce were engaged in this sector. The other major states like Haryana, Kerala, Orissa and Rajasthan has registered more than one fourth of the total incremental non-farm workforce in transport activities. Services sector is emerging as an important sector

employing more than one fifth of additional labour force in ten major states out of fifteen states during 1991 and 2001. In the states like Assam, Gujarat, Karnataka, Maharashtra, Punjab and Tamil Nadu, one fourth or more of total incremental workers were accommodated during this period.

(v) Now If we look at the broad sectoral categories such as 'secondary' and 'tertiary', it appears that, the secondary sector accounted for a grater share, (more than 50 percent) of the incremental total main non-farm workforce in eight major states- Andhra Pradesh, Bihar, Haryana, Orissa, Punjab, Rajasthan, Tamil Nadu and UP. In the remaining seven states the tertiary sector acted as a prime absorber of the incremental main non-farm workers. In case of Total workers the situation is much more dominating by the secondary sector where twelve out of fifteen states provided greater proportion of additional total non-farm workers.

Thus between broad sectoral categories such as secondary and tertiary, while the former appears to be gaining importance as prospective source of employment in case of both main and Total workforce , while the latter seems to be emerging as a much more apprehensive and insignificant in the case of total non-farm workers in large number of states in India. In other words, the diversification of rural employment away from farm to non-farm that is observed in a large number of states in India has been more due to the growth of secondary sector employment in case of Total (Main +Marginal) rural workforce while in that of Main workforce, the dominance of secondary sector is marginally higher than the contribution by the tertiary sector.

SUMMARY AND CONCLUSION

As expected, the states of India differed significantly with regard to the incidence of non-farm employment. All through our study period, the incidence of non-farm employment among the main workforce has been highest in Kerala (60.2 per cent in 2001) while it was lowest in Madhya Pradesh (14.4 per cent in 2001). As regards, the incidence of non-farm employment among the Total Rural workforce, taking main and marginal workers together, Kerala has captured the first position. In the year 2001-02, the incidence of non-farm employment in Kerala exceeds 50 per cent. On the other hand, Madhya Pradesh posited at the lowest position as regards, incidence of non-farm total workers during 1991-92; the incidence being less than 10 per cent that slightly improves to 12.4 per cent during 2001-02.

An important feature of non-farm development in India over the post reform decade has been that, while in 1991 only two states fell in the category those with a high (more than 25 per cent) incidence of Total non-farm workers, six states found to place with a high incidence in the year 2001. Interestingly, four out of five states categorised as the low incidence of non-farm employment during 1991 have shifted to the category of medium incidence of non-farm employment during 2001. As regard to Main workforce in the states, however, there has been an impressive improvement in the incidence of non-farm employment over the last decade. Nevertheless looking at the over all situations (Main and Total workforce), we conclude that, the process of occupational diversification which had slackened in many states in early 1990s, has perhaps started gaining its momentum by the year 2001 which should be welcomed as happy development. In any case the type of occupational diversification experience in larger parts of rural India over the post reform period or so could hardly be dismissed as an insignificant phenomenon.

Our study revealed that as of 2001, Kerala had the most diversified employment structure of Total rural workers, which is followed by West Bengal, Punjab, Assam, Tamil Nadu and Haryana. In all these states, the incidence of Total rural non farm workers exceeds 25.0 per cent in 2001. As regards employment of main workforce apart from highly diversified states of West Bengal and Kerala, other states where a significant proportion of main workers were in non farm employment are Punjab, Assam, Tamil Nadu,

Haryana, Orissa and Andhra Pradesh. So, as a whole, in the year 2001 there appears to be six states (Kerela, West Bengal, Punjab, Assam, Haryana and Tamil Nadu), where the degree of occupational occupation has been 'high' while in eight other states (Uttar Pradesh, Rajasthan, Andhra Pradesh, Gujarat, Bihar, Karnataka and Maharashtra) this has been of 'medium' level.

We computed annual growth rates of Total rural non farm workers in all India as well as for fifteen major states for this reference period 1991 to 2001. Our main findings here has been that total rural non farm workers, taking Main and Marginal workforce jointly in all India experienced impressive growth rates between the years 1991 and 2001 (more than 5 per cent per annum). Almost a similar conclusion can be drawn as regards growth patterns of main non-farm workforce at all India level; interestingly, the growth rate of Total workforce is much higher than the rate of growth among main workforce. This implies that the grater marginalization of rural workforce towards non farm employment thrive the growth of Total rural non farm employment during the post reform period. It is also to be noted that on the whole the growth patterns of non-farm workers in majority of states followed the growth pattern observed for all-India.

In this recent years, Assam recorded the highest growth of Total non workers, which is followed, in descending order of growth rates, by Rajasthan, Punjab, West Bengal, Orissa, UP, Karnataka, Gujarat, Andhra Pradesh, Kerela, Maharashtra, Tamil Nadu and Madhya Pradesh. In case of growth of Main non farm workforce during this same period, Rajasthan recorded the highest growth rate (5.8 per cent), which is followed by Punjab, Assam, west Bengal, Haryana, Gujarat, Orissa, Andhra Pradesh, kerala, Bihar, and Maharashtra. In only one state Madhya Pradesh the growth rate of main non farm workers turned out to be negative during this post reform decade. Another noteworthy feature of non farm development in India has been that some of the erstwhile less diversified states (where the incidence of non farm had been low) have started demonstrating noteworthy performance as regards growth of non farm workers (both Total and Main workers), during this post 1991 years. The states that deserve specific appreciations are Assam, Gujarat, Orissa, Andhra Pradesh, Rajasthan, Bihar and Uttar Pradesh.

In analyzing the sectoral composition of rural non farm workers at all India level, we found that rural manufacturing sector occupies an important position in providing employment to Total rural non farm workers, which is followed by, in order of importance, by services, trade (wholesale and retail), construction and transport-storage etc. in case of total Main non farm workforce, the sectors, in order of importance, have been manufacturing, services, trade and construction.

The state level scenarios as regard sectoral distribution of non farm workers reveal that, in the year 2001, rural manufacturing sector absorbed more than 10 per cent of Total rural workforce in Kerala, Punjab, Tamil Nadu and West Bengal. The services sector played an important role in providing employment to Total non farm workforce in Kerela, Assam, Haryana, Punjab, West Bengal (absorbing more than 8 percent in each states)the trade sector has been absorbing more than 5 per cent Assam, Kerela, Punjab and West Bengal. Another sector namely construction has absorbed more than 3 per cent of Total rural labour force in Haryana, Kerela, Punjab, Orissa and Rajasthan. In case of Main non farm workforce, it is observe that, rural manufacturing sector in kerela, Punjab, Tamil Nadu and West Bengal absorbed more than 10 per cent of the total rural main workforce. Even in the states like Andhra Pradesh, Gujarat, Haryana and Orissa this sector alone provided employment to more than 8 per cent of Main workforce. Similarly the services sector has been highly important from the point of view main workforce employment in Assam, Kerala and Punjab (absorbing more than 12 per cent of the rural main labour force.) while more than 8 percent of rural main workers are involved in this sector in Haryana, Orissa and West Bengal. As regards employment in trade, the most important states are Assam, Kerala, and West Bengal. Construction makes significant contribution in Gujarat, Haryana, kerela, Orissa and west Bengal only.

Our identification of the emerging sub sectors within the rural non farm sector in India as well as in states provided a holistic picture in post reform period. From this exercise it is revealed that in all India, for total rural non farm workers, the emerging and most promising sectors have been rural manufacturing and services, which absorbed the bulk of the incremental Total non farm workers in rural India over the post reform 1991 to 2001. In case of Main non farm workers, however, the sectors remain the same as in case of Total non farm workforce. Nevertheless, taking a broad view it appears that, as

regards absorption of incremental Total non farm workforce, rural manufacturing has been emerging fast in Andhra Pradesh, Haryana, Bihar, Karnataka, Madhya Pradesh, Orissa, Rajasthan, Punjab and West Bengal. Services seem to be doing well in Assam, Karnataka. Maharashtra, Gujarat and Punjab; construction activities in Andhra Pradesh, Gujarat, Haryana, Kerala, Karnataka, Madhya Pradesh, Orissa, Rajasthan; Wholesale and Retail trade in Assam , Bihar, Gujarat, Haryana, and West Bengal. As regards the employment of incremental main non farm workforce, rural manufacturing has been steadily assuming importance in Bihar, Haryana, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, and West Bengal. The other sectors that are emerging as important are services in Assam, Karnataka, Madhya Pradesh, and Maharashtra and construction activities in Andhra Pradesh, Haryana, Kerala, Orissa, Rajasthan, and Tamil Nadu. It also needs to be mentioned that, when we consider broad sectoral categories such as 'secondary' and 'tertiary', the former sector clearly appears to have employed greater proportion of incremental both Total and Main non farm workers in all India as well as in the majority of the states. This findings leads to conclude that, in the process of occupational diversification that is experienced by India as well her states the secondary sector assumes the pivotal role in the process in case of both Total and Main rural non farm workforce during the post reform period.

So, it is evident from our state-level analysis that, the growth of agricultural employment in large parts of India has experienced a downturn rapidly during the period 1991 to 2001 along with a simultaneous augmentation of non-agricultural employment among rural workforce. This phenomenon would have the potential to contribute in the creation of strong base of rural non farm sector. The performance of rural non farm employment in the major states in India during the reference period with present stagnation in agriculture clearly hinges on the fact that, rural non farm sector in India could act as the 'safety net' by providing an alternative source of occupation to rural people particularly in the lean season of agricultural employment or in the absence of any gainful engagement in agricultural sector (e.g. employment in rain fed arid and semi arid regions where the possibility to be absorbed in agricultural employment is low). Indeed further expansion of rural non farm base would have a significant role in reducing mass poverty and hunger with a synchronized and organized strategy of rural development policy in India.

CHAPTER 4

TRENDS IN THE COMPOSITION AND SHARES OF RURAL NON-FARM EMPLOYMENT IN DISTRICTS OF ANDHRA PRADESH: A COMPARISON BETWEEN 1991 AND 2001

In our introductory chapter, we have already mentioned that the basic objective of this study is to explore the nature and relationship between agricultural growth and employment diversification in Andhra Pradesh during the post reform period. The overall stagnation in agriculture although was initiated cumulating itself in some parts of India in late 1980s, but the crisis was prominent from mid of 1990s. Since late 1990s, the deceleration in agricultural growth has been evident in all regions of India. The negative impact of this slowdown is more acute in rain fed areas. The diversification towards high value commercial crops in these rain fed areas, especially in western and southern regions of India with the expectation of high return and protifitability have brought in the volatility and associated market risks. This shift in cultivation from traditional crops to high value crops also encapsulated high investments by borrowing money from non-institutional sources at exorbitant rate of interest. As rain fed areas are more vulnerable to frequent failure of rainfall and droughts that lead to fluctuations of agricultural output in large magnitudes became common. The resultant effect has been transmitted to increasing distress and desperation among farmers.

Therefore, in this chapter we would analyze the incidence of occupational diversification in the districts of Andhra Pradesh. After the all India and state level analysis, this district level analysis at two chosen point of time would reveal the holistic scenario of farm and non-farm employment during the period 1991 to 2001.

The state level analysis of employment diversification in rural areas already revealed the relative status in the two-reference point of time 1991 and 2001.

Andhra Pradesh is the fifth largest of Indian states in terms of geographical area and population. Close approximation reveals that one third of state domestic product comes from agriculture and allied activities that also provide 64.55 percent of state's population.

If we look at the incidence of non-farm employment separately for main and Total workers, taking Main and Marginal workforce together we could find two different story of employment diversification at this two different point of time. Interestingly it is evident from the state level analysis that, Andhra Pradesh has the 'medium' incidence of non-farm employment during the period. Here we will start with district level incidence of non-farm activities in total, and then we would gradually move to rural areas.

It can be clearly observed that, for non-farm workers in Total workforce, combining Main and Marginal workers together of Andhra Pradesh, increased rapidly between 1991 and 2001. The table shows that, incidence of total non-farm employment in Andhra Pradesh increased from 28.8 percent in 1991 to 35.3 percent in 2001. For rural Andhra Pradesh, the share of rural non-farm employment rose sharply from lower level of 16.7 percent to 22.1 percent during the post reform period. The percentage share of non-farm activities in urban areas of Andhra Pradesh has been accentuated from 82.2 percent in 1991 to 90.3 percent in 2001. Therefore, it is evident that, during the period of reforms, there is buoyancy in the expansion of non-farm employment for Total workers in Andhra Pradesh.

Now if we look at the absolute number of Total workers engaged in non-agricultural activities at these two points of time, namely 1991 and 2001, the table gives information about the growth of almost 3 percent in absolute numbers of non-farm employment during this period. In rural Andhra Pradesh, the growth of non-farm occupation is 3.5 percent, higher compared to lowest growth of 2.2 percent in urban areas.

If we look at the incidence of non-farm employment separately among the main workers in Andhra Pradesh we would note some contrasting findings compared to the observations in the midst of marginal category of workers. The share of non-agricultural activities has been increased from among main workers from 29.6 percent in 1991 to 37.3 percent in 2001. But the increase in non-farm employment is equally pronounced in both rural and urban areas of Andhra Pradesh.

The absolute numbers of main workers in non-farm activities entail a low growth of around 3 percentages compared to the rapid growth of marginal workers in non-farm occupation. The pace of growth is more pronounced in rural areas of Andhra Pradesh at 3.5 percent during 1991 to 2001.

Table 4.1: Percentage of non-farm workers to total workers in Andhra Pradesh

	Main workers			*Total workers*		
Year	Total	Rural	Urban	Total	Rural	Urban
1991	29.6	17.1	82.7	28.8	16.7	82.2
2001	37.3	23.4	90.0	35.3	22.1	90.3

Table 4.2: Growth of Main and Total workforce in Andhra Pradesh

	Total (Main+Marginal) Workers			Main Workers		
Year	Total	Rural	Urban	Total	Rural	Urban
1991	8627436	4094375	4533061	8426524	3947375	4479149
2001	12295496	6230710	6064786	11054553	5488545	5566008
Growth (%)	3.61%	4.29%	2.95%	2.80%	3.35%	2.20%

The districts of Andhra Pradesh can be broadly segregated into three agro-climatic zones- The coastal Andhra zone, the Rayalaseema zone and the Telengana region. The Rayalaseema zone is semi arid and is drought prone receives around 700 mm rainfall. Now we have calculated the decadal growth of non-farm employment at the district level, separately for main workers and Total workers taking Main and Marginal category workforce together for Andhra Pradesh as well as the 22 districts of Andhra Pradesh. The above table reveals annual compound growth rate calculated from absolute numbers of non-farm workers both in rural and urban areas. The important points are emerging as follows:

(i) In rural Andhra Pradesh, the pace of growth in off-farm activities is much higher at around 3.5 percent. Among the rural areas, the highest growth of non-farm activities in Kurnool (6 percent) and lowest in West Godavari (0.9 percent). The districts like Krishna, Guntur, Prakasham, Ananthapur, Cuddapah, Rangareddy, Mahbhubanagar and Medak, the rural no farm employment grows in a considerable momentum during the last decade. The zone-wise picture reveals that, the Rayalaseema zone has registered highest growth in non-agricultural occupation (4.7 percent), much above the state level. Contrastingly,

the coastal zone of rural Andhra Pradesh has witnessed lowest growth in non-farm employment during the reference period.

Table 4.3 Annual Growth rates (in percentage) of rural non-farm workers for Main and Total (Main+Marginal) workers

Districts/Regions	Annual Growth (in percentage) Main workers	Annual Growth (in percentage) Total workers
Srikakulam	2.3	2.9
Vizianagaram	1.6	3.8
Visakhapatnam	2.9	2.3
East Godavari	1	1.4
West Godavari	0.9	0.8
Krishna	4.5	4.9
Guntur	2.8	3.2
Prakasham	5.2	5.7
Nellore	3.4	-18.1
COASTAL ANDHRA	*2.6*	*4.0*
Kurnool	6.0	6.4
Ananthapur	4.8	5.3
Cuddapah	4.8	5.4
Chittoor	3.2	4.0
RAYALASEEMA	4.7	*3.0*
Rangareddy	4.8	5.7
Nizamabad	3	3.4
Meadk	4.8	5.9
Mahbubnagar	5.5	6.4
Nalgonda	2.9	3.3
Warangal	3.2	4.1
Khammam	2.9	3.6
Karimnagar	2.7	3.3
Adilabad	2.8	3.6
TELANGANA	3.5	*4.2*
ANDHRA PRADESH	3.4	4.0

For Total workers, the decadal growth of non-farm employment during post reform period is marginally higher than the growth of rural non-farm main workers in Andhra Pradesh throughout the period; while the annual growth rate of main non-farm employment is 3.5 per cent the growth of Total rural non-farm workers is 4.0 percent during the decade.

(i) The over all growth of non-farm employment in Andhra Pradesh is 4.0 percent. Kurnool and Mahbubnagar (6.4 percent) jointly shared the highest growth rate. In addition, the lowest figure was observed in West Godavari (0.80 percent). The districts like Kurnool, Ananthapur in Rayalaseema region, Medak, Mahbubnagar, Warangal, and Khammam, of Telengana region have shown considerable increase in non-farm employment during the reference period of 1991 to 2001. Coastal Andhra has registered the highest growth in Total non-farm employment during the reference period.

When we consider growth rates of rural non-farm workers between 1991 and 2001 it is clear that, in rural Andhra Pradesh, the absolute numbers of rural non-farm workers have been increasing uninterruptedly in all districts through out the period. Overall, it appears that, in vast majority of districts in Andhra Pradesh the absolute numbers growth rates of Main as well as Total workers in rural non-farm sector more or less expanded. During this period, the impressive growth in rural non-farm employment for marginal workers has occurred in the districts like Rangareddy, Mahbhubanagar, and Warangal. . In contrast, West Godavari successively remained the district witnessing lowest growth in absolute numbers of non-farm employment during this period.

Therefore, finally given the two different scenarios reflecting the decadal growth rates of non-farm employment for both main and marginal workers in rural and urban areas separately, the following points are emerging:

(i) The growth rates of non-farm occupation among main workers were marginally lower compared to the growth of Total Rural workers in non-farm employment during this post reform period. So, it is indeed clear that, during the post reform decade the marginal farmers have shown greater reliance on non agricultural activities. In other words, employment diversification towards non agricultural activities is much more pronounced among the marginal category of workers who are increasingly absorbed in these sectors during the reference period.

(ii) If we look at the growth of non-farm employment in three major agro-climatic zones of Andhra Pradesh, we would observe that the Rayalseema Region has registered the lowest rate of growth in non-farm employment during this period. Nevertheless, the average annual growth is significantly lower in Coastal

Andhra (0.8 percent). The coastal region is characterized by favorable agro-climatic conditions for agricultural development give impetus for more dependence on prospective agricultural activities rather than non-agricultural occupations in this region. This perhaps partly explains why the district like West Godavari in Coastal Andhra repetitively registered minimal increase in absolute numbers of workers engaged in non-agricultural activities for both main and Total non farm workers. Contrastingly, the Rayalaseema and Telengana regions are characterized by dry and rain fed region, which registered much increase in absolute numbers of non-farm employment. The districts like Mahbhubanagar, Medak, Nalgonda, Warangal, and Rangareddy in Telengana region confirmed considerable increase in non-agricultural activities. Similarly, the districts like Ananthapur, Kurnool, and Cuddapah in 'rocky hot and semi arid region of Rayalaseema, have established a greater intensity towards non-agricultural activities by a significant increase in absolute number of non-farm workers during the post reform period.

Table 4.4 Districts Arranged in Descending Order of Percentage of Rural Non-farm Workers to Total main workers

Category of workers	*% of RNF* Workers	*Districts/ Regions (% share in 1991)*	*Districts/ Regions (% share in 2001)*
Main Workers	*High (Above 25.0)*	Visakhapatnam (29.6)	Adilabad (27.0)
		Nizamabad (26.5)	Nizamabad (35.6)
		Rangareddy (47.5)	Karimnagar (31.7)
			Medak (25.7)
			Rangareddy (28.5)
			Nalgonda (25.5)
			Srikakulam (25.2)
			Nellore (25.2)
			Cuddapah (26.4)
	Medium (15.0 to 25.0)	Srikakulam (17.0)	Mahbubnagar (21.8)
		Krishna (21.1)	Warangal (21.8)
		Nellore (17.1)	Khammam (17.8)
		Adilabad (20.5)	Vizianagaram (22.8)
		Nalgonda (19.0)	Visakhapatnam (23.2)
		Vizianagaram (17.9)	East Godavari (23.9)
		Chittoor (15.8)	West Godavari (21.6)
		Cuddapah (23.6)	Krishna (24.3)
		Kurnool (20.3)	Guntur (19.2)
		Medak (16.4)	Prakasham (22.5)
			Kurnool (21.8)
			Ananthapur (20.3)
			Chittoor (21.6)
	Low (Up to 15.0)	East Godavari (11.7)	
		West Godavari (12.4)	
		Warangal (14.0)	
		Guntur (10.3)	
		Prakasham (13.9)	Nil
		Ananthapur (13.6)	
		Mahbubnagar (12.8)	
		Karimnagar (9.3)	
		Khammam (14.3)	

4.1 District level scenarios in Andhra Pradesh

In our next section, we would apply the Chadha and Sahu (2002) criteria across the districts of Andhra Pradesh to exactly trace out the incidence of rural non-farm workers in India. The Agrarian crisis is in particular severe in rural Andhra Pradesh. Unsurprisingly the growing emergence of non-agricultural employment, particularly in rural areas is also evident from the increase in absolute numbers of non-farm workers. Now in section we would analyze the relative position of the districts in terms its degree of incidence in rural non-farm employment at two different points of times, i.e., 1991 and 2001.

(i) Between the years 1991 and 2001, it is found that, Rangareddy and Nizamabad have shared the first position interchangeably as regards the incidence of rural non-farm employment for rural main workers. Similarly, Karimnagar and Khammam shared the lowest share in non-farm employment.

(ii) In 1991 out of rural areas in twenty-two districts, nine districts are classified as the districts with low concentration of non-farm activities. This scenario has remarkably been changed during the reform period; where the significant expansion of rural non-farm employment in these nine districts drives them in the medium category of incidence in farm employment.

(iii) During this reference period, seven more districts were added in the category of high incidence of rural non-farm employment, whereas in 1991 only three districts namely Rangareddy, Visakhapatnam and Nizamabad were identified as high occurrence of non-farm activities. The high increase in the incidence of rural non-farm employment is largely contributed by backward districts of Telengana regions.

(iv) As regards rural non-farm employment among total workers, taking main and marginal workforce together in districts of Andhra Pradesh, it is found that, the incidence of non-farm employment was highest in Nizamabad throughout the period. Mahbubnagar and Khammam have shared the lowest position in the years 1991 and 2001 respectively. In 2001, 33.7 percent of Total workers engaged in

non-farm employment in Nizamabad, while the corresponding figure were 12.8 percent and 16.4 percent for Mahbubnagar and Khammam respectively.

(v) In 1991, a vast majority of the districts (fifteen out of twenty-two districts) fell in the 'medium' category where the incidence of rural non-farm workers among the total rural workers was between 15 and 25 percent. Overall, it appears that, in pre reform 1991 most of the districts in Andhra Pradesh represented 'Medium' degree of employment diversification. However, the situation have changed significantly in rural areas in the year 2001 when no single district was identified to be in the category representing 'low' incidence of non-farm employment. In addition to only one district Nizamabad fell in the category of high incidence of rural non-farm employment in 1991, two more districts, namely Karimnagar and Rangareddy were added in this category in 2001.

(vi) In 2001, nineteen districts out of twenty districts were recognized as the districts having medium incidence of non-farm employment, the average share of being more than 20 percent. Interestingly, among three agro climatic zones, the biggest percentage share secured by Telengana Region while in 1991 the highest share was jointly secured by Coastal Andhra and Telengana region. Rayalaseema region posited in the category of low incidence of non-farm employment in pre reform 1991 has shifted to medium category of rural non-farm employment incidence during the decade.

Table 4.5 Districts Arranged in Descending Order of Percentage of Rural Non-farm Workers to Total Rural Workforce(Main + Marginal)

Category of workers	*% of RNF Workers*	*Districts/ Regions*	*% Share in 1991*	*Districts/ Regions*	*% Share in 2001*
Total Rural workforce (Main+Marginal)	*High (Above 25.0)*	Nizamabad	28.0	Rangareddy	27.2
				Nizamabad	33.7
				Karimnagar	29.5
	Medium (15.0 to 25.0)	Srikakulam	17.2	Srikakulam	21.4
		Visakhapatnam	16.6	Visakhapatnam	21.9
		Vizianagaram	17.5	Vizianagaram	20.2
		East Godavari	21.4	East Godavari	22.2
		West Godavari	21.1	West Godavari	20.5
		Krishna	16.3	Krishna	22.0
		Coastal Andhra	17.3	Guntur	17.5
		Nellore	17.1	Prakasham	20.8
		Cuddapah	16.0	**Coastal Andhra**	22.6
		Chittoor	15.4	Nellore	20.9
		Rangareddy	18.7	Cuddapah	23.2
		Medak	16.6	Kurnool	19.8
		Nalgonda	19.1	Ananthapur	18.3
		Warangal	15.3	Chittoor	20.1
		Karimnagar	23.8	**Rayalaseema Region**	20.1
		Adilabad	20.6	Medak	24.5
		Telengana Region	18.5	Mahbubnagar	20.1
				Nalgonda	23.1
				Warangal	19.8
				Khammam	16.4
				Karimnagar	29.5
				Adilabad	25.0
				Telengana Region	24.0
	Low (below 15.0)	Guntur	14.3		
		Prakasham	13.8	**NIL**	
		Kurnool	13.8		
		Ananthapur	12.9		
		Rayalaseema Region	14.9		
		Mahbubnagar	12.8		
		Khammam	14.1		

Table 4.6: Growth rate of rural employment in Andhra Pradesh (1991 and 2001)

Category	Rural	Rural	% Annual	Category	Rural	Rural	% Annual
Main Workers	1991	2001	Growth Rate	Total Workers	1991	2001	Growth Rate
I to IX Total	23026505	22975526	-0.02%	I to IX Total	24450742	28148498	1.42%
Main Workers	(100.0)	(100.0)		(Main+Marginal) Workers	(100.0)	(100.0)	
Agriculture				Agriculture			
(I) Cultivators	7703384	7303521	-0.50%	(I) Cultivators	8096453	7757337	-0.43%
	(33.5)	(31.8)			(33.1)	(27.6)	
(II)Agri-Labourers	10940275	9517765	-1.40%	(II)Agri-Labourers	11800784	13384671	1.27%
	(47.5)	(41.4)			(48.3)	(47.6)	
(III)Agrl.Allied	435471	665695	4.30%	(III)Agrl.Allied	459130	775780	5.39%
	(1.9)	(2.9)			(1.9)	(2.8)	
(I to III) Total Farm Workers	13550492	17486981	2.60%	(I to III) Total Farm Workers	20356367	21917788	0.74%
	(82.9)	(76.1)			(83.3)	(77.9)	
Rural non-farm				Rural non-farm			
(IV)Mining & Quarrying	153253	202275	2.90%	(IV)Mining & Quarrying	154837	218650	3.51%
	(0.7)	(0.9)			(0.63)	(0.78)	
(Va)Household Mfg	742685	1020630	3.20%	(Va)Household Mfg	800994	1228200	4.37%
	(3.2)	(4.4)			(3.3)	(4.4)	
(Vb)Non-Household Mfg	690240	885870	2.50%	(Vb)Non-Household Mfg	717877	1022090	3.60%
	(3.0)	(3.9)			(2.9)	(3.6)	
(IV) Construction	178854	487770	10.60%	(IV) Construction	180804	584660	12.45%
	(0.8)	(2.1)			(0.74)	(2.1)	
(VII) Trade	765788	919680	1.90%	(VII) Trade	795035	1031470	2.64%
	(3.3)	(4.0)			(3.3)	(3.7)	
(VIII)Transport	236079	418410	5.90%	(VIII) Transport	236748	443835	6.50%
	(1.0)	(1.8)			(1.0)	(1.6)	
(IX) Other Services	1180476	1553910	2.80%	(IX) Other Services	1327476	1701805	2.50%
	(5.1)	(6.8)			(5.4)	(6.0)	
(IV to IX) Total RNFS Workers	3947375	5488545	3.40%	(IV to IX) Total RNFS Workers	4213771	6230710	4.00%
	(17.1)	(23.9)			(17.2)	(22.1)	

Section 4.2: Trends in the composition and shares of rural non-farm employment in Andhra Pradesh districts: A comparison between 1991 and 2001

In order to provide some insight to variation in RNFS characteristics and growth among the districts we first consider rural Andhra Pradesh as a whole and then the differences between districts.

Rural employment data is considered in this section. The data presented relate to the degree of labour absorption in the RNFS that is measured as the ratio of main workers in the RNFS to main workers in the rural areas. This is computed using Census data, as NSS data lacks district-wise information.

Only about 24 per cent of total main workers are generally involved in non-farm activities. There are more differences between the share of those involved with non-farm sector in India and those involved in Andhra Pradesh. Total main workers in RNFS reached 54 million in 2001, a rapid increase from 39 million of total main workers in 1991. At that time, the share of rural non-farm employment to total rural employment was 23.9 percent, considerably higher than 17.1 per cent calculated for 1991.

In terms of the composition of rural non-farm employment for 2001, other services accounted for the highest share followed by household industries, trade and commerce, non household industries. Rising trends could be seen in all sub sectors, especially in construction activities that registered a growth of 11 percent between 1991 and 2001. The analysis rural non-farm employment when deconstructed at sub sector level shows that the share of transport-storage-communication particularly remains low throughout the period.

From the above table 4.6 if we compare the growth rates of workforce by industry groups then it shows that, the total agricultural workforce in Andhra Pradesh grew at around 3 percent between the reform periods, while the rate of growth of non-farm employment was around 3.5 percent during the period. So, among main category of workers, rural non-farm workforce compared to farm workforce elevated sharply during the reform period. The highest rural employment growth rate during this period was among construction workers (10.6 percent). The growth rate of trade and commerce was lowest (1.9 percent), the negative sign actually denotes a deteriorating share of cultivators' community in total rural employment in Andhra Pradesh during 1991 and 2001. All the sectors despite of the

workforce in two sectors in farm employment namely cultivation and agricultural labour have witnessed a decline during this period. Only agricultural allied activities has experience an unpretentious growth of 4.3 percent between 1991 and 2001. This clearly recognizes that during post reform period, within farm employment main workforce are largely absorbed in the realm of agriculturally diversified activities.

The data show that, agriculture is the predominantly the key economic activity in rural Andhra Pradesh. However, in post reform period there appears to be a modest shift away from agricultural employment. This is further confirmed by the reduction in cultivators and agricultural labourer along with slow growth in agricultural allied activities. This entire pointer to the fact of agricultural distress in the state.

The above table indicates that, between 1991 and 2001, in Andhra Pradesh there was an increase in mining and quarrying (category IV). This could be due to the liberalization policies functional to cement production and the removal of subsidies to the granite industry. Storage and warehousing increased from 1991 to 2001. This could be due to the increase in public construction of *godowns* for food grains and essential commodities in all marketing centers, and the encouragement by the authorities to private entrepreneurs to construct warehouses.

Now let us have look at the incidence of rural employment among the total rural workforce, by taking the main and marginal category of workers collectively. The total number of total workers in the rural non-farm sector arrived at more than 62 million in 2001, with the share of 22.1 per cent in total workforce (main + marginal) engaged in rural non-farm sector; leading to an considerable increase from 17.2 percent in 1991.

The structural composition of rural non-farm employment for Total workers at 2001 reveals that, other services registered highest share followed by, household manufacturing industries, trade and non household manufacturing industries. The rising trend is evident in all sub sectors.

If we compare the growth rates of the workforce according to the industrial groups, it shows that the total rural agricultural labour force in Andhra Pradesh grew at 0.74 percent during this post reform period, while Total rural non-farm employment ensured a comprehensive rate of growth of 4.0 percent during this period. The highest rural employment growth rate for Total workers between this reference periods was found to be

in construction activities (12.5 percent) and the employment growth of agricultural labourers was the lowest (1.3 percent). Like the main workforce, all the sectors except cultivators showed a growth throughout the period, while employment in cultivation witnessed a declining trend by 0.43 per cent.

Agricultural employment predominantly absorbs 78 percent of total labour force combining main and marginal category of workers, a declined from 83.3 percent in 1991. The share of cultivators' community in total workforce has shown a significant decline from 33 percent to 26.5 percent in 2001. The share of agricultural labour has also marginally gone down between the reference periods. This along with rapid growth of employment in agriculture-allied activities among total rural workforce brings out the increasing trend of rural workers towards agricultural diversification. Although it is clear that, the growth of agricultural employment is substantially higher among main workforce compared to Total Workforce during the post reform period, while the overall growth of rural employment is higher for Total rural workforce compared to growth of employment among rural main labour force. These interestingly proliferate the contemporary distress in agrarian front of rural Andhra Pradesh in terms of generating employment in farm sector.

Regarding construction and transport activities, a tremendous growth has taken place among the Total workers between 1991 and 2001. This may be because of increase in public construction and betterment of physical infrastructure like roads etc.

From the above discussion, it would seem that, between 1991 and 2001 the level and growth of rural employment in Andhra Pradesh differs across different categories of workforce; namely main workers and Total (Main+Marginal) workers. The growth rates of Total workforce in all sub sectors are considerably much higher than the growth rates of employment for main workforce except the growth in other services. The significant increase in absolute numbers of Total workforce in all sector undoubtedly depict a noteworthy occupational diversification of total workforce in rural employment in Andhra Pradesh, with showing shrinkage in agricultural employment.

In farm employment, Total workforce registered a positive growth in all sub sectors, except a marginal decline in cultivation; while among main workforce the decline of cultivators and agricultural labour is more pronounced. Nevertheless, for both main and Total

workforce agriculture allied activities is absorbing increasing numbers of workers during the period.

The change in percentage point of share of farm employment between 1991 and 2001 among main workforce is significantly higher than the change in percentage point share of Total workers engaged in non-farm activities in 2001. Among non-farm sub sectors, the tertiary sector comprising of trade, transport and construction is appeared to be contributory sector, absorbing increasing numbers of both main and Total workforce during the period. Services registered highest share in non-farm sector in both main and total rural workforce throughout the decadal period.

4.3 District wise trends in rural employment in Andhra Pradesh

RNFE shares and growth by district are shown in following Tables. Activities absorb varying proportions of workers across districts, and the annual change in the proportions involved in each sector points to a diversification of the rural economy during the decade. The expansion of sub-sectors of activities has resulted in wider opportunities in RNFE for both main and marginal. Yet, some districts seem to have performed better than others have. In terms of growth rates, 12 of the 22 districts displayed increases for total share as well as for RNFE share.

The district-level share and growth rates of rural employment, combining both farm and non-farm between 1991 and 2001 are also presented in the following tables. The difference in shares amongst main and Total(Main and Marginal) workforce across the districts grew between 1991 and 2001.

In main workforce (table 4.7), the biggest group of workers in 1991 was agricultural labourers. However, the sector, which expanded most rapidly during the post reform decade, was construction sector. As we have already seen, most sectors have expanded in Andhra Pradesh during the decade with the exception of cultivators and agricultural labourers. The districts in which cultivators have declined the most are Srikakulam, Vizianagaram, Visakhapatnam, and East Godavari. These districts have not faced a decline of similar magnitude in agricultural labour. The biggest decline in this sector, albeit from a small base, was in Adilabad.

For total RNFE, the largest variation in share across districts is for the household industry (CV = 0.73) in 2001. Differences across districts can also be observed in growth rates for the agricultural and allied sector (a difference of 11.8 per cent points change between Nalgonda and Cuddapah).

The most pronounced uniformity (i.e. lowest sub-sector CV among districts) in terms of growth rate between 1991 and 2001 is for construction sector. The proportion of workers involved as construction workers has increased by a similar proportion across the districts. Besides the district-wide increase of the numbers of workers in construction activities and in transport-storage-communication, trade has grown throughout AP, with the exception of Nellore for transport and Rangareddy, Visakhapatnam, and Nellore for the trade and commerce sector.

Table 4.7: District wise share and growth rates of rural employment (farm and non-farm) activities of Main workforce between 1991 and 2001

	Cultivators Growth (%)	% Share in 2001	Agricultural labour Growth (%)	% Share in 2001	Agri allied activities Growth	% share in 2001	Mining & Quarrying Growth	% Share in 2001
Srikakulam	-3.40%	29.5	-2.50%	40	0.70%	5.4	0.50%	0.6
Vizianagaram	-1.90%	38.1	-1.10%	36.1	2.30%	3.1	3.10%	0.8
Visakhapatnam	-1.60%	44.7	-1.00%	29	2.40%	3	14.50%	0.8
East Godavari	-1.60%	15.9	-1.10%	55.9	5.70%	4.3	3.00%	0.2
West Godavari	-0.70%	16.4	-0.40%	59.6	2.30%	2.4	-4.20%	0.1
Krishna	-1.60%	16.7	-0.60%	55.4	5.30%	3.6	10.80%	0.6
Guntur	-0.10%	24.8	-1.00%	53.8	3.60%	2.2	22.50%	1.0
Prakasham	0.80%	30.8	-2.10%	43	5.20%	3.7	12.60%	1.0
Nellore	-0.90%	24.0	-2.10%	46.7	2.10%	4.2	-5.60%	0.3
Coastal Andhra	-1.20%	26.8	-1.20%	46.6	3.40%	3.5	7.70%	0.6
Kurnool	1.10%	28.7	-0.20%	48.2	6.20%	1.4	33.90%	2.6
Ananthapur	0.10%	40.5	-1.10%	37.4	-0.20%	1.7	4.20%	0.6
Cuddapah	-0.60%	33.2	-1.80%	38.7	-1.00%	1.7	5.10%	1.0
Chittoor	-0.70%	40	-0.60%	36.2	-0.10%	2.2	-5.00%	1.1
Rayalaseema	-0.10%	35.6	-0.80%	40.1	0.80%	1.7	6.20%	1.3
Rangareddy	0.70%	39.2	-2.60%	29.7	1.10%	2.6	-1.80%	1.9
Nizamabad	-0.50%	36	-2.60%	26.1	5.20%	2.4	8.20%	0.5
Meadk	-1.10%	38.4	-1.40%	33.3	6.40%	2.6	2.80%	0.7
Mahbubnagar	-0.90%	38	-1.50%	37.5	4.00%	2.7	3.30%	0.5
Nalgonda	-0.60%	32.5	-1.80%	38.1	11.70%	3.9	9.10%	0.8
Warangal	0.70%	39.9	-3.00%	35.1	11.60%	3.1	7.90%	0.7
Khammam	0.40%	29.9	0.10%	50.4	5.00%	1.9	-2.50%	1.2
Karimnagar	-0.80%	33	-2.50%	31.3	11.00%	4	1.30%	1.2
Adilabad	1.10%	43.6	-3.50%	27.3	5.40%	2	-8.20%	1.5
Telengana	-0.20%	36.7	-1.90%	34.3	7.30%	2.8	-0.40%	1.0
Andhra Pradesh	-0.50%	31.8	-1.40%	41.4	4.30%	2.9	2.80%	0.9
India	-0.59%	44.3	-1.49%	26.4	5.83%	3.8	2.9%	0.6
Mean	-0.60%	32.4	-1.50%	40.5	4.30%	2.9	5.10%	0.9
SD	0.01	8.39	0.01	9.69	0.03	1	0.09	0.6
CV	-1.85	0.26	-0.6	0.24	0.8	0.3	1.77	0.6

(Table contd.)

Districts/Regions	hhs industry	% in 2001	non hhs industry	% In 2001	Construction	% in 2001	Trade & commerce	% in 2001	TSC	% in 2001	other services	% in 2001
Srikakulam	-0.2%	3.7	4.6%	3.6	8.9%	2.0	0.9%	4.7	1.2%	1.9	2.92%	8.8
Vizianagaram	3.8%	3.7	3.9%	3.0	5.4%	1.5	3.4%	4.3	4.5%	1.7	3.46%	7.2
Visakhapatnam	-4.0%	3.3	-1.9%	3.5	10.3%	2.0	-6.4%	3.9	3.3%	2.6	-4.41%	7.9
East Godavari	3.2%	3.6	12.7%	3.6	16.9%	1.5	5.6%	5.3	10.1%	1.7	6.03%	8.0
West Godavari	1.1%	2.7	7.5%	3.5	12.8%	1.2	3.7%	4.4	9.0%	1.7	6.57%	8.0
Krishna	0.9%	2.4	1.4%	3.9	13.9%	2.0	0.2%	4.9	8.2%	3.3	-0.63%	7.3
Guntur	2.6%	2.2	7.6%	3.1	9.4%	1.8	6.1%	3.8	11.7%	1.7	4.37%	5.6
Prakasham	4.6%	2.4	4.4%	3.4	14.8%	3.6	3.1%	3.9	5.5%	1.5	9.72%	6.7
Nellore	3.2%	4.0	-1.5%	3.6	11.9%	2.9	-1.4%	4.5	-2.4%	1.9	1.74%	8.0
Coastal Andhra	1.4%	3.1	3.8%	3.5	11.7%	2.1	1.5%	4.4	5.5%	2.0	2.79%	7.4
Kurnool	-10.5%	3.0	0.3%	2.6	14.0%	1.8	5.7%	3.8	14.1%	1.7	6.24%	6.2
Ananthapur	6.3%	4.2	-1.6%	3.5	12.7%	1.6	4.4%	3.4	9.3%	1.3	5.7	6.2
Cuddapah	2.7%	4.3	-4.8%	3.4	6.2%	2.7	-1.0%	4.5	4.5%	2.1	2.86%	8.4
Chittoor	7.2%	3.0	10.2%	3.5	11.8%	2.0	5.2%	3.9	9.9%	1.7	4.17%	6.3
Rayalaseema	-1.6%	3.6	0.3%	3.3	10.8%	2.0	3.5%	3.9	9.2%	1.684	5.14%	6.5
Rangareddy	-16.6%	2.2	-7.9%	5.2	8.6%	3.8	-0.5%	4.4	8.1%	2.8	-1.99%	8.2
Nizamabad	1.4%	15.4	6.5%	7.1	4.3%	1.1	1.8%	3.8	6.3%	1.2	3.65%	6.4
Meadk	4.1%	4.2	3.8%	7.3	10.0%	1.5	4.1%	4.1	10.4%	1.8	4.93%	6.2
Mahbubnagar	8.1%	3.9	2.1%	3.7	14.4%	3.1	2.5%	3.4	7.7%	1.5	5.21%	5.7
Nalgonda	-2.2%	4.4	3.0%	4.7	8.1%	2.7	2.7%	4.4	7.3%	2.5	1.14%	5.9

Warangal	11.3%	4.7	3.2%	3.2	7.6%	2.0	1.3%	3.5	6.7%	1.8	1.79%	6.1
Khammam	0.1%	1.8	1.4%	2.4	10.8%	1.9	2.3%	3.1	6.3%	1.4	4.11%	6.0
Karimnagar	-0.2%	12.2	23.2%	4.5	25.0%	2.4	3.0%	3.5	20.4%	1.4	1.90%	6.5
Adilabad	6.3%	9.4	0.3%	3.8	12.8%	1.8	1.4%	2.8	10.2%	1.4	2.81%	6.3
Telengana	0.9%	6.1	4.3%	4.8	11.9%	2.3	2.1%	3.78	9.7%	1.787	2.40%	6.3
Andhra Pradesh	3.2%	4.4	2.5%	3.9	10.6%	2.1	1.8%	4.0	5.9%	1.8	2.79%	6.8
India	5.60%	3.6	3.00%	4.6	9.3%	2.5	3.0%	4.3	6.0%	2.1	2.90%	7.8
Mean	1.6%	4.5	3.4%	3.9	11.4%	2.1	13.2%	4.0	29.7%	1.8	0.3	6.9
SD	0.06	3.14	0.06	1.15	0.04	0.66	0.57	0.55	1.14	0.48	1.12	0.92
CV	3.50	0.70	1.70	0.30	0.36	0.31	4.34	0.14	3.84	0.26	4.45	0.13

Table 4.8: District wise share and growth rates of rural employment (farm and non-farm) activities of Total (Main+Marginal) workforce between 1991 and 2001

Districts/Regions	Cultivators		agricuitural labour		Agri-allied activities		Mining &Quarrying	
	growth	% in 2001	growth	% in 2001	growth	% in 2001	growth	% in 2001
Srikakulam	-3.07%	24.0	1.69%	49.7	1.89%	4.5	8.7%	0.47
Vizianagaram	-1.65%	38.0	2.12%	36.6	4.42%	3.1	5.8%	0.67
Visakhapatnam	-1.93%	31.9	2.16%	44.5	4.61%	3	9.8%	0.66
East Godavari	-1.27%	13.6	1.08%	60.1	6.31%	3.8	7.0%	0.23
West Godavari	-0.54%	14.3	1.35%	62.8	3.15%	2.3	-3.5%	0.13
Krishna	-1.30%	14.6	1.49%	59.9	6.66%	3.5	5.3%	0.52
Guntur	-0.06%	22.1	0.80%	58.2	4.09%	2.1	6.0%	0.91
Prakasham	0.84%	27.4	-0.03%	47.8	7.07%	3.9	13.5%	0.88
Nellore	-0.01%	20.9	1.39%	52.4	-15.53%	4	-21.1%	0.28
Coastal Andhra	-1.04%	22.2	1.22%	53.5	-1.15%	3.3	0.4%	0.54
Cuddapah	-0.40%	29.1	1.23%	45.9	0.17%	1.6	6.3%	0.86
Kurnool	1.41%	26.0	1.90%	52.7	7.27%	1.3	4.2%	2.31
Ananthapur	0.20%	35.8	1.67%	44.2	0.52%	1.6	15.7%	0.59
Chittoor	-0.74%	35.6	1.97%	41.8	1.50%	2.3	10.1%	1.01
Rayalaseema	-1.19%	31.9	-0.43%	46.2	-1.31%	1.7	5.5%	1.22
Rangareddy	0.76%	34.4	0.31%	35.7	2.44%	2.5	2.7%	1.79
Nizamabad	-0.40%	31.0	1.04%	32.9	6.63%	2.3	10.2%	0.47
Medak	-0.89%	32.7	2.07%	40.3	7.55%	2.4	3.6%	0.62
Mahbubnagar	-0.69%	32.3	1.85%	44.9	5.05%	2.5	4.5%	0.43
Nalgonda	-0.68%	27.7	1.13%	45.4	12.40%	3.6	10.1%	0.72
Warangal	0.73%	33.5	0.48%	43.8	12.43%	2.8	3.7%	0.55
Khammam	0.43%	26.2	2.21%	55.4	5.08%	1.9	-2.2%	0.99
Karimnagar	-0.69%	28.9	0.47%	37.9	11.51%	3.6	0.4%	1.1
Adilabad	1.25%	36.7	0.41%	36.2	4.82%	2	-7.8%	1.22
Telengana	-0.13%	31.2	1.19%	41.9	7.98%	2.7	0.4%	0.82
Andhra Pradesh	-0.43%	27.6	1.27%	47.6	5.39%	2.8	3.5%	0.78
India	0.28%	40.3	2.33%	33.1	8.16%	3.9	4.0%	0.5
Mean	-0.44%	28.0	1.23%	46.8	4.27%	2.73	4.0%	0.8
SD	0.01	6.86	0.01	8.15	0.05	0.85	7.0%	0.47
CV	-2.29	0.24	0.57	0.17	1.28	0.31	1.84	0.59

(Table contd.).

Districts/Regions	HHS industries		Non hhs industries		Construction		Trade & Commerce		TSC		Other services	
	growth	% in 2001	growth	% in 2001	growth	% in 2001	growth	% in 2001	growth	% in 2001	growth	% in 2001
Srikakulam	1.00%	3.8	8.10%	3	17.60%	1.9	-0.60%	3.6	6.70%	1.44	1.60%	7.2
Vizianagaram	1.90%	3.4	7.30%	3.5	14.00%	2.2	0.70%	3.4	6.80%	2.24	2.20%	6.6
Visakhapatnam	1.90%	3.6	2.80%	2.7	12.20%	1.4	-0.50%	3.6	4.60%	1.37	1.90%	6.9
East Godavari	1.60%	3.8	3.40%	3.7	12.80%	1.4	0.30%	4.6	2.90%	1.44	-0.40%	7.1
West Godavari	2.30%	2.9	2.00%	3.8	10.20%	1.2	-0.50%	3.8	2.20%	1.53	-0.60%	7.1
Krishna	3.10%	2.4	3.90%	3.6	13.40%	1.9	3.60%	4.3	7.50%	2.86	4.40%	6.5
Guntur	10.00%	2.2	2.10%	2.9	10.10%	1.7	0.80%	3.4	3.70%	1.47	1.30%	5
Prakasham	5.90%	2.4	5.20%	3.2	16.30%	3.5	3.20%	3.5	5.90%	1.34	3.30%	6.1
Nellore	-17.0%	3.7	-18.00%	3.3	-6.70%	2.9	-19.90%	4.1	-17.50%	1.63	3.10%	6.9
Coastal Andhra	-2.9%	3.1	-2.20%	3.3	7.20%	2	-5.10%	3.8	-1.20%	1.7	1.60%	6.5
Cuddapah	5.8%	4	5.80%	3	13.20%	2.6	3.80%	3.8	6.90%	1.75	3.60%	7.2
Kurnool	8.1%	2.8	8.30%	2.5	12.30%	1.7	5.30%	3.4	10.30%	1.47	4.50%	5.7
Ananthapur	8.1%	4	7.50%	3.1	7.00%	1.5	2.90%	2.9	6.90%	1.09	2.50%	5.1
Chittoor	4.3%	3	4.50%	3.3	12.80%	2	2.40%	3.5	4.40%	1.52	2.00%	5.6
Rayalaseema	4.3%	3.4	4.30%	3	8.50%	1.9	1.20%	3.4	4.30%	1.43	0.90%	5.8
Rangareddy	8.0%	2.4	3.00%	4.9	14.20%	3.9	2.70%	4.1	8.30%	2.59	6.10%	7.5
Nizamabad	2.1%	14.8	7.60%	6.8	7.10%	1.2	2.50%	3.5	7.20%	1.1	2.00%	5.9
Medak	6.3%	4.4	5.20%	7	12.60%	1.6	4.70%	3.6	11.20%	1.54	5.20%	5.8
Mahbubnagar	9.8%	3.8	3.00%	3.4	16.50%	3	3.00%	3	8.50%	1.32	5.40%	5.2
Nalgonda	-0.8%	4.4	3.90%	4.4	9.50%	2.6	2.60%	3.7	7.80%	2.1	3.20%	5.2
Warangal	5.4%	4.4	-0.30%	2.9	10.50%	1.9	4.40%	3	8.70%	1.52	3.20%	5.4
Khammam	2.4%	1.9	2.40%	2.3	12.50%	1.8	2.50%	2.7	6.90%	1.24	4.00%	5.4
Karimnagar	6.4%	11.6	-2.60%	4.2	12.00%	2.3	3.70%	3.1	7.60%	1.21	1.70%	5.9
Adilabad	7.1%	8.8	1.20%	3.5	16.10%	2	2.20%	2.5	11.40%	1.26	2.70%	5.8
Telengana	4.5%	6.2	2.50%	4.3	12.40%	2.3	3.20%	3.2	8.50%	1.52	3.60%	5.7
Andhra Pradesh	4.4%	4.4	3.60%	3.6	12.50%	2.1	2.60%	3.7	6.50%	1.6	2.50%	6
India	8.43%	3.9	4.30%	4.1	11.75%	2.3	4.16%	3.6	6.79%	1.7	27.08%	6.6
Mean	3.6%	4.45	2.9%	3.7	11.4%	2.1	1.2%	3.5	5.7%	1.6	2.7%	6.1
SD	0.05	2.96	0.1	1.1	0.05	0.67	0.05	0.47	0.05	0.4	0.02	0.7
CV	1.45	0.66	1.8	0.31	0.41	0.32	3.9	0.14	0.97	0.3	0.59	0.1

In the analysis of rural employment among the Total workforce, i.e. combining Main workforce and Marginal workforce at sectoral level, some important changes are observable in the growth rates between 1991 and 2001 for Andhra Pradesh and India. Perhaps, most striking is the difference in the growth rate of employment in transport-storage and communication. The proportion of those employed in this sector has grown by 2.5 per cent in Andhra Pradesh compared to 27.1 percent in India. The sector, which has absorbed employment considerably high in Andhra Pradesh than in India, is construction activities. In the remaining sub sectors, the growth of employment during this period was higher at all India level compared to growth rates in Andhra Pradesh. In farm employment while the cultivators community secured a marginal increase during the period, the growth of employment in this sector in Andhra Pradesh has turned to be negative. With regard to non-farm sectors, the growth of employment in the sectors like household industries and other services at all India is significantly higher than the growth in Andhra Pradesh. So, it is evident the rural industries in Andhra Pradesh and services were incapable of generating sufficient employment compared to growth of employment in these sectors at all India level during the post reform period. The growth of trade and commerce activities also shows a serious lag in this period with the pace of growth at all India level. So, we can conclude that, in farm employment the significant growth in agricultural labour along with low growth in remaining two sectors, compared to national level clearly bring out the severe distress of marginal workforce in rural Andhra Pradesh during the post reform period in agriculture. Contrarily, the overall growth of employment in rural non-farm sector during this period is lagging behind considerably the national growth of non-farm employment in rural areas.

Now we turn to the district wise share and growth rates of rural employment of both farm and non-farm employment between 1991 and 2001. The agricultural labourers remain the predominant in terms its share in total workforce in 2001. In terms of the expansion of sectors, construction sector expanded most rapidly during this period. The table clearly reveals that most sector have expanded in Andhra Pradesh during the decade with only exception of cultivation. In the districts like Visakhapatnam, Srikakulam, Vizianagaram, Chittoor and Nalgonda, the employment in cultivations have mostly declined.

In rural non-farm employment, the household industries registered the largest variation across the districts in 2001. This inter districts disparity in growth rates can also be observable in agriculture allied activities, where a difference of more than 11 percentage points between Warangal and Cuddapah is evident during the post reform period. In other sector like household industries, construction and Transport there are differences in the growth rates of the districts. The most pronounced uniformity (i.e. lowest sub-sector CV among districts) in terms of growth rate between 1991and 2001 is for construction activities. The proportion of workers involved in construction activities has increased by a similar proportion across the districts.

It should also be noted that, the growth of employment including farm and non-farm sector is more pronounced in Telengana region compared to coastal Andhra and Rayalaseema region of Andhra Pradesh. Among these three agro-climatic zones of Andhra Pradesh, coastal Andhra has registered lowest growth rate in all sub sectors. The rapid increases in absolute numbers of marginal workforce in Telengana revealed the fact that, this backward region witnessed a significant marginalization of rural workforce during the post reform period.

4.4 Shares and growths in traditional and modern rural non-farm sector

In our next section, we would present the shares and growth rates of traditional and modern rural non-farm sector. With regard to agriculture related employment, i.e. cultivators, agricultural labour and agriculture allied activities; there are some differences across the districts for both main and marginal workforce.

(i) For main workers, in agricultural related employment, Khammam has the highest share (82.2 percent) of total workers involved in this sector, whilst Nizamabad has the lowest share of only 64.4 percent in 2001. For marginal workers, the highest share in agricultural employment was secured by Guntur (91.1 percent), while Nizamabad is again registered lowest percentage share in agriculture (74.7 percent). Interestingly, both the districts belong to the dry rain fed area of Telengana region of Andhra Pradesh.

Table 4.9: District wise share and Growth rates of rural employment (farm and non-farm traditional and modern) activities of main workforce between 1991 and 2001

	Main Workers					
	Agricultural sector	Growth	Modern RNFS	Growth	Traditional RNFS	Growth
	Total %(2001)	(%)	Total%(2001)	(%)	Total%(2001)	(%)
Srikakulam	74.8	-2.7%	12.7	2.8%	12.5	1.9%
Vizianagaram	77.2	-1.4%	11.2	3.9%	11.5	3.6%
Visakhapatnam	76.8	-1.2%	12.8	-1.4%	10.5	-4.3%
East Godavari	76.1	-0.9%	12.3	8.8%	11.6	5.0%
West Godavari	78.4	-0.4%	10.9	6.1%	10.6	4.9%
Krishna	75.7	-0.6%	14.7	3.5%	9.7	-0.3%
Guntur	80.8	-0.6%	11.4	8.6%	7.8	3.8%
Prakasham	77.5	-0.8%	13.4	6.4%	9.1	8.1%
Nellore	74.8	-1.5%	13.2	-0.1%	12.0	2.2%
Coastal Andhra	77.2	-1.0%	12.5	4.2%	10.3	2.4%
Kurnool	78.2	0.4%	12.5	8.0%	9.2	-2.6%
Ananthapur	79.7	-0.5%	10.4	3.0%	9.9	6.3%
Cuddapah	73.6	-1.2%	13.7	-0.2%	12.7	2.8%
Chittoor	78.4	-0.7%	12.3	6.0%	9.3	5.0%
Rayalaseema	77.9	-0.4%	12.1	4.2%	10.0	2.2%
Rangareddy	71.5	-0.8%	18.1	-1.8%	10.3	-7.8%
Nizamabad	64.4	-1.3%	13.8	4.8%	21.8	2.0%
Meadk	74.3	-1.1%	15.3	4.9%	10.4	4.6%
Mahbubnagar	78.2	-1.1%	12.2	4.9%	9.6	6.3%
Nalgonda	74.5	-0.9%	15.1	4.5%	10.3	-0.4%
Warangal	78.2	-1.0%	11.1	3.9%	10.8	4.9%
Khammam	82.2	0.3%	10.0	2.9%	7.8	3.1%
Karimnagar	68.3	-1.3%	13.0	9.2%	18.7	11.0%
Adilabad	73.0	-0.9%	11.3	0.6%	15.7	4.8%
Telengana	74.1	-0.9%	13.2	3.7%	12.7	3.0%
Andhra Pradesh	76.1	-0.9%	12.7	3.7%	11.2	3.0%

Table 4.10: District wise Share and Growth rates of rural employment (farm and non-farm traditional and modern) activities among Total (Main+Marginal) workforce

Districts	Total (Main+Marginal) Workers					
	Agricultural sector	Growth	Modern RNFS	Growth	Traditional RNFS	Growth
	Total%(2001)	(%)	Total%(2001)	(%)	Total%(2001)	(%)
Srikakulam	78.2	-0.04%	10.5	4.76%	11.0	1.42%
Vizianagaram	77.8	0.15%	12.0	5.48%	10.0	2.12%
Visakhapatnam	79.4	0.36%	9.7	2.75%	10.5	1.89%
East Godavari	77.6	0.81%	11.3	2.68%	10.8	0.21%
West Godavari	79.4	1.02%	10.5	1.52%	10.0	0.16%
Krishna	77.9	1.06%	13.1	5.49%	8.9	4.06%
Guntur	82.4	0.63%	10.3	3.09%	7.2	3.26%
Prakasham	79.0	0.52%	12.4	7.11%	8.5	3.97%
Nellore	77.2	-1.30%	12.2	-17.31%	10.7	-9.54%
Coastal Andhra	78.9	0.42%	11.3	-2.05%	9.6	-0.10%
Kurnool	76.6	0.55%	12.0	6.45%	11.2	4.33%
Ananthapur	80.1	1.80%	11.4	7.06%	8.5	5.57%
Cuddapah	81.6	0.97%	9.2	5.96%	9.1	4.62%
Chittoor	79.7	0.65%	11.4	5.13%	8.7	2.71%
Rayalaseema	79.8	-0.76%	10.9	3.89%	9.2	2.00%
Rangareddy	72.6	0.59%	17.3	5.23%	9.9	6.51%
Nizamabad	66.2	0.47%	13.1	5.96%	20.6	2.07%
Meadk	75.4	0.78%	14.3	6.08%	10.2	5.63%
Mahbubnagar	79.7	0.81%	11.1	5.97%	9.0	7.04%
Nalgonda	76.7	0.73%	13.5	5.13%	9.6	1.15%
Warangal	80.1	0.83%	9.9	4.01%	9.8	4.10%
Khammam	83.5	1.67%	9.1	3.58%	7.4	3.57%
Karimnagar	70.4	0.30%	12.0	1.79%	17.5	4.54%
Adilabad	74.8	0.91%	10.4	1.83%	14.6	5.08%
Telengana	75.8	0.79%	12.1	4.41%	11.9	4.07%
Andhra Pradesh	77.9	0.74%	11.7	4.70%	10.4	3.25%

(ii) In relation to the changes in the proportion of main workers involved with agricultural sector, a severe decline has taken place in all the twenty districts , except in two districts-namely Kurnool and Khammam. The average annual declines, where they have happened are, however, relatively small (2.7 percent) in Srikakulam and the decadal decline in agricultural employment is highest in West Godavari (0.4 percent).

(iii) It is also evident that, Rayalaseema zone has witnessed the highest decline among all three zones in Andhra Pradesh. The agricultural distress of recent times in these districts of Rayalaseema and Telengana region can further be identified with a declining trend of main workforce in agricultural employment during the decade.

(iv) In contrast, we have different observation for Total rural workforce in Andhra Pradesh. Combining main and marginal workers together, the share of rural employment in agriculture is marginally high across the districts compared to the proportion of main workforce engaged in this sector. All the districts showed a considerable growth in agricultural employment except the two districts Srikakulam and Nellore. The biggest growth is evident in Ananthapur (1.8 percent) and Vizianagaram has the lowest growth of 0.15 percent in agricultural employment between 1991 and 2001. These two districts have actually registered a decline in agricultural employment over the post reform decade. However, unlike in case of main workforce, the majority of the districts secured a growth in this sector though small in magnitude. This is perhaps because of a large number of marginal workforce in rural Andhra Pradesh is still dependent on agricultural employment. Hence, the significant growth in agricultural employment among marginal workforce determines the positive growth of agricultural employment among Total workforce in Andhra Pradesh.

(v) If we compare the share and growth of agricultural employment among three agro-climatic regions of Andhra Pradesh, we would have some interesting observations. The share of employment in this occupation is highest in Rayalaseema region in 2001, where the growth of workforce in this sector is highest in Telengana region. Interestingly in the Rayalaseema region, the agricultural employment has decelerated in the reference period. Almost all the districts in backward region of Telengana have registered a considerable augmentation of rural workforce in the agricultural employment in terms their growth during the post reform period.

Turning to the traditional and modern sectoral component of district non-farm employment, we have equated predominantly traditional RNFE with HHI and other services and predominantly modern RNFE with mining and quarrying, non-HHI, construction, trade and transport. Among main workforce, Rangareddy (18.1 percent) has the greatest proportion of non-farm workers in modern sector, while Nizamabad has the greatest proportion of 21.8 percent in traditional non-farm sector.

(vi) Among the Total workforce, the two districts namely Rangareddy and Nizamabad have registered the highest percentage share in modern and traditional non-farm sector respectively. However, the share of employment in non-farm sector is smaller among the Total workforce, compared to proportion of non-farm employment among main workforce. The share of non-farm employment in traditional sector was highest in Nizamabad (20.6 percent) and lowest in Guntur (7.2 per cent). In the districts like Srikakulam, Vizianagaram, Visakhapatnam of coastal Andhra, Kurnool of Rayalaseema region Medak, Rangareddy, Karimnagar and Adilabad of Telengana region the share of rural non-farm employment in traditional sector is discernibly high in 2001.

The growth of employment in non-farm traditional sector varied across the districts. Mahbubnagar (7.04 %) witnessed the largest employment growth in this sector and West Godavari (0.16 percent) registered the slowest pace of growth in traditional non-farm occupation. In the districts Kurnool, Ananthapur, Cuddapah, Rangareddy, Medak, and Karimnagar the decadal growth of traditional non-farm employment is significantly high among marginal workers during the post reform period. On the other hand, the only districts Nellore of coastal Andhra has registered negative growth in traditional RNFS during the period.

It also apparent from the table that, amongst the three regions in Andhra Pradesh, Telengana region secured the highest percentage share in traditional non-farm employment followed by the highest rate of decadal growth of traditional non-farm employment in this region during the decade. In coastal Andhra region, the absolute number engaged in traditional RNFS has declined over the period thus showing negative growth in this decade. In modern non-farm sector, Rangareddy (17.3 percent) has the highest concentration of rural non-farm employment, whereas Khammam has recorded lowest proportion of modern non-farm employment in 2001. In the districts like Vizianagaram, East Godavari, Krishna,

Prakasham, Nellore, Kurnool, Medak and Nalgonda the share of employment in modern RNFS is significantly high.

The average decadal growth of employment in modern RNFS is higher compared to the average decadal growth of employment in traditional RNFS across all the districts of rural Andhra Pradesh. Prakasham witnessed the largest expansion of non-farm employment in this sector, while the least growth of employment was evident in West Godavari during the post reform decade. The districts like, Vizianagaram, Kurnool, Ananthapur, Chittoor, Nizamabad, Medak, Mahbubnagar, observed a remarkable expansion of rural non-farm employment of Total workforce in modern sector during the decade.

Region wise segregation revealed that, the Coastal Andhra region has demonstrated the lowest as well as negative growth of employment along with the lowest employment share in modern non-farm sector during this reference period. The development of modern RNFS is most pronounced in Telengana region. The absorptive capacity of modern RNFS in this region manifested a large proportion of Total workers during this period; the average growth of employment in this sector is also highest in this region. The notable expansion of modern RNFS compared to the growth of traditional RNFE among Total workforce in these regions confirmed the emerging importance of modern RNFS during the decade.

Now if we look at the scenario of rural non-farm employment prevailing amongst the main workforce, we would observe some distinctive features in it.

(i) The share of non-farm employment in traditional sector is highest in Nizamabad (21.8 percent) and lowest in Khammam (7.8 per cent) in 2001. Only in few districts like Nellore, Cuddapah, Karimnagar, and Adilabad the percentage share of RNFE is considerably much above the share of Andhra Pradesh as a whole. Most of the districts registered a share that is lower than the state level figure of 11.2 percentages.

(ii) The growth of employment is largest in Karimnagar (11 per cent) and lowest in Srikakulam (1.9 per cent). The growth figure in this sector also involves some negative numbers implying that, some districts like Visakhapatnam, Krishna, Kurnool, and Nalgonda have actually experienced a deteriorating trend during this decade.

(iii) In modern rural non-farm sector, the share of employment on an average is higher than the average share of non-farm employment in traditional sector across the districts in 2001. The highest proportion of rural employment in this modern sector was evident in Rangareddy (18.1 percent) and lowest percentage share was observed in Khammam (10 per cent). In the districts like Krishna, Prakasham, Nellore, Nizamabad, Medak, Nalgonda have shown satisfactory percentage share accounted for rural non-farm employment in this sector.

(iv) With reference to expansion of this modern rural non-farm sector, among main workforce, Karimnagar (9.2 per cent) and Adilabad (0.6 per cent) have experienced the highest and lowest growth of employment in this sector respectively during the post reform decade. Only three districts—Visakhapatnam, Nellore, and Rangareddy have witnessed a reduction in the absolute numbers of main workforce in this sector.

(v) The Telengana region has relatively larger share in rural modern non-farm occupation, but interestingly the expansionary growth of employment in this sector was higher in Coastal and Rayalaseema region during the decade.

4.5 IDENTIFICATION OF EMERGING SUB SECTORS

In this section, we would compute the change in absolute numbers of rural non-farm workers, separately for main and marginal workforce between the years 1991 and 2001 and worked out the shares of different sectors within. This would facilitate to identify the emerging sub sectors within the rural non-farm sector during the post reform period. We would first consider the main workforce.

(i) During the period 1991 and 2001, in Andhra Pradesh, an additional 15.4-lakh worker has been added to the army of total non-farm main workers. Among this additional main workforce engaged in rural non-farm sector nearly 25 percent have been absorbed in other services, while the other sectors contributed significantly towards employment generation are : construction (21.7 per cent), household manufacturing (18.0 percent), non household manufacturing (12.7 percent) , transport- storage-communication (11.8 percent), and whole sale and retail trade (10.0 per cent). In case of Total rural workforce, 20.1 lakh workers

have added to the number of rural non-farm workers in Andhra Pradesh during the same period. The rural household industries alone accounted for more than 20 per cent of the additional workforce, which is followed by construction (20 percent), other services (18.6 per cent), non-household industries (15.1 per cent), whole sale and retail trade (11.7 per cent). The rural manufacturing sector alone accounted for 36.3 per cent of these additional total non-farm work forces. It appears that, for the Total non-farm workforce in rural Andhra Pradesh, the emerging (and perhaps promising too) sectors have been manufacturing and construction activities, while in case of main non-farm workforce, the fresh entrants in this sector have been largely attracted to the household manufacturing industries and other service sectors.

(ii) Table 4.11 clearly shows that, nearly 54 per cent of additional non-farm workers among the main workforce in Andhra Pradesh during the period, 1991 to 2001 were absorbed in the secondary sector while the remaining 46 percent were employed in the tertiary sector. In the case of Total workforce, on the other hand, nearly 60 per cent of additional non-farm workers were employed in secondary sector while 40 percent in the tertiary sector. In other words, in rural Andhra Pradesh, the secondary sector is assumed to play a more dominating role as an absorber of additional non-farm workers for both main and total workforce.

(iii) There is a wide variation among the districts of Andhra Pradesh as regards additional non-farm workers into different sector. As regards main workforce, more than one fourth of additional non-farm workers have been employed in construction sector in Srikakulam, Vizianagaram, East Godavari, West Godavari, Prakasham, Mahbubnagar and Khammam during the post reform period 1991 to 2001. while the rural manufacturing sector absorbed more than one third of additional workers in East Godavari, West Godavari, Guntur, Nellore, Ananthapur, Nizamabad, Medak, Karimnagar and Adilabad during the period. On the other hand, the service sector presumed an important role as an absorber of additional main non-farm workers is visible in Srikakulam, Vizianagaram, Visakhapatnam, Krishna, Nellore, Cuddapah, Rangareddy, Mahbubnagar, Nalgonda, Warangal, and Khammam (absorbing more than one-fourth of the

additional workers). while the sectors like transport-storage- communication, account for considerable share of employment provided to additional non-farm main workforce in Srikakulam, Vizianagaram, Visakhapatnam, east Godavari, west Godavari, Krishna, Nalgonda, and Warangal (the share being more than 15 per cent).

(iv) Turing to the absorption of additional Total workforce, combining main and marginal workforce together rural manufacturing has been extremely important in the districts of East Godavari, West Godavari, Guntur, Cuddapah, Nizamabad, Medak, Khammam ,Karimnagar and Adilabad , absorbing more than 40 per cent of the incremental workforce. In six districts namely Srikakulam, East Godavari, West Godavari Prakasham, Mahbubnagar and Khammam, construction sector absorbed 25 per cent or more of additional Total non-farm workers during our study period. The service sector is also emerging as an important source of non-farm employment among total rural workforce in Visakhapatnam, Krishna, Rangareddy, and Khammam accommodating 25 per cent of incremental workforce.

(v) It also appears from the table that, only in three districts Krishna, Nalgonda, and Warangal the tertiary sector accounted for more than 60 percent of the incremental rural non-farm workforce among the main workforce. In the remaining districts secondary sector acted as a prime absorber of additional main rural non-farm workers. In case of total workforce, these three districts along with Khammam the tertiary sector accounted for more than 50 percent of the total incremental rural non-farm workforce during the period.

Thus, between broad sectoral categories such as 'secondary' and 'tertiary', it is evident that, secondary sector appears to be gaining importance as the potential source of employment among both main and marginal non-farm workforce in Andhra Pradesh. In other words, the diversification of rural employment, i.e. away from farm to non-farm observed in a large number of the districts in Andhra Pradesh has been more due to the growth of secondary sector employment among the main and Total workforce during the period.

Table 4.11: Percentage Share of Different Sectors in Total Change in Rural Non-Farm Workers between 1991 and 2001 for *Main* Workforce

Districts/Regions	change in non farm workers (in lakh)	Mining & Quarrying	household manufacturing	non household manufacturing	Construction	Secondary sector	Trade & Commerce	Transport Storage etc	Others services	Tertiary sector
Srikakulam	39682	5.6	-13.1	36.3	28.4	51.6	-4.8	16.2	31.3	42.7
Vizianagaram	26751	12.9	0.6	11.2	28.6	40.4	-10.4	16.3	40.8	46.7
Visakhapatnam	51552	5.4	0.1	25.8	21.4	47.3	2.3	20.0	24.9	47.3
East Godavari	27796	4.1	7.5	27.9	45.5	81.0	-2.6	16.8	0.7	14.9
West Godavari	22271	-3.7	29.9	11.3	38.3	79.5	-15.8	15.4	24.6	24.2
Krishna	100983	2.6	4.6	11.3	15.7	31.7	15.9	19.0	30.8	65.7
Guntur	68961	9.1	27.6	8.3	22.8	58.8	6.2	10.0	15.9	32.1
Prakasham	103437	7.4	9.5	13.3	30.4	53.2	11.3	6.9	21.1	39.4
Nellore	57034	-2.1	18.9	19.2	23.1	61.2	7.7	8.4	24.9	40.9
COASTAL ANDHRA	498467	4.9	9.6	16.6	25.5	51.8	5.8	13.5	24.1	43.3
Kurnool	121205	8.9	15.9	14.0	12.5	42.4	15.4	10.4	22.8	48.7
Ananthapur	89900	6.4	27.7	22.0	8.8	58.5	10.6	8.0	16.5	35.1
Cuddapah	73372	4.4	16.3	12.9	18.1	47.3	12.9	9.6	25.9	48.3
Chittoor	71321	10.7	12.7	17.2	21.5	51.4	10.5	8.6	18.8	37.9
RAYALASEEMA	355798	7.7	18.3	16.4	14.5	49.3	12.7	9.3	21.1	43.0
Rangareddy	71925	3.1	9.0	9.4	24.0	42.4	7.6	13.2	33.8	54.5
Nizamabad	76287	2.8	22.1	36.6	4.2	62.9	6.8	6.1	21.3	34.2
Medak	92530	1.8	14.5	23.4	9.8	47.7	14.2	11.6	24.8	50.5
Mahbubnagar	125192	1.4	23.2	7.7	25.4	56.3	8.4	8.8	25.1	42.3
Nalgonda	75199	7.3	-17.3	19.3	23.4	25.3	16.0	19.6	31.8	67.4
Warangal	65115	3.0	25.8	-8.9	18.5	35.4	19.5	16.4	25.6	61.6
Khammam	40157	-7.6	0.6	6.8	27.0	34.4	14.1	14.5	44.7	73.2
Karimnagar	92503	-0.4	68.4	-26.0	20.1	62.4	13.8	9.1	15.1	38.0
Adilabad	47997	-30.2	66.2	1.9	19.8	87.9	5.6	13.4	23.3	42.2
TELANGANA	686905	-0.4	24.0	7.9	18.9	50.8	11.7	11.9	26.0	49.6
ANDHRA PRADESH	1541170	3.2	18.0	12.7	21.7	52.4	10.0	11.8	24.2	46.0

Table 4.12: Percentage Share of Different Sectors in Total Change in Rural Non-Farm Workers between 1991 and 2001 for *Total* (Main + Marginal) rural Workforce

	Change in Non farm Workers (in lakh)	Mining & Quarrying	household manufacturing	non household manufacturing	Construction	Secondary sector	Trade & Commerce	Transport storage	Others services	Tertiary sector
				Total Work Force (Main + Marginal)						
Srikakulam	58691	5.0	6.9	30.8	28.3	71.0	-4.0	12.9	20.0	29.0
Vizianagaram	77121	4.2	8.7	25.5	23.5	61.9	3.4	15.8	18.9	38.1
Visakhapatnam	42245	9.8	15.5	16.0	23.1	64.3	-4.6	12.1	28.2	35.7
East Godavari	44955	3.9	19.1	36.7	34.5	94.2	4.3	12.7	-11.2	5.8
West Godavari	23262	-3.3	35.3	42.3	44.9	119.2	-12.0	18.4	-25.6	-19.2
Krishna	117382	2.5	7.5	13.4	16.2	39.7	15.3	17.6	27.4	60.3
Guntur	81155	8.6	28.8	11.6	22.3	71.3	5.6	9.6	13.5	28.7
Prakasham	121378	7.1	11.9	14.2	30.8	64.0	10.5	6.6	18.9	36.0
Nellore	-1434606	1.9	14.2	14.6	2.0	32.7	23.3	6.7	-1.3	28.7
COASTAL ANDHRA	-868417	-0.3	14.2	11.1	-13.4	11.6	35.0	2.9	-12.9	25.0
Kurnool	90458	4.2	18.3	13.8	19.6	56.0	12.4	9.0	22.6	44.0
Ananthapur	134618	8.6	16.5	15.0	13.0	53.0	14.8	10.0	22.2	47.0
Cuddapah	106864	6.2	29.6	21.9	9.9	67.6	9.9	7.2	15.3	32.4
Chittoor	96430	9.5	15.9	18.3	21.8	65.5	11.3	8.1	15.2	34.5
RAYALASEEMA	278431	9.8	22.7	19.7	20.4	72.5	7.2	9.5	9.1	25.8
Rangareddy	91865	3.6	11.1	10.7	24.9	50.3	8.3	12.3	29.1	49.7
Nizamabad	97238	3.0	29.0	37.0	6.3	75.3	8.0	5.8	11.0	24.7
Medak	126556	1.7	19.0	25.9	10.3	56.9	12.4	9.4	21.3	43.1
Mahbubnagar	159726	1.6	25.0	9.3	25.5	61.4	8.1	7.9	22.6	38.6
Nalgonda	92509	7.0	-5.9	21.9	23.9	47.0	13.2	17.5	22.3	53.0
Warangal	88471	2.6	27.7	-1.2	19.0	48.1	16.2	13.3	22.4	51.9
Khammam	52633	-5.2	8.6	9.7	26.1	39.2	12.3	12.4	36.2	60.8
Karimnagar	122259	0.5	65.1	-15.3	19.3	69.6	11.7	7.7	11.1	30.4
Adilabad	68700	-20.5	58.8	5.3	20.8	64.4	6.4	11.2	18.0	35.6
TELANGANA	899957	0.4	27.3	11.4	19.3	58.4	10.6	10.3	20.7	41.6
ANDHRA PRADESH	2016939	3.2	21.2	15.1	20.0	59.5	11.7	10.3	18.6	40.5

SUMMARY AND CONCLUSION

As expected, the districts of Andhra Pradesh differed significantly with regard to the incidence of non-farm employment. All through our study period, the incidence of non-farm employment among the main workforce has been highest in Rangareddy (28.5 per cent in 2001) while Karimnagar and Khammam shared the lowest position interchangeably in 1991 and 2001, as the incidence of rural non-farm employment is lowest in Khammam(17.8 per cent in 2001) . As regards, the incidence of non-farm employment among the Total Rural workforce, taking Main and Marginal workers together, Nizamabad has captured the first position. In the year 2001-02, the incidence of non-farm employment in Nizamabad exceeds 33 per cent. On the other hand, Mahbubnagar and Khammam posited at the lowest position in 1991 and 2001 respectively as the incidence of non-farm total workers during 1991-92 being less than 13 per cent that slightly improves to 16.4 per cent during 2001-02.

In Andhra Pradesh an imperative feature of non-farm development over the post reform decade has been that, while in pre reform 1991 only one district Nizamabad fell in the category those with a high (more than 25 per cent) incidence of Total non-farm workers, three districts found to place with a high incidence in the year 2001. Interestingly, no single district in Andhra Pradesh has been identified to be categorized as the low incidence of non-farm employment during 2001. All the remaining nineteen districts have reallocated their position to the category of medium incidence of non-farm employment during this period.

As regard to Main workforce in the states, however, there has been an impressive improvement in the incidence of non-farm employment over the last decade. Nevertheless looking at the over all situations (Main and Total workforce), we conclude that, the process of occupational diversification which had restricted only in few districts in early 1990s, has perhaps started gaining its momentum by the year 2001 which should be welcomed as happy development. In any case, the type of occupational diversification experience in larger parts of rural Andhra Pradesh over the post reform period or so could hardly be dismissed as an unimportant observable fact.

Our study exposed that as of 2001, Nizamabad had the most diversified employment structure of Total rural workers, which is followed by Karimnagar, and Rangareddy. In all these three districts, the incidence of Total rural non-farm workers exceeds 25.0 per cent in 2001. As regards employment of main workforce apart from highly diversified districts of Nizamabad and Karimnagar, other districts where a significant proportion of main workers were in non-farm employment are Rangareddy, Adilabad, Cuddapah, Medak, Nalgonda, Srikakulam, and Nellore. So, as a whole, in the year 2001 there appears to be nine districts where the degree of occupational occupation has been 'high' while in thirteen other districts (Mahbubnagar, Warangal, Khammam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari , Krishna, Guntur Prakasham, Kurnool , Ananthapur and Chittoor) this has been of 'medium' level. It is apparent that, the medium incidence of non-farm employment among main workforce is more pronounce in Coastal Andhra and Rayalaseema region, while the high incidence of non-farm employment is more prominent in Telengana region during 2001. However, in case of Total non-farm workforce all three regions registered medium level of non-farm employment in 2001.

We computed annual growth rates of non-farm workers in Andhra Pradesh as well as for twenty-two major districts during this reference period 1991 to 2001 separately for Main and Total rural workforce. Our main findings here has been that, the non-farm main workers in total, taking Main and Marginal workforce together in Andhra Pradesh experienced low growth rates between the years 1991 and 2001 (less than 5 per cent per annum); while the growth of non-farm employment among Main workforce is marginally lower than the growth of non-farm employment among Total rural workers. Almost a similar conclusion can be drawn as regards growth patterns of main non-farm workforce at district level; interestingly, the growth rate of Total workforce is much higher than the rate of growth among main workforce in majority of the districts of rural Andhra Pradesh. This implies that the grater marginalization of rural workforce towards non-farm employment thrive the growth of Total rural non-farm employment during the post reform period. It is also to be noted that overall the growth patterns of non-farm workers in majority of districts followed the growth pattern observed for rural Andhra Pradesh.

In analyzing the overall scenario of rural employment in Andhra Pradesh at this two reference point 1991 and 2001, we observe that, among main workforce there was a rapid increase in the share of agricultural employment from 58.8 percent in 1991 to 76.1 percent in 2001; while in case of Total rural workforce, taking Main and Marginal workers together rural employment witnessed a genuine reduction of the percentage share in this sector through out the period. Interestingly the increase in the share of cultivators has pushed the frontier of agricultural employment among main workforce with a simultaneous decline in the share of agricultural labour during this period. In case of total workforce, the shrinkage in cultivators' community in rural Andhra Pradesh is evident in 2001. This implies a considerable marginalization of rural workforce towards non-farm employment through out the period. In rural non-farm employment both the Main and Total workforce the percent share has been increased by more than 6 percentage point during the period. Industry wise the highest share was registered by rural manufacturing followed by services, trade, construction and transport.

The growth of employment of farm workers is higher among rural main workers, while in case of the growth rate of non-farm employment; Total rural workforce is much ahead of the total Main workforce. Except the growth of agriculture-allied employment amongst Main workers, for all other remaining sectors, the growth of employment is much better among Total rural workers in comparison to total Main workforce. Now looking at the sectoral growth rates of rural employment during the decade broadly, we observe that the highest growth rate was secured by construction activities, followed by transport etc, agriculture allied activities, household manufacturing, mining, services and trade. In case of Main workforce, within agricultural employment, there was a decline in absolute numbers of both cultivators and agricultural labourers. However, in case of Total rural workers, the increase in absolute numbers of agricultural labourers is quite vivid during the period.

In analyzing the sectoral composition of rural non-farm workers at Andhra Pradesh, we found that rural manufacturing sector occupies an important position in providing employment to Total rural non-farm workers, which is followed by, in order of importance, by services, trade (wholesale and retail), construction and transport-storage etc. In case of

total Main non-farm workforce, the sectors, in order of importance, have been manufacturing, services, trade and construction.

The district level scenarios as regard sectoral composition of non-farm workers reveal that, in the year 2001, rural manufacturing sector absorbed more than 10 per cent of Main rural workforce in Nizamabad, Medak, Karimnagar, and Adilabad. The services sector played an important role in providing employment to Main non-farm workforce in Srikakulam, Visakhapatnam, East Godavari, West Godavari, Nellore, Cuddapah, and Rangareddy, (absorbing more than 8 percent in each states) the trade sector has been absorbing more than 4 per cent in Srikakulam, Vizianagaram, east Godavari, West Godavari, Krishna Nellore, Cuddapah, Rangareddy, Medak, and Nalgonda. Another sector namely construction has absorbed more than 3 per cent of Total rural labour force in Prakasham, Rangareddy, and Mahbubnagar. In majority of the districts, construction occupies more than 2 per cent of total rural Main workforce. . In case of Total non-farm workforce, it is observe that, rural manufacturing sector in Nizamabad, Medak, Nalgonda, Warangal Karimnagar, Adilabad absorbed more than 8 per cent of the Total rural workforce. Even in the states like Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Nellore, Cuddapah, Ananthapur Chittoor, Rangareddy and Mahbubnagar in Andhra Pradesh this sector alone provided employment to more than 6 per cent of Total rural workforce. Similarly, the services sector has been highly important from the point of view Total workforce employment in Srikakulam, Visakhapatnam, East Godavari, West Godavari, Cuddapah and Rangareddy (absorbing 7 per cent or more of the Total rural labour force.). As regards employment in trade, the most important districts are East Godavari, Krishna, Nellore, and Rangareddy. Construction makes significant contribution in Prakasham, Nellore, Rangareddy and Mahbubnagar only.

We also computed the annual growth rates of rural non-farm Main and Total workers in each sector for the state Andhra Pradesh as well as for the districts. Our main findings here has been that, Total rural non-farm workers in construction sector experienced most impressive growth rates between 1991 and 2001(more than 12 percent per annum). Almost a similar trend can also be noticeable as regard growth patterns of rural Main non-farm workforce at state level. It is also observed that, by and large the growth patterns of non-

farm workers in majority of districts followed the growth pattern observed for Andhra Pradesh as a whole.

In this recent decade, construction sector recorded the highest growth of Total Rural non-farm workers, which is followed in descending order of growth rates by non household manufacturing and transport-storage etc. in case of rural non-farm Main workforce, the growth of construction sector is followed by growth rates in transport, household manufacturing, other services, and non household manufacturing. In construction, the districts like Srikakulam, Prakasham, Mahbubnagar, Rangareddy and Adilabad witnessed an outstanding growth of employment of Total non-farm workforce during the period, while in Srikakulam, Vizianagaram, Kurnool, Ananthapur and Nizamabad the expansion of non household industries were noteworthy. In transport etc the growth rates of employment are considerably high in Krishna, Kurnool, Rangareddy, Medak, Mahbubnagar, Warangal and Adilabad. Amongst Main non-farm workforce, the growth of employment in construction is high in Visakhapatnam, East Godavari, West Godavari, Krishna, Prakasham, Kurnool, Ananthapur, Mahbubnagar, Adilabad and Karimnagar. In transport East Godavari, Guntur, Kurnool, Medak, Karimnagar, and Adilabad registered a significant expansion of non-farm employment during the decade. The household manufacturing recorded remarkable growth of non-farm Main workers in Vizianagaram, Prakasham, Ananthapur, Chittoor, Mahbubnagar, Warangal, and Adilabad. Services are important in East Godavari, West Godavari, Prakasham, and Kurnool, while in transport sector the noticeable expansion of employment is evident in East Godavari, West Godavari, Krishna, Guntur, Kurnool, Chittoor, Medak, and Karimnagar.

In analyzing the growth rates and shares of rural non-farm employment in traditional and modern non farm sectors in Andhra Pradesh we observed that, in Andhra Pradesh the growth of modern RNFS is higher than the growth of employment in traditional RNFS for both Main and Total workforce. In case of Main workforce, the districts like West Godavari, East Godavari, Guntur, Prakasham, Chittoor and Karimnagar the growth of employment is significantly high in modern RNFS; while the traditional RNFS is significant in Prakasham, Ananthapur and Karimnagar. The shares of employment during the period, in 2001 is remarkably high in Rangareddy, Medak, Nalgonda; while The share of employment is high in the districts like Srikakulam, Nellore, Cuddapah, Nizamabad,

Karimnagar and Adilabad. Incase of Total workforce, the growth of employment in modern sector is highest in Prakasham, the other districts where the growth of employment in modern RNFS is high are Ananthapur, Kurnool, Medak, Mahbubnagar, Nalgonda and Krishna. The growth of employment of Total rural Workers in traditional RNFS is highest in Mahbubnagar. The other districts like Rangareddy, Ananthapur, Adilabad, and Medak have also registered impressive growth of employment in traditional RNFS. The share of modern RNFE almost in all major districts have higher share than the share of employment in traditional sector. In Krishna, Prakasham, Nellore, Rangareddy, Medak, Nalgonda and Mahbubnagar the share of employment in modern RNFS is relatively higher than other district while in traditional RNFS the share of employment is noticeably high in Srikakulam, Kurnool, Nizamabad, Karimnagar and Adilabad.

Our identification of the emerging sub sectors within the rural non-farm sector in Andhra Pradesh as well as in districts provided a holistic picture in post reform period. From this exercise, it is revealed that in all Andhra Pradesh, for Total rural non-farm workers, the emerging and most promising sectors have been rural manufacturing and construction, which absorbed the bulk of the incremental Total non-farm workers in rural Andhra Pradesh over the post reform 1991 to 2001. In case of Main non-farm workers, however, the most promising sectors appear to be rural manufacturing and services. Nevertheless, taking a broad view it appears that, as regards absorption of incremental Total non-farm workforce, rural manufacturing has been emerging fast in Visakhapatnam, East Godavari, West Godavari, Guntur, Cuddapah, Nizamabad, Medak, Mahbubnagar and Karimnagar. Construction seems to be doing well in Srikakulam, East Godavari, West Godavari, Prakasham, Mahbubnagar, and Khammam; services activities in Visakhapatnam, Krishna, Rangareddy and Khammam; Wholesale and Retail trade in Krishna, Nellore, Ananthapur and Warangal. As regards the employment of incremental main non-farm workforce, rural manufacturing has been steadily assuming importance in East Godavari, West Godavari, Guntur, Nellore, Ananthapur, Nizamabad, Medak, Karimnagar and Adilabad. . The other sectors that are emerging as important are services in Srikakulam, Vizianagaram, Krishna, Cuddapah, Rangareddy, Nalgonda, Mahbubnagar, Warangal and Khammam and construction activities in Srikakulam, Vizianagaram, East Godavari, West Godavari, Prakasham and Mahbubnagar. It also needs to be mentioned that, when we consider broad

sectoral categories such as 'secondary' and 'tertiary', the former sector clearly appears to have employed greater proportion of incremental both Total and Main non-farm workers in Rural Andhra Pradesh as well as in the majority of the districts. This findings leads to conclude that, in the process of occupational diversification that is experienced by India as well her states the secondary sector assumes the pivotal role in the process in case of both Total and Main rural non-farm workforce during the post reform period.

Therefore, the central point of the district level analysis clearly identifies the fact that, since the growth of agricultural employment in large pats of Andhra Pradesh have been stagnated during the post reform period; creation of a strong base of non-farm sector is urgently called for. The trends and structural composition of rural employment, comprising of farm and non-farm employment in Andhra Pradesh over the reference period clearly underlie the fact that, rural non farm sector could play the role of 'safety net' for vast section of rural (both main and marginal) workers particularly in the event of periodic slide in agricultural employment or in absence of gainful agricultural employment. Perhaps, this could be the reason why both the Coastal Andhra and Telengana region, though belong to completely different agro-climatic region show considerable expansion of rural non-farm employment. The increasing intensity of employment diversification in the districts of rural Andhra Pradesh is quite substantial during the post reform period 1991 to 2001. This is also very likely to contribute to the State's recent efforts to lowering the rural distress and poverty. In fact, the prevailing situation immediately necessitates re-orientation state's rural development policy aimed according an important role to the rural non-farm sector in overall strategy for promoting growth and employment.

CHAPTER 5

FACTORS DETERMINING RNFE AND VARIABLES USED IN THE REGRESSIONS

This chapter will describe the determining factors of districts' rural non farm employment for both main and Total workforce (Main+ Marginal) viz., the ratio of rural non farm sector main workers (those who have worked more than six months (183 days) in the year) to total rural main workers and the ratio of Total rural non farm workforce (consisting of both Main and Marginal category of workers) to Total Rural workforce. The hypothesized determinants are represented by the variables listed in this section, and analyzed by multiple regressions. These factors can be broadly categorized in two groups: agricultural related variables (1) commercialization, (2) irrigation (3) land holding size, and non farm related variables: (4) urbanization (5) incidence of poverty (6) levels of literacy (8) land pressure and (9) infrastructure.

These independent variables are explained below.

Agriculture related variables:

Commercialization (X_1): this is measured across the districts by the percentage of area devoted to the cultivation of non food crops in total gross cropped area. We make a hypothesis that, the greater market oriented commercial crops would enhance the agricultural income that in effected can be transmitted through increasing demand for non farm goods, thus accelerating the growth of non farm employment. Besides, employment opportunities in non-farm activities like processing, grading, and marketing, may be more widespread.

It is in fact, observed in many instances that rice is often a commercial crop and that involved a high proportion of non farm activities. During a survey in the villages of Chandia and Comilla in Bangladesh, Greeley (1987) recognized that, 25 per cent of the net value added that was embodied in rice at retail generated from post harvest local rural non farm sector activities. The process of winnowing, threshing, drying, husking and milling are all essential to transform the farm product into a consumable. Thus this process is inherently integrated with commercialization of agriculture. Nevertheless, the strength of local linkages varies across the types of the crops; e.g. jute would generate

more rural non farm employment than rubber processed usually far away for most added values. In Andhra Pradesh, the main non food commercial crops are oilseeds, groundnut and castor, seasum, sunflower, chillies, sugarcane, Mesta, cotton and tobacco. These crops involve a lot of local processing employment for oil seeds, cotton and tobacco more than for rice. Thus, this study expects a positive relation between non-farm employment and the proportion of area under commercial crops to total cropped area.

Irrigation ***(X_2)***: irrigation is a significant contributor to agricultural development by enhancing growth and productivity, so this is often treated as an important indicator to agricultural development. An increase in the irrigation ratio (measured by the percentage share of gross irrigated area to total gross cropped area) results in a shift in cropping pattern from less remunerative crops to more remunerative crops and improvements in factor productivity. The combined effect would be realized in the increase in value addition that gradually augmented incomes in agricultural sector. So, our hypothesis is that, irrigation augmented agricultural income that will lead to an intensification of demand for goods and services produced in rural non farm sector via forward and backward avenues of consumption and production linkages, thereby creating new employment opportunities in rural non farm sector.

The study of Kumar (1984) attempted to examine the relationship between the extent of irrigation and level of non farm employment at the village of Matar Taluk in the state of Gujarat during the period 1965-82. This study was based upon a sample of 28 villages obtained from census data of 1961 to 81. A cross section analysis revealed that, there is no such meaningful relationship between these two for any of the census years. The simple correlation coefficients were all negative though not statistically significant. Thus Kumar concludes that his analysis does not suggest any relation between irrigation and Rural Non Farm Sector.

Another study by Hazell, P. and C. Ramasamy (1991) pointed out that, irrigation always elevated farm labour (whether by intensifying double crop which allows more fertility leading to higher investment or by extensifying more land). Thus they concluded that, if irrigation has to raise non-farm labour even more than farm labour, very strong local linkages are considered necessary to enhance such non farm employment.

So, the impact of irrigation on non farm employment is conjectured through its impact on output, factor productivity and agricultural income. Contrastingly, it would also be possible that, in a highly irrigated area, the seasonal variation in demand of farm labour is reduced considerably; consequently this may reduce the need for looking for alternative RNFE. So it is difficult to ascertain the net impact of irrigation on rural non farm employment. A positive relation is hypothesized based on the presupposition that the linkage effects will outweigh the negative possibility of reduction in employment. This also implies that as total demand for labour farm and non-farm rises there will be a tendency to introduce labour-saving innovations in both sectors.

We argue that, irrigation would work separately, only if given per capita agricultural output, and given yield, irrigation enhances the linkages to local RNFS. But irrigation also reduces seasonality of agricultural labour, cutting the need to seek RNFS work.

Land holding size **(X_3):** The share of rural non farm employment is hypothesized to have an inverse relationship with the average size of the operational holdings per person. The limited absorptive capacity of their operational holdings compels the poor, landless labourers and land poor farmers to switch over to Rural Non Farm Sector. On the other hand, agricultural output or income creates greater demand for RNFS and generates surplus for investment in the RNFS. A substantial improvement will be to count irrigated land or the crop twice. Therefore it is argued that farm size may have positive or negative relationships with RNFE. Average farm size is estimated in hectares.

Non-farm related variables

Levels of literacy **(X_4):** The impact of literacy on rural non farm sector is expected to be positive [Chadha (1992)], however non farm activities can be broadly divided in to two types- traditional and modern. In traditional non-farm employment, literacy may be dissuading factor to participation or employment. On the opposite side, it may have favourable impact on modern rural non farm sector.

It can be expected that, education may have negative effect on labor supply; because as the education level among the workers increases, their preference for manual work changes. The levels of education would also alter their attitude to work. Data results at disaggregated level should be examined to analyze the impact of education on rural non

farm employment, especially on modern non farm sector that is hypothesized to have a positive relation with the level of education.

Therefore, we need to study the impact of literacy on different categories of non farm employment, broadly among the traditional non farm sector and modern non farm sector. Because, modern sector may require literate and skilled labour force, where in other traditional sector, the unskilled labour can be absorbed. So, we expect a positive association of literacy with modern non farm sector and a negative relation with the traditional rural non farm employment. In our analysis we have considered seven different major categories of activities in addition to the aggregate level. The level of literacy is estimated by calculating the proportion of literate population to total population.

Urbanization (X_5): urbanization is measured by the proportion of population in urban areas out of total population. The process of urbanization can affect the share of rural non farm employment in two ways. In supply side, urban workplaces provide new employment opportunities for the people residing in rural areas. Workers in rural areas may physically move between urban and rural fragment. If the rural non farm workers shift to town, then the proportion of rural non farm employment would come down; consequently, the proportion of rural residents engaged in non-farm production rises. Besides, the urban markets help to the commodities produced in rural non farm sector.

Basically, there are two main avenues through which urbanization bears a positive association with rural non farm sector. On supply side, it provides production support and location advantage to rural non farm sector. Urbanization requires services of local artisans, semi skilled, illiterate causal workers in rapidly growing urban manufacturing and services. It creates demand for manufactured consumer goods and semi-finished raw materials of rural based. On demand side, urban markets play the role in originating the demand for goods and services produced in rural non farm sectors. The small towns and cities act as urban hubs with full market opportunities for rural non farm products. The study of Shukla (1991) concluded that: the share of small towns in district urban population provide a necessary support in favour of magnitude and share of rural non farm employment.

Percentage of bank branches in villages(X_6) and Road length in a rural district(X_7): we have used road length per 100 square kilometers and rural banks per 100,000 people as proxy variables for the infrastructure. The role of infrastructure in promoting rural non farm employment is crucial. The availability of physical infrastructure such as roads and banks will be high in the developed region. Also, the infrastructure would facilitate the magnitude of rural non farm employment through production or product supply side. Rural infrastructure also influences the supply costs (farm and non-farm) as it also affects the articulation of supply and demand via cheap transport and information. But again the role of infrastructure can work in two opposite directions—one hand it permits urban areas, for instance, to demolish rural competition by cheaply entering at (low) marginal cost. In the case of Maharashtra a negative relation was observed (Shukla, 1991). Shukla noted that infrastructural investments in rural areas give inducement to the position of agricultural development, at the expense of Rural Non Farm Employment, through this is not counterproductive to Rural Non Farm Employment. However, on balance we expect a positive sign for the coefficient.

The percentage of villages with rural bank branches was shown by Binswanger and Khandker (1995) to be a powerful explanatory of RNFS share and growth across districts in all-India (though not an explanation of agriculture variance).

Several studies aimed to identify the role of rural infrastructure o in promoting the rural non farm sector (Hazell and Haggblade (1991); Shukla (1991 and 1992); H. P. Binswanger (1993) and G. Gangadhar (1997)]. The reason of assigning a positive role of rural infrastructure is that, it stimulates the responsiveness of the rural non farm activity toward increased demand arising from agriculture and urban growth centres. We consider the road length to represent the infrastructural facilities at the district level.

The studies by Haggblade (1995), Shukla (1991) and Gangadhar (1997) found a positive sign in their empirical exercise. In the study by Murty and Durga (1992) agricultural development, infrastructural development and overall development are all expected *a priori* to have a negative relationship with RNFE, while a positive sign is expected for the poverty coefficient.

Incidence of poverty (X_8): the incidence of poverty is measured by the percentage of population below poverty line. The association between poverty and rural non farm employment may be positive or negative depending upon the particular situation persists in rural areas. The high level of poverty may result in high level of RNFE due to *'distress diversification'*. If the condition of agricultural development is poor and inadequate to generate sufficient income, then the dependence on non farm activities would be relatively high for survival of the poor people ion rural areas. If a particular region/district suffers from acute poverty the effective demand would be low; that in effect jeopardize the expansion of RNFE. In these regions the relative lack in the effective demand for rural non farm goods and services compared to the regions with similar average consumption but less poverty prevent the development of non farm sector rather than encouraging it. The higher saving income ratio of relatively rich works as an incentive for the expansion of rural non farm sector. The initial hypothesis is that there will be an inverse relationship between the incidence of poverty and non-farm employment.

Land Pressure (X_9): land pressure is measured in terms of population density. Population pressure may attribute positively to the expansion of rural non farm employment. In words, if demographic pressure is accompanied by a sustained increase in per capita income in rural increase, it would aggravate the demand for certain services e.g. construction activities in local non farm sector. Otherwise if population density would not be an adjunct to persisting rise in income of the rural people, then the increasing demographic pressure may necessitate the expansion RNFS with the presence of overpopulated agriculture sector. So, our hypothesis would say that, any positive association would suggest wider development linkage hypothesis and negative relation would capture the distress driven phenomena of employment diversification.

Definitions are given in the following table 5.1.

Table 5.1: Description of the variables used in the Regression Analysis

	variables	Definition	Sources
X_1	% Commercial crops to total cropped area Commercialization = % "non-food" crops / total crop.	The area under commercial crops in each district of AP for 1991 and 2001 refers to crops which are used for Total condiments and spices (areca nuts, turmeric, ginger, garlic, coriander, tamarind); Total oilseeds Groundnut, seasum, coconut, rape and mustard, sunflower, Total edible oil seeds (linseed, castor, niger seeds); Total drugs and Narcotics (coffee, Indian hemp, betel leaves, tobacco).	Season and crop reports 1991-92 and 2000-01, Directorate of Economics and Statistics, Govt. Of AP
X_2	Irrigation ratio = % irrigated area / total cropped area	Measures the potential irrigation (takes into account existing or planned irrigation command areas. An irrigation command area is an area which receives or which is expected to receive water from an irrigation system). % gross areas irrigated to gross sown area (in '000 Hectares).	Directorate of Economics and Statistics, Govt. Of AP 1991 and 2001
X_3	Average Farm Size in Hectares (operated).	Total operated land in a district/number of holdings in a district.	Statistical Abstracts of AP (1991 and 2001), Directorate of Economics and Statistics, Govt. Of AP,
X_4	Literacy rate	% literate population to total population	Census of India, 1991 and 2001
X_5	Level of Urbanisation	Urban population as percentage of total population. Urban areas are defined to have the following characteristics: a minimum population of 5,000, a minimum population density of 400 persons per square kilometer, and at least 75 per cent of the male working population engaged in non-farm pursuits	Census of India, 1991 and 2001
X_6	% Rural Population below the Poverty line	The poverty norm has been developed by Centre for Economic and Social Change (CESS).	Centre for Economic and Social Change, Hyderabad,

X_7	Infrastructure / Banks % of Banks those are rural in total number of banks in a district.	Percentage of villages with bank branches per 100,000 populations. Measures the district-wise spread of commercial bank offices in AP in 1991 and in 2001.	Statistical Abstracts of AP (1991 and 2001)
X_8	Road length. Total length of roads / 100 km^2 Geographical areas.	Road length per 100 square kilometers. (Roads maintained by the P.W.D (R&B), National Highways district-wise, 1990-91 (in Kms) and roads maintained by *zilla praja parishads* and by *Mandal praja parishads*).	Statistical Abstracts of AP (1991 and 2001)
X_9	Land pressure	Population density	Census of India, 1991 and 2001
Y_1	Rural Workers in non farm Activities as a % of total workers	Non-farm employment is measured by primary occupational status. Individuals are asked whether they worked in agricultural or non-agricultural activities for at least 183 days during the previous year. It is defined as (the ratio of non-farm workers divided by total rural main workers) * 100. Rural non-farm workers are defined as rural main workers	Census of India, 1991 and 2001

5.1: Values and Key characteristics of the dependent and explanatory variables

A summary of the variables of 1991 and 2001 of the 1991 level, 2001 level values for all the variables are presented in tables 5.1 and 5.2 respectively. Table 5.2 reports about the summary statistics for independent variables. Descriptive statistics were computed and the mean difference was estimated by the t-ratio. Five independent variables are statistically significantly different at 1 per cent in 1991 and 2001-- commercialization, average farm size, literacy rate, and percentage of population below poverty line, road infrastructure and number of banks in rural areas per 100000 populations.

The average farm size, measured by the average operational holdings in Andhra Pradesh is lower in 2001. The available data on the operational holdings suggest that since 1971 this state has witnessed a gradual decline in the absolute number and area covered by large and medium holdings. There is therefore an increase in smaller holdings compared to large holdings, and it is also evident that, this large increase in small holdings is significantly attributed to proportion of tenancy contracts. Besides, the issue of substantial increase in marginal holdings that accounted for more than half of farmers in the early 1990s is likely to impact on the cultivation in Andhra Pradesh.

TABLE 5.2: Descriptive statistics of the independent variables for 1991 and 2001

	Independent Variables	Mean for 1991 (standard deviation) [C.V.]	Mean for 2001 (standard deviation) [C.V.]	t-value of the difference between 1991-2001
X_{1it}	% Commercial Crops to Total Cropped Area	35.1 (25.7)[73.2]	30.0 (18.4) [61.3]	1.84*
X_{2it}	% Irrigation to Total Cropped Area	43.7 (18.68) [42.75]	44.9 (18.9)[42.09]	-0.92
X_{3it}	Average Farm Size (Acres)	3.92 (1.34) [34.18]	3.1 (1.34) [43.22]	8.09***
X_{4it}	% Literacy to Total Population	41.83 (6.74) [16.11]	59.45 (6.44) [10.83]	-29.51***
X_{5it}	Urban Population as Percentage of Total Population	22.8 (8.2) [35.96]	22.7 (9.1) [40.1]	-0.024
X_{6it}	% Population below the Poverty line	42.6 (17.48)[41.03]	56.7 (8.87) [15.64]	-4.39***
X_{7it}	Infrastructure(total length roads) (Km)	46.31 (11.4) [24.62]	65.61 (16.5) [25.15]	-6.64***
X_{8it}	Banks per 100000 Population	6.6 (2.16) [37.73]	5.82 (2.0) [34.4]	6.33***
X_{9it}	Land Pressure (Population density)	255.07 (100.09) [39.24]	289.8 (110.4) [38.09]	-8.02***
	Number of Observations	25	25	

Notes: - CV: Coefficient of variation

- Differences between 1991 and 2001 means.

- *** significant at 1 per cent, ** significant at 5 per cent * significant at 10 per cent

Table 5.3: Descriptive statistics of Dependent Variables (Cross districts average of Total Rural Workers whose primary occupation is in the sector) for 1991 and 2001

	Dependent Variable	Mean for 1991 (standard deviation) [C.V.]	Mean for 2001 (standard deviation) [C.V.]	t-value between 1991-2001
Y_{1ilt}	Mining and Quarrying	0.69 (0.72) [103.6]	0.80 (0.50) [62.05]	-1.07
Y_{2ilt}	Household Industries	3.35 (2.61) [77.8]	4.45 (3.14) [70.49]	-4.84***
Y_{3ilt}	Non-household Industries	2.9 (1.14) [39. 1]	3.66 (1.18) [32.32]	-4.12***
Y_{4ilt}	Construction	0.75 (0.22) [28.8]	2.10 (0.71) [33.8]	-11.60***
Y_{5ilt}	Trade and commerce	3.23 (0.70)[21.8]	3.48 (0.49) [14.09]	-2.90***
Y_{6ilt}	Transport & etc	0.96 (0.29) [30.5]	1.6 (0.43) [27.01]	-11.57***
Y_{7ilt}	Services	5.42 (1.13) [20.8]	6.11 (0.76) [12.4]	-4.45***
Y_{8ilt}	% Rural non-farm Workers as a % of Total Rural Workers	17.3 (3.6) [20.6]	22.2 (3.9) [17.6]	-11.57***
	Number of Observations	25	25	

Notes: - CV: Coefficient of variation
- Differences between 1981 and 1991 means.
- *** significant at 1 per cent, ** significant at 5 per cent * significant at 10 per cent

Table 5.4: Descriptive statistics of Dependent Variables (Cross districts average of Total Rural Main Workforces whose primary occupation is in the sector) for 1991 and 2001

	Dependent Variable	Mean for 1991 (standard deviation) [C.V.]	Mean for 2001 (standard deviation) [C.V.]	t-value
Y_{1ilt}	Mining and Quarrying	0.72 (0.75) [104.1]	0.90 (0.54) [60.3]	-1.69
Y_{2ilt}	Household Industries	3.30 (2.54) [77.0]	4.53 (3.22) [71.0]	-4.70***
Y_{3ilt}	Non-household Industries	2.97 (1.15) [38.6]	3.9 (1.17) [30.0]	-4.85***
Y_{4ilt}	Construction	0.78 (0.22) [28.5]	2.13 (0.68) [31.67]	-11.81***
Y_{5ilt}	Trade and commerce	3.32 (0.72) [21.7]	4.00 (0.57) [14.1]	-8.44***
Y_{6ilt}	Transport & etc	1.02 (0.31) [30.5]	1.83 (0.49) [26.83]	-13.08***
Y_{7ilt}	Services	5.13 (1.0) [19.5]	6.86 (0.96) [14.0]	-12.62***
Y_{8ilt}	% Rural non-farm Workers as a % of Total Rural Main Workers	16.2 (3.16) [19.53]	24.56 (4.58) [18.64]	12.78***
	Number of Observations	25	25	

Notes: - CV: Coefficient of variation
- Differences between 1981 and 1991 means. - *** significant at 1 per cent, ** significant at 5 per cent * significant at 10 per cent

Table 5.2 reports the summary statistics for the independent variables. Descriptive statistics were computed and the mean difference was estimated by the t-ratio. Five independent variables are statistically significantly different at 1 per cent in 1981 and 1991: commercialisation, literacy, land holding size, percentage of population below the poverty line, and infrastructure (roads). The reason why commercialisation is significantly higher in 2001 is that AP has emerged as one of the major rice surplus states and also as a major supplier of commercial crops such as tobacco, chillies, cotton, sugar-cane and groundnut. Groundnut, the most important oilseed crop in AP, accounts for a substantial portion of the total Indian area under such crop Groundnut is mostly rain fed during the Kharif and irrigated in the rabi season. All four districts in the Rayalaseema region, and the Mahbubnagar and Warangal districts in the Telengana region, jointly together accounted for a significant percentage of the total area under groundnut in the State during 2001-02.

5.2 Regression Analysis

The form of equation used for average decadal growth rates between 1991 and 2001 and shares for the two years for both main and marginal workforce as well as for the sub sectors described below. The hypothesis mentioned in this chapter would be used to make inferences about the expected sign between the independent and dependent variables.

$Y_{1it} = a_0 + b_1X_{1it} + b_2 X_{2it} + b_3 X_{3it} + b_3 X_{3it} + b_4X_{4it} + b_5X_{5it} + b_6 X_{6it} + b_7 X_{7it} + b_8X_{8it} + U_{it}$

Where "i" denotes the districts and't' is the year of observation for 1991 and 2001 except for the growth equations.

Y_1 = Rural workers engaged in non farm activities as a percentage of total workers

X_2 = Irrigation ratio defined as percentage of irrigated area / total cropped area

X_3 = Average land holding size in hectares

X_4 = Literacy rate (per cent)

X_5 = Urbanisation (per cent urban population)

X_6 = Percentage of persons below poverty line

X_7 = = Banks per 100,000 (hundred thousand) population

X_8 = Total length of roads per 100 kilometers geographical area

X_9 = Land Pressure measured in terms of Population density

U_i = Disturbance term with the classical properties

The empirical findings of the econometric model are described in this section. A correlation matrix of all the variables was calculated and main findings are reported below.

5.3 The Determinants of Inter-districts variation in the shares of Rural Non Farm Employment (Main and Total Workforce) in 2001

In order to understand the nature of the relationships between dependent and independent variables, a correlation matrix of all the variables was obtained (see Appendix Table 2). This exercise is helpful to check whether variables are "related" to each other, or move together. Typically a correlation coefficient r in excess of about 0.8 reflects a strong relation and indicates the risk of multicolinearity problems. The correlation is not important but might affect some of the reduced model results. There are in fact no serious correlation problems.

In direction of the causation to RNFE, from the "independent" variables listed in our equation. The RNFS in a district might, in turn, determine any one or more of the independent variables (for example poverty). Where appropriate we return to this issue in the discussion of the regression results.

In the model there is a common intercept for all districts and for 1991 and 2001. The slope coefficients are also common for all districts and both years. This implies that disturbance terms are independently and identically distributed. The appropriate estimation method is OLS applied to panel data. Further assuming normality for the disturbance term, all the important statistical properties of the k-variable linear model are valid.

Diagnostic tests were undertaken for all the regressions for normality of the disturbance term, Heteroscedasticity and functional form. The heteroscedasticity test used was based on the regression of squared residuals on squared fitted values. It has a chi-square distribution with 1 degree of freedom. The computed residuals are used to test for normality (based on the skewness and kurtosis of residuals). In a chi-square test with 2 degrees of freedom, the result possibly indicates a non-normal disturbance term. Similar results are observed for other categories of RNFE, as will be noted subsequently.

While estimating by OLS, in most of the cases non-normality was encountered, implying that an inference cannot be made regarding the statistical significance of coefficients. To overcome this problem, we plotted the residuals and looked for outliers

The next problem was heteroscedasticity, error of variance was not constant, thereby violating one of the central assumptions of classical linear regressions model. White's (1980) heteroscedasticity corrected variance covariance matrix was used to find the appropriate standard errors and these were used to make inferences about the significance of the variables in the model.

As for functional form, although it can be detected, the solution is not straightforward. It was found that log linear specifications removed the problem except in one case (viz., mining and quarrying), where little more can be done.

The estimated coefficients of the log regression equations of the selected variables for 1991 and 2001 data for Total and Main workforce are presented in the following table. The data were tested against different models (quadratic, semi-log and log functions). Log form results capture diminishing returns and are therefore preferred and presented. The model passed all the diagnostic tests.

Total RNFE shares among main workforce: the variables explain 46 per cent of the cross-district variation in total rural non-farm employment as a share of total rural employment among main workforce. With the exception of the coefficients associated with commercialization, literacy, poverty and banks all other variables have shown the expected signs. The irrigation, significant at the 10 per cent level is positively associated with the rural non-farm employment among main workforce. The average size of farm and poverty are also positively related to rural non-farm employment though not significant. The negative sign for the variable literacy rate might be related to the fact that, literacy is affecting the percentage of Rural Non Farm Employment only once a certain level of development has been achieved: traditional Rural Non Farm Employment activities like toddy tapping, vegetable vending, canal labour and petty trade need little education.

The sign of commercialization is opposite of our hypothesis, but it is significant at 20 per cent level. This could imply that, rapid growth of commercial crops and thus income from non-food crop cultivation has failed to generate sufficient rural non-farm

employment via forward and backward linkages in product and factor market. For example the story of agro-food processing industries and contract farming in agriculture attributed to production of more cash crops. This rapid corporatisation of agriculture and greater reliance on private players (MNCs) in post reform period had in reality produced negative consequences in rural Andhra Pradesh. So, with the absence of the local linkages in rural areas and increasing distress among rural poor obstructed the expansion of rural non-farm sector. The remaining variables (including road length, and people below poverty line), have the expected signs but are found be insignificant, even at the 10 per cent significance level.

The RNFE elasticity to literacy is 0.504. Such strong impact is unlikely to run causality from literacy to RNFE; a 1 per cent increase in the percent of literate population would decrease the percent of RNFE by 0.504 per cent. One possible explanation is that, of the two types, modern and traditional RNFE, at the district level traditional RNFE outweighs the modern RNFE, where traditional RNFE require less education. The result for literacy support the wider/overall 'development linkage' (ODL) hypothesis that traditional RNFE share rises with lower levels of literacy.

Irrigation ratio indicates overall economic growth and is expected to be positively linked with the RNFS. The regression coefficient for irrigation is 0.20, and is statistically significant at 10 per cent level in explaining district-level RNFE shares. This result for irrigation suggests that higher agricultural productivity (associated with irrigation) is linked to a high RNFE share. The analysis substantiates the hypothesis that growth linkages from irrigated agriculture lead to modern RNFE.

Average farm size elasticity of RNFE is 0.198. A 1 per cent increase in the average farm size would increase the total share in RNFE by 0.198 per cent. This implies support for the hypothesis (AGL) that the traditional RNFE share rises with distress diversification. Further our results differ from those obtained by earlier researchers in the sense that they found no clear-cut significant relationship between poverty and RNFS i.e. earlier researchers did not find a significant relationship either.

Total RNFE shares among total workforce: Now if we consider the share of rural non farm employment to total rural employment among total workforce as the dependent variable, it is observed that, about 55 percent of the inter state variation in the share of

RNFE among total rural workforce is explained by the explanatory variables in the model. In this model, a negative relation between the percentage of commercialization and percentage of RNFE was observed to be statistically significant at the 5 percent level of significance. Our model suggests that, 1 percent increase in commercialization leads to 0.138 percent decline in the share of non farm employment among total workers. A similar negative relation in case of literacy rate was found which is also statistically significant at the 1 percent level of significance. This relation implies that, 1 percent increase in literacy would cause more than 1 percent decline in rural non-farm employment among marginal workforce. If the traditional rural non farm sector dominates over the modern non farm sector among total rural workers the improvement in literacy rate would lead to a reduction in traditional non farm activities as it requires less skilled and literate workforce. On the other hand irrigation, average farm size and urbanisation significant at 5 per cent level contribute positively to the share of rural non-farm employment among total rural workers.

For total workforce commercialization, urbanisation, average size of farm and irrigation are significant at 5 percent level. The elasticity of RNFE with respect to the level of irrigation is 0.22, i.e. a 1percent increase in percentage of irrigated land to total cropped area induces 0.22 percent increase in the share of RNFE among total workers. Similarly operational holding is associated directly with share of RNFE; at 5 percent level of significance. The elasticity of RNFE to operational land holding is 0.316, which suggests that, 1 percent increase in land holding would lead to an increase in the share of 0.316 percent in rural non farm employment. The importance of land distribution among rural people played contributing role the incidence of non farm employment among total workforce.

Another determining variable urbanisation, measured in terms of percentage of total population living in the urban areas has a positive correspondence with the share of RNFE. This variable is significant at 5 percent level of significance. The positive relationship shows that an increase in land pressure would cause an increase in rural non farm employment within total workforce as a whole. The elasticity of RNFE to urbanisation is 0.189, which means that a 1 percent increase in population pressure would lead to a decline in the share of RNFE among marginal workforce by 0.189 percent. This

implies that the development Indicators like urbanisation have a positive consequence on RNFE if this is allowed to increase in a persistent manner.

Table 5.5: Estimated coefficients of multiple regression of the logged percentage of non-farm to total employment in rural areas and selected variables for 1991 and 2001

Variables	Total Rural Workforce	Total Rural Main Workforce	Total Rural Workforce	Total Rural Main Workforce
Ln Y= % of RNFE	(1991)	(1991)	(2001)	(2001)
Constant	2.39894 (3.81)****	2.416353 (4.12)****	1.918924 (2.37)***	2.902 (3.08)****
Log Commercial Crops	-.074942 (-0.76)	-.0556663 (-0.63)	-.138751 (-2.17)**	-.073 (-1.09)*
Log Farm Size	-.0689242 (-0.42)	-.0854466 (-0.55)	.3163609 (1.68)**	0.198 (1.01)*
Log Irrigation	.1389576 (1.05)*	.14283 (1.18)*	.2204212 (1.74)***	0.204 (1.55)**
Log Bank	-.0211894 (0.41)	-.0166179 (-0.34)	-.0237963 (-0.44)	-0.275 (-1.72)**
Log Poverty	-.1428626 (1.63)**	-.1353739 (-1.71)**	.3040285 (1.11)*	0.158 (0.56)
Log Literacy	-.7945315 (1.54)**	-. 8159261 (-1.76)***	-1.162393 (-2.68)****	-.5041 (-0.99)
Log Urbanisation	.261736 (1.40)**	.287 (1.70)**	.1897486 (1.68)**	-0.670 (0.54)
Log Road Length	-.0741486 (-0.38)	-.0839835 (-0.45)	.0701386 (0.73)	-0.266 (-1.72)**
Log Land pressure	.0237775 (0.15)	.0063831 (0.04)	.1133674 (0.77)	-.0238 (-0.16)
R^2	0.5633	0.5546	0.5529	0.46
F =	2.15	2.08	2.06	1.41

Notes: - The figures in brackets are t-values; - Number of observations: 25;
- **** Significant at 1 per cent; *** significant at 5 per cent, ** significant at 10 per cent, and * significant at 20 per cent

5.4 The Determinants of Inter-Districts variation in the shares of Rural Non Farm Employment (Main and Total Workforce) in 1991

Total RNFE shares among Main workforce: The log-linear regression model explains 55 per cent of cross-district variations in the share of rural non-farm Employment among maiN Workforce in 1991. Like in 2001 except commercialization, literacy, road length and Bank all other coefficients of the remaining variables acquired their expected signs. Only three variables irrigation, Urbanisation and land pressure have influenced the share of rural non farm employment in a positive direction. The irrigation ratio significant at 20 percent level is directly associated to the share of RNFE whIle the level of urbanisation is turned out to be significant at 10 percent level of significance. Only the variable land pressure measured by population density though influenced positively is not significant in the model of 1991. The literacy rate is inversely related to the share of RNFE. The coefficient of literacy rate is significant at 5 percent level, which Suggests that a strong negative association between RNFE and literate persons. This reason may be the dominance of traditional non farm sector over the modern sector. Literacy may start affecting the percentage of RNFE positively only after reaching at a certain level of development.

The sign of coefficients for commercialization is negative; the opposite of our hypothesis, but is not significant. This could imply that districts with rapid agricultural growth had better absorption of labour in the farm sector itself, and thus less spillover effects into the RNFS. However the negative sign may be due to the fact that rural downs have not been Included in the analysis. Alternatavely, the problem may be that rice is a strongly 'Commercial crop' in some high RNFE districts, although in fact It is not here.

The Elasticity of RNFE to literacy is .8159 percent. Such strong impact is unlikely to run causalaty from literacy to RNFE; a 1 per cent increase in the percentage share of literate population would decrease the percent of RNFE by .8159 Per cent. One possible explanation is that of dhe two types, modern and traditional RNFE, at the district level traditional RNFE outweighs the modern RNFE, where traditional RNFE require less

education. The result for literacy support the wider/overall 'development linkage' (ODL) hypothesis that traditional RNFE share rises with lower levels of literacy.

Irrigation ratio is an indicator of agricultural development at district level in Andhra Pradesh and it is hypothesis to be positively related to share of RNFE. Incase of main workforce the regression coefficients for irrigation is 0.142 and is statiSdically significant at 20 per cent level in explaining district-level RNFE shares. These results for irrigation suggesT that higher agricultural productivity (associated with irrigation) is linked to a high RNFE share. The Analysis confirms the hypothesis that growth linkages from irrigated agriculture lead to RNFE.

The urbanization elasticity of RNFE is 0.287.A 1 per cent increase in the level of urbanisation would increase the Total share of main workers in RNFE by 0.29 per cent. Thls relationship is as expected and significant at the 20 per cent level.

This implies support for the over all development linkage hypotheses (ODL) that the RNFE share rises with higher level of urbanisation.

The coefficient of poverty is 0.13 percent. A 1 percent increase in poverty leads that decline in share of RNFE by 0.13 percent. This relationship is as expected and significant at the 10 per cent Level. This implies support for the hypothesis (ODD) that RNFE share rises with declining incidence of poverty.

Total RNFE shares among Total workforce: the log linear regression model using the percentage share of marginal workforce in al non-farm employment as dependent variable, explains 56 percent of cross district variation of share of RNFE in 1991.the variables except commercialization, literacy, road length, and banks all the remaining five explanatory variables have their expected signs. The only three variables irrigation ratio, urbanization and population density have associated positively to the percentage of RNFE among total workforce. The irrigation ratio and urbanization though directly related to the share of RNFE have not appeared to be significant in explaining the incidental percentage share of RNFE among total labour force in 1991. The level of urban population to total population is imperative at 10 percent level of significance. Like in case of main workers, the literacy is proved to be significant contributory factor among total workforce.

The coefficient of commercialization is negative opposite to our predicted hypothesis but not significant even at 20 percent level. On the other hand, irrigation, statistically significant at 20 per cent level has a positive association with RNFE. This reveals a strong positive and direct influence of agricultural development on the share of RNFE. The expansion of the irrigational facilities in the districts had induced the agricultural growth that in effect had generated the linkage effects in both traditional and modern non-farm activities in farm sector itself. The elasticity of RNFE to irrigation is 0.138, which means a 1 percent in increase in the area of non-food crops essentially increases the share of total workers in RNFS by 0.138 per cent.

The role of poverty, statistically significant at 10 percent level is also turned out to be an imrortant component in explaining the share of total workforce in non-farm activities. The RNFE elasticity to rural poverty is –0.14, i.e. a 1 percent increase in incidence of poverty would reduce the share of RNFE activities among Total workforce by 0.14 per cent. So, it can be said that Rural Non Farm sectors started performing its poverty-reducing function among total labour reserves in rural Andhra Pradesh.

The urbanisation, coming out to be significant at 10 per cent level is positively associated to the share of RNFE. The coefficient of elasticity is 0.26. This implies that, if the population density increased by 1 percent, then it would increase the share of RNFE by 0.26 percent. The level of urbanisation is considered to be one of the developmental push factors positively associated to share of RNFE.

Table 5.6: Districts shares of RNFE in Total employment among Main workforce: Estimated coefficients logged for seven sectors

	1991							2001						
Ln(Y) (X)	Mining	HHI	Non HHI	Construction	Trade	Transport	Service	Mining	HHI	Non HHI	construction	Trade	transport	Services
constant	4.16	6.43	1.36	-0.69	-0.48	-2.19	0.02	0.51	7.05	1.70	-2.02	-0.57	-2.66	0.39
	(1.52)**	(3.36)****	(1.02)*	(-0.88)*	(-0.85)	(-3.20)****	-0.03	(-0.16)	(2.27)***	(1.21)*	(-0.97)*	(-0.70)	(-1.80)***	-0.5
ln Comm.	-0.27	0.13	-0.26	0.30	-0.03	0.13	-0.01	0.23	-0.05	-0.33	0.05	-0.02	-0.04	-0.03
crops	(-0.64)	-0.42	(-1.23)*	(2.47)***	(-0.34)	(1.19)*	(-0.16)	(0.96)*	(-0.20)	(-2.99)****	-0.28	(-0.33)	(-0.34)	(-0.55)
ln irrigation	-0.45	0.64	0.32	0.52	-0.12	0.08	-0.11	0.42	0.68	-0.04	0.26	-0.15	-0.07	-0.17
	(-0.78)	(1.59)**	(1.13)*	(3.2)****	(-1.00)*	-0.54	(-0.99)*	-0.83	(1.39)**	(-0.19)	-0.77	(-1.13)*	(-0.28)	(-1.38)**
ln farm size	0.09	-0.58	0.53	0.57	-0.17	-0.12	-0.31	0.74	-0.13	0.28	0.51	-0.14	0.17	-0.35
	-0.12	(-1.16)	(1.52)**	(2.76)****	(-1.12)*	(-0.66)	(-2.32)***	(0.99)*	(-0.18)	-0.83	(1.03)*	(-0.75)	(-0.50)	(-1.89)***
ln literacy	-1.052	-4.16	-1.20	-1.40	0.81	0 .8492	0.94	-3.18	-3.93	-0.44	0.20	1.17	1.18	0.88
	(-0.47)	(-2.65)****	(-1.10)*	(-2.16)***	(1.75)***	(1.51)**	(2.28)***	(-1.92)***	(-2.42)***	(-0.60)	-0.18	(2.76)****	(1.53)**	(2.13)***
ln urbanisation	1.3046	0.88	0.31	0.60	-0.23	0.07	-0.15	1.05	0.58	0.06	-0.05	-0.18	-0.11	0.00
	(1.61)**	(1.55)**	-0.78	(2.56)***	(-1.37)**	-0.33	(-1.00)*	(1.97)***	(1.11)*	-0.26	-0.13	(-1.30)*	(-0.44)	-0.01
ln road	-0.83	0.53	-0.03	0.58	-0.23	0.13	-0.36	0.20	0.16	0.26	-0.21	-0.01	-0.38	0.12
length	(-0.98)*	(0.89)*	(-0.08)	(2.37)***	(-1.30)*	-0.62	(-2.29)***	-0.23	-0.18	-0.66	(-0.37)	(-0.03)	(-0.93)*	-0.54
ln poverty	-0.13	-0.45	-0.02	-0.13	-0.05	-0.15	0.00	1.49	-0.12	-0.05	0.79	-0.22	0.38	-0.19
	(-0.35)	(-1.70)**	(-0.09)	(-1.20)*	(-0.70)	(-1.52)**	(-0.03)	(1.29)*	-0.11	(-0.10)	(1.04)*	(-0.75)	-0.72	(-0.67)
ln banks	-0.18	-0.11	0.01	-0.10	0.00	0.00	-0.01	0.01	-0.07	-0.21	-0.20	-0.23	-0.25	-0.21
	(-0.80)	(-0.69)	-0.09	(-1.55)**	-0.08	(-0.04)	(-0.33)	-0.07	(-0.45)	(-2.81)****	(-1.84)***	(-5.4)****	(-3.2)****	(-5.1)****
ln	-0.72	-0.59	0.11	-0.10	0.32	0.21	0.14	0.12	-0.52	-0.11	0.20	0.10	0.52	-0.14
land pressure	(-1.08)*	(-1.25)*	-0.32	(-0.51)	(2.36)***	(1.24)*	-1.11	-0.15	(-0.65)	(-0.30)	-0.38	-0.49	(1.36)**	(-0.68)
R^2	0.54	0.53	0.45	0.68	0.715	0.8	0.708	0.6	0.41	0.58	0.38	0.758	0.61	0.7099
F	2	1.94	1.38	3.65	4.19	6.71	4.05	2.54	1.16	2.27	1.04	5.24	2.63	4.08
Hetero scadasticity	0.976	0.71	0.033	1.262	1.742	0.563	0.01	2.432	1.655	0.148	0.087	0.607	0.249	3.006

Notes: - The figures in brackets are t-values; - Number of observations: 25;
- **** Significant at 1 per cent; *** significant at 5 per cent, ** significant at 10 per cent, and * significant at 20 per cent

5.5 The inter Districts Variations in the share of RNFE for *Rural Non Farm Main workforce* by Industry (seven Categories Only)

The estimated coefficients of the multiple regression analysis of the districts shares of RNFE Log equation for seven distinct non-farm sectors are reported in Table 5.6. In disaggregating total RNFS into seven sectors we followed the categories specified in 1991 and 2001 census: mining, household industry (HHI), other than household industry (NON-HHI), construction, trade, transport and services. Of these, some are wholly or predominantly modern (i.e. non-HHI. trade, transport and services) whilst others are wholly or predominantly traditional (i.e. HHI, construction) groups of activities. The present results have a higher adjusted R^2 as well as a consistent pattern of signs and level of significance for many variables.

This sub section can be concluded by looking at the significant variables which we have identified. We separate these variables depending upon the central hypothesis which is distress diversification to traditional Rural Non Farm Sector and or growth linkages to modern RNFE. We underlined that, it not always possible to trace out whether there will be support either for or against the hypothesis for each variable we examined.

For mining and quarrying, the level of urbanisation and literacy are significant at 5 per cent level. Urbanisation is positively associated to share of RNFE in this sector, while literacy is inversely related to this traditional sector.

For household-manufacturing industries, the irrigation ratio, significant at 10 percent level is directly associated with household industries, while the literacy rate, significant at 5 per cent level has an inverse relationship with household industries.

For non-household manufacturing industries, commercialization and banks, significant at 1 percent level, are inversely related to the employment share in this sector. Average size of farm, significant at 10 percent is also associated positively to this modern RNFS.

For construction activities, the number of banks in rural areas is significant at 5 percent level affecting in an adverse way.

For trade and commerce activities, literacy rate, statistically significant at 1 per cent is directly associated with the share of RNFE in this sector, while no. of banks, statistically significant at 1 percent level varies inversely with the activities.

For transport-storage and communication activities, the literacy rate and land pressure, statistically significant at 10 percent are positively associated to TSC, while the no. of banks, statistically significant at 1 percent is inversely related to this activities.

In services, irrigation and average farm size statistically significant at 10 percent and 5 per cent respectively inversely related to these activities, while literacy significant at 5 per cent level contributed positively to these activities. The no. of banks, statistically significant at 1 percent is inversely proportional to services.

So, from the above highlights of the facts, we can conclude that, irrigation has a significant positive association with household industries and services confirming the Agricultural growth linkage hypothesis. For modern RNFS, commercialization and banks negatively affect the incidence of non household industries, which supports the wider development linkages hypothesis. Construction activities are also negatively associated to the no. of banks in villages; this may suggest that, the developmental indicators would ensure the over all development linkage hypothesis. The average farm size is negatively significant to the services, thus again supporting the distress driven hypothesis of employment diversification in traditional RNFS. The most important development factor in our analysis across all the sub sectors is literacy. Literacy has been manifested to be a significant factor both in positive and negative direction across all sub sectors. It is positively significant for trade and commerce and transport storage activities and traditional services but negative for mining quarrying, and household manufacturing verifying the wider distress driven diversification hypothesis. The positive relation between literacy and services also lead to distress diversification.

Urbanization is positively significant for mining and quarrying and this positive connection support the wider hypothesis (ODL), that development raises the modern RNFE share. Parallely, the incidence of poverty significant at 10 percent level is positively connected to this sector. This clearly proved the phenomena of distress induced employment diversification towards the traditional RNFS. The results showed irrigation has a significant bearing on the composition of RNFE.

The inter Districts Variations in the share of RNFE for *Total Rural Non Farm Main workforce* by Industry (seven Categories Only) in 1991

Now we look into the estimated coefficients of the multiple regression analysis of the district shares of RNFE for seven distinct non-farm sectors in the year 1991. The coefficients of urbanisation at 10 per cent level of significance, road length land pressure have a negative impact on mining and quarrying sector. In HHS industry, irrigation and urbanisation, significant at 10 percent level have a positive relation with this sector. Literacy, significant at 5 per cent level has negative effect on this traditional RNFS as expected, because literacy has a positive effect for the modern sectors such as those mostly covered: trade, transport and services. Poverty is also negatively significant at 10 percent for this sector. In non HHS industries, the share of employment is positively influenced by average size of the farm and irrigation, while the commercialisation has an inverse relationship with this sector. But commercialisation has attributed positively to construction activities at 5 per cent level of significance. Beside commercialisation, irrigation, average sizes of farm, urbanisation road length have positively contributed to the share of employment in construction at 1 per cent level of statistical significance. Road length, significant at 5 per cent level is also found to be positively related to this modern RNFS. Banks in rural areas is negatively significant for this sector.

Literacy has a positive association significantly with trade activities at 5 per cent level. Land pressure has also a positive impact on trade activities at 1 percent level of significance. Urbanisation, significant at 5 per cent level has an inverse relation with this modern RNFS. For trade, literacy is observed to contribute positively at 5 per cent level of statistical significance. Commercialisation and land pressure, significant at 20 per cent also contribute positively to this sector. Poverty is turned out to be an important determinant, affecting negatively at 5 per cent level of significance. For transport-storage-communication literacy has significantly positive influence at 5 per cent level. Commercialisation and land pressure are also significant at 20 per cent level inducing positively. Poverty is negatively associated with this traditional RNFS at 5 per cent level of significance. In services, literacy is come out to be significant at 5 per cent level bearing a positive sign. Land holdings and road length, significant at 5 per cent are negatively significant.

5.3 The inter Districts Variations in the share of RNFE for *Total Rural Non Farm workforce* by Industry (seven Categories Only) [for both 1991 And 2001]

Now if we look at the estimated coefficients of the multiple regression analysis of the districts shares of RNFE log equation for seven distinct non-farm sectors, taking main and marginal workforce together, we would get a comprehensive picture of what is happening in the pattern of employment diversification in 2001.

In mining-quarrying, the level of urbanisation and literacy are significant at 5 percent and 10 percent level respectively, while urbanisation affects this traditional sector directly in a positive way, the impact of literacy is negative for this traditional RNFS. Apart from these two variables commercialization, significant at 20 levels also has a positive relationship with this sector.

For household industries, literacy significant at 1 per cent level is inversely related to household industries. Irrigation ratio, significant at 5 percent level is positively related to this sector.

In non house hold industries, commercialization, significant at 1 per cent level contributes inversely to the employment share of this sector. The elasticity of RNFE in non household industries to commercialization is 0.34 per cent, i.e. a 1 per cent increase in commercial crops would lead to a decline in share of RNFE in non house hold sector by .34 percent. The other significant factor is average size of farm, significant at 10per cent level is directly associated with this sector. A 1 per cent increase in land holding size would increase share of RNFE by 0 .43 per cent.

For construction activities, four variables- irrigation, land holding, poverty and land pressure are turned out to be significant. All these variables have a positive association with construction sector. The average size of the farm and poverty are highly significant at 1 per cent level. A 1 per cent increase in average operational holdings would raise RNFE by 1.09, while a 1 increase in the incidence of poverty will increase the share by 1.72 in this modern sector.

For trade activities, literacy rate land pressure significant at 10 percent and 5 per cent level respectively have a positive impact upon this sector.

In transport activities, average land holding size, land pressure, poverty and road length are significantly influencing the sector. Land holding size and land pressure significant at 1 per cent level have positive association with this modern RNFS; where poverty and road length, significant at 5 per cent level are associated positively and negatively respectively.

For service sector, commercialization and land pressure are the two crucial factors. Commercialization significant at 20 per cent level has an inverse relationship with the share of employment in service sector, while land pressure, significant at 10 per cent level is positively related to this sector.

So, from the above discussion on the share of RNFE among total workforce in 2001, we conclude that, irrigation has a positive association with household industries, construction activities. This confirms the agricultural growth linkage hypothesis of these two sectors. For modern RNFS, non household industry is significantly and negatively affected by commercialisation, this suggests that, wider commercial agriculture failed to generate linkages in this sector. The average size of the farm measured in terms of average operational holdings is positively associated with non household industries, construction, and transport activities. This positive association with modern RNFS depicts the overall development driven hypothesis of employment diversification in this sector. Another developmental factor literacy has been identified to be a noteworthy determinant contributing positively in trade and commerce activities and traditional services but negatively in mining quarrying, and household and non household manufacturing verifying the wider distress driven diversification hypothesis. Poverty has also emerged to be a factor in explaining the share of RNFE among total rural workforce in construction and transport activities. The positive association of poverty with this modern RNFS reveals an overall distress driven hypothesis of diversification in these sectors.

The inter Districts Variations in the share of RNFE for *Total Rural Non Farm workforce* by Industry in 1991: for mining, urbanisation, significant at 10 per cent is positively associated with this sector, whereas road length and land pressure are inversely related to this traditional RNFS. For HHS industries, irrigation and urbanisation, significant at 10 per cent level, are positively associated with this sector, while the other two variables literacy and poverty have influenced in a negative direction. Literacy,

significant at 1 percent level strongly bears an opposite relationship with this traditional RNFS. The elasticity of household industries to literacy is 3.84, i.e. a 1 per cent increase in literacy rate would decrease RNFE in HHS manufacturing by 3.84 per cent. Poverty, significant at 10 per cent also has a strong negative accountability with the share of RNFE in HHS industries as the elasticity being 0.4504 percent in 1991. A 1 per cent decline in poverty level can effectively contribute to the increase in the share by .45 percent.

In non household industries, commercialisation is identified to be significant at 10 per cent, contributing negatively to this sector. The other variables like irrigation and average size of farm, statistically significant at 20 per cent and 10 per cent respectively, have a positive association with employment share of this sector; while literacy, significant at 20 per cent level affects negatively to this sector.

The share of employment in construction activities is largely magnified by, commercialisation, Irrigation and average size of farm. Commercialisation is statistically significant at 5 per cent level whereas Irrigation and average size of farm are significant at 1 per cent level. The estimated coefficient of irrigation is 0.51, i.e. a 1 per cent increase in gross irrigated area would stimulate construction activities by 0.51 per cent. The elasticity of RNFE in this modern sector to average size of the farm is 0.6211 per cent. A 1 per cent in increase in average operational holdings would encourage RNFE by 0.6211 per cent. Urbanisation and road length significant at 5 per cent level also influenced this sector positively. Literacy and banks, significant at 5 per cent have an inverse relation ship with construction activities. A 1 per cent increase in literacy would reduce RNFE in construction by 1.36 per cent.

For trade and commerce, literacy has an encouraging role in this modern RNFS at 5 per cent level of significance. Land pressure also turned out to be significant at 1 per cent level, having a positive nexus with trade activities. The urbanisation and road length significant at 10 per cent level are identified to be inversely associated to RNFE of this sector. The transport sector is considerably influenced by literacy and land pressure in a positive direction at 10 per cent level of significance. The negative liaison is identified in the incidence of poverty which is significant at 10 per cent level. In service sector, the only positive factor contributing positive at 5 per cent level of significant is literacy,

while average sizes of the farm and road length have an inverse relationship with this traditional RNFS.

So, following the regression result of the analysis among seven subsectors of RNFS in 1991, we would observe that, irrigation has a positive impact on HHS and non household industries, construction activities establishing the agricultural growth linkage hypothesis to these traditional and modern RNFS. Commercialization, on the other hand, has a negative association with non household industries. This suggested that, agriculture distress linkages to this sector. Contrastingly, commercialisation played a supportive role in construction sector, advocating the growth linkage to this sub sector. Farm size is positively significant for non household industries, construction and it may suggest that, distress driven linkages would become weaker, if average size of operational holding increases. It is associated inversely to services, signifying agricultural distress linkages to this traditional RNFE sub-sector. Poverty is negatively significant for household industries and transport sector thus supporting the 'wider linkages hypothesis' (ODL). Literacy is negatively significant for HHS industries and construction activities, leading to overall distress diversification while it is positively significant for trade and transport activities and other services, confirming the wider development linkage diversification to this sector.

Urbanisation is positively significant for mining, HHI, construction and trade activities. And this positive connection proliferate the wider hypothesis (ODL), that development raises the modern RNFE share. Land pressure is inversely related to mining-quarrying, and positively related to trade activities and transport activities. This positive connection support the wider hypothesis (ODL), that development raises the modern RNFE share.

Table 5.7: Districts shares of RNFE in Total Rural Employment (Main + Marginal): Estimated coefficients logged for seven sectors in 1991 and 2001

		1991							2001					
Ln(Y)	Mining	HHI	Non HHI	construction	Trade	Transport	Services	Mining	HHI	Non HHI	Construction	Trade	Transport	Services
(X)														
constant	4.04	6.22	1.24	-0.77	-0.52	-2.33	0.39	-0.24	6.60	1.68	-2.94	-1.12	-3.61	-0.28
	(1.47)**	(3.23)****	(0.94)*	(-0.95)*	(-0.94)*	(-3.51)****	-0.69	(-0.08)	(2.39)***	(1.26)*	(-1.68)**	(-1.67)**	(-3.32)****	(-0.39)
ln Comm.	-0.30	0.06	-0.29	0.27	-0.04	0.10	-0.05	0.23	-0.11	-0.34	-0.04	-0.04	-0.08	-0.07
crops	(-0.69)	-0.2	(-1.42)**	(2.19)***	(-0.47)	(0.93)*	(-0.54)	(1.08)*	(-0.50)	(-3.28)****	(-0.29)	(-0.85)	(-0.93)*	(-1.15)*
ln irrigation	-0.44	0.60	0.29	0.52	-0.12	0.08	-0.09	0.00	0.81	0.08	0.47	-0.03	0.09	-0.05
	(-0.77)	(1.47)**	(1.04)*	(3.07)****	(-1.01)	-0.57	(-0.77)	(-0.00)	(1.85)***	-0.38	(1.67)**	(-0.25)	-0.52	(-0.46)
ln farm size	0.15	-0.55	0.55	0.62	-0.14	-0.05	-0.31	0.46	0.09	0.43	1.09	0.20	0.72	0.07
	-0.21	(-1.09)*	(1.58)**	(2.95)****	(-0.97)*	(-0.30)	(-2.06)***	-0.69	-0.14	(1.35)**	(2.64)****	(1.27)*	(2.80)****	-0.4
ln literacy	-1.03	-3.84	-1.05	-1.36	0.80	0.88	0.77	-2.38	-4.28	-0.75	-0.93	0.54	0.34	0.18
	(-0.46)	(-2.43)**	(-0.96)*	(-2.07)**	(1.78)***	(1.61)**	(1.65)**	(-1.62)**	(-3.0)****	(-1.08)*	(-1.01)*	(1.53)*	-0.6	-0.47
ln urbanisation	1.30	0.79	0.24	0.59	-0.24	0.06	-0.14	1.12	0.52	0.07	-0.14	-0.14	-0.13	-0.04
	(1.59)**	(1.38)**	-0.62	(2.48)***	(-1.45)**	-0.3	(-0.81)	(2.39)***	(1.12)*	-0.31	(-0.48)	(-1.27)*	(-0.70)	(-0.31)
ln road length	-0.84	0.48	-0.05	0.58	-0.22	0.12	-0.33	0.72	-0.02	0.17	-0.68	-0.08	-0.54	-0.08
	(-0.98)*	-0.8	(-0.12)	(2.31)***	(-1.31)*	-0.59	(-1.88)***	(0.94)*	(-0.03)	-0.46	(-1.42)**	(-0.43)	(-1.82)***	(-0.37)
ln poverty	-0.12	-0.45	-0.01	-0.13	-0.05	-0.13	-0.04	0.87	0.22	-0.02	1.72	0.11	0.94	0.27
	(-0.32)	(-1.67)**	(-0.08)	(-1.12)*	(-0.69)	(-1.44)**	(-0.53)	-0.85	-0.22	(-0.04)	(2.70)****	-0.45	(2.37)***	(1.00)*
ln banks	-0.18	-0.11	0.01	-0.10	0.00	0.00	-0.02	0.00	-0.05	-0.04	0.03	0.00	0.03	0.00
	(-0.81)	(-0.69)	-0.07	(-1.58)**	-0.07	(-0.05)	(-0.38)	(-0.03)	(-0.36)	(-0.63)	-0.36	-0.1	-0.51	-0.08
ln land pressure	-0.69	-0.56	0.13	-0.09	0.34	0.22	0.12	-0.24	-0.26	0.01	0.85	0.35	0.96	0.25
	(-1.03)*	(-1.19)*	-0.4	(-0.46)	(2.55)****	(1.36)**	(0.89)*	(-0.33)	(-0.37)	-0.02	(1.89)***	(2.04)***	(3.43)****	(1.34)*
R^2	0.54	0.53	0.47	0.68	0.73	0.81	0.45	0.68	0.49	0.59	0.47	0.62	0.67	0.43
F	1.99	1.86	1.5	3.62	4.49	6.9	3.16	3.51	1.61	2.44	1.48	2.68	3.33	1.28
Heteroscedasticity	0.0046	1.401	3.065	1.449	2.164	2.563	0.478	1.401	2.576	1.924	1.474	1.398	0.351	0.985

Notes: - The figures in brackets are t-values; - Number of observations: 25;
- **** significant at 1 per cent; *** significant at 5 per cent, ** significant at 10 per cent, and * Significant at 20 per cent

Table 5.8: District growth rates of RNFE in total employment: Estimated Regression Coefficients for 1991-2001 for Total Rural Workforce (Main+Marginal) and Total Rural Main Workforce:

Variables Ln Y= % of RNFE	Total Rural Main Workforce	Total Rural Workforce (Main+Marginal)
Constant	1.84249 (0.52)	.3451744 (1.40)**
Log Commercial Crops	-.0194725 (-0.94)*	.0002636 (0.18)
Log Irrigation	-.0332494 (-1.43)**	-.0019424 (-1.21)*
Log Farm Size	.9990036 (2.34)***	-.0134384 (-0.45)
Log Bank	.0357851 (0.32)	-.0190341 (-2.47)***
Log Poverty	-.0497163 (-1.35)*	-.0024849 (-0.98)*
Log Literacy	.046255 (0.79)	.0013165 (0.32)
Log Urbanisation	.0142632 (0.35)	-.0010316 (-0.37)
Log Road Length	.0335709 (1.39)**	-.0005639 (-0.34)
Log Land pressure	-.0074447 (-1.38)**	.0001861 (0.50)
R_2	0.64	0.42
F =	2.97	1.21
Heteroscedasticity	3.065	1.449

Notes: - The figures in brackets are t-values; - Number of observations: 25;
- **** Significant at 1 per cent; *** significant at 5 per cent, ** significant at 10 per cent, and * significant at 20 per cent

Table 5.9: Regression result for growth of Rural Non Farm Employment to Total employment

		Main workforce							Total workforce(Main+Marginal)					
(Y) / (X)	Mining	HHI	Non HHI	Construction	Trade	Transport	Services	Mining	HHI	Non HHI	Construction	Trade	Transport	Services
Constant	0.56	0.28	0.36	0.25	0.30	0.42	0.30	0.58	0.34	0.41	0.32	0.32	0.44	0.31
	(2.19)***	(1.38)**	(1.83)***	(1.48)**	(1.49)**	(1.96)***	(1.54)**	(1.88)***	(1.29)*	(1.56)**	(1.47)**	(1.24)*	(1.69)**	(1.26)*
ln Comm.	0.002	0.008	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.000	0.000	-0.001
Crops	(1.46)**	-0.67	-0.41	(-0.26)	-0.4	-0.11	(-0.04)	(1.13)*	-0.4	-0.38	(-0.26)	-0.29	-0.07	(-0.05)
ln irrigation	-0.0028	-0.001	-0.0025	-0.0018	-0.0012	-0.0014	-0.001431	-0.00317	-0.002	-0.0027	-0.002	-0.001	-0.002	-0.001
	(-1.66)**	(-0.80)	(-1.91)**	(-1.63)**	(-0.88)*	(-1.03)*	(-1.13)*	(-1.58)**	(-1.00)*	(-1.57)**	(-1.38)**	(-0.84)	(-0.98)*	(-1.20)*
ln farm size	-0.053	0.002	-0.018	0.002	0.000	-0.001	0.004	-0.065	-0.011	-0.031	-0.010	-0.009	-0.009	-0.007
	(-1.69)	-0.07	(-0.74)	-0.1	-0.01	(-0.02)	-0.15	(-1.76)	(-0.37)	(-0.97)	(-0.36)	(-0.29)	(-0.29)	(-0.25)
ln literacy	0.0022	1.2700	0.0022	0.0003	0.0003	-0.0012	-0.0001	0.0033	0.0009	0.0028	0.0001	0.0009	-0.0007	0.0010
	-0.53	0	-0.68	-0.1	-0.08	(-0.34)	(-0.04)	-0.66	-0.2	-0.63	-0.02	-0.21	(-0.17)	-0.24
ln urbanisation	-0.0033	-0.0014	-0.0035	-0.0035	-0.0022	-0.0019	-0.0022	-0.0014	-0.0001	-0.0026	-0.0026	-0.0009	-0.0008	-0.0007
	(-1.25)*	(-0.66)	(-1.72)***	(-1.99)***	(-1.07)*	(-0.86)	(-1.11)*	(-0.40)	(-0.03)	(-0.88)*	(-1.04)*	(-0.32)	(-0.28)	(-0.24)
ln road	-0.0032	-0.0031	-0.0036	-0.0030	-0.0030	-0.0029	-0.0029	0.0002	-0.0004	-0.0014	-0.0012	-0.0006	-0.0007	-0.0002
Length	(-2.33)***	(-2.89)****	(-3.50)****	(-3.30)****	(-2.85)****	(-2.58)****	(-2.9)****	-0.12	(-0.23)	(-0.79)	(-0.81)	(-0.36)	(-0.43)	(-0.14)
ln poverty	-0.004	-0.002	-0.002	0.001	-0.002	-0.001	-0.001	-0.006	-0.003	-0.003	0.000	-0.003	-0.002	-0.002
	(-1.68)**	(-0.79)	(-0.96)*	-0.4	(-0.82)	(-0.60)	(-0.58)	(-1.82)***	(-1.00)*	(-0.99)*	-0.2	(-0.96)*	(-0.72)	(-0.91)*
ln banks	-0.003	-0.006	-0.006	-0.004	-0.008	-0.009	-0.008	-0.015	-0.018	-0.020	-0.015	-0.020	0.000	-0.019
	(-0.34)	(-0.79)	(-0.81)	(-0.69)	(-1.09)*	(-1.14)*	(-1.12)*	(-1.56)**	(-2.25)***	(-2.37)***	(-2.24)***	(-2.46)***	-0.62	(-2.51)****
Ln land pressure	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	-0.020	0.000
	(1.28)*	(1.89)***	(2.24)***	(3.09)****	(1.90)***	(1.85)***	(2.17)***	(-0.08)	-0.39	-0.79	(1.38)*	-0.49	(-2.47)***	-0.46
R^2	0.5866	0.59	0.68	0.66	0.6	0.59	0.62	0.43	0.39	0.45	0.47	0.39	0.42	0.42
F	2.36		3.61	3.38	2.56	2.47	2.75	1.27	1.07	1.38	1.45	1.09	1.23	1.23
Heteroscedasticity	0.018	0.362	1.149	0.534	0.016	1.609	0.241	3.060	0.216	0.301	1.901	0.071	2.8142.	2.398

Notes: - The figures in brackets are t-values; - Number of observations: 25;
- **** Significant at 1 per cent; *** significant at 5 per cent, ** significant at 10 per cent, and * significant at 20 per cent

5.6 The Determinants of Inter-District Variations in the Growth (1991-2001) of RNFE:

Table 5.8 reports the estimates of the RNFE growth model. Three separate regressions were run: one each for total workforce and main workforce in RNFE. Looking at these columns only, it is found that for the whole sample of main workforce the growth of RNFE is significantly associated with irrigation, average size of farm, road length, poverty and land pressure. However, irrigation ratio bears unexpected sign. The results suggest that a 1 per cent increase of irrigation ratio would result in a decline in the growth of RNFE by .033 per cent and that a 1 per cent increase of average size of farm, i.e. land holding size would cause a growth of RNFE among rural main workforce by 0.99 percent. The road length has been appeared to influence the growth of rural non farm strongly in a positive direction. A 1 per cent increase in road length will apparently increase the growth of non-farm employment by 0.034 per cent. On the hand, poverty and land pressure are also significant in influencing the growth of RNFE in an inverse way among main workforce between the 1991 and 2001. A 1 percent increase in the incidence of poverty would reduce the RNFE growth by 0.49 per cent and a 1 per cent land pressure would lead to .007 percent decline in the growth RNFE.

Now if we take a look at the entire sample of total rural non farm workers (main and marginal together), we would observe that, the growth of total non-farm workers in rural districts of Andhra Pradesh is only significantly associated with no of banks in rural areas. It is interesting to note that only this infrastructural variable is emerged to be significant and bears an inverse relation in explaining the growth of total rural non farm employment during the decade. A 1 per cent in number of banks in rural areas would reduce the growth in total RNFE by .019 percent. The inverse relationship is opposite to our predicted hypothesis. However, this inverse relationship is not easy to explain following a linear causality between growth of RNFE and no. of banks in rural areas. The banking infrastructures persuade the expansion of modern RNFS compared to traditional RNFS. If the growth of total employment in traditional RNFS dominates over the growth of employment in modern RNFS, the overall growth in total non farm employment would have shown an opposite relationship with no. of rural banks.

In conclusion, it is interesting to note that; growth of rural non farm employment between 1991 and 2001 among main workforce is significantly and adversely influenced by irrigation. This result opposes the narrow Growth linkage hypothesis. Whereas the infrastructure (road length), which is positively significant which in turn implies overall development linkage hypothesis (ODD). The average size of farm is also significant in explaining the wider over all development driven hypothesis. However, irrigation is related inversely to growth of RNFE among main workforce, opposing the narrow growth linkage hypothesis. Interestingly, poverty is inversely proportional to the growth of non farm employment of main workforce. This once again reconfirms the distress driven hypothesis of employment diversification.

For total rural non farm employment, the growth result is no of banks is turned out to be most significant affecting unfavorably the growth of RNFE during the decade. The inverse relationship pointed out the distress driven hypothesis. Again the irrigation ratio and poverty both reveals a negative relation with total RNFE.

5.7 The Determinants of inter-districts variation in the Growth of RNFE (1991-2001) (by seven industrial categories)

Table 5.9 presents the RNFE growth regressions by industry (7 categories). Here also the method used for explaining the growth of RNFE by categories between 1991 and 2001 is the standard OLS method. For main workforce, the most striking result is that, road length is found to be robustly significant in all 7 sub sectors. In all the sectors road length had an unexpected sign. A 1 percent increase in road length is associated with decline in the growth of RNFE by .004 per cent for non household manufacturing; although in other sectors the relationship is less strong. Once again, this implies that road length tend to reduce the growth of share in RNFE.

Irrigation is significantly negatively associated with mining-quarrying, non household manufacturing, and construction activities. The growth of mining and quarrying is significant at 10 percent level influenced by irrigation, commercialization, average size of farm, and poverty. Besides, road length is significant at 5 percent level. The coefficient of average farm size is considerably large for this sector. A 1 percent decline in average land holding size would increase the growth of rural employment in mining by .053 per

cent. For the household industry model the growth of HHI is significantly influenced by road length and land pressure. Surprisingly, the road length came out very strongly to influence the HHI negatively. A 1 percent increase in road length will decrease the growth of HHI by .003 per cent. For the non household industries, only four variables- irrigation, urbanisation, road length and land pressure influenced non HHI model. The surprising result is the level of urbanisation, which is negatively significant in non HHI model. This suggests that, 1 per cent increase in the level of urbanisation decreases growth of non HHI by .004 per cent. On the other hand, we can also see that irrigation contributes negatively to the growth of employment in this sector. Most importantly, road length is negatively related non HHI sector. A 1 per cent increase in road length will decrease the growth by -.004 percent. For construction model, irrigation, urbanisation, road length and land pressure are significant. We can see a negative relationship between infrastructure and construction. Urbanisation may, on the other hand, negatively influence construction in rural areas. The irrigation on the other part attributed in a pessimistic way for the growth of the sector. Road length unexpectedly came out to be strong affecting negatively the growth of employment of main workforce in this sector. Only Land pressure contributed positively to the growth of the construction sector. The reason may be that with the increase in population density enhances the demand for more construction works, thus a positive relation can be identified. In trade sector, irrigation, urbanisation, banks, road length are negatively significant, where as land pressure is positively significant. The result for irrigation, urbanisation negative effect suggests that trade employment is urban based. The infrastructural variable influenced negatively to this modern RNFS. For transport sector, land pressure is significant in affecting positively, while the impacts of irrigation, road length and banks have a negatively significant effect on transport, the reason being that transport is urban based.

For services, which is also a modern sector, model population density is positively encouraging. This result is as we expected. Urbanisation and irrigation are negatively associated with services. In this service sector irrigation generates more farm employment. The impact of infrastructural variable is also negative in services sector.

The conclusion for this subsection is that, commercialization is only positively significant for the growth of mining and quarrying RNFE, and this supports the over all development

linkage hypothesis to this traditional RNFE. Irrigation is negatively related to mining-quarrying, non household industries, construction, trade, and transport. This supports that, agricultural development has failed to contribute in the growth of employment in Traditional as well modern RNFS. The average size of farm is only significant in mining & quarrying, affecting negatively. This proves the distress driven diversification to this sector. The level of urbanisation is negatively significant for all sub sectors, while the numbers of rural banks is significantly related to trade activities. Interestingly, the infrastructure development (road length) is negatively significant for all sub sectors during the decade. On the other hand, the land pressure is significant in affecting the growth of RNFE in all the sub sectors in a positive direction. This also, supports the over all development induced diversification towards Rural Non Farm Sector during the decade.

Now we will look into the growth regressions, taking growth the total Rural Non Farm Workers (Main and Marginal together) in seven sub sectors as the dependent variables. Here we also use the standard OLS method in explaining the growth of RNFE by categories between 1991 and 2001. Diagnostics did not show any problems at the conventional level. The most salient result is that the number of rural banks was revealed to be strongly significant in all seven sectors. In all the sectors it bears unexpected sign. A 1 per cent increase in percentage of rural banks, decrease the growth of Rural Non Farm employment by 0.20 per cent in transport-storage and communication activities; though the value of the coefficients are comparatively smaller in all other sub sectors. Once again it would remind us that, the infrastructure played a jeopardizing role in growth of rural non farm employment during the decade. Thus it tends to reduce the growth of its share in rural areas.

Irrigation is significantly negatively associated with mining-quarrying, non household manufacturing, and construction activities. The growth of rural employment in mining and quarrying is significant at 5 percent level, influenced by average size of farm and the incidence of poverty. Besides, irrigation and banks are significant at 10 percent affecting negatively the growth of RNFE in this sector. For household industry model, the growth of HHI is significantly influenced by banks, irrigation and poverty. The result shows that, a 1 per cent increase in banks in rural areas would decrease the growth of house hold

industries by .0183 per cent. Surprisingly, poverty has come out to be strong in influencing the HHI negatively. A 1 percent increase in poverty will decrease the growth of HHI by .0026 per cent. For the non-household industry only 3 variables irrigation, banks, poverty and average land holding size have influenced non HHI. The surprising result is land-holding size, which is inversely related to non-HHI sector model. This suggests that, a 1 per cent increase in land holding size decreases the growth of non-HHI by .031 percent. This means that, higher the landlessness higher would be the possibility to be absorbed in the non-HHI sector. For the construction model, irrigation, land pressure, banks, and urbanisation are significant. We can see a positive relationship between land pressure and construction. Urbanisation may, on the other hand, negatively influence construction in rural areas. The number of rural banks is also impacting construction activities negatively. For trade and commerce, poverty and banks are negatively significant. The result suggested that, 1 per cent increase in banks in rural areas decrease the growth of employment in trade by .0195 per cent. Similarly, a 1 per cent decline in level of poverty would increase the growth of trade activities by .0026 per cent. In transport sector activities, irrigation and road length have appeared to be significant influencing this sector negatively. This suggests that, agriculture growth linkage and over all infrastructural development fail to capture the growth of RNFE in this sector. The impacts of irrigation, poverty and banks are also evident in the growth of services during the decade. These variables have shown a negative association with the growth of the RNFE in services.

In conclusion, we would say that, infrastructure development (the percentage of rural bank branches) is negatively significant for the growth of all sub sectors, and this supports overall distress driven hypothesis of RNFE growth during the decade. Commercialization is positively significant for the growth of mining and quarrying, and this supports the wider (ODL) hypothesis to traditional RNFE. Agricultural development (irrigation) is negatively significant for mining-quarrying, non-household industries and construction that supports our central hypothesis of distress induced diversification. Poverty is negatively significant for mining and quarrying. Urbanisation is negatively significant for non household industries and construction. This again proves the over all distress driven diversification in modern RNFS. So, it apparent those, all these significant

variable have shown a holistic trend of distress induced growth of Rural Non Farm Employment among total rural workforce during post reform decade.

5.8 Conclusions

Conclusions for Total log RNFE shares and total Main RNFE shares

There are some distinct issues: (1) The variables which explain inter-district differences in RNFE are not the same for total main workforce and Total rural workforce, taking the main marginal workforce together and (2) the share of RNFE among total rural workforce have a lower mean than mean share of RNFE among rural main workers in 2001. One interesting result is that the variables significantly associated with RNFE among main were different from those that were significant for total RNFE. The conclusion (for the log sample for 1991) for total (main + marginal) is that, irrigation, average size of the farm and level urbanisation are positively significant, and commercialisation and poverty negatively significant, in explaining a district RNFE share. For both main and total workforce irrigation and literacy are positively significant and commercialisation is negatively significant. However, there is no such perceptible difference between the factors affecting RNFE among total workers and main workers at the reference point 1991. In 2001, in addition to these variables the rural infrastructural variable, i.e. banks and road length have positively significant for RNFE share in main workforce, while in case of total rural workforce the role of infrastructure are insignificant. The results for irrigation suggest that higher agricultural productivity (related to irrigation) is linked to a high RNFE share growth for main and total rural workers. The analysis of determinants of RNFE confirms the hypothesis that growth linkages from irrigated agriculture lead to modern RNFE. The result for farm size support for the hypothesis (AGL) that traditional RNFE share rises with distress diversification for those with little or no land.

Literacy supports the wider/overall 'development linkage' (ODL) hypothesis that traditional RNFE share rises with lower levels of literacy. The result, for males only, supports the AGL hypothesis in the case of irrigation and ODL in the case of literacy.

The results for road length and percentage of bank branches in the case of main labour oppose the hypothesized growth linkages (AGL) relationship. There is no obvious explanation for this result. Some other variables, which we could not consider, might be of importance and, could explain further variations in the dependent variable.
Poverty has played an inverse role significantly with share of RNFE in 1991, but interestingly, its role became insignificant in explaining the RNFE share in 2001.

Conclusions for disaggregating sub-sectors of RNFE:

The conclusion for the log sample for the share of the seven sub-sectors is that irrigation is significant positively for HHI, supporting the strict growth linkages (AGL) hypothesis to modern RNFE. For traditional household industry the fact is that irrigation is significantly positive. This is surprising, but percentage of villages with banks is negatively significant for non household industries and trade; thus supports distress diversification. Binswanger and Khandker (1995) find that the percentage of villages with banks at the all-India level highly positively significant for total RNFS per cent - credit may be a key constraint on modern and traditional RNFS alike (but not on agriculture as argued by Binswanger and Khandker 1995), cutting across the "growth linkages versus distress diversification" debate.
Farm size is positively significant for services among main workforce and for total rural workforce it is positively significant in non household industries, construction, and transport activities, this may suggest that distress linkages decline as average farm size rises in these sectors.
Urbanization is positively significant for mining and quarrying, HHI, construction and trade activities. And this positive connection proliferate the wider hypothesis (ODL), that development raises the modern RNFE share. Since for non HHI urban options may pull away rural non farm workers, this positive net link provides special strong indication in support of wider hypothesis (ODL), that development raises the modern RNFE share. As urbanization increases employment is generated for remaining residual non farm people; nearby villages take advantages of modern local-not just urban –employment opportunities.

Poverty is turned out to be significant in 1991 both for main and marginal workforce. It is negatively significant for traditional RNFS, like mining quarrying and services for main workforce where as among total rural workforce, poverty is negatively associated with percentage of employment in HHI and transport activities, which tends tend to rise as poverty falls. If transport is 'modern' sub sector of RNFE, this supports the wider linkage hypothesis. In 2001, poverty remained significant for total rural workforce affecting the construction and trade activities positively whereas among main workforce, the share of employment in traditional RNFS rises as poverty increases. This positive association clearly indicates that, distress induced diversification is actually taking place in these sectors in 2001. So, interestingly, the role of poverty has tilted towards the rural work force thriving them into more distress driven diversification in 2001.

Literacy is positively significant to trade and transport activities. Conversely it is negative for mining-quarrying, household industries, supporting the ODD distress driven diversification hypothesis. The fact that, literacy is positively significant for services, however opposes our hypothesis that, rural services, which are predominantly tradition oriented are linked to distress diversification.

Conclusion from the growth of RNFE shares regressions

The result for the total main labour force is that irrigation, commercialisation, poverty and land pressure are negatively significant. This implies that the districts with high concentration of irrigated lands, and of agricultural commercialisation, tend to show slower growth of total RNFE. On the other hand the negative relation between the growth of RNFE and land pressure also indicates that, districts with high population density have dampened growth of RNFE among main workforce. All these suggest that distress diversification (ADD) hypothesis supports the growth of rural non farm employment during the decade. The inverse relationship between poverty and growth of RNFE indicates that, districts with low incidence of poverty show high tendency in growth of RNFE; thus indicating the overall wider development linkage hypothesis of growth in rural non farm employment.

Average farm size and infrastructure, namely the road length being positively significant, support the ODL hypothesis. For total rural workforce, bank infrastructure is also

significant, but affecting negatively, also supporting the wider (ODL) hypothesis. Besides, irrigation and poverty are also negatively associated with RNFE among total rural workers. The negative association with irrigation opposes the growth linkages hypothesis whereas the inverse relation with poverty once again proves the wider ODD hypothesis.

The agricultural distress diversification (ADD) and overall growth linkages (ODL) hypotheses are supported for total RNFE growth among main workforce. For the growth of RNFE in total rural workforce, i.e. taking main and marginal workforce together, there is some support for the wider (ODL) hypothesis but not for the AGL hypothesis.

Conclusions for all the seven sub-sectors growth regression results

Road length is strongly negatively significant. In explaining district level growth of RNFE, the association with road length is negative in all the sub-sectors. There is no obvious explanation for this negative relationship but lack of infrastructure, which implies that fewer non-farm employment opportunities for rural residents (because they cannot commute to town centres) may be associated with greater distress diversification in rural RNFE.

Irrigation is negatively related to mining-quarrying, non household industries, construction, trade, and transport, this supports that, the agricultural development has failed to generate any growth linkages in the growth of employment in Traditional as well modern RNFS. The level of urbanisation is negatively significant for all sub sectors. The negative growth relationship implies that NFE is mostly urban based. There is no obvious explanation for this negative relationship but lack of urbanisation, which implies that fewer non-farm employment opportunities for rural residents (because they cannot commute to town centres) may be associated with greater distress diversification in rural RNFE.

For total rural workforce poverty is negatively significant in household industries. However this pattern runs in favour of the hypothesis stated. Infrastructure development (The percentage of rural bank branches) is negatively significant for all sub sectors, which is surprising and has no obvious explanation. Average size of the farm is negatively significant for non-household industries. This means that, higher the

landlessness higher would be the growth of employment of total labour force in non-HHI sector, supporting the distress driven growth of RNFE in this sector. Irrigation is negatively significant for mining-quarrying, non HHI and construction activities. The negative relation suggests that, the employment in these sub sectors has grown fastest in areas of low agriculture potential; thus supporting agriculture distress diversification hypothesis. Commercialization of agriculture is only positively related to mining and quarrying. Urbanization is negatively significant for non household industries and construction activities. This means that, non-farm employment in these modern sub sectors is biased towards urban areas.

The overall results for total RNFE share support the hypothesis that there is a positive linkage effect from expansion of irrigation (i.e. districts with more irrigation increase RNFE share, or districts with faster growth in irrigation area secured faster growth in RNFE share or both to RNFE). This is especially true for male RNFE compared to females in both modern and traditional sectors. Similarly, poverty reduction has quite a high impact in promoting RNFE. One of the other findings is that impact of literacy is positively associated with high percentage share of modern RNFE in districts, and negatively associated with traditional RNFE shares in districts. The problem, though, is that education affects both labour supply and labour demand in different stages of socio-economic and technological development. Making inferences about its effect and relation with development level can only be tentative; in other words, its influence needs to be considered cautiously. We expect education to raise modern RNFE share, lower traditional RNFE share, in early and late stages of development. The district level data analysis in most respects supports the hypothesis that growth linkages (AGL) are the main explanation for high shares in, and the growth of, 'modern' RNFE, and distress diversification (ADD) for 'traditional' RNFE. Also in most respects this supports the wider hypothesis (ODL) that linkages are the main explanation for high shares in and growth of , modern RNFE, and overall distress diversification (ODD) for traditional RNFE. An increase in investment on irrigation, and infrastructural facilities coupled with large scale non-farm activities would generate a significant increase in non-farm employment.

BIBLIOGRAPHY

ACHARYA, B.T. (1995): *Rural Industry Expansion: Some Issues*, in Raghavan, K. and Sekhar, L. (eds.) op cit., pp 335-342.

BASANT, R. (1993) Diversification of Economic Activities in Rural Gujarat: Key Results of a Primary Survey, *The Indian Journal of Labour Economics*, 36(3), pp 361-86.

----- (1994) Economic Diversification in Rural-Areas - Review Of Processes With Special Reference to Gujarat, *Economic And Political Weekly*, 29(39), pp A107-16.

BASANT, R. and B.L. KUMAR (1989) Rural Non-Agricultural Activities in India: A review of Available Evidence, *Social Scientist*, 17 (1 and 2), pp 13-71.

BASANT, R., B.L. KUMAR and R. PARTHASARTHY (1998): Non-Agricultural Employment in Rural Gujarat, Rawat Publications, Jaipur.

BASANT, R. AND JOSHI, H. (1989) 'Non-Agricultural Employment in Rural Gujarat: Some Evidence from an Agriculturally Developed Region'. India: Paper presented at the seminar on Non-agricultural Employment in India: Trends and Prospects, The Gujarat Institute of Area Planning, Ahmedabad

BASU, D.N., KASHYAP, S.P. (1992): Rural Non-agricultural Employment in India - Role of Development Process And Rural-Urban Employment Linkages, *Economic and Political Weekly*, 27(51-52), pp A178-A189.

BHADURI, A. (1996) Employment, Labour Market Flexibility and Economic Liberalisation in India, *The Indian Journal of Labour Economics*, 39(1), pp 13-22.

BHALLA, S.(1997), " Trends in Poverty, Wages and Employment in India", *The Indian Journal of Labour Economics*, Vol.40 No. 2.

BHALLA, S. (1993) Patterns of Employment Generation, *The Indian Journal of Labour Economics*, 39(1), pp 1-12.

----- (1993) Test of Some Propositions about the Dynamics of Changes of the Rural Workforce Structure, *The Indian Journal of Labour Economics*, 36(3), pp 428- 39.

----- (1994) Poverty, Workforce Development and Rural Labour Markets, *The Indian Journal of Labour Economics*, 37(4), pp 609-22.

---- (1997) The Rise and Fall of Workforce Diversification Process in Rural India, in G K Chadha and Alakh N Sharma (eds), op cit., pp 145-183.

BINSWANGER, H. P. AND KHANDKER. S. (1995): 'The Impact of Formal Finance on the Rural Economy of India', *Journal of Development Studies'*, Vol. 32, No. 2 pp.234 62.

BINSWANGER, H. P. *et al* (1983), *Thailand: Rural Growth and Employment,* The World Bank. Washington D.C.

BHATTACHARYA, B.B., and MITRA, A. (1993) Employment And Structural Adjustment - A Look At 1991 Census-Data, *Economic And Political Weekly*, 28(38), pp 1989-1995.

BHATTACHARYA, S.N. (1986) *Rural Economic Growth in Indian Theory and Practice*, Metropolitan, Delhi.

BREMAN, J., and S. MUNDLE (eds.) (1991) *Rural Transformation in Asia*, Oxford University Press, Delhi.

CENSUS OF INDIA (1991) Government of India,

CENSUS OF INDIA (2001) Government of India

CHADHA, G.K. (1992) 'Non-farm Sector in Rural China: Trends and Variations in Labour Productivity', Asian Regional Team for Employment Promotion, New Delhi, ILO, World Employment Programme.

CHADHA, G.K. (1993) Non-Farm Employment for Rural Households in India: Evidence and Prognosis, *The Indian Journal of Labour Economics*, 36(3), pp 296-327.

----- (1994): *Employment, Earnings and Poverty: A Study of Rural India and Indonesia.* Sage Publications, New Delhi.

----- (1997) Access of Rural Households to Non-Farm Employment: Trends, Constraints and Possibilities, in G K Chadha and Alakh N Sharma (eds), op cit., pp 184- 215.

CHADHA G.K. and SAHU, P.P (2002): "Post Reform Setbacks in Rural Employment: Issues That Needs Further Scrutiny", *Economic and Political Weekly*, Vol. 37, No. 21, May 25.

CHADHA G.K. and ALAKH N. SHARMA (eds) (1997) *Growth, Employment and Poverty: Change and Continuity in Rural India.* Vikas Publishing House. New Delhi. pp.470

CHAKRAVERTY, M.L., and P. MISHRA (1995) Non-Farm Employment Pattern of the Bauris (Scheduled Caste Community) of Puri District (Orissa), *Indian Journal of Agricultural Economics*, 50(3) pp 292-293.

CHANDRASEKHAR, C.P. (1993) Agrarian Change And Occupational Diversification - Nonagricultural Employment And Rural-Development In West-Bengal, *Journal Of Peasant Studies*, 20(2), pp 205-270.

DASGUPTA, B (1995): Institutional Reforms and Poverty Alleviation in West Bengal, *Economic and Political Weekly* 30(41, 42), pp 2691-2702.

DATT, G. and M. RAVALLION (1996) *Why have some Indian states done better than others at reducing poverty?*, World Bank Research Working Paper 1594, Washington DC.

DESHPANDE, S., and L. DESHPANDE (1998): Impact of Liberalisation on Labour Market in India. What to Facts from NSSO's 50th Round Show? *Economic and Political Weekly*, 33 (2), L31-40.

DEV, S.M. (1990) Non-agricultural Employment In Rural India - Evidence At A Disaggregate Level, *Economic And Political Weekly*, 25(28), pp 1526-1536.

---- (1996) Experience of India's (Maharashtra) Employment Guarantee Scheme: Lessons for Development Policy, *Development Policy Review*, 14(3), pp 227-53.

EAPEN, M. (1994) Rural Non-agricultural Employment In Kerala - Some Emerging Tendencies, *Economic And Political Weekly*, 29(21), pp 1285-1296.

--- (1995) Rural Non-agricultural Employment In Kerala - Inter-District Variations, *Economic And Political Weekly*, 30(12), pp 634-638.

--- (1996) Rural non-farm employment - Some reflections on petty production, *Economic And Political Weekly*, 31(26), pp 1673-1675.

Ellis, F. (1988): *Peasant Economics - Farm Households and Agrarian Development.* Cambridge, U.K.: Cambridge University Press.

FISHER, T., MAHAJAN, V and A. SINGHA (1997) *The Forgotten Sector*, Intermediate Technology Publications, London. 274 pp.

GANGADHARA RAO, G. (1997) Rural non-farm Employment in India, Spellbound Publications, Rohtak, India

GAURAHA, A.K. (1995) Pattern of Non-Farm Employment of Marginal Farmers in Raipur District of Madhya Pradesh, *Indian Journal of Agricultural Economics*, 50(3) pp 450-451.

GREELEY, M. (1987) *Post harvest Losses, Technology, and Employment: The Case of Rice in Bangladesh.* Boulder and London: Westview Press.

GHOSH, JAYATI (1995) Employment and Labour under Structural Adjustment – India Since 1991, *The Indian Journal Of Labour Economics*, 38(4) pp 567-76.

GUPTA, S.P. (1995) Possibilities of Income and Employment in On-Farm and Non-Farm Activities: An Economic Evaluation, *Indian Journal of Agricultural Economics*, 50(3) pp 456-457.

---- (1995) Economic reform and its impact on poor, *Economic And Political Weekly*, 30(22), pp 1295-1320.

HAZELL, P. AND HAGGBLADE S. (Oct.-Dec. 1991) 'Rural - Urban Growth Linkages in India', *Indian Journal of Agriculture Economics*, Vol. 46, No. 4, pp. 515-529.

HAZELL, P. AND RAMASAMY C. (1991) *The Green Revolution Reconsidered: The Impact of High-Yielding Rice Varieties in South India.* Baltimore and London: Johns Hopkins University Press

ISLAM, NURUL (1997), The Non-farm sector and Rural Development: Review of Issues and Evidence, FAED Paper No. 22, International Food Policy Research Institute, Washington DC

JARQUE, C. M. AND BERA, A. K. (1987) 'A Test for Normality of Observations and Regression Residuals', *International Statistical Review*, Vol. 55, pp. 163-172.

JAYARAJ, D. (1994): Determinants of Rural Non-Agricultural Employment, in P. Visaria and R. Basant (eds.), op cit.

KANNAN, K.P (1990) Towards Understanding the Dynamics of Rural Labour Markets: An Approach Based on Indian Evidence, *The Indian Journal of Labour Economics*, 33(3), pp 200-16.

KUMAR, A. (1993) Rural Non-Farm Employment: A Static and Dynamic Study of Inter-State Variations, *The Indian Journal of Labour Economics*, 36(3).

LANJOUW, J.O and P. LANJOUW (1995) Rural Non-Farm Employment: A study, *Policy Research Working Paper* 1463, World Bank, Washington.

LANJOUW, PETER and SHARIFF ABUSALEH (2000), "Rural Non-Farm Employment in India: Access, Income and Poverty Impact", National Council of Applied Economic Research, New Delhi, December

LANJOUW, Jean O. and LANJOUW, PETER (2001), The Rural Non-Farm Sector: Issues and Evidence from Developing Countries", Agricultural Economics, Vol. 26, Issue1, October.

MATHEW, E.T. (1995) Unemployed And Self-Employed - Job Preferences And Employment Perspectives, *Economic And Political Weekly*, 30(44), pp 2815- 26.

MATHUR, A. and P.K. PANI (1993) The Character of Rural Industrialization and its Employment Impact in India: An Inter-Regional Perspective, *The Indian Journal of Labour Economics*, 36(3).

MELLOR, J (1976) *The New Economics of Growth: A Strategy for India and the Developing World*, Cornell University Press.

MITRA, A. (1993) Rural Non-Farm Employment, Poverty and Women, *The Indian Journal of Labour Economics*, 36(3) pp 455-69.

PAL, K.P., PAL, G.P, and D.P. PAL (1995) Non-Farm Employment and Rural Economic Transformation in India, *Indian Journal of Agricultural Economics*, 50(3), pp 456

PAPOLA, T.S. (1992) Rural Non-Farm Employment: An Assessment of Recent Trends, *The Indian Journal of Labour Economics*, 35(3), pp 238-45.

---- (1994) Structural Adjustment, Labour Market Flexibility and Employment, *The Indian Journal of Labour Economics*, 37(1), pp 3-16.

PARTHASARATHY, G. (Jan-March 1987) 'Changes in the Incidence of Rural Poverty and Recent Trends in Some Aspects of Agrarian Economy', *Indian Journal of Agricultural Economics*, Vol. 42, No. 1, pp. 1-21.

RAMSEY, J. B. (1969) 'Tests for Specification Errors in Classical Linear Least Squares Regression Analysis', *Journal of the Royal Statistical Society*, Series B, Vol. 31, pp. 350-371.

RANIS, G. and F. STEWART (1993) Rural Non-agricultural Activities in Development: Theory and Application, *Journal of Development Economics*, 40(1), pp 75-1101.

RAVALLION, MARTIN (2000) What is Needed for a More Pro-Poor Growth Process in India?, *Economic and Political Weekly*, 35(13), pp 1089-1093.

RAY, S (1997) Globalisation, Structural Change and Poverty: Some Conceptual and Policy Issues, *Economic and Political Weekly*, 32(33-34), pp 2117-35.

REDDY, S. S. (1991) 'Poverty and Agricultural Growth in Rural Andhra Pradesh' Inter District Analysis, Centre for Economic and social studies, (CESS) Poverty Project Monograph No.1.

SALETH, M.R. (1996) Rural Non-Farm Employment in Tamil Nadu: A Quantitative Analysis at the Household Level, *The Indian Journal of Labour Economics*, 39(2), pp 335-51.

SAMAL, K.C. (1997a) Rural Non-Farm Activities in Specific Regions of Orissa, *Journal of Rural Development*, 16(3), pp 457-464.

--- (1997b) Features and Determinants of Rural Non-Farm Sector in India and Orissa, *Journal of Indian School of Political Economy*, 9(1), pp 65-93.

---- (1998) Poverty Alleviation After Post-Liberalisation: Study of a Tribal Block in Orissa, *Economic and Political Weekly*, 33(28), pp 1846-51.

STATISTICAL ABSTRACTS OF ANDHRA PRADESH (1991 and 2001), Directorate of Economics and Statistics, Govt. Of AP, pp.114-116

SEN, ABHIJIT (1994) Rural Labour Markets and Poverty, *The Indian Journal of Labour Economics*, 37(4), pp 575-607.

--- (1996) Economic Reforms, Employment and Poverty, *Economic and Political Weekly*, 31(35-37), pp 2459-77.

----- (1997) A Structural Adjustment and Rural Poverty: Variables that Really Matter, in G.K. Chadha and A.N. Sharma (eds.) op cit.

SHUKLA, V. (1991) Rural Non-farm Activity - A Regional Model And Its Empirical Application To Maharashtra, *Economic And Political Weekly*, Volume 26, Issue 45, pp 2587-2595.

-- (1992) Rural Non farm Employment In India. Issues And Policy, *Economic And Political Weekly*, Volume: 27, Issue 28, pp 1477-1488.

SHYLENDRA, H.S. and P. THOMAS (1995) Non-Farm Employment: Nature, Magnitude and Determinants in a Semi-Arid Village of Western India, *Indian Journal of Agricultural Economics*, 50(3), pp 410-16.

SINGH, S. (1993) Some Aspects of rural Non-Farm Sector Development in developing Countries, *The Indian Journal of Labour Economics*, 36(3).

THORAT, S. (1993) Land Ownership Structure and Non-Farm Employment of Rural Households in India, *The Indian Journal of Labour Economics*, 36(3).

UNNI, J. (1988) Agricultural Labourers In Rural Labour Households, 1956-57 To 1977-78 - Changes In Employment, Wages And Incomes, *Economic And Political Weekly*, 23(26), pp A59-68.

--- (1991) Regional Variations In Rural Non-agricultural Employment - An Exploratory Analysis, *Economic And Political Weekly*, 26(3), pp 109-22.

--- (1996a) Diversification of economic activities and non-agricultural employment in rural Gujarat, *Economic And Political Weekly*, 31(33), pp 2243-2251.

--- (1996b) Non-Agricultural Employment and Rural Livelihoods: Macro *vis-à-vis* Micro View, *The Indian Journal of Labour Economics*, 39(4), pp 795-808

---- (1998) Non-agricultural employment and poverty in rural India - A review of evidence, *Economic And Political Weekly*, 33(13), pp A36-A44.

VAIDYANATHAN, A. (1986) Labor Use In Rural India - A Study Of Spatial And Temporal Variations, *Economic And Political Weekly*, 21(52), pp A130- A146.

---- (1986) Report on the Workshop to Evolve an Agenda of Research on Rural Non-Agricultural Employment, *Indian Journal of Agricultural Economics*, pp 151- 57.

---- (1994) Employment Situation - Some Emerging Perspectives, *Economic And Political Weekly*, 29(50), pp 3147-3156.

VYAS, V.S. and P. BHARGAVA (1995) Public Intervention for Poverty Alleviation: An Overview, *Economic and Political Weekly*, 30(41-42), pp 2559-72.

VERMA, B.N and N. VERMA (1995) Distress Diversification from Farm to Non- Farm Rural Employment Sector in the Eastern Region, *Indian Journal of Agricultural Economics*, 50 (3).

VIBHUTI, S. (NOV. 1991): 'Rural Non-farm Activity - A Regional Model and its Empirical Application to Maharashtra', *Economic and Political Weekly*, Vol. XXVII, No.45, pp.2587-95.

VIDYULATA, PUNIA, R.K., and V.P. CHQNAL (1995) Non-Farm Employment Among Rural Women (A Case Study of TRYSEM), *Indian Journal of Agricultural Economics*, 50(3) pp 458-459.

VISARIA, P. (1991) Evolving An Employment Policy For The 1990s - What Do The Data Tell Us, *Economic And Political Weekly*, 26(15), pp 969-979.

--- (1995) Rural Non-Farm Employment in India: Trends and Issues for Research, *Indian Journal of Agricultural Economics*, 50(3) pp 398-409

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

VYAS, V.S. and P. BHARGAVA (1995) Public Intervention for Poverty Alleviation: An Overview. *Economic and Political Weekly*, 30(41, 42), pp 2559-72.

VYAS, V.S. and G. MATHAI (1978) Farm and Non-Farm Employment in Rural Areas: A Perspective for Planning, *Economic and Political Weekly*, 13(6, 7), pp 1369-74.

VYASULU, V. (1995) Management of Poverty Alleviation Programmes in Karnataka: An Overview. *Economic and Political Weekly,* 30(41, 42), pp 2635-2650.

WHITE, H. (1980): "A Heteroscedasticity Consistent Covariance Matrix Estimator and a Direct Test of Heteroscedasticity", *Econometrica*, Vol.48. pp. 817-818.

Appendix Table 1: Correlation Matrix of all variables of 1991 used in the log-linear model at district level:

	Total RNFE	Main RNFE	commcrop	irrigation	land holding	literacy	urbanisation	road length	poverty	Land pressure	banks
Total RNFE	1										
Main RNFE	0.99	1									
commercrop	-0.63	-0.58	1								
Irrigation	0.41	0.40	-0.52	1							
land holding	-0.37	-0.37	0.52	-0.61	1						
Literacy	-0.06	-0.07	-0.02	0.39	-0.27	1					
Urbanisation	0.06	0.08	-0.08	-0.05	-0.04	0.66	1				
road length	0.08	0.03	-0.42	0.22	-0.34	0.39	0.22	1			
Poverty	-0.36	-0.32	0.33	-0.38	0.11	-0.44	-0.10	-0.23	1		
Land pressure	0.38	0.35	-0.59	0.48	-0.69	0.38	0.26	0.59	-0.34	1	
Banks	-0.01	-0.01	-0.16	0.02	-0.07	0.02	0.00	0.10	-0.08	0.002	1

Appendix Table 2: Correlation Matrix of all variables of 2001 used in the log-linear model at district level

	Total RNFE	Main RNFE	commcrop	irrigation	land holding	literacy	urbanisation	road length	poverty	Land pressure	banks
Total RNFE	1.00										
Main RNFE	0.89	1.00									
commercrop	-0.45	-0.40	1.0								
irrigation	0.16	0.26	-0.62	1.0							
land holding	-0.05	-0.16	0.62	-0.67	1.0						
literacy	-0.20	-0.13	-0.28	0.51	-0.34	1.0					
urbanisation	0.08	0.01	-0.07	-0.10	0.03	0.53	1.0				
road length	0.14	0.13	-0.21	0.15	-0.19	0.07	-0.13	1.0			
poverty	-0.22	-0.24	0.62	-0.57	0.38	-0.18	0.05	-0.14	1.0		
Land pressure	0.20	0.15	-0.62	0.48	-0.71	0.45	0.28	0.24	-0.52	1.0	
banks	-0.03	-0.06	-0.18	0.06	-0.11	0.10	-0.02	0.57	-0.09	0.03	1.0

Note: There are no correlation problems that were deemed worth reporting