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Abstract

In the past two decades, there are significant changes in rural India. There is some significant progress in reduction of poverty. This study examines the pathways by the Dokur villagers of Andhra Pradesh in India to survive and improve livelihoods in the face of a decade of persistent drought. The study is based on quantitative and qualitative data collected by ICRISAT: (a) longitudinal household survey data for the period 1975 to 2009, and (b) information and data gathered through focus group discussions with the villagers. It has documented various types of livelihood strategies, government policies, programs, process and outcomes over the period. The changes in ownership of productive assets including land, cropping patterns, occupational structure, household income, food intake and nutrition, children's education, and improvement in living standard are also examined. The per capita income of households has increased rapidly in the recent years. However, income inequality situation has worsened as high-income opportunities are favourable to resource endowed households. As a consequence of increased income from multiple sources, consumption level has gone up and consumption has been smoothened, and overall living standard has improved. Access to education particularly for girls and children from marginalized families has increased. Finally, the study identified enabling factors at household level and suggests development policy.

Keywords: drought, coping mechanism, migration, livelihoods, income, inequality, poverty.

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1. Introduction

Rural development used to be a sectoral issue with agriculture as the main focuses as a way of livelihoods until recently. However, it is transforming rapidly from predominantly agricultural to a diversified economy in developing countries. Kuznets (1957) collected a large amount of evidence in support of this observation, and also documented the simultaneous decline over time of the labour force employed in agriculture, the large increase in the share of the labour force employed by non-farm sector. Other surveys of the sectoral development process conducted in more recent times have confirmed the validity of the patterns described by Kuznets. The surveys by Chenery and Syrquin (1975), Mundlak et al. (1997), Long (2011) and Bdul (2012) are particularly extensive both in terms of countries and of time periods covered.

The increased diversity of rural economy leading to the diverse pathways of development in each region/local context based on the local resource endowments and geographical location (Long, 2011). However, across Indian villages, some common trends like increased role of non-agricultural sector and migration income, crop diversification from subsistence to commercial crops, expansion of livestock sector as new livelihood strategies are evolving. Further, the government policies have significant influence on the process of change and its wider influence on the well-being of the population. The technological advances, liberalization and globalization is having its own impact at local level. Studying the dynamic interaction of various aspects of changes on livelihoods of villagers overtime provide better understanding about the process of change in technology, environment, economy, political and culture. Keeping this the paper examined the dynamic changes in a village (Dokur village) located in Semi-Arid Tropics of India, which was intensively studies by earlier researchers like Binswanger and Rosenzweig (1986), Wakler and Ryan (1990). The paper finds that over the last forty years there is significant changes happened in the rural livelihoods. The main driving forces of change are (i) non-farm employment within villages, (ii) rural-urban linkages and demonstration effects (iii) migration to large cities for increased incomes, (iv) public investments in education, health and sanitation (v) safety-net programs like public distribution systems, large scale government employment program(MGNREGA) and (vi) women empowerment through self-help-groups.

Following the section one, section two explains analytical framework, section three describes data, methodology and background of the village. Section four dealt with distribution and ownership of assets, changes in cropping pattern, livestock, section five deals with change in real wage rates, occupational and income distribution, poverty trends, access to education and health and nutrition. Section six deals with access to public services and section seven critically examine implications for development strategies and policies and section eight concludes.

2. Rveiw of Literature and Framework of analysis

Himanshu et al (2011) indicate that the non-farm sector in rural India has grown steadily during the past 30 years, with some acceleration during the late 1990s to the mid-2000s followed by a levelling off after 2004-05. By taking example of Palampur village of Western Uttar Pradesh, he linked the recent phenomenon of rural poverty decline with the diversification of the village economy. The paper also highlighted the close association between rural poverty reduction and rural non-farm growth, growth of small towns. Krishna and Shariff (2011) Examined the panel data for more than 13,000 rural Indian households over the 12-year period 1993-94 to 2004-05 shows that two parallel and opposite flows regularly reconfigure the national stock of poverty. Some formerly poor people have escaped poverty; concurrently, some formerly non-poor people have fallen into poverty. These simultaneous inward and outward flows are asymmetric in terms of reasons. One set of reasons is associated with the flow into poverty, but a different set of reasons is associated with the flow out of poverty. Both sets of reasons vary considerably across and within states. States with high and low rates of

economic growth have variously experienced high and low rates of escape and descent. No clear correlation exists at the level of states between higher growth rates and faster poverty reduction. Thus, to claim that “growth of aggregate consumption/income is a sufficient condition for poverty reduction,” does not amount to an adequate policy prescription. Rather than simply banking upon growth, direct actions must be taken to reduce poverty. Mukhopadhyay and Rajaraman (2012) Even though, households incomes increased in rural India in the recent decade, the riskiness of the incomes are increasing faster than the actual rise in incomes, as a result most of the households are not able to invest in pucca houses, which is one of the indicators of permanent income. Krishna and Bajpai (2011) stated that the distribution of benefits from economic growth since the early 1990s has followed an identifiable spatial pattern. People in the largest cities have achieved the greatest gains, followed by people in small towns and villages close to towns. Further away, in villages located more than five kilometres from the nearest town – home to more than half of the entire population of India – inflation-adjusted per capita incomes fell between 1993 and 2005. The steepest declines were experienced by the lowest income groups. Rising inequality is a natural result of these spatially distributed trends. The debilitating effects of “distance from town” need to be countered by connecting outlying villages with more and better physical and social infrastructures. Similarly experience of other countries including China shows the importance of diversified sources of income in vitality of rural economy. While examining the Chinese rural economy, Siciliano (2012), highlighted that the reducing the rural–urban income gap in China is clearly a critical objective for both economic growth and equity. The multi-functionality of rural areas should be taken into account by Chinese policy-makers and planners as a viable strategy to achieve rural development targets. Increasing rural incomes and improving rural living conditions does not necessarily have to be obtained through rural–urban migration. On the contrary, experience in many rural areas of developed and developing countries suggests that rural development policies which have the potential to stimulate the diversification of the rural economy between on-farm and outside farm activities, together with financial support, expert information and education, environmental conservation programs, can all stimulate a rise in the livelihood of rural residents and to maintain farm activities. Studies from India and abroad indicating the rural transformation with more diversified income and employment options to rural population, but the actual process underlying these changes is not very well documented in India and elsewhere.

Rural Transformation Development (RTD) is a term that captures changes in traditional rural industries, the employment, consumption structure, and the social structure. These changes signify a transformation from previously isolated urban and rural economic structures toward more coordinated urban-rural development. Such transformation radically changes the urban-rural relationship and the relationship between agriculture and industry (Long, et al., 2011). The World Bank (2001) in its World Development Report mentioned three factors namely opportunities, empowerment and security to promote development in the villages. These three factors are also closely associated with the process of economic diversification. If the opportunities like multiple activities and non-farm and migration income enhances returns and exposure and thereby increase opportunities to rural population, the empowerment through literacy, female education, skill, awareness, assets, health and connectivity improves the capacity and scope of harnessing the opportunities. The resultant derivatives are augmented remuneration and returns from diverse sources. The paper also assess the government programs for their efficacy in providing social security and protecting the vulnerable sections from the market uncertainties. Mainly programs relating to food security, health, drinking water and sanitation, housing and employment generation are considered. The effectiveness of local governance institutions will be assessed for their overseeing role in functioning of government schools, hospitals, sanitation, drinking water etc. The paper tries to examine what are the driving forces of change in income and employment, poverty, consumption, health and education over the years from 1975 to 2009. The specific objectives of the study are (i) To document the pathways and mechanisms how the *Dokur* villagers of SAT-India, (ii) To document the changes in livelihood options and their underlying factors, and finally (iii) Impact of government policies, institutions and programs (iv) to suggest policy options for increasing effectiveness of local governance?

3. Data, Methodology and Study Village Description

This study is based on Village Level Studies (VLS) dataset generated by International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) for the period 1975-84, and 2001-2009. VLS dataset has been generated by ICRISAT's resident field investigators who lived in the villages to periodically revisit the same households over the years. In 1975, ICRISAT initiated the VLS in two village of Andhra Pradesh (Aurepalle and Dokur) and four villages (Shirapur, Kalman and Kanzara and Kinkhed) of Maharashtra (see Rao et al. 2009, for more information about VLS database and Dokur village). The aim was to understand the dynamic changes in village economy in the SAT region. Data from 40 households (10 each from landless, small, medium and large landholding groups) for each of the study villages was collected during 1975-1984 (Table 1). Sample size was not proportional to the number of households in each category of households in the village. In 2001, village studies were resumed in these VLS villages. This initiative commenced with a fresh census of all households and a more representative sample proportional to the number of households was included. In 2001-2004, total sample size was 80. In 2005 and 2006, this number increased to 94, which included split-offs of the original VLS households. However, in 2008, the non VLS households were detached from the data thereby including the old VLS sample households and their split-offs thereby bringing the sample to 98 households. In addition to VLS dataset, we have conducted several Focus Group Discussions (FGDs).

Table 1. Distribution of sample Households in Dokur ICRISAT VLS Dataset, 1975-2010.

Farm size	Operational holding (ha)	No. of HHs in 1975-85	No. of HHs in 1989	No. of HHs in 2001-04	No. of HHs in 2005-06	No. of HHs in 2007-08
Labour	< 0.2	25	25	25	24	26
Small	0.21 – 0.9	25	25	39	24	24
Medium	0.91 – 2.1	25	25	19	20	20
Large	> 2.1	25	25	18	31	30
Total HHs		40	48	80	94	98

¹The landholding class is characterized by its operational land holding, which is defined as owned land + leased in/shared in land – leased out/shared out land.

Village Description

Dokur is a village in Devarakadaramandal, Mahbubnagar district, Andhra Pradesh state. Dokur is 3.5 km far from its Mandal main town Devarakadara. Dokur is located 23.1 km distance from its district main city Mahbubnagar. It is located 112 km distance from its state main city Hyderabad. It is located between 16°36'03'' N latitude and 77°50'40'' E longitude. It is characterized by hot semi-arid conditions with mixed red and black soils. Soils are characterized by nitrogen, potassium and zinc deficiency. Mean annual rainfall is 700-1000 mm. Mean temperature is 25-29° C. Available water capacity is medium to very high. Length of growing Period is 120-150 days. In the Table 2, general statistic of the Dokur village comparing from 1975 to 2006 is presented. The transport facilities through road have widely improved and currently the village is connected to nearest towns by buses and auto-rickshaws. Telephone connections significantly developed from none during 1975 to 60% of households in the village (Table 2). More than 70% of HHs has television sets and increasing more during recent years. Information from newspapers and televisions are playing an important role in educating and increasing general awareness among the people. The lifestyle of the people in the village is changing. During 1975, the source of fire for household utilities was firewood, coal, and cow dung cakes. However, by the year 2006, there are about 50% of the families by having cooking gas connections through the government sponsored programs or through local providers. About 25 active SHGs are functioning in the village. Educational opportunities increased through establishment of new schools and upgrading of existing schools. There is expansion of both public and private primary health centres in the village in recent years. One main attraction to attend the schools is government sponsored mid-day-meal scheme, which provide nutritious food during lunch for every child who attend the school, it helped in reducing drop-outs and increasing school enrolment ratios. Tremendous improvement in communication occurred. Thanks to the cell phones and motor bikes. Number of agricultural equipment increased rapidly.

About 12 tractors, 20 power sprayers and 70 two wheelers owned by the villagers. Toilet facilities have increased in the village. Many were converted their thatched houses into pucca houses. Electrified households increased from 60% to 100% with the implementation of the scheme which provide free electricity for one-bulb houses. However, frequent and uninformed power cuts a big problem for use in houses and for running bore-well pumps. About 30% of households are with toilets. Many villagers now read newspapers on a regular basis. All these amenities confirm that living conditions in the villages have improved over time.

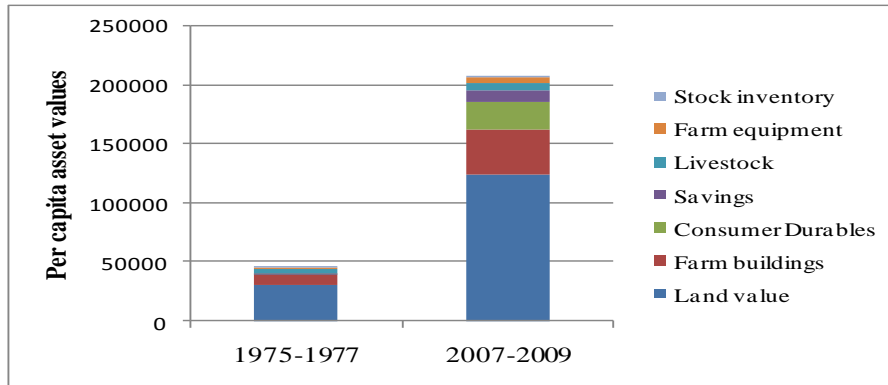
Table 2: General statistics of the Dokur Village, 1975 to 2007

Description	1975-76	2010-11
Total geographical area (ha)	1358	1358
Irrigated area (%)	32.0	10.3
Source of irrigation	Tanks (3), open dug wells (80), bore wells (0)	Tanks (3 dried), open dug wells (0), bore wells (200)
Total no. HHs	313	530
Total population	1783	2816
Average family size	6	5.31
School education available	7 th class (Upper primary)	10 th class (High school)
Total no. graduates	7	35
Pupils studying outside the village	20	100
Literacy level (%)	16	70
Anganwadi	1	3
Kasturba school for orphans (6 th -10 th standard)		500 (1)
Primary Schools	1	1
High School	0	1
Private school	0	0
Milk production	NA	600 liters/day
Electrification of HHs (%)	60	100% (free electricity supply for hhs with one bulb)
Sources of credit	Money lenders	Co-op Bank (PACS), SBH at Devarkadra, APGVB at Koukuntla & Moneylenders
DWACRA Groups (SHGs)	Nil	33 (25-active)
Private medical practitioners	1 RMP	1 RMP & 1 IRHS clinic
No of tractors	0	12
No. of four wheelers	0	8 HHs
Power sprayers	Nil	20
Radio	50	4
TV	Nil	70% HHs
Drinking water	Hand Pumps	50% HHs
Sanitation	Nil	30% HHs
Cooking gas	Nil	50% HHs
Cell phone	Nil	60% HHs

4. **Distribution and ownership of assets**

Change in household assets is an important indicator of living standards over a long period. Even though the relative importance of land decreased, its real estate value is increasing especially the lands located near roads. Still land is the major asset and contributes to about 70% to total assets of households in Dokur (Figure 1). The share of productivity enhancing assets like farm equipment, tractors, and irrigation pump sets is increasing among all households. Assets (land, house, livestock, irrigation wells and consumer durables) were divided in 80% of panel households due to family division since 1975. Average total assets per household are around Rs. 80000 in 2009/10.

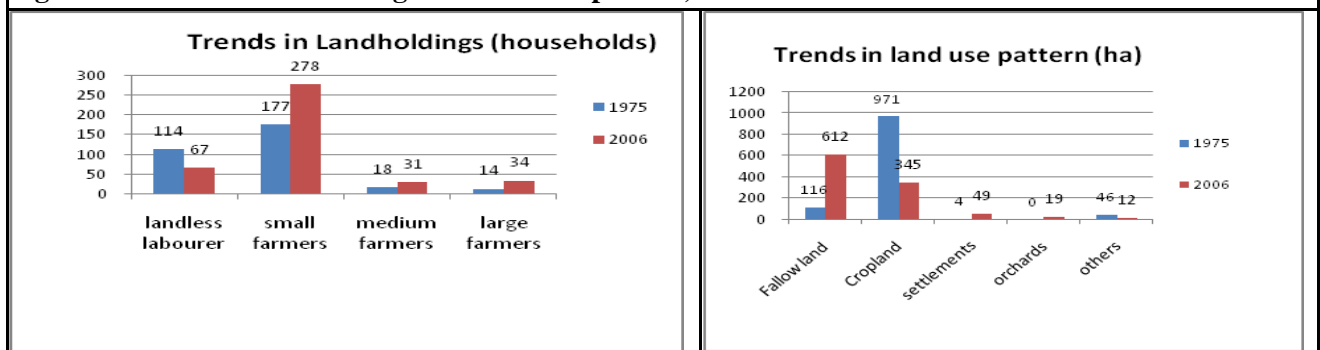
Figure 1: Trends in average ownership of assets by households (Rs 2009/10 equivalent) in Dokur, 1975/76 and 2009/10.



Source: Authors' calculation based on VLS Dataset.

In the village, small farmers (with land holding below 2 ha) dominate numerically (68% of the HHs) followed by agricultural labourer (16% of total HHs), medium (land holding between 3 - 5 ha) and large farmers (land holding above 3 ha) (Figure 2). Share of small, medium and large farmers increased mainly due to split in households while landless labourer decreased due to the outmigration of landless labourer to work in near-by urban centres between 1975 and 2009. With the consequent frequent droughts, low profitability of farming, scarcity of water and labour many households out-migrated in search of employment, resulted in increase in fallow-landover the years. This is a general trend in whole of Telangana region (Reddy, 2011).

Figure 2. Trends in landholdings and land use pattern, 1975-2009.



Source: Authors' calculation based on Household Survey data.

Trends in cropping pattern changes

The cropping pattern has been changed to adjust to water scarcity, change in market demand, prices and profitability. Sorghum is replaced with castor and groundnut in dry lands due to decline in demand for sorghum at macro level and increase in relative profitability of groundnut and castor. Many farmers also discontinued paddy cultivation due to water scarcity and shortage of labour, instead opted for less water intensive crops like cotton, groundnut and castor. However, Dokur farmers seen frequent crop failures of cotton crop over the decade, due to heavy infestation of pests and diseases. Some farmers also committed suicides as they invested heavily in failed bore-wells and pesticides. Dokur has three irrigation tanks (one big and two small) and a large tank called *peddacheruvu*, which was getting filled up every year and was supporting two paddy crops in the command area all through seventies and eighties. But during the last one decade, there was less availability of water at the tank due to scanty rainfall and cessation of inflow from the catchment area. All the command area lying fallow, and many of the open wells also dried up. Farmers switched over to bore wells from open well and tank irrigations systems as major source of irrigation, which increased of cost of cultivation. The risk is also high as farmers have to try 10 bore-wells to get success of at least in one bore well. Over the last two decades, area under irrigation declined in the village. The share of irrigable area in the gross cropped area was only 46% in the village. Orchards have replaced crop land to cope with reducing water availability and to take advantage of growing demand from nearest market (Hyderabad). Except paddy, all other crops reported stagnant or slower growth in yields. Increase in paddy yield from about 15 q/ha to 60 q/ha can be attributed to adoption of high yielding varieties. Increase in yield of paddy, free-electricity to irrigation-pumps and procurement of paddy by government at assured price encouraged cultivating paddy by some farmers.

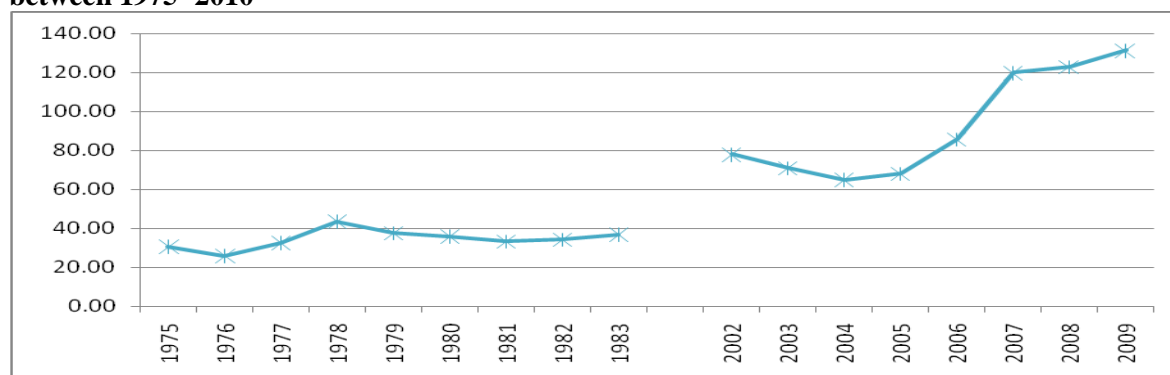
Livestock population

With the increasing demand for milk, many villagers tried to rear crossbreed cows for higher milk yield in early 1990, but due to the non-suitability of crossbreed to local conditions many died abruptly. Hence farmers shifted again to buffaloes for milk. Most of the buffaloes are purchased with the help of loans drawn from Self-help-groups program by women members. The incomes generated from the milk sale were mostly used to meet the needs of working capital in farming or to meet the day-to-day domestic expenses. All other livestock population decreased since 1975. Population of cows and draught animals has reduced significantly due to the high maintenance costs, lack of fodder and higher labour requirements.

5. Trends in Real wages and employment and income

There is a general trend of increase in real wage rates and employment opportunities in non-farm sector within villages, near-by towns and urban centres. Real wage (in 2009/10 Rs equivalent) for agricultural workers has continuously increased in Dokur over time (Figure 3). Real wage rate for male agricultural workers has increased more than four times during the last three and a half decades (from Rs 30.51 per day in 1975/76 to Rs 131.3 per day in 2009/10). Still there is wide gap between male and female wage rates, in 2009-10, daily wage rate of male and female agricultural workers Rs. 131.3 and Rs. 71.4, respectively. It was true for both agricultural and non-agricultural wage except during the paddy transplanting days during which the female wages are higher than male wages due to higher demand for women in paddy transplanting. The ratio of female wage rate to male wage rate is about 50% (Table 3). Non-farm wage was always higher than agricultural wage in Dokur. During the last eight years (between 2002 and 2009), average non-farm real wage for male workers has increased by 68% (increased from Rs 91.4 per day to Rs 153.1 per day). And interesting thing is that machine labour charges relative to male wage rate decreased significantly from 19 to 4 times that of male wage rates from 1975 to 2009. The relatively cheaper machine labour is the driving force for increased mechanization in agricultural sector mainly in land preparation, harvesting and threshing. Further, at state level ratio of per capita non-agricultural income to agricultural income is much higher and increased from 4.73 in 1993 to 5.28 in 2003, which is a driving force for shifting workers from agricultural sector to non-agricultural sector and increased migration to urban centres (Table 4).

Figure 3. Daily Real wage rates (in 2009/10 Rs equivalent) for Male Agricultural Workers in Dokur between 1975 -2010



Source: Author's calculation based on ICRISAT VLS dataset.

Table 3. Relative wage rates of female, child, bullock pair, RFS and machine labour relative to male wage rate

Wage rate relative to male wage rates	1975-76	1984-85	1991-92	2001-02	2006-07
Female	0.7	0.5	0.5	0.5	0.6
Child	0.7	0.5	0.5	0.5	na
Bullock pair (without operator)	2.5	5.0	4.5	4.1	2.5
RFS / Year	384.6	409.1	236.4	200.0	150.0
Tractor / Hour	19.2	8.2	7.3	5.9	4.2

Table 4. Per capita GSDP per worker (in Rs) in Agriculture and Non-agriculture Activities

Year	Agriculture	Non-Agriculture	Ratio (Non-agril/Agri)
1993	7201	34077	4.73
2003	9830	51924	5.28
% Change	36.5	52.4	

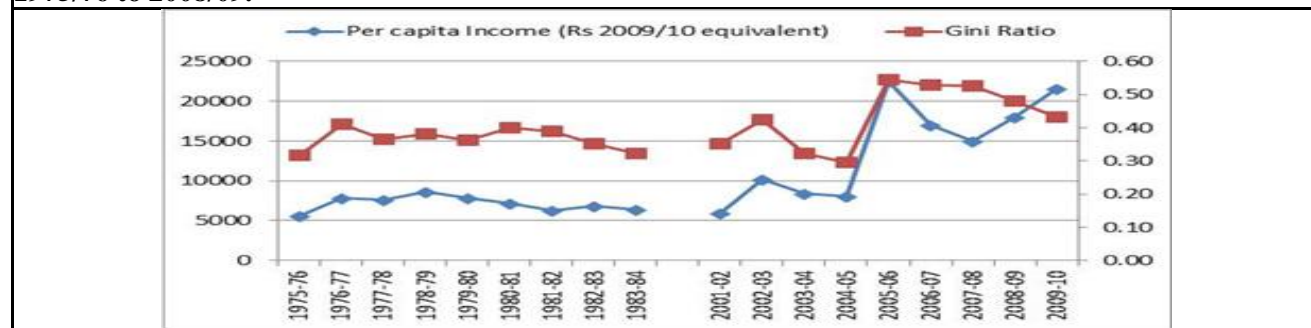
Note: Workers in agriculture and non-agriculture considered to calculate the per capita GSDP per worker, is based on NSSO 50th (1993-94) and 61st (2004-05) round and New series (1993-94) GSDP figures of DES(Hyderabad) Source: Human Development Report 2007, Andhra Pradesh

Occupational and income structure of households

Dokur villagers have experienced important changes in their income level and sources of income over the years. Per capita real income (Rs 2009/10 equivalent) increased substantially (Figure 4 and 5). Between 1975/76 and 2008/09, per capita real annual income has increased more than three times (from Rs. 5641 in 1975/76 to Rs. 17974 in 2008/09). The relative importance of farm income reduced, while income from migration and non-farm income increased over the years. Other sources of income include wage earnings from labor and livestock. However, the share of households reporting agriculture as main occupation continues to be high, even though its share in household income decreased. The main rural transformation engines are technological progress in agriculture and expansion of non-farm incomes. The process of transformation in the village is slow until early 1990s, it picked up in the last decade. Technological progress in agriculture has often been considered the trigger of the income and employment diversification of villages. Dokur villagers have experienced a decade of continuous drought (1992 to 2004). They adopted migration, diversifying into non-farm activities as coping strategies for frequent droughts. Due to drought they had negligible income from crop production during 2001-2004 (Figure 4). Despite a decline in the agricultural income, the income levels of households in real terms have more than doubled between 1975-78 and 2005-08 (except extreme drought

years of 2001-04). The incomes from the farm and non-farm labor, business, salaried jobs, caste occupations, and out-migration has increased further and probably linked more to urban centres than to farm sector in the village. The incidence of poverty has declined from three-fourth of households to one-third over the period. It is interesting to see from figure 5 that the number of households with subsidiary occupation(multiple occupations) increased over the period which is also a risk mitigating strategy.

Figure 4. Trends in per capita Income (Rs. 2009-10 equivalents) and inequality in income in Dokur, 1975/76 to 2008/09.



Source: Authors' calculation based on Household Survey data.

One negative side of income diversification is increase in income inequality among households in Dokurvillage (Figure 4). Estimated values of the *Gini* coefficient indicate that income inequality among sample households has increased in recent years. It was as high as 55% in 2005-06 and about 50 % during the last three years (2006-07 to 2008-09), while inequality at state level is 25 to 30%. It implies that rapid transformation of village through income diversification, not able to benefit all households equally and many are not able to take advantage from earning opportunities. The most vulnerable social groups, the scheduled castes in particular, have not substantially improved their living conditions over the last decades (see for example Gang et al., 2008, Sundaram and Tendulkar, 2003). There are studies that have used either large surveys (mainly National Sample Survey consumption and National Family Health Surveys) or fieldwork based small sample surveys to show the evidence of caste differentials in consumption, income, education, occupations, and development indices (e.g. see Deshpande, 2001; Hasan and Mehta, 2006; Mohanty, 2006; Srinivasan and Mohanty 2004; Sundaram 2006; Reddy 2011).

The households resorted to many coping strategies during drought years. The major coping strategies adopted by the villagers are crop diversification, which require low cost of inputs and shifting to inter/mixed cropping on larger area to spread risk, try to get new loans from government, friends, relatives and money lenders. Postponement of long-term loans, marriage of female children and major investment in agriculture, looking for more employment opportunities (farm/non-farm) outside the village, migration to cities/towns for search of employment, reduce the consumption of alcohol, toddy, meat, oils, and milk, substitute higher price food with lower price food items, reduce the quantity of food consumption, mortgage/sale of gold and silver, sale of livestock, and mortgage/sale of land (Rao *et al.*, 2009). The coping strategies vary for single year drought compared to continuous drought for more than one year. Compared to past in the recent years importance of migration, non-farm work and multiple occupations is increased as main household coping strategies. It is interesting to see that, migrants have many options to choose from in terms of distance (5km to 1000 km from Dokur), nature of employment (regular with food and accommodation, monthly salary, casual(and skill sets (semi-skilled, manual, caste occupations) and in terms of wage rates (Table 5).

Table 5: The nature and extent of migration in Dokur, location of employment and wage rates.

Nature of employment	Distance (kms)	Place	Gender	Wage rate
Non-farm work like canal digging, construction, laying roads, hamali (loading and unloading), etc.	100-1000	Hyderabad in AP; Pune, Goa and Mumbai in Maharashtra; and Surat, Baroda, Ahmedabad in Gujarat	Male, female	Rs 10,000 in advance (1000 per month) plus free food and accommodation
Washermen and barbers (caste occupations)	> 600	Goa and Pune	Male	Rs 3000-4000 per month
Driving of jeep, taxi and trucks, etc	125	Mahabubnagar and Hyderabad	Male	Rs 2500-3000 per month
Service boys in hotels, bar-cum-restaurants and lodges	125	Mahabubnagar and Hyderabad	Male	Rs 2000 per month and free food and accommodation
Laying underground cables and water pipes	25-125	Mahabubnagar and Hyderabad	Male, female	Rs 80-100 per day
Driving autos	5-125	Devarkadra, Mahabubnagar and Hyderabad	Male	Rs 150-200 per day
Monthly salaried jobs in shops, Companies and other establishments	5-125	Devarkadra, Mahabubnagar and Hyderabad	Male	Rs 2500-3500 per month
Maid servants in homes	25-125	Mahabubnagar and Hyderabad	Female	Rs 400-800 per month
Carpenter, goldsmith, barber and other caste occupations	10-30	Devarkadra, Mahabubnagar and Hyderabad	Male	Rs 100-150 per day

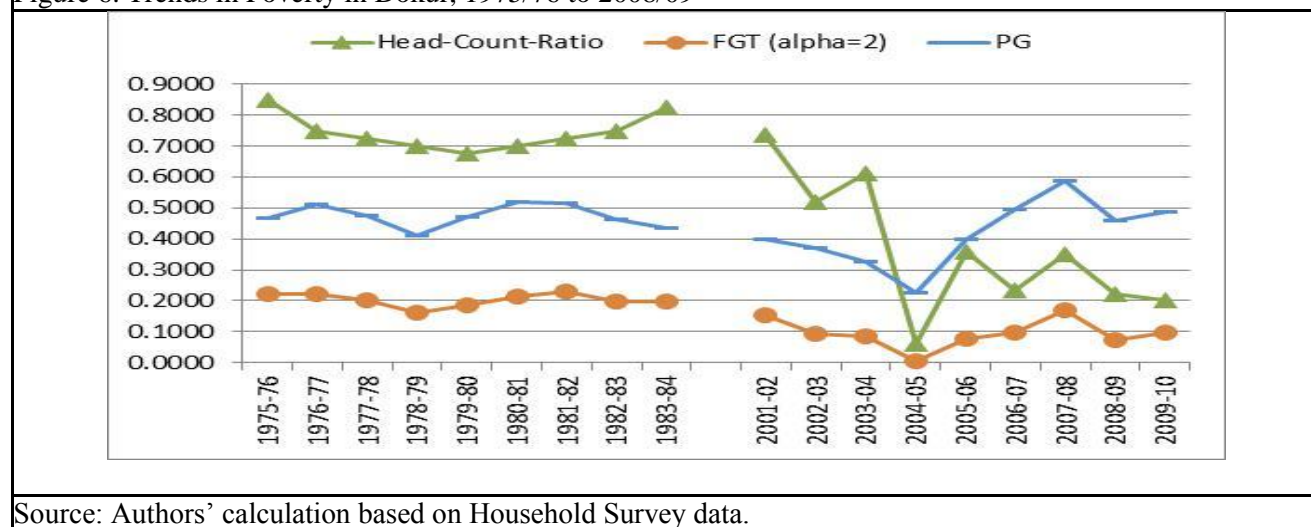
However, the migration, frequent commuting between rural-urban areas resulted in occurrence of health problems relating to migration. Gandhi *et al.*, (2008) gave a comparison of the general and sexual health status of migrants and non-migrants. Compared to non-migrant villagers, the health of the migrants was relatively poor, with 36 % of the respondents complaining of ill-health and of considerable difficulties in handling daily tasks, especially at the migration sites. 29 % of the migrants suffered from sexually-related illnesses (gonorrhoea and syphilis being the common illnesses in Dokur). With regard to both general and sexual health, the migrants were the ones most seriously affected, which is serious socio-economic problem on the future productivity and health costs if it is not addressed by policy.

Trends in poverty levels

Poverty significantly decreased in Dokur village over the years (Figure 6). The positive correlation of high-earning non-farm employment with wealth, education, landholding and upper caste households (Reddy and Kumar, 2006) may also suggest that those who begin poor in land, capital, education and backward caste households face an uphill battle to overcome entry barriers and investment requirements to participation in high-earned nonfarm activities capable of lifting them from poverty. It is also confirmed by increased *gini* ratio of income. This suggests that features unique to in the rural markets impede the entry of marginalized subpopulations into higher-return niches, thereby causing the nonfarm sector to have distributionally regressive effects on incomes. On the other hand, most of the lower strata households are opting to temporary migration, even though it helps in smoothen consumption its impacts on long term social welfare needs to be analysed in-depth. Only few households who are lucky enough opted for permanent migration to cities, leaving their children to be taken care by other elders (grandparents) benefited. These households spent migration income on children's education, resulting in children's getting higher paid employment in urban centres. Poverty

policy should aims to improve the investments in physical and human capital of the households. The largest employment program in India (MGNREGA) provided guaranteed minimum 100 days of work for each person who opts for in every year. It generated a significant number of work days within the villages for working class at prescribed minimum wage and also increased real wages in the villages. With the introduction of new guidelines for implementation of MGNREGA, on-line transfer of money to the accounts of workers there is increased transparency in the program implementation and reduction in corruption.

Figure 6. Trends in Poverty in Dokur, 1975/76 to 2008/09



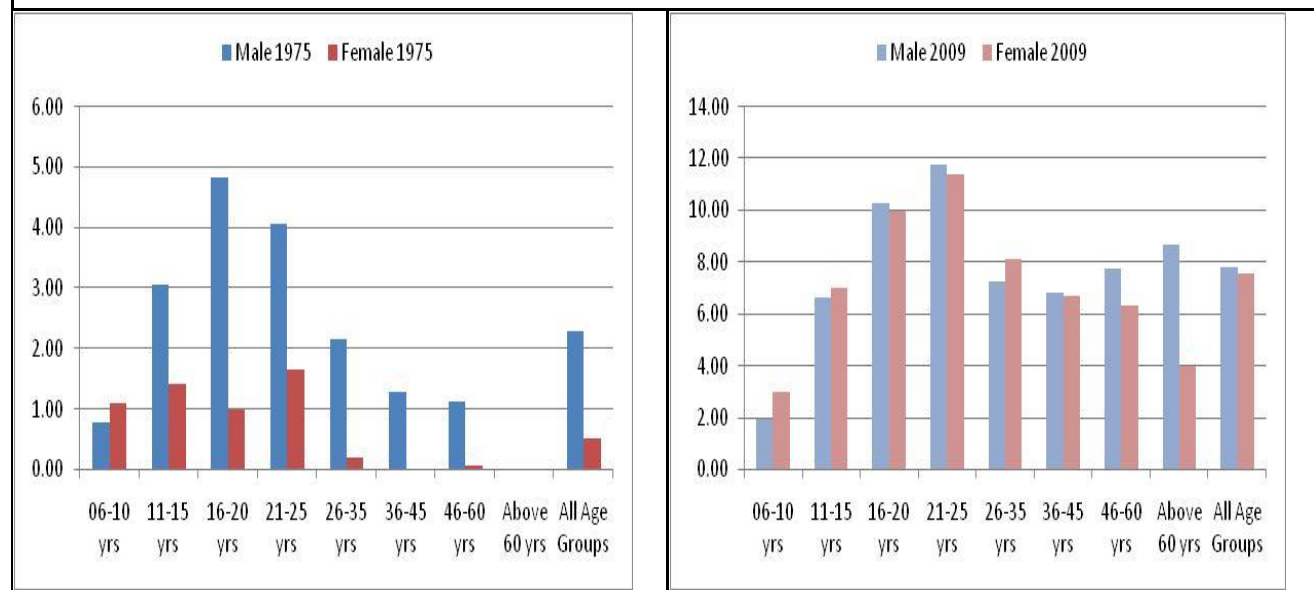
6. Access to public services

Education and social safety nets

Access to education helps to gather knowledge, skills and enhances abilities of individuals to take part in higher-earning economic activities. It widens choice of occupation and increase locational mobility. Dokur villagers have experienced substantial increase in educational attainment. Average years of schooling increased in 2009/10 for both male and female children irrespective of their family wealth and caste status. In 1975/76, male population of sample households, on an average, had 2.3 years of schooling while it was 0.53 years for female population. In 2009/10, average years of schooling for male and female population increased to 7.82 years and 7.60 years, respectively (Figure 9). In case of younger generation (aged below 25 years), gender equality in education is more prominent. Mid-day meals have been introduced in the school. The 86th Constitutional Amendment Act 2002 made education free and compulsory for all children between 6 and 14 years of age. The current scheme of universalization of education-for-all (the *SarvaShikshaAbhiyan*) which is one of the largest educational initiatives in the world showing results with increased enrolment roles. Elementary school started in 1966 and it was upgraded to high school (10th class) in 2007. An enquiry into the school enrolment of children revealed that all children of the sample households in Dokur aged upto 14 years were going to the school in 2009/10 (Figure 7). The gender gap in school enrolments is negligible in the village in 2009 compared to 1975. Thus, it appears that government's efforts accompanied by awareness and positive attitude towards education have increased access to and achievement in education for the new generation. The importance attached by the parents to education is evidenced by the substantial expenditure in education and the rapid diffusion of private schools in rural areas (Tilak, 2002). Parents spent large sums on education even for children that are enrolled in government schools, particularly in books, travel and uniforms (Sipahimalani, 2000). According to NSSO data used in this study, household in Andhra Pradesh spent on

average 3% of total outlay on the education of their children. This figure is quite large if one considers the typical Indian household portfolio asset allocation. However, still a lot to do in education sector especially in improving quality of government school education and infrastructure. Share of education in GDP is still quite low (3.78%) when compared to the target of 6% in 2008/9 (Planning Commission, 2007).

Figure 7. Level of educational attainment (average years of schooling) by gender in Dokur, 1975/76 and 2009/10



Source: Authors' calculation, based on Household Survey 1975/76 and 2009/10.

Health and Nutrition

In addition to education, health and nutrition are important investment on human capital by households. Palacios (2011) reported general health status, access to health services and maternity care in the study village. She used two datasets for this purpose: (a) Kim Chung, then a Ph.D. candidate, collected dataset on food-security related information in four of the six VLS villages in the early 1990s; and (b) information collected by ICRISAT in 2007. From these datasets, among other health and nutrition indicators, average Body Mass Index (BMI) for women (and men where possible) was calculated. BMI is basically a ratio of weight to height and is considered a decent indicator of overall health. A BMI between 18.5 and 23 is considered normal range, and BMI below 18.5 implies malnourishment or eating disorders. In 1992, average BMI fell below the 18.5 malnourishment threshold (Palacios, 2011). General health as indicated by average adult BMI has improved since 1992; likewise, malnourishment rates have fallen as well. It is important to note that average men's BMI was lower than women's in most cases, which may indicate that women were not necessarily the first to sacrifice their own food intake when there is not enough.

India has some of the worst indicators of child well-being. About half of all Indian children are undernourished; more than half suffer from anemia, and a similar proportion escape "full immunization". There is therefore an urgent need to re-examine what India is doing for the survival, well-being and rights of children under the age of six years (Dreze, 2006). Women's access to prenatal and maternal care for healthier pregnancies, safer deliveries, and healthier children is an important investment for gender equity and future generations (Palacios, 2011). Women in village reported that 40 years ago, all women gave birth at home in the presence of a few female family members, with no trained medical staff. High rates of maternal and child mortality was prevalent in the village. Now, all pregnant women go to at least a government hospital if not a private hospital to give birth. Government hospitals do not charge for delivery and even provide Rs. 1000

worth of quality food to the mother. Prenatal, maternal and child health has improved in the village due to the presence of government health care workers, some stationed permanently in the village and some who make regular weekly rounds to check up and distribute medications. Thus, health status of men, women and child has improved.

The village has better and improved health facilities presently compared to 1975. Primary health centre (30-bed hospital) has been functioning within 7 kms at Devarkadramandal (Table 6). Institute for Rural Health Studies (IRHS) clinic established in 1989 have been providing basic health services to the villagers at Dokur and also to neighbouring villagers. Local Registered Medical Practitioner (RMP) is also rendering consultations to the villagers at minimum fees. Primary health centre is also available in the nearest village. General health camps were conducted for free of cost by the primary health centre concerned. The camps provided treatment for general ailments and identify the critical cases of TB, AIDS, GE, Malaria, and Cataract for subsequent treatment. Under Total Sanitation Campaign (TSC) a total of 110 families provided with subsidised toilets. The TSC advocating a shift from high subsidy to a low subsidy regime, greater household involvement, demand responsiveness, and providing for the promotion of a range of toilet options to promote increased affordability.

Table 6. Details of different hierarchy of health service providers in Dokur

Headquarters name	Place	Functionary name	Year of Est.	Distance from AWC
Child Development Project Office (CDPO)	Atmakur	CDPO	2002	25
Sector	Devarkadral- I	Supervisor	2002	10
Primary Health Centre (PHC)/ Community Health Center (CHC)	Peroor	Medical Officer	1994	18
Institute for Rural Health Studies (IRHS)	Dokur	Medical officer	1989	0
PHC Sub Center	Dokur	Auxiliary Nurse Midwife	1984	0
Area Hospital	Narayanapet	Medical Superintendent	2002	55

Food Security

Food security is defined as sufficient food consumption by all at all times for a healthy and productive life at household level (FAO, 2008). The government of India provide subsidised supply rice, kerosene and sugar to all the ration cardholders through fair price shop of the village. The allotment of different ration cards to all households in the village is based on each household's income level. The white cardholders (BPL card holders) are those households who own less than 2.5 hectare of land. There are other category of households falling above the poverty line (APL) know as green cardholders and not eligible for any subsidised items. Disabled, widows, and person above the age of 65 years would also fall under BPL and are eligible to get 10 kg rice for a month under *Annapurna program* on free of cost. Household who do not own any land and fall under BPL are also eligible to get 35 kgs of subsidised rice per a month for Rs 1 per kg through *Antyodaya Anna Yojana program*. This program provide food security to all the households residing in the village, earlier there are many loopholes in the program with lot of corruption, but with increased transparency and active decentralised democratic institutions corruption reduced significantly.

Credit

Most common problem in rural areas is under investment in infrastructure, social and economic activities. Availability and access of credit at affordable interest rates is a major problem in rural areas. Though Primary Agricultural Cooperative Societies (PACS), Regional Rural Banks (AP GraminaVikas Bank) and scheduled commercial banks provide financial services to the farmers under different schemes, the informal credit market dominates in the village. With greater accessibility with minimum procedural delays in getting informal credit, however, informal sources are for short-duration, for fewer amounts with higher interest rate. However, the informal credit markets (either with Micro Financial Institutions, money lenders, relatives, friends, traders and commission agents) characterized by unethical recovery practices. Hence there is a need for strengthening formal credit system through innovative schemes like *Kisan Credit Cards*, SHG-Bank linkage program, mobile banks etc.

Women empowerment

Traditionally Indian society discriminate women in all activities of life, consequently the sex ratio (women to men ratio) are less in India. Various government programs targeted to women (Anganwadies) are also having positive impact on women development. Anganwadi programs are targeted at improving the nutrition and health of children below six years, women (particularly those pregnant and lactating) and adolescent girls. Government is also encouraging girl children through providing bicycles, depositing Rs.100000 in their accounts for future educational expenses. Twenty years back, women are not participated in discussions relating to village problems, now after SHG formation women fully-engaged in village development activities equivalent to men. Women in the village are organised into 33 Self-Help-Groups (SHGs) which were linked to the nearby banks. Each group comprises of 10-15 members, each member save Rs.30 to Rs.50 each month. The sum is deposited in the bank in joint account. Based on the performance of SHGs in savings, the groups can get additional loans from the banks for purchase of livestock, starting business etc. out of 33 SHGs, 25 are active now, the remaining eight SHGs not-active due to non-repayment of loans, internal conflicts etc. Women are actively participating in all economic activities in the village, but wage rates are about 70% of men wage rates. Women mostly work on paddy transplanting, cotton picking, weeding etc.

Beneficiaries in government programs

Even though only 525 households residing in the village, under PDS 600 white card (below poverty line cards) and 10 pink card (above poverty line cards) families taking subsidised rice, kerosene and sugar. Under Antyodaya Anna Yojana (AAY) additionally 48 families are benefiting from PDS. Under pension scheme 103 persons (55 old age persons, 46 widows and 2 physically handicapped persons) are getting monthly pensions. Under Indira Awasayojana (housing scheme) 246 houses are sanctioned for subsidy for construction of houses in identified lands. Under Anganwadi program 46 children 12 pregnant women are benefiting through nutrition food, through Mid-day-meals program at schools about 300 students are benefiting, about 33 SHGs are benefited from Indira KranthiPathakam which benefited about 400 women members of SHGs by providing loans for productive purposes, under MGNREGA program 250 persons from 100 families in the village benefited and generated 10000 man-days in addition to asset creation like repairing village roads, cleaning of filed channels, check dam construction for water conservation etc. villagers' constructed overhead tanks and fitted drinking water taps in 180 households and fitting of taps is in progress in rest of the households. Some agricultural based development programs are sheep and goat deworming program, subsidised seed, fertilizer, power sprayer distribution to eligible farmers under National Food Security Mission (NFSM), distribution of subsidised sprinklers and drip irrigation systems under micro-irrigation scheme. Village panchayat financed construction of new school building, laying internal roads, community hall for backward caste during the past six years. Overall, effectiveness of government programs is increasing over the period, it is the result of improvement in (i) transparency and governance improvement in government programs management at all levels and (ii) increased awareness about the programs at grass root level.

7. On-going-Government programs Policy Recommendations

Most of the government programs targeted to reducing inequality and poverty since independence. Despite this, still about 30% of rural households in Andhra Pradesh are poor, and inequality is still a serious issue. Dokur village is one of the representative villages in SAT-India where development pathways are more feasible in non-farm sector, rural-urban migration due to its proximity to highways and largest urban centre (Hyderabad). Villagers improved their livelihoods due to technological progress in agriculture, mainly adoption of high-yielding varieties of cotton and paddy varieties, multiple sources of income, increased share of non-farm and remittance income, improved health and education facilities either from public or private funds etc. Democratic institutions like village panchayat, parent committees, self-help groups helped in proper functioning of government programs like MGNREGA, Indira Awasayojana (subsidised housing scheme), Indira Jala Prabha (subsidised bore-well scheme), Public Distribution System, Anganwadi program, Mid-day-meal program, complete sanitation. There is a lot of improvement in all government programs, there is visible reduction in siphoning of money from government programs by vested interest groups and corruption at all levels.

Even though fruits of development reached many, some are lagging behind due to lack of access to physical, human and social capital. Also, an inter-temporal analysis of inequality shows that the increased inequalities between haves and have-nots is a major concern and needs to be addressed. The education, physical and social capital are important determinants of mobility towards higher-paid employment. The increased investments through public expenditure on public goods like education, health, housing and sanitation helps in providing equal opportunities for both haves and have-nots. This will help children of vulnerable groups to educate to enter-in-to higher earned employment, which ultimately helps in occupational mobility towards higher earned employment. The study finds the most important factors in successful functioning of government programs is enhanced transparency, active participation of local people in decision making and better local governance. They helped in pro-active role of locals in supervising the activities under MGNREGA, Anganwadi, PHCs, school education and PDS etc for more efficient functioning.

With the out-migration of young men from the village, feminization of agriculture and graying of person's dependant on agriculture is visible in the village. Hence there is a need for important policy shift to provide effective basic minimum needs of the women, children and old aged persons with emphasis on quality education with adequate infrastructure in the schools, with optimum pupil to teacher ratio, women skill development in tailoring, embroidery, small scale industries etc., proper implementation of old age pension scheme. Even though the government of Andhra Pradesh having ambitious plans for women and child development and also old-age people like *Anganwadicentres*, AP rural livelihood programs through SHGs and old age pension scheme, but their effectiveness is questionable. The common implementation problems like attracting young, educated and enthusiastic workers to work in rural areas are a major problem in the coming years. Even if potential people are recruited and working rural areas, retaining them, keeping up the tempo is major problem, over time most of the grass root Anganwadi workers are losing motivation to work as the salaries are low and there is no incentives for better work. To increase effectiveness of the programs there is a need for higher transparency, local community participation and increased incentives to work for young women in *anganwadi* centres.

Another important aspect is importance of non-farm employment and migration not only as drought coping strategies but to move to higher earning employment and living standards. It means occupational mobility to higher employment strata require developing a connection with the city. It is also confirmed by many other studies also Krishna and Shariff, 2011 found that the households residing in villages located fewer than 5 km from the nearest city and connected by better bus services and denser telephone links had significantly higher odds of breaking out of poverty. Households who derived a higher share of income from non-farm sources had

a significantly higher chance of escaping poverty. Within the rural sector, rural non-farm employment opportunities need to be encouraged as first step in transformation and balanced rural–urban migration need to be promoted to reduce income and cultural gaps in rural-urban settings. Within the agricultural sector, policy reforms are needed to rapid technological progress, increase in value-added production beyond traditional food grains. Agriculture needs to be placed in the context of an agri-system that encompasses farming, wholesaling, processing, and retailing (Fan and Gulati, 2008) as a holistic strategy. The recent policy reforms like Foreign Direct Investment (FDI) in food retailing are right strategies, if they link with rural economy by pumping in investments in cold-storages, development of warehouses, value-chains and better infrastructure. There is high probability of some of the small farmers, agricultural labourer and scheduled caste households left out of the market driven development. This is where the existing program like MGNREGA, PDS, old age pension scheme, zero% interest rate for women needs to target and ensure social safety net. Different development programs including input and output subsidies should be targeted to smallholders in drought prone villages where temporary migration is frequent. Local governance must be accountable for their work with higher transparency and more participation should be encouraged to place checks on the administration system (Fan and Gulati, 2008). Understanding inequality, its structure, and how it affects poverty at village level will help in policy formulation to suite local needs. The local demographical, economical and political factors needs to be taken into account while implementing the programs like MGNREGA to avoid elite capture and to target benefits to lower strata population who are most likely by-passed by the markets. Dreze (2007) among many remain optimistic about the potential of MGNREGA like programs in creating both employment as safety net and also a way to create productivity enhancing assets in rural areas. Finally, the insights from the study will be helpful in understanding the rural transformation, policy formulation and implementation to improve wellbeing, to reduce poverty and inequality. This is crucial because knowing factors that account for inequality will be vital in harmonizing government efforts against inequality and poverty. This study will permit scientists, analysts, policy-makers and international institutions to have a more precise vision on how inequality issues at village level may be tackled.

8. Conclusion

Poverty in rural India has declined substantially in recent decades. The percentage of the rural population living below the poverty line fluctuated between 50% and 65% during mid-1970s, but then declined steadily to about one-third of the rural population by the early 1990s. This steady decline in poverty was associated with rural transformation first led by green revolution technology in paddy 1970s, 1980s, then led by increased diversified income and employment opportunities from agricultural diversification to high value crops like cotton, livestock and non-agricultural sources. Public investment in rural areas has also benefited the poor through its impact on the growth of the rural farm and non-farm economy. After realising that the trickle down effects of growth not having significant impact on reduction of poverty, central and state governments increased public expenditure on poverty alleviation program, and employment programs during 1980s and 1990s which has directly benefited vulnerable sections of society and reduced rural poverty (Fan et al., 1999). Growth in agricultural production and technological progress is most crucial for poverty alleviation in rural areas, although it alone is not sufficient. Public expenditure on agricultural development, irrigation, education, and rural roads significantly contributed in reducing poverty (Fan and Rao, 2003) in the early periods of development. There is a recognizable increase in incomes, assets and consumption for most of the households due to multiple sources of income and increased consumerism, technological progress in consumer goods like cell phones. There is a change in the income structure, with declining shares from agricultural incomes and increasing non-farm income, migration and remittances since 2000. Furthermore, there is a smoothening of annual incomes due to diversified strategies followed by households, which reduced vulnerability to frequent droughts and also facilitated investments in human and physical capital. With the exposure to non-agricultural sector and rural-urban linkages people realized the gains from higher investments in the human capital, resulted in higher school enrolments even at post-secondary school level for both boys and girls. Finally, the quality of public services like education and health services, water, and credit services, have improved a lot since 2000 which are main reasons for improved livelihoods strategies. However, It is observed that the

reduction in malnutrition rates is much less than that might be expected given the sustained growth in per capita incomes over the period. This can only be attributed to a decline in the consumption of calories per capita (Deaton and Dreze, 2009). Despite the significant progress made, large differences in earnings between men and women exists till date, still some of resource poor households are not able to cross the poverty line (Reddy and Rao, 2003) which needs to be addressed through effective implementation of government developmental and safety net programs.

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