Chapter-II
Review of Literature
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This chapter presents a survey of literature on the income and employment of labour in agriculture and allied activities. Agriculture in India underwent substantial changes consequent to green revolution based on farm mechanization and adoption of HIV seeds, fertilizers. Economic irrigation based technology reforms have changed the facet of agriculture. In country as well as in the states, the agricultural labourers constitute significant portion of rural community. Their employment, earnings and efficiency affects the economy of the country. There is urgent need for addressing to the problems of agricultural labourers. Review studies cover various aspects pertaining to labour employment viz. relationship between labour employment and technology in agriculture, agricultural technology and labour employment in crop production, labour employment in allied agricultural activities. The economic literature pertaining to agriculture labour is much wider and varied, while the scope of this study is limited. As such we have focused primarily on the problems related to employment and income of agricultural labour. In view of the recent changes in agriculture, we have confined to the review of the studies of post-1980 years to present comparative picture of post green revolution pre-economic reforms and post-economic reforms period to provide background of a comparative perspective.

The relationship between the various ingredients agricultural technology and labour employment is dynamic of covering socio-economic as well as technical links between inputs and output. The Green Revolution followed by economic reforms in India have been associated with the growth and development of market and non-market forces, which in term influence the
extent and nature of labour employment in agriculture. The articles reviewed are presented in chronological order.

Agrawal (1980)\(^1\) and Rao (1980)\(^2\) observed that tube well irrigation affects cropping pattern and intensity more positively than the canal and tank irrigation. Cultivation of labour intensive crops and rise in cropping intensity raises the agricultural labour employment, and income. Narain and Ray (1980)\(^3\) observed that the extent and quality of irrigation along with labour availability explains more than 80 per cent of the variation in cropping intensity in 12 out of 17 states in India. Singh et. al (1980)\(^4\) using regression equations to analyse cross sectional data pertaining to 150 farms of the same district, observed that tractor use has negative impact on labour use. While this negative impact was significant in wheat it was not so in paddy, because of limited use of tractor on Paddy farms. Pearse (1980)\(^5\) observed that in Punjab, land preparations, seeding and irrigation were the jobs that were normally done by family labour have been affected by mechanizations. The overall use of hired labour seems to have increased consequent to adoption of HYV technology while the use of family labour has declined.

Agrawal (1981)\(^6\) reported that since harvesting accounts for 87.8 per cent of the female labour time in HYV wheat cultivation, it seems not to be affected by mechanization. Introduction of combine for harvesting operation is most likely to affect the

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absorption of female and casual labour of Punjab. **Dasgupta and Ishikawa (1981)** recognized the need for the examination of the inter linkages between labour absorption and technology, institutions & farm enterprises for different agro-climatic regions and situations and suggested that three broad categories of labour employment can be identified for examinations of the effects of various technology inputs:

(a) Labour employment in crop production,

(b) Labour employment in allied activities for example, dairying, processing etc.

(c) Labour employment in non-agriculture activities in directly supporting agriculture through backward and forward linkages like transport, repair facilities, etc.

Author further observed that well irrigation has more positive effect on cropping intensity and labour absorption. **Singh et. al. (1981)** and **Oberai & Ahamad (1981)** observed the labour use to be negatively associated with tractor use. The decomposition exercises which decomposed observed employment changes in terms of technology inputs also arrived at similar conclusion. **Joshi et. al (1981)** used modified version of Rajkrishan’s model for decomposing the change in labour utilization in Wheat-Rice cropping system between 1966-67 and 1977-78 and arrived at similar results for Eastern and Western regions in Uttar Pradesh. **Patel (1981)** on the basis of Bench mark survey data in Gujarat, attributed 31.78 per cent of the additional labour days per hectares to irrigation operation itself.

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and remaining 68.22 per cent to other changes brought about by irrigation like larger use of fertilizer, changes in cropping pattern and resulting large production per acre. Ghodake et. al. (1981)\textsuperscript{12} observed that the farm size and the proportion of male labour employment for crop activities move together, while there is an inverse relationship between farm size and the proportion of female labour employment. Since labour employment is function of irrigation, its development through adequate availability of credit is vital for agricultural development. Balister et. al. (1981)\textsuperscript{13} conducted a study on impact of S.F.D.A. on production pattern, income and employment on the basis of the data obtained from 22 beneficiaries and 22 non- beneficiaries. Using ‘t’ test they found that average yield of Bajra deshi, Bajra hybrid, Cotton, Wheat high yielding varieties, Pea and Gram per hectares was 16.5, 21.23, 10.30, 35.14, 14.67 and 15.44 quintal respectively on beneficiaries farm and in the case of non beneficiaries farm it was 10.94, 16.40, 8.17, 29.76, 12.43 and 9.36 per hectares respectively for the same crops. The net income per hectare was Rs. 1503 and Rs. 1120 on beneficiaries farms and non-beneficiaries respectively. Singh et. al. (1981)\textsuperscript{14} examined the change in total labour employment in 60s and 70s in Jaunpur district in U.P. covering Maize, Paddy, Wheat and Potato, and reported that farm labour employment for all crops increased till 1927-73 but declined thereafter. They interpreted that labour has been substituted by higher rate of use of fertilizer and irrigation inputs and human labour use in interculture, harvesting and threshing operations have been reduced considerably.

Naidu (1981) observed that in Cuddupa district (Andhra Pradesh) the inverse relationships of farm size and cropping intensity and farm size and labour use are fast disappearing because the large farmers are using land more intensively as also the new technology for higher profitability. Subbarao (1981) reported that in east Uttar Pradesh although the cropping intensity of farms increased between 1966-69 and 1975-76. The labour input use was less than proportionate to the increase in cropping intensity for small farms. Sheila (1981) observed that the combination of HYV use and higher cropping intensity increased the use of hired labour in general and the concentration of demand of hired labour in top most acreage categories.

Prasad et. al. (1983) observed that the study indicated the scope for the increase in labour utilization by bringing more area under HYV or hybrid is quite restricted as there is only a marginal increase in utilization of man power to the extent of 11 to 23 man days per hectare under hybrid (i.e. 16.8 per cent and 23 per cent over local) Jowar and Cotton respectively. Functional analysis shows that area effect is negative and significant one indicating under-utilisation of engaged labour for both the crops. Wage rate has shown the negative effects while technology registered positive and significant effect on labour utilization in Cotton. Consequent to this, the scope of increased utilization in labour on account of technology may be dwindle owing to area

and wage rate effects. Chakravarti S. K. (1983) observed that in the wage rate the higher would be the substitution of hired labour by self labour. This substitution obviously leads to shrinkage of employment opportunities for hired labour.

Singh Rajendra (1984) concluded that the maximum number of human labour days were saved in case of Posta (opium); sugarcane and vegetables after consolidation and the minimum number of human labour days were saved in case of Paddy both Desi and HYV, similarly, the maximum saving of bullock labour Pair-days as a result of consolidation of holdings has been found in case of Posta followed by Sugarcane, vegetables and Wheat. Thus consolidation resulted in saving of human labour as well as bullock labour. One might think that lesser absorption of human labour on consolidated holdings as compared to unconsolidated holdings, may lead to unemployment or underemployment but really this was not so because in case of large farms the requirement of hired labour was more on consolidated holdings than on unconsolidated holdings. In nutshell, it may be suggested that the surplus as well as saved labour days can be absorbed well by intensifying the cultivation on consolidated holdings than on unconsolidated holdings. Srivastava et. al. (1984) observed that the man-days for cultivation of Tomato, Brinjal, Potato, Lady’s finger, Cauliflower, Peas, Sponge Gourd (Tori) Sauash Melon (Tinda) and Bottle Gourd (Loucki) were found to be 92, 146, 125, 160, 74, 50, 86, 46 and 54 respectively. The man-power requirement during different months revealed that vegetable cultivation is an important source of additional

Ray S. K. (1985) observed that water management, not irrigation alone, encompassing flood control, drainage, etc; with massive public investment and community participation inland infrastructure development, may help to enhance the employment prospect in the crop producing sector. Even then, unemployment and Poverty Problems will remain. Kalla J. C. (1985) observed that the correlations between tractorisation and its stipulated determinants were significantly positive for agricultural productivity, irrigation and labour density. The results were further marked by relatively weak, nevertheless negative degree of association for tractorisation with respect to holding size and drought animal density. Finally rural literacy was related with tractorisation rather weakly nevertheless positively. In order to test multi-co linearity, the inter-determinant correlation coefficients were computed which revealed relatively high degree of correlation between agricultural productivity and irrigation on the one hand and irrigation and labour density on the other. Singh et. al. (1985) reported that annually a male worker was without work for 151 days on marginal farms, 128 days on small farms and for 129 days on medium farms. The female labour unemployment was 157 days, 130 days and 160 days per annum on marginal small and medium farms respectively. On an average a worker earned Rs. 942 on marginal farm, Rs. 1889 on small farms and Rs. 2223 on medium size farm.

Singh et. al. (1986)\textsuperscript{25} reported that gaddi tribe is mainly dependent on sheep and goat for their livelihood labour for which contributes 64.2 per cent of the total household income. About 67.7 per cent of the total man-days available are utilized for sheep and goat rearing followed by 17.0 per cent of the man-days for off-farms services. About 93.8 per cent of the total man-days utilized for sheep and goat rearing are contributed by male labour.

Singh et. al (1987)\textsuperscript{26} observed that the level of employment of a farm family is mainly determined by the size of farm business, intensity of cropping, type of crops grown, cropping pattern adoption, level of adoption of modern farm technology etc. on one hand the availability of employment opportunity on the other. Dark et. al. (1987)\textsuperscript{27} noted that the utilization of male labour days for different crops was about 43 per hectare and that for female labour it was worked out to be 85 days, the highest utilization being in small holdings. The study leads to the following conclusions: (i) Groundnut, hybrid cotton and bhendi crops require high levels of male as well female labour. (ii) As regards male labour employment July, August and September are observed as peak period while a period consisting of November to March was noted as lean period. (iii) Demand for female labour is concentrated in July and August while February to June can be considered as lean period of employment. (iv) Hybrid cotton provides much high employment to male as well as female labour than local cotton. Taking into consideration the peaks and slumps in demand for human labour in agriculture, it can be suggested that there is a necessity of providing employment for 5 months


each to male as well as female workers during the lean periods of employment. Singh (1987) observed that female worker earned Rs. 563 per annum, while the annual earning of a male worker was Rs. 962 on average. The proportion of kind wage to that of cash wages was one fourth and the earning of both the male and female workers were not at all sufficient for meeting their daily food needs even. As regards their daily wages, a female worker received Rs. 3.82 and a male worker Rs. 4.57 per cent day. This fact obviously confirms that female workers were low paid in comparison to male workers. The male-female wage differential also shows that a female worker received wages which were about 42 per cent less than a male worker in a year and on per day basis a female worker received about 17 per cent less than that of a male worker. Inamdar et.al. (1987) observed that, while employment of female family labour has tended to decline, employment of hired female labour has increased in preference to male labour due to rise in the wages of male labour. Thus, ownership of land may be at most a catalytic agent, but real changes are needed in the resource base and mix of farm activities for worthwhile absorption of labour.

Rastogi et. al. (1988) reported that the contribution of child to total labour was negligible. About 77 per cent of man labour utilized in the area was hired. Further, over 92 per cent of woman labour expended was paid labour. It may be mentioned that the family women normally do not participate in farm activities due to socio-religious stigma. Majority of the hired woman labour was from lower caste/category of households. The labour spent per ha

was 21.57 hours on jute cultivation. The labour employed on paddy and vegetables per ha. was respectively half and three fourths of the labour utilized on jute cultivation.

Kathuria et. al. (1989)\(^{31}\) reported that the study revealed that in flood affected field human labour and bullock labour utilized per hectare was 835 hrs and 458 hrs respectively whereas in the case of unaffected fields the labour utilized in the respective order was 675 hrs and 183 hrs/ hectare for wheat crop. However, in case of Paddy crop, the family labour utilized/ hectare was 1455 hrs and 1393 hrs in flood affected and unaffected fields respectively whereas the bullock labour in the same order, worked out to be 262 and 195 hrs.

Archana Sarthi (1989)\(^{32}\) observed that the Indian Rural Workforce has been rising at the rate of about 1.9 per cent per annum over the period 1971-1981. During this period, the total net sown area has hardly risen: It was 0.4 per cent over the whole decade as seen from the census figures. In absence of any significant occupational diversification it is obvious that there would be rise in the magnitude and proportion of workers available for work in the capacity of wage labourers. The proportion of female labourers too has increased everywhere except in Kerala and West Bengal. Mohanty A. K. (1989)\(^{33}\) observed that poor are unacceptable in Modern industries therefore employment programmes for the illiterate and unskilled poor are to be planned in agro-industries which require less capital but provide large employment of an enduring type.

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Guha Sumit (1990) observed that labour intensity is generally gauged by looking at labour days per unit of cultivated land, but there are earlier disadvantages to this approach. To begin with, land is not uniform in quality and differences in labour absorption between two sets of farms at different points in time may originate simply indifferences in rainfall, soil or irrigation. It may be noted that it is difficult to eliminate these effects. Guha (1990) concluded that the evidence suggests (but does not prove), that labour-intensity was changing even before the green revolution, but that direction of change was far from uniform; and that the regions where it was tending to move downward were also to be the quickest to adopt the new technology. These, in turn, tended to reduce labour requirements per cropped hectare, and per unit output, but at the aggregate level the improvement is relatively small. In 1956-57, 21 per cent of the gross cropped area was irrigated; in 1969-70, 23 per cent. Making full allowances for these changes, it does not seem plausible that the net cultivated area absorbed significantly more labour in 1970 than in 1930 in fact the opposite seems rather more likely. Sidhu et. al. (1990) observed that in the initial of agricultural development, farm mechanization along with seed irrigation-fertiliser technology has been proved to be complementary to the demand for human labour. But this trend is not likely to continue in future. It is feared that Punjab agriculture has reached a stage where increased mechanization like introduction of harvesting combines and more use of labour substituting inputs like weedicides and herbicides might start

competing with labour force resulting into its displacement. On the other hand, the scope of labour use promoting forces like increase in cropping intensity as well as agricultural production is limited with the existing level of technology due to higher incremental capital-output ratios. Consequently, the demand for labour in the Punjab may not grow enough in future to absorb the growing labour force. The solution to be the problem of disguised and open employment, therefore, lies in creating employment opportunities in the secondary and tertiary sectors of the economy. Lalwani (1990) observed that employment elasticities serve a useful purpose of knowing the effect of price change on employment in dairying. On the other hand, decomposition analysis identifies the determinants that raise labour absorption when dairy farmers shift in favour of crossbred cattle, output change emerges as a predominant force. This implies that the new technology (Crossbred cattle) would succeed only if such animals lactate at higher levels than both buffaloes and indigenous cows. And for crossbreds to lactate at higher levels, the availability of concentrates and other nutrients at remunerative prices throughout the year is a bare pre-requisite. But, are India’s poor dairy farmers being landless and having marginal farm sizes in a position to meet such bovine requirements? If not, the success of crossbreeding of cattle with exotic dairy strains in providing gainful employment is open to question. Singh et. al (1990) observed that the farmers (on all the farms) preferred relatively more labour intensive enterprises than income generating enterprises, perhaps due to heavy dependence of family labour on farms. The reorganization of existing

38. Singh R., “Possibilities of Increasing Income and Employment through Progressive Farmers’ Practices of Vegetable Farms in Deoria (Uttar Pradesh),
resources increased the net return but decreased employment. Further, the reorganization of existing resources and progressive farmers' practices increased the returns over both the actual and normative plan but reduced employment. However, when reorganization was done with progressive farmers' practices and capital borrowing, both net returns and employment increased. This may be attributed to increased cropping intensity (by 49 per cent). It is therefore suggested to extend the progressive farmers' practices with strong financial support. **Gulati A., et. al., (1990)** reported that observation of labour in agriculture is a complex phenomenon and depends on a host of technological and institutional factors. Land augmenting technological changes generally lead to higher labour use per unit of land in the early stages of development. However, in later stages, yield augmenting changes become more important and along with rising mechanization, labour use per unit of land declines. In an aggregate sense the capacity of agriculture to absorb labour is limited. It is not implied that for Indian agriculture this limit has come. The scope for labour absorption through public investment in irrigation and consequent rise in cropping intensity still exists. However, more and more labour should find employment in secondary and tertiary sectors at higher levels of productivity. **Kurien N. J. (1990)** observed that the major share of labour force is engaged in agriculture as self-employed or wage employed. While the organized sector at all levels, public sector undertakings and organized Private sector which attracts the provisions of the factories Act employs about 30 millions persons, the total labour force in agriculture and allied sectors could be as much as 125 million as self-employed and 75 million as wage-

employed. Another major segment of the labour force numbering 50 million or more is engaged in the unorganized private sector as wage-employed or self-employed.

Rai et al. (1991) observed that as agricultural modernization takes place, labourers who are not directly absorbed into more productive agricultural jobs may be absorbed indirectly into non-farm jobs in industry directly or indirectly related to agriculture. Further, increased consumption expenditure of farm population resulting from increased income may lead to creation of more jobs in other industries producing durable as well as consumable goods. Krishnan T. N. (1991) observed that the wage structure in this economy follows a hierarchical order reflecting social custom, which results in a strong tendency for wage relativities to remain stable over the long run. Second, this study demonstrated that markets for different categories of labour can indeed be interrelated and that such interrelationship operates through the wage structure even in the absence of inter-market labour mobility. It is shown that a rise in the wage rate of any category of labour within a structure of interrelated labour markets is transmitted to other wage rates in order to re-establish wage relativities, and this appears to be independent of the degree of unionization of any category of labour. Finally, it is found that a weakening of product demand is reflected in a widening of the relative wage differential in the short run and the effect of a rise in wages on employment and output is mainly determined by the conditions of product demand and the rate of technology use.

Joshi (1992) observed that in the post-green revolution belt, employment for 283 man-days per annum was available to the agricultural labourers as against 119 man-days of employment in the non-green revolution belt. Moreover, wage rates for men, women and children for different agricultural operations were also higher and hence the incomes of the agricultural labourers were higher in the post-green revolution belt than in the non-green revolution belt. Lalvani Mahesh (1992) concluded that the shift away from the existing milch bovines to crossbred cattle has raised employment for the landless as well as for the land owning dairy households, although such a rise is substantial in the medium and large farm sizes alone. But what is important to observe is the way the total estimated percentage change in employment is composed of between the components of input and technological change across four categories of dairy farmers. Whereas the increased input use has played a predominant role in raising employment in the landless farm size category, the technological change has contributed the most in the land owning category.

Banerjee Amalesh (1993) observed that the condition of agricultural labour is likely to worsen in a truncated reform which eludes land reform and the basic structure of production relations in the agrarian sector and which emphasizes on agro-industries and infrastructure development by private investment depending on profitability and market condition. Agricultural labour market is quite diversified due to agro-climatic conditions and uneven development of agricultural mode of production. The

green revolution area reflects mechanization, high wage and demand for labour; backward zones reflect traditional agriculture and labour surplus with consequent high intensity of poverty; the hill and dry land zones show low production, shifting cultivation and denudation of forests, degradation of ecological balance, labour surplus and acute poverty. This represents different wage regimes and labour market which cannot be cleared by uniform policy. Gaitham et. al. (1993)\textsuperscript{46} observed that the results revealed that the wage employment was 165 days in farm and 60 days in non-farm activities. Preparatory cultivation and sowing are the major farm activities for males and children while sowing and harvesting are the major sources of employment for female labour. The total farm earning of male were three times that of children and 3 $\frac{1}{2}$ times that of female labour. The non-farm earning of the females and children were more or less same and were nearly 54 per cent of the total male labour earnings. Wage employment was high in the irrigated villages compared to the unirrigated villages. The need is suggested to implement wage employment schemes in the unirrigated area to augment farm labour employment. Varghese (1993)\textsuperscript{47} reported that the productivity of wheat on farms operated with annual servants was found to be assured labour supply on farms has positive impact on farm productivity. The timely farm operative and the consequent higher productivity are the advantage for landowners engaging annual contract labour while work guarantee and lump sum advance payment which in turn is used for productive purposes are the encouraging factors for the landless households.


\textsuperscript{47} Varghesh K. A., "Contract Emppoyment in Agricultural and Its Effect on Income, Wages and Farm Productivity in the Humid South-Eastern Plains of Rajasthan.,
Subramanian (1994)\textsuperscript{48} observed that to generate employment in the rural areas it is necessary to think of integrating farm and non-farm sectors. Due to lack of skill among labourers, capital substitution takes place in the non-farm sectors; The non-farms sector may face a stiff competition from large scale industries if development of skills does not take place. Therefore, it is necessary to provide the necessary training to the rural labourers to enhance their skills. In Indian agricultural the share of agriculture in the gross domestic product has declined but the share of labour force depending on agriculture has remained more or less constant. Under such condition of low elasticity of employment to output the best solution may be to siphon off the surplus labour from agriculture. Since it is difficult to do so, the next alternative is to develop self-employment in non-farm rural sectors.

Chandra (1996)\textsuperscript{49} observed that agricultural diversification through vegetable crops has a huge potential for employment and income generation in Western Himalayan Region. Vegetable cultivation, due to its labour intensive nature, is more beneficial for the marginal and sub-marginal holdings where family labour availability per unit of land is higher compared to bigger size holdings. This is the reason that the percentage of area shifted to vegetable crops increased with a decrease in farm size in the vegetable growing area. Findings based on micro level investigations reveal that in the case of commercial and high profitability enterprises farm size is not a constraint for production and marketing. It is not correct to assume, that the marginal and small farmers do not have sufficient land to put


\textsuperscript{49} Chand Ramesh., "Diversification through High value Crops in Western Himalayan Region: Evidence from Himachal Pradesh., Indian Journal of Agricultural Economics, Vol. 51, No. 4, 1996.
under commercial crops after allocating land to food grains to meet the family needs. It is found that where economic incentive is available the farmer's allocated area based on relative profitability irrespective of the food grains requirement of the family which can be easily met through purchases. Parthasarathy (1996)\textsuperscript{50} observed that the higher incidence of poverty among agricultural labour households is not due to larger average size of the household or due to lower worker participation rates. The average size of an agricultural labour household is smaller than that of either a household self-employed in agriculture or other rural labour households, partly because of the greater predominance of nuclear families and also because of higher incidence of infant mortality. The work participation rates among agricultural labour households are highest. Female participation in the labour force is high. Adults work up to ripe old age. Work participation rates among children school-going age are not insignificant. Yet, except in cases in which adults within the households exceed around 60 per cent or more, the agricultural labour households are trapped into poverty. While a small family could help the household cross the poverty line, the basic problems are unemployment and low wages.

Mohandas, et.al. (1997)\textsuperscript{51} observed that cost escalation is the most important factor which makes rice cultivation a relatively less remunerative enterprise, as such, the ways and means to reduce the cost of production to the maximum extent possible is the prime concern. Mechanisation should be allowed wherever possible and thus reduce the cost of human labour.


\textsuperscript{51} Mohandas, K. et.al., Economic analysis of Rice Production in Kuttanad Areas of Kerala, Agricultural situation in India, LIV (9), pp-555-560, (1997).
Jeomal Uni (1997) observed that while the slow gain in labour productivity in agriculture is a reflection of the inability of agricultural sector to absorb any further labour gainfully, the slow transfer of labour from agriculture also refracts the inability of the non-agricultural sector to create employment rapidly enough. Rao A N. (1997) reported that the human labour constituted the major cost component accounting for the highest share on all crops with the exception of Mango. The share ranged from 45.74 per cent on Lady's finger (Bhindi) to 18.17 per cent on ground nut. The amounts spent on human labour were high on flowers, vegetables with exception to tomato, followed by fruits and then field crops. Planning Commission (1997) decided to follow three-pronged strategy to meet the basic food requirement (i) increase in overall employment and incomes by raising farm productivity and through the growth of other economic activities in rural areas (ii) provision of gainful supplementary employment through poverty alleviation schemes. These will generate additional employment in the short run but would also help in the creation of durable rural infrastructure for more sustained employment overtime and (iii) distribution of food grains through public distribution system at concessional prices to those living below poverty line. Mishra S N. (1997) observed that unit industrial growth begins to affect a net transfer of labour from agriculture; agriculture remains the bulwark for absorbing major portion of the additional labour force resulting from the growth of Population. Employment, therefore, is a goal which the agricultural sector must, serve in the foreseeable future in India,

given the fact that Industrial take off seems to have just begun following the Industrial Policy reforms. Role of agricultural development in poverty alleviation is well recognized. In recent years, poverty has come to be discussed under food security or 'Social Security net' in the context of structural adjustment programmes. Bhalla et. al. (1997)\textsuperscript{56} observed that on the one hand, rapid rise in agricultural output combined with increasing intensity of cultivation increased the demand for labour in agriculture in some parts of India, on the other hand, there took place a rapid capitalization in agriculture in response to rising wages (and availability of capital at cheap rates) and this resulted in displacement of labour in certain agricultural operations. Furthermore, many areas where new technology had not taken roots also continued to absorb labour in agriculture because of increasing population and non-availability of non-agricultural employment. Besides output growth and increase in rural labour force, labour absorption in agriculture (employment elasticity) was also affected by factors like size and fragmentation of holdings, level of wages, extent of mechanization, cropping intensity, crop composition and other technological changes in the production process. Subramaniyan et. al. (1997)\textsuperscript{57} observed that for the farmers producing Banana, the explanatory variables output, farm size, bullock labour, fertilizer, organic manure and number of irrigations had positive impact on the demand for labour. Among all the inputs used, Banana is highly responsive to fertilizer and human labour. Inverse relationship between farm size and output prevailed. Further, the demand for human labour is price inelastic. The use of bullock labour and human labour is

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\textsuperscript{56} Bhalla et. al. (1997), "Recent Development in India agriculture, Economic and Political Weekly march - 29, 1997.
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complementary to each other.

Krishniash (1998)\textsuperscript{58} observed that the importance of non-farm avenues may be understood from the fact that these occupations such as Toddy tapping and selling, Sheep rearing and Kambli weaving, Employ almost one fourth of all the households especially during the lean season viz. January to June. Krishnaiah M (1998)\textsuperscript{59} observed that the labourers under annual contracts seasonal contracts or periodical (for specific operation) contracts come under this category of tied voluntary labour contracts. The frequency of changing employers, the disappearance of (if not the total absence of) the dependence of labour on employers for credit or other considerations, etc. and movement towards convergence of their payment with united, casual labourers wages characterize this type of labour. Deshpande et. al. (1998)\textsuperscript{60} observed that (1) stabilization has been blamed for stagnation in the sectoral distribution of male workers and retrogression in that of the female workers. The drought of 1987-88 forced men and women to move out of primary (agriculture) and into secondary (construction) sectors, with normal rains in the following years public expenditure on relief works undertaken in response to the drought was reduced and men and women, particularly the latter, reverted back to the primary sector. The population census shows a marginal fall in the share primary in rural male employment between 1981-1991 and a marginal retrogression in women’s employment. Employment of intermittent and casual workers increased faster than of those who reported being employed for at least in the

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\bibitem{60} Deshpande S. and Deshpande L., "Impact of Liberalisation on Labour Market in India: What do Facts from NSSO's 50\textsuperscript{th} Round Show?,”
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greater part of the year and much faster than for regular wage/salaried workers.

Subrahmanyam (1999)\(^{61}\) reported that under the present farming conditions, each hectare of land (net area) generates employment for 137 days of which more than one half is for females. However, the generation of employment per hectare varies between 97 days in the low cropping intensity zone with groundnut as the main crop and 257 days in high cropping intensity zone with paddy as the main crop. Paddy, cotton and chilies have high total as well as female labour content. Sugarcane has the lowest demand for female labour, despite its high demand for total labour. Sarma, A.K. (1999)\(^{62}\) observed that with increase in the level of mechanisation there has been decrease in the level of human labour employment not only the per cropped hectare basis but also net sown hectare basis too. This indicates labour displacement effect of mechanization in Jorhal district (Assam) as observed in some other areas of the country. It has to be noted that the labour displacement effect was such that even the increase in cropping intensity due to mechanization could not neutralise this effect. Further, with the increase in mechanization the demand for hired labour (both casual and permanent) increased while participation of family labour declined. Rajula Chandram, et al. (1999)\(^{63}\) observed that the differences in wage rates of women agricultural labour in Kerala and Tamil Nadu were not on account of any economic factor but was influenced by labour attachment practices and bargaining power. It is viewed that the condition of woman agricultural

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62. Rajula Chandram., et al., Differential wage Pattern in Kerala and Tamil Nadu, Agricultural Situation in India, LVI (1), PP-7-8, 1999.
labourers can not be improved unless there are organizations of the agricultural labourers essential to protect them from the exploitative forces in the rural scene to improve their bargaining power and also to act as pressure groups for an efficient delivery of the benefits of the development programmes.

Bandhopadhyay et. al. (2001) reported that no significant qualitative change in the composition of the three employment categories, viz. self employed, regular employees and causal labour was observed except some minor changes around 2-3 per cent while change was more during the post-reform period than during the pre-reform period. Biradar et. al. (2001) observed that there is an apprehension that the economic reforms have an adverse impact on the employment and poverty particularly in rural India. Although it is premature to assess the impact of economic reforms, the data on employment and unemployment published by the NSSO for 1999-00 reveal the unfavourable changes and dimensions of rural employment during the post-reform period. The growth rate of employment, which was on the rise for all categories of work force (except rural females) in the early reform period, has steeply declined and a negative growth rate of employment for rural females is observed. Similarly, the unemployment rates, which started to register a declining trend on the eve of economic reforms, have begun to go up during the post-liberalization era. The quality of rural employment especially in the case of women seems to be significantly deteriorating during the post reform period. There is adequate evidence to believe that the rate of casualisation and informalisation of employment has been increasing in recent years. The incidence of casualisation is not uniform across different levels of education

and activities both in the rural and urban areas. It is found to be quite high among illiterate women as against men, particularly in the rural economy. As the level of education kept increasing, the proportion of workers experiencing casuallisation of employment declined in the early 1990s. Singh A. K. (2001) observed that the increased mobility of rural labour was breaking the traditional isolation of the rural labour market and leading to compression of wage differential, although it also lead to some conflict in the interests of the local and migrant labour. In states like West Bengal, it was pointed out that such conflict was mediated by labour unions which were quite strong. In other areas terms of labour contract were being negotiated by contractors or group leaders. It was felt that internal dynamics of contract labour system in terms of laying down of terms of contract, sharing of income among group members, impact on women, etc. needed in-depth analysis. Saraswat S. P. et. al. (2001) observed that Census 1991 indicated that the cultivators formed 63 per cent of the Total workforce, followed by other workers (32 per cent), agricultural laboures (3.30 per cent) and household industry workers (1.43 per cent). Underemployment was found to be acute in rural areas as a male worker was without work for 151 days on marginal farms, for 128 days on small farms and for 129 days on medium farms. Rai et. al. (2001) observed that the share of agricultural labour force in total labour force has declined over the years but the pace of decline was much lower than the decline in its share in total national income. The gross capital formation in agriculture on private as well as public

account and per capita income exercise significant positive impact on agricultural labour force. No conclusive inference could be drawn on the impact of economic liberalization on agricultural employment. Rajesh et. al. (2001) observed that there is not much difference in the levels of wage rates as between operations, contradicting the common perception that peak season activities like harvesting and sowing are paid much better. Minimum wages have been revised upwards, they are often not implemented and workers are paid wages much lower than the prescribed minimum. This confirms the existence of imperfection in the labour market, which could be rectified to a maximum extent by improving the bargaining power of the landless agricultural labourers, for which formation of Labour Co-operatives is one of the best ways. Solanki et. al. (2001) observed that the total labour use in crop production activity in the command area was higher by 21.48 per cent at 311 hours per farm (average farm size being 1.74 ha) as compared to the non-command (256 hours). The increased use of family labour, attached labour and casual labour per farm was to the extent of 39.43 hours, 16.83 hours and 2.89 hours respectively over the labour use in the non-command area per farm. The labour use in terms of per hectare of cultivated area was found to be higher by about 34 per cent at 266.54 hours in the command area than that of the non-command area (186 hours). Khatkar et. al. (2001) observed that the employment in livestock (22.57 per cent) and non-agricultural sector (40.11 per cent) has also increased in the post-reform period as compared to crop farming (37.32 per cent).

The wage rate of agricultural labourers increased manifold in the post-reform period over the pre-reform period, from Rs. 7 in 1976-77 to Rs. 55 in 1994-95. It indicates the positive relationship between structural reforms in the economy and diversification, employment as well as wage rates in the study areas. Kabra Kamal Nayan, et. al. (2001)\textsuperscript{72} observed that during reforms era between 1991 to 1999 there has been rise in 13.4 lakh employed persons in which 3.3 lakh belongs to private sector while during these 10 years the work force has inclined by 10 crore persons. Is it proper to reduce employed persons in the present scenario?

Singh G. et. al. (2002)\textsuperscript{73} reported that human labour cost in cultivation of Wheat crop in India recorded 8.96 per cent per annum between 1971-72 to 1996-97. The human hour per hectare ranged between 2.7 hours per hectare in Punjab to 52.2 hours per hectare in Uttar Pradesh. In 1996-97 it recorded 18.9 per cent of the total cost of cultivation in Haryana, 18.8 per cent in Madhya Pradesh and 23.4 per cent in India. Hazarika, C. et. al. (2002)\textsuperscript{74} observed that a specific trend of increasing labour employment was noted in all categories of farmers. It may be on account of increase in gross cropped area and cropping intensity over existing plan. Increase of area under labour intensity crops fur thus increased employment potentially. Nair (2002)\textsuperscript{75} observed that the guiding principle in mechanizing India agriculture has been to maintain a socially desirable mix of human labour, draught power and mechanical power. This is to ensure elimination of the risk of labour displacement. The draft of the

\textsuperscript{49} Singh G., et. al., Analysis of growth Trends in cost of cultivation of wheat crop in India, Agricultural Situation in India, LIX (6), pp-341-351, 2002.
\textsuperscript{50} Hazarika, C. et. al., Prospect of increasing Farm income and Employment through Diversification Agricultural Situation in India, LIX (9) PP- 549-556, 2002.
\textsuperscript{75} Nair P K. K., "Creditable Impact of Tractors, Survey of Indian Agriculture 2002."
National Policy of Agricultural Mechanisation, 1998 observed that with the emphasis on timeliness, precision and general improvement in the quality of work, farm mechanization has resulted in increase in employment.

Chadha (2003)\(^{76}\) observed that the rate of growth of employment for rural workers engaged in agricultural and allied activities fell from 1.38 per cent during 1983/1993-94 to 0.18 per cent during 1993-94/1999-00; for rural females, from 1.24 per cent to (-) 0.02 per cent. The post reform employment situation was far worse in agricultural sub-sectors other than field crop production. For example, against the decline in the rate of growth of employment for rural workers engaged in field crop production from 1.68 per cent during 1983/1993-94 to 0.23 per cent during 1993-94/19999-00, the decline was far more steeper, from 2.01 per cent to 3.35 per cent in the case of plantations, from 23.40 per cent to 13.42 per cent for agricultural services, from 1.89 per cent to (-) 1.12 per cent for forestry-logging, and from 4.09 per cent to (-) 6.37 per cent for fishing. Sharma et. al. (2003)\(^{77}\) observed that there are two conflicting views about the effect of agricultural development on the institution of permanent labour that is employed to perform special non-monitorable tasks. Some scholars argue that as agricultural development proceeds, the incidence of this type of permanent labour declines and that of permanent labour employed to perform all types of activities including casual labour increases. This has been attributed, among other things, to factors like different levels of labour demand during peak and slack seasons, decline in the seasonality in agriculture due to irrigation and diversification.

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very high uncertainty in the use of labour during the peak season, cheaper and easy availability of credit to the labour, particularly the consumption credit, increased migration of labour from backward regions, etc. According to others, agricultural development necessitates the use of more delicate machinery whose upkeep is a non-monitorable task and the extent to which such technologies substitute for causal labour, it shall lead to an increase in the use of permanent labour.

Sisodia B. V. S. et. al., (2004)\(^78\) observed that Eastern Uttar Pradesh has alarming situation of unemployment and poverty. It also faces chronic food insecurity at household level as considerable flock of the families in the region lacks purchasing capacity. Agriculture sector is biggest one, which accounts for about 56 per cent of total workforce. The further agriculture policy of this region needs to be addressed in the context of increasing agriculture in general and cultivation of labour intensive and export oriented agriculture production in particular, employment generation and poverty alleviation.

Sharma B. L. et. al. (2004)\(^79\) observed that human labour employment is function of technology level in Rajasthan. Human labour Employment can be increased by raising level of technology in Rajasthan. Sidhu R.S. et. al. (2004)\(^80\) observed that the demand for labour in the crop sector decreased continuously by 23 per cent from 385 days per farm in 1987-89 to 297 man days in 2000-03. However, the Dairy sector helped in generating employment in the farm sector during this period. Dairy is basically a labour intensive enterprise and uses surplus family
labour and attached labour. The use of labour on an average
farm increased from 182 man days in 1987-89 to 257 man days
and proportional increase of 41 per cent. As a matter of fact,
growth in employment in Dairy has compensated for the fall in
labour employment in the crop sector and on the whole there was
marginal fall of 13 man-days (2.3 per cent) in farm employment
in Punjab. The share of crop Production in farm employment
decreased from 67.9 per cent in 1987-89 53.5 per cent in 200-03
and that of Dairy sector improved from 32.1 per cent to 46.5 per
cent, respectively.

In case of marginal, small and semi-medium farms, the
increase in employment due to Dairy enterprises completely offset
the fall in employment in the crop sector resulting into net gain
in labour use on these farms. The labour absorption was higher
by 23 man-days on marginal farms, 4 man-days on small farms
and 36 man-days per annum for semi-medium farms. However,
farm employment declined by 71 man-days on medium size
farms and by 197 man-days on large farms due to substantial fall
in labour demand in crop production resulting from
mechanization and herbicides use despite significant rise in
employment in Dairy enterprise showing that it was relatively the
large size farm, which were experiencing decline in labour
absorption and the decline was very large. Prasad D. S. (2004)81
observed that consequent to rise in Dairying the employment was
more than double in the landless size group, nearly one and half
times in the other size groups compared to the existing situation.
The percentage increase over the existing situation was found to
be 110.71 per cent, 32.26 per cent and 63.33 per cent,
respectively for the landless, marginal, small medium and large

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Reddy District of Andhara Predesh, Vol -60, No. 3 (2005)
size-groups. These results suggest that the employment potential in the Dairy economy under consideration was maximum in the small size-group, and minimum in the medium size-group, while the landless, large and marginal size-groups occupy the second, third and fourth positions respectively.

Roy Tirthankar (2005) observed that to examine wage data and trends of earning, three factors are particularly important. First, individual work capacities can vary a great deal and vary especially with respect to wage at low level. Wage rate may include an implicit investment in work capacity. In that case, one wage and another and one worker and another are not comparable. Second, wages vary according to casual or permanent status, because the employer may trade-off the advantages of market for that of labour for peak season work. Wage may be adjusted by implicit insurance premiums. Again, there is a comparability problem. Third, wages vary according to seasons, especially in monsoon-dependent agriculture. Neither source of data is clear on capacity, casual /permanent distribution or the seasonality issue. Khatkar, R. K. et. al. (2005) observed that the higher employment in crop enterprise speaks of the lack of other employment opportunities in the rural areas. This was further testified by lower proportion of off-farm employment in the selected villages changing between 2 to 19 per cent of the rural youths). The tenancy Pattern indicated preference for fixed money income rather than share and fixed produce. The reverse trend of tenancy by leasing-out land by the marginal and small farmers indicated the non-viable holdings owing to diseconomies of scale as well as higher cost of

82. Roy Tirthankar, Agricultural Labour and Economic Transition in colonial India, Lessons from wage data; Economic Growth center, Yale University, 2005.
cultivation. The study recommends creation of other avenues for gainful employment in the rural areas for such large number of displaced work force. Commercial dairying, bee keeping, Poultry farming, mushroom cultivation, floriculture, horticulture, etc, must be encouraged through development of the required marketing infrastructure. Government of India (2005) recorded in Economic survey 2004-05 that the share of agriculture in total employment dropped from 60 per cent in 1999-00 to 57 per cent in 1999-2000. On the other hand employment growth in all sub sectors within services (except community, social and personal services) exceeded 5 per cent per anum. Special emphasis to promote public investment in rural areas for absorbing unemployed labour force for asset creation was suggested for growth in employment in rural sector.

Government of India Planning Commission (2007) identified the following specific weaknesses on the employment front which illustrate the general failing.

- The rate of unemployment has increased from 6.1 per cent in 1993-94 to 7.3 per cent 1999-2000 and further to 8.3 per cent in 2004-05.
- Unemployment among agricultural labour house holds has risen from 9.5 per cent in 1993-94 to 15.3 per cent in 2004-05.
- Under employment appears to be on rise as evident from awakening of the gap between usual status and current daily status measures of creation of incremental employment opportunities between periods 1994 to 2000 and 200 to 2005.
- While non-agricultural employment expanded at a robust

annual rate of 4.7 per cent during the period 1999-200 to 2004-05. The growth was largely in the organized sector.

- Despite fairly healthy GDP growth, employment in the organized sector actually declined, leading to frustration among the educated youth who have rising exceptions.
- Although real wages of Casual labour in agriculture continue to rise during 2000-05, growth has decelerated strongly, as compared to the previous.
- Unless otherwise stated, the employment and unemployment estimates are on current daily status (CDS) basis for other measures of employment which are also relevant. Three kinds of estimates for the unemployment are obtained following the three different approaches.
- Growth of average real wage rates in non-agriculture employment in the period 1999-2000 to 2004-05 has been negligible. Seen over the longer period of two decades (1983-84 to 1993-94 and 1993-94 to 2004-05), the wages have steadily increased at over 2 per cent per annum.
- In respect of entire rural male casual labour, the growth in real wages accelerated from 2.55 per cent (1983-84 to 1993-94) to 2.78 per cent per annum (1993-94 to 2004-05).
- Real wages stagnated or declined even for workers in the organized industry although managerial and technical staff did secure large increase.
- Wage share in the organized industrial sector has halved after the 1980s and is now among the lowest in the world.

Planning Commission (2007)\textsuperscript{86} reported that according to latest N.S.S. figures (61st round) agriculture continues to employ 70 percent of our rural workforce, industry 14.4 per cent and

\textsuperscript{86} Govt. of India- Planning Commission, 11th five year plan Ensuring Rural and Urban Live hood (2007).
services 14.8 per cent. However, in view of the decline in agriculture's contribution to GDP and the near constant proportion of workers dependent on it, there is need for rapid generation of off-farm employment constituting sericulture, horticulture and pisciculture.

Planning Commission (2007)\textsuperscript{87} the unemployment rate of SCs in rural and urban areas is about 5.5 per cent as against 3.5 per cent for others. Special programmes of employment are necessary to reduce this by increasing employment among SCs. Priority needs to be given to SCs in the employment Guarantee Scheme with proper monitoring of coverage.

The National Sample Survey Organization (NSSO) on employment and unemployment situation among social groups in India in its report (61st Round, July 2004-June 2005) brought out that the proportion of persons in the labour force was the highest among STs followed by SCs, OBC and others. The labour force participation rate for these groups was 51 per cent, 44 per cent, and 40 per cent, respectively. Those belonging to the SC communities suffer from very high incidence of support and need to be provided with job-oriented training to enable them to have better opportunities. Such training will be provided under the Apprentice Act. Large numbers of SCs and STs depend on agricultural wages to sustain themselves.

Khatkar R. K. (2008)\textsuperscript{88} observed that Dairy enterprise played a major role in providing gainful employment to the farmers in general and to non-irrigated farmers in particular in arid regions. The crop enterprise provided higher employment on irrigated farms compared to non-irrigated farms owing to higher cropping intensity on the former category of farms. Male members got

\textsuperscript{87} Planning Commission, 11th Five Year Plan, Social Justice, 2007.
higher employment in crop farming while female members engaged themselves more in livestock sector and household work. Employment through hiring out labour was found higher on unirrigated farms. Singh Babu (2008)\textsuperscript{89} observed that implementation of watershed development project has resulted in area expansion, increase in net cultivated area, increase in livestock population, improvement in crop productivity and employment days. Besides the watershed project could help arrest degradation of both arable and non-arable lands. All these have enhanced the farmers income and employment opportunities at the local level and small holders have benefited more and have improved livelihood. Shukla Archana (2008)\textsuperscript{90} observed that many crop operations continue to be characterized by gender based specialization which in turn has translated into lower wages for women. A comparison of the overall number of hours worked by men and women suggests that while these vary across villages within a village there are no male female differences. Thus women are paid less than men, even though the length of their working day is comparable to that of men. Nevertheless, there are signs that changes are taking place, there is some evidence that the Kisan Melas and other extension efforts not only bring about increased awareness of technological management options, but also may have played a role in narrowing gender differentials in wages, both directly as well as indirectly by influencing the demand and contractual arrangements for labour.

The review of literature form basis of the models and methods used in this study and presented in Chapter-III, the

\textsuperscript{89} Singh Babu, "Impact of watershed: An increase in livelihood security farmer in District Jalaun of Bundelkhand region, Uttar Pradesh. Vol. 63 No. 3 (2008).
Chapter on research methodology. The review of literature on different aspects of agricultural labour cannot be claimed to be complete. However, attempt has been made to accommodate various findings and observations on different aspects of problem under the constraints and limitations of the presents study.

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