CHAPTER II

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The major objective of this thesis is to assess operation wise labour absorption in agriculture. An analysis of this situation requires an understanding of related studies on labour absorption. Further, post Green Revolution labour absorption has been an area of fertile research carried out by eminent researchers and authorities. An analysis and understanding of these monumental studies would provide the framework for the present study. Therefore, a review of literature in the field becomes the logical starting point of this empirical work. This chapter attempts to provide the review of literature.

The objective of this section is to provide a brief review of some important studies relating to labour absorption in Indian agriculture. The studies are mostly empirical in content, which attempt to identify the factors underlying the observed differences in the labour input per unit of land. Moreover, the studies under review consider the technological and economic factors responsible for the observed differences in labour use. In other words, the observed differences may result from the inter-play of technological inputs,
viz. biological and mechanised, along with simultaneous implementation of development programmes. Thus the studies on labour absorption can be grouped under three categories such as 1. Impact of agricultural programmes. 2. Technological change and labour use 3. Labour application across crops and farm operations. Some studies have already reviewed the earlier studies on the issue of labour absorption. More prominent are Parameswaran (1983) Ratna Reddy (1986) and Uma Shankar Patnaik (1997).

II.1 IMPACT OF VARIOUS AGRICULTURAL DEVELOPMENT PROGRAMMES ON LABOUR ABSORPTION

Green Revolution presents several challenging economic issues. Some of these have attracted greater attention of economists and others still remain relatively neglected. Rapid increases in agricultural production and income are among the most widely discussed issues, whereas the effects on employment and income distribution are relatively less widely discussed one. The various Agricultural development programs like Intensive Agricultural Development Programme (I.A.D.P.), High Yielding Variety (HYV) and Multiple Cropping Programme have directly affected the labour market situations in Tanjavur and it has appreciably increase the demand for labour (Muthiah, 1970). Katar singh (1972) found that
the hired labour employment per hectare increased in most of the
districts and the index of area under improved varieties had a
significant effect on employment per hectare.

According to *Ray and others* (1979) before the implementation
of the Training and Visiting programs (T & V programmes) most of
the cultivable area was under the traditional crop varieties. The
introduction of the T & V programme has the potential to increase
the cropping intensity, employment of family labour marginal value
productivities of all inputs and the extent of adoption of
recommended practices, on both the categories of farms. However,
the impact of these systems is found to be more on the small
holdings as compared to the large. The evaluation of I.A.D.P by
*Despande and others* (1980) also reveals that the change in the
adoption of improved agricultural practices and a change in the
cropping pattern had resulted in an increase in the employment of
labour.

Regarding the impact of Small Farmers Development Agency,
on labour absorption *Agarwal and Prasad* (1980) found from their
study that human labour employment per acre of operational
holdings was found to higher on the beneficiary small farms over
their non-beneficiary counter parts. The labour employment has also spread over almost in all the twelve-month of the year compared to peaks and slack months on these farms before the participation in the S.F.D.A. Programme.

II. 2 TECHNOLOGY AND LABOUR USE

The impact of technology change on labour input per unit area is varied. Land augmenting factors like seed-fertilizer-water combinations often have positive impact on labour demand. Gangwar's study (1970) is strengthening the view that the adoption of new technology had not resulted in any significant reduction in the total labour utilization, but it has certainly increased labour productivity. Shah and singh (1970) have also found that the employment of casual and permanent labour is higher on the progressive medium and large farms as compared to the less progressive farms. The new technology has not only pushed up employment and productivity per acre but also agricultural wage.

Bisaliah (1978) has suggested that 12 per cent of the increased employment per acre for adoption over the non-adopted is explained by the change in technology i.e. by the adoption of HYV against traditional variety of seeds 15 per cent of the negative employment
effect is explained by wage variations. Among farms of two different technologies a complementary inputs explain 54 per cent of total increased in labour input per unit of area of 54 per cent irrigation contributed 9 per cent capital 5 per cent and fertilizer application 40 per cent. Factors explaining the rest of 19 per cent variation could be ignored because they do not come under the H.Y.V and associated inputs. *Joshi, Bhat and Jha (1981)* made an attempt to decompose total change in agricultural labour employment between 1966-67 and 1977-78 in terms of important components like irrigation, high yielding varieties, tractorisation and cropping intensity. It shows that the mechanical technology (Tractor ploughing) mechanical threshing (Tractor driven pumps) has displaced labour, while biological technology (Irrigation and high yielding varieties) has exerted a positive influence.

*Daulat Singh and Singh (1981)* found that the farm labour employment has been generated upto 1972-73 as a result of adoption of Modern Technologies in agriculture but afterwards the employment of male labour increased overtime but that of female labour declined abruptly.
According the “policy Guidelines” of the ILO, the H.Y.V. programme represents a labour intensive technology, since that is required is not only the H.Y.V. of seeds, assured water supply, inorganic fertilizers, pesticides etc., but also careful and time specific operations. Some developments in technology, such as short maturing crops, further enhance the labour absorption capacity because they permit multiple cropping and more intensive use of land and labour. Besides, this strategy pivoting around a biological innovation, i.e. the high yielding variety of seeds, is size neutral. Therefore, the small farmers, who constitute the bulk of the peasantry can also benefit from this technology. The same view is observed from Goswami and Bora(1970), where there is considerable scope for employment of the surplus labour in the agricultural sector itself by introducing H.Y.V. and intensive farm practices.

The impact of H.Y.V. of seed and yield and labour input per unit area was measured by Dixit Singh (1976). They suggested that the yield per unit area was higher for H.Y.V. seeds than for traditional varieties. Human labour days per unit area was higher for H.Y.V. than for traditional varieties though in each case it declined with the increase in size. The proportion of hired labour was found to increase as size increased.
In nature of agricultural production is such that it provides employment on the seasonal basis. There is however, a considerable scope for increasing employment of farm workers by the increase in irrigation facility and the expansion of area under H.Y.V. programme.

A notable work in connection with the impact of irrigation on labour absorption was undertaken by Arun Patel (1961). He found that the assurance of water supply through canal irrigation would by itself induce the farmers to make changes in their agriculture so as to realize the expected employment potential. The same view is expressed by Navin Chandra Joshi (1980), who finds that a substantial additional employment could be generated by the expansion of irrigated agriculture and the largely expanded allied sector of dairy farming forestry and fisheries.

The provision of irrigation has also increased family labour employment in agriculture. Chinnappa and Silva (1982) estimated that every acre which went over to high yielding varieties of paddy generated an additional demand for 17.1 person days (9.4 mandays and 7.7 women days).
II. 3 IMPACT OF MECHANIZATION

Studies in mechanization and its relationship with labour input and output per unit area mainly focus on the complementarity between land augmenting inputs and mechanization along with size effects and the impact of tractorisation indicate that the cropping intensity, output and employment are all higher in tractor than in bullock farms. The study by Billings and Arjun Singh (1969) explains that normally a Punjab farmer on well irrigated land use, on an average 15 per cent cropping intensity with the use of pumpsets, tractors and reapers, it is possible to raise the intensity to cover 200 per cent and thus increased the demand for labour.

Bose and Clark (1969) have concluded that tractorisation of large farm in West Pakistan reduced labour wage by as much as 50 per cent per acre. On a similar line Crewall and Kahlon (1970) argue that mechanisation, especially tractorisation does not displace labour. Joshi (1973) contends that mechanization makes intensive and extensive cultivation and has a positive effect on labour demand.
Motilal's (1973) study on Alipur block in Union Territory of Delhi analyse, the fact of tractorisation on human labour employment. He has concluded that there is some displacement of human labour following tractorisation if there is no change in the cropping intensity. Comparing, the before and after situations of tractor use, among the tractorised farms.

Chopra (1974) shows that there has been a slight decline in permanent hired labour days per acre, where as family and causal labour per acre increased marginally. A higher intensity of cultivation involves more intensive application of inputs, particularly labour to land. Due to existence of positive relationship between crop intensity and labour use. This size of farm is usually found to have negative relationship with the employment of labour per unit of land. Bharadwaj (1974) notices that labour days per hectare spent on all farms are inversely related to size of holding. As for as individual small farms are concern, the relationship is negative in all cases but statistically significant only in few cases.

Mehra (1976) argues that the labour input per unit area increased due to mechanized input use. On the other hand Naidu (1977) attempts to explore whether mechanisation has had
any impact on the use of human labour and bullock labour. He shows that mechanisation displaces bullock labour but not human labour.

Studies brought out by Shigeru Ishikawa (1978) relating to South East Asia show that improved agricultural practices would absorb more labour. A number of studies were carried out in India also about the Labour absorption capacity in agriculture. It is used that the labour input per unit of land in Indian agriculture is significantly lower than that in Japanese and other Southeast Asian agriculture. A part of this difference has been attributed to the difference in the Agro-climatic conditions. It is understood that here is a positive association between labour input per unit of land and output per unit of land and hence the above mentioned differences can be bridged to some extent. It would be interesting to know the factors that promote both an increases in output and in employment. They are H.Y.V. irrigation, cropping intensity, cropping pattern, size of holding, fertiliser input, agricultural wage rate etc., on labour use in agriculture.

The study conducted by Balister and Singh (1981) in Bichapuri block of Agra district of Western U.P. examines the effect of farm
technology on cropping pattern, cropping intensity, crop yield and labour absorption. The degree of commercialisation and cropping intensity increased with the increase in the level of mechanisation. However, the labour absorption per hectare of cultivated area shows an increasing trend with the increase in the level of mechanisation. This increase was due to an increase in the cropping intensity and shift in the cropping pattern from less labour intensive crop more labour intensive crops.

It is hypothesized that adoption of high yielding variety leads to substantial increase in labour input per unit of cultivated land. In Kalyanpur block of U.P. it was found that on hectare of land under H.Y.V. of maize, paddy and wheat employed 16.74, 14.36 and 14.74 additional mandays when compared to local varieties. The generation of increase employment is due to many reasons H.Y.V. seeds need better care than local seeds in many aspects. Since yield is higher under H.Y.V. greater an amount of labour is needed for harvesting and threshing. Some studies have come to the conclusion that irrigation cultivation needs greater labour input than dry cultivation.
No doubt some studies have shown negative association between irrigation and labour input. In Saurastra it was found that dry Bajra (Hybrid) cultivation required more labour input than irrigated Bajra (Hybrid).

Some studies have focused on cropping intensity as another important factor, which leads to a substantial increase in labour input in agriculture. A unit of land cultivated several times in a year certainly leads to significant increase in labour input. The change in cropping pattern has positive effect on labour absorption. A mixed cropping pattern (i.e. cultivating more than one crop in a plot of land at the same time) said to have positive effect on labour input. It is held that labour input is inversely related to size of holding. The explanation for this is that the small farmers, by and large, use family labour. Finally wherever possible the small farmer increase crop intensity and changes the crop pattern in favour of labour intensive crops so as to have employment and higher income.

A few other studies have shown an inverted 'U' shape relationship between size of land holding and labour input use. Apart from seeds and irrigation facilities, cultivation needs some other complementary input also. Material inputs may be in terms of
tools and implements machinery to plant nutrients like farm yard manure, green manure, chemical fertilizers and use of pesticides found significant positive correlation with labour input. Finally it is held that village wage rate and analysis of farm management surveys as well as small sample inquiries suggests that principal variants of labour use are cropping intensity cropping pattern, bio-technology mechanisation irrigation, land size distribution and a number of institutional factors. Activity specific labour demands also have been calculated for different agro-climatic zones, techniques and farm sizes, which form the building blocks for constituting macro scenarios of employment in agriculture. There are few studies at the micro level fewer of recent origin, which identify causalities or generate parameters that could help assess incremental labour use in agriculture sector.

Some recent works concentrate on interpreting time trends and point comparisons in labour use and also complete elasticities of employment with respect to time to conclude that limits to the same are reaching in many areas. Other cross sectional studies find wide variations across crops and regions which are interpreted as pointers to raise employment in the future.
II. 4 LABOUR USE ACROSS CROPS AND FARM OPERATIONS

*Parthasarathy (1990)* based on various empirical investigations on the question of labour use in Indian agriculture highlighted some of the determinants of labour demand in Tamil Nadu agriculture. The study is based on the data collected from “Comprehensive scheme for cost of cultivation of principal crop” for the year 1979 – 80 and 1981 - 1982. The study revealed a potential in Tamil Nade agriculture to absorb additional labour force at least to the extent the labour using technologies permit. Further, the impact on the labour demand was also found to be directly related to their use level to an extent. However, the differential response of different crops of inputs is well recognized. The author suggested that there is a need for an analysis at the individual crop level.

*Sarthi Acharya (1992)* analysed a recent data set on the cost of cultivation survey (COC). The individual elasticities calculated showed that the response to hired labour is greater than that to total labour with respect to every variable. The labour use varies extensively across crops and states, because of the individual characteristic of each crop, inter-state differences in farming system and the levels of development. Labour use in agriculture is
contingent upon modernisation of agriculture, labour promoting and displacing technologies.

From the analysis of crop wise labour use by *Avikar* (1992) observed that intensity of female labour use is observed comparatively more in hybrid Jowar (177.62) followed by cotton hybrid (161.15) Groundnut and Paddy (120.31). The allocation of area under these crops worked out to 35.42% of gross cropped area. Thus the intensity of female labour use is likely to be increased with an increase in the proportion of allocation of area under these crops. In addition, female labour utilization would increase with an increase in the area under crops, which have greater male to female labour ratio.

*Rajendran* (1993) analysed the utilisation pattern of labour power at farm level in relation to Agro-climatic feature and assessed the magnitude of labour use across crops and operations. The crop wise labour use across villages did not vary much. In other words, in all the villages more labour was used for sugarcane crop followed by paddy, groundnut and other crops. However, the magnitude of labour power used varies among the villages. More labour power was utilised for sowing followed by transplantation, manuring and irrigation.
Dairya (1994) study computed agricultural incomes of farmers and developed an explanation of their variation, by region, crop and climate category, based on COC data in Eighties. It is observed that the absolute income derived from crop agriculture is not impossible when compared with the subsistence needs of the people. There is wide fluctuation in the incomes derived from the different crops in different states. High value cereals, cash crop and oilseeds yield a higher income compared to coarse cereals and pulses. States with better irrigation facilities yield higher incomes compared to rain fed ones. Inter-crops variations in income are higher than inter-state variation. Uma Shankar Patnaik (1997) while examining the factor elasticity’s along with the impact of technology on labour use across farm operations, observed that some operations are more labour intensive than other operations.

II. 5 CONCLUSIONS

In view of the discussion made various earlier studies, it seems to be pertinent to examine the issue of labour absorption with respect to (a) individual crops, (b) individual agricultural operations involved for each crop and (c) individual input relationship with labour for each crop/operation.