CHAPTER II

REVIEW OF LITERATURE

On the eve of India’s independence in 1947, Indian agriculture was characterized by feudal land relations and primitive technology. Agriculture was reeling under the prevalence of fragmented and scattered unirrigated holdings under zamindari system, indebtedness of farmers from moneylenders, outmoded farming techniques, subsistence farming and fluctuation in crop output. During the first half of this century agricultural production rose marginally as compared to the growth of population. The cultivable land increased marginally whereas the population increased more than two times of the increased in the agricultural productivity.

After independence the thrust of the Indian Government was to bring self-sufficiency in food production and rapid economic growth in the country at the nearest possible. The then Prime Minister Pandit Jawaharlal Nehru felt the immediate necessity of Planning Commission in India to reorganize the Indian economy through the adoption of Five Year Plans. The First Five Year Plan
was launched in the country in April 1951 with special emphasis on agricultural development. During the plans, emphasis was laid down on the landreforms, development of basicinfrastructure, such as irrigation, power, research and extension service, credit, marketing and transport network along with effective price and facilities for procurement and distribution of farm inputs. By the end of the first plan India attained self-sufficiency in food grains production.

By the beginning of the Second Five Year Plan the then Prime Minister thought that rapid economic development and economic growth could be brought about only by rapid industrialization in the country. Accordingly, in consultation with Prof.Mahalonabis, a new economic model giving special importance to the development of industrial development was launched. The agricultural sector was given lesser importance in comparison with the First Five Year Plan on the pretext that the agricultural sector had achieved its own optimum.

Thus, the Indian planners prepared and launched the second Five Year Plan with an over optimistic/wrong view that without an extra effort and special emphasis agriculture could sustain itself.
But by the end of the second Five Year Plan there was the problem of severe food crisis in India. India had to import huge amount of food grains from other foreign countries to fed millions of hungry mouths.

By then the Indian Planners, economists, research scholars and agriculturists came to realize the importance of agriculture and allied activities in the Indian economy. Many researchers came out to make in-depth studies on the problems of agrarian development in India particularly re-organization of land use system.

Then the Govt. of India invited a team of agricultural experts, sponsored by the Ford Foundation, to work in close cooperation with Indian experts in making a careful study of the agricultural situation and to make recommendations for future action. The Team suggested that certain areas with assured water supply and with high potential for rapid increase in food production should be taken up for intensive cultivation. Thus Intensive Agricultural District Programme (IADP) was set up during the Third plan to develop the whole farming community. The establishment of the IADP was a new dimension in the direction of modernizing Indian agriculture.
Again, if Indian Economy was to be freed from food imports and increased agricultural production was to be achieved in a short span of time that a new strategy was much needed. Against this background the new Agricultural strategy which aimed at rapid and spectacular increase in food grown production was adopted from 1966-67. The introduction of New Agricultural strategy has readily changed the shape of Indian agriculture.

In 1970s when High Yielding Varieties of rice and wheat made their entry into India in the form of Green Revolution, Punjab and Haryana proved to be the most successful stories for them. HYVs offered a higher level of per capita income that would be translated into a better lifestyle and hence the progress of the nation along with meeting the growing demand for food across the globe. It served these objectives to a large extent. The “miracle” seeds of the Green Revolution have become mechanisms for breeding new pests and creating new diseases. In 1970, Norman Borlaug was awarded the Nobel Peace Prize for his work in developing high-yielding varieties (HYVs) of wheat. The “Green Revolution” launched by Borlaug’s “miracle seeds”, is often credited with having transformed India from “a begging bowl to a
bread basket.'', and the Punjab is frequently cited as the Green Revolution's most celebrated success story.¹

Taking Punjab as a model state, after introducing green revolution of unlike other states the development of agriculture took a very different shape. The growth rate of agricultural production was much faster than other states. With the advent of Green Revolution, Punjab has emerged as the most advanced state in agricultural development. This was made possible by the adoption of HYVs seeds, expansion in the irrigated area, fertilizer consumption, pesticides, rural credit and growth of farm mechanization in the state.

The impact of Green Revolution in Punjab was achieved due to the adoption of high yielding varieties (HYVs), particularly paddy and wheat. Punjab was never known for rice cultivation but it was only after the adoption of HYVs of rice, the area under rice showed a tremendous increase. Due to rapid expansion of irrigation facilities, the net sown area has increased tremendously. Canals and tube wells are the main sources of irrigation in the state.

Before the adoption of new agricultural strategy, the irrigation facilities available in the state were quite inadequate.

Then, the Fourth Five Year Plan emphasized the necessity to make increasing use of science and technology for the promotion of agriculture. Thus, the planning commission adopted a “yield increase” strategy through the introduction of intensive agricultural production techniques.²

The Fifth Plan, while adhering the basic policies of the Fourth plan, made some modifications in the programme for agriculture with a view of increasing their efficiency. It was proposed to cover more food crops under HYV. New programme was to cover not only irrigated agriculture but also dry farming areas in a large scale. Subsequently, in Sixth to Eighth plans the objectives of planning remained more or less the same except of the emphasis on growth with social justice.

The Ninth plan was launched in the fiftieth year of India’s independence. The focus of Ninth plan was growth with social justice. It assigned priority to agriculture and rural development

²Tyagi, B.P. - Agricultural Economics and Rural Development, Published by Jai PrakashNath and Co. P-802.
with a view to generating adequate productive employment and eradication of poverty. The direction in planning that was beginning in the Ninth plan has been carried forward in the Tenth plan also. The Tenth plan’s new thrust was diversification towards high value and more remunerative crops, considering the agro-climatic conditions; endowment of land and water resources and the market demand both within the country and outside. During the Eleventh Plan, the Planning Commission is actively encouraged to go for contract farming in fruits, vegetable and other crops. It is also encouraged to provide seeds, fertilizers and assured marketing.

So far we have discussed about the priorities given by the Indian planners during the different plan periods for the development of agricultural sector in India. The necessity for the development of agriculture in India hardly needs to be emphasized. But now the main problem of agricultural development in the country is that the size of the cultivable land area has been decreasing significantly due to many factors such as urbanization, change from agrarian economy into a modern industrialized economy etc. On the other hand, the demand for agricultural products, particularly that of food grains, has been increasing
tremendously due to rapid population growth. It would be worthwhile to mention that God has given us two hands to feed our mouth, but the mouth started functioning some fifteen years before the hands start to work to feed the mouth. Since the size of the whole land remains fixed and the size of cultivable lands being decreased, the increase in cropping intensity becomes only way to feed the increasing mouths.

Indian Economists and Geographers received inspiration in land use studies from L. Dudley Stamp, who had attended the 25th session of the Indian Science Congress held at Calcutta in 1938. Such studies cover inventories of land use surveys and isolated topical or regional descriptive account of land use variation in space and time. Of late, more studies are being undertaken with the application of quantitative techniques in the analysis of various land use components. In Ranchi University E. Ahmed (1954) has analysed land use types in relation to physical elements. According to him slope of the land should be considered in preparing the

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3FAO, Agricultural Commodities, Projection for 1975 and 1958 (1967).
development scheme of an Indian village.\textsuperscript{4} The land utilization survey in Eastern Uttar Pradesh conducted by M. Shafi (1960) have made strong plea to carry out land use survey combined with the survey of land capability. This will help in determining optimum utilization of the available land in relation to their intrinsic qualities.\textsuperscript{5}

In Sagar University S.N. Mishra (1964) has studied land use in Khadar and ravines of the lower – Middle Gomati Valley. He has attempted land use planning for better adjustment of agriculture to the physical environment for optimum exploitation and conservation of natural resources.\textsuperscript{6}

Singh (1970) has studied the land use systems in Mirjapur and Envisons and his study includes measurement of land in the area through village-level survey. \textsuperscript{7}Goutam (1976) has studied land use and revealed that a comprehensive land development planning requires a “multi-disciplinary” approach, where specialists in


\textsuperscript{6}Mishra, S.N. – Land use in the Khadar and Ravine Tract of the Lower Middle Gomati Valley, National

\textsuperscript{7}Singh, V.R- Land use patterns in Mirjapur and Envisions, Ph.D. thesis, Banaras Hindu University, 1970. Geographical Journal of India, 10(3and4)
various field need to analyse a lot of data in order to arrive at a “Integrated Plan”. According to him, a concerted effort of a number of disciplines can only bring about a variety of information necessary for land use planning. He has advocated that photo-interpretation technique may be used for data acquisition.\(^8\)

K.K.L. Das (1979) studied about “Population and land resources in North Bihar Plain-west of hose” in which he has shown the relationship between population and the intensity of the utilization of land in the study area.\(^9\) VenkataramananL.S. and Prahladachar (1980) analysed the growth rates in area, yield and output of major crops in six states, viz. Punjab (including Haryana), Rajasthan, Uttar Pradesh, Bihar, Maharashtra and Andhra Pradesh for the period 1950-51 to 1974-75 and examined the impact of growth rates of crops on cropping pattern in these states. This study also attempted through ‘decomposition method’ to study the area, yield


and cropping pattern effects on crop output growth in these states in the period under the reference.\textsuperscript{10}

At first the rates of growth in individual crops is related to the changes in cropping pattern, then the attempts to offer a plausible explanation for the macro state level changes in the cropping pattern witnessed in the six states during the reference period.

Secondly, it suggested a method of measuring the ‘aggregate’ change in the cropping pattern of a state in terms of ‘substitution’ and ‘expansion’ effects by comparing the area growth rates of individual crops with the corresponding growth rate in gross cropped area.

The main findings of this study are: The relative acreage under food grains and non-food grains in the Punjab remained stationary over the period 1950-75, but the relative shares of wheat and rice among food grains and that of cotton among non-food grains improved. The favourable factors for their growth, either singly or jointly, were the use of HYVs fertilizers and irrigation.

Unlike in Punjab, the share of food grain crops in the gross cropped area, bajra in particular, increased considerably in Rajasthan. This development in Rajasthan unmistakably reflects the increase of subsistence agriculture and the growing disparity in farming conditions and farm incomes between states like Punjab and Rajasthan.

The main changes in the cropping pattern that occurred in Andhra Pradesh during the period 1950-75 where the improvements in the relative shares of paddy, maize and sugar cane (the latter two crops however occupied small shares in the gross cropped area).

Yield increase and/or the spread of irrigation were the main contribution factors for area growth and consequently for the growth of output.

The result of this study showed that, comparison between Northern Punjab and Coastal Northern Tamil Nadu, for 1970-73, shows that even though the percent irrigated land was higher in the former region (73.62%) than in the latter region (61.66%), the agricultural production per hectare (productivity) was higher in the latter region (Rs.20303 than in the former Rs.1067).
At the same time, the cropping pattern index was higher in Coastal Northern Tamil Nadu (126.4) than in Northern Punjab (119.5). The fertilizer use was less in Coastal Northern Tamil Nadu than that in Northern Punjab. In Orissa, although the cropping pattern index is higher than that in Punjab, the agricultural productivity is much low and so are the fertilizer use and irrigation too.

In this study the regression results show that higher the cropping pattern index, the higher will be the agricultural productivity. This result is important in deciding how far high-yielding food grain technology, along with fertilizer and irrigation, needs to be pushed in comparison with growing more of high value crops in order to increase agricultural productivity in different region. It appears that marginal manipulations in the cropping pattern in region can increase agricultural productivity significantly even if the use of fertilizer and irrigation remain unchanged. The extension machinery can play a big role in tapping the comparative advantage of different regions.

Chadha.G.K. and Sharma.R.K. (1982), as examined whether the Green Revolution has any relationship with form size cropping intensity in Indian agriculture. The study examines the relationship
separately for each of the 318 districts of India, spread over almost all states. The 1970/71 agricultural census reports for various states have been used extensively for this analysis.\textsuperscript{11}

As per the results it is interesting to note that almost conclusive evidence emerges in favour of the inverse relationship in a green revolution area such as the Punjab and Haryana. The small farmers in these districts have lost their traditional edge of higher cropping intensity. This study also examined the cropping intensity on irrigated as well as on unirrigated area. Among the irrigated areas, a majority of districts suggested an inverse relationship, but there are a large percentage of districts showing a positive or neutral relationship. In some districts, an improved irrigation structure seems to have promoted higher cropping intensity on irrigated areas of large farms, while for many others; the inverse relationship persists in spite of a positive correlation between farm size and improved irrigation base. It means that in spite of a technological disadvantage in the matter of improved irrigation

facilities, the marginal and small farmers continue to cultivate their lands more intensively over a large part of Indian agriculture. In summary it appears that an assured and flexible year round supply of their family labour continues to play a critical role in increasing cropping intensity. Perhaps, their family labour will continue to play this role in future as well.

Sharma J.L. (1990) examined the inter-state disparities in agricultural growth in India. The main objectives of this study are: to examine the inter-state disparities in agricultural growth and to identify the factors responsible for these disparities. The data for the study was obtained from Statistical Abstract of India, covering the period 1966-67 to 1987-88.\(^{12}\) The main conclusions of this study are that, size of holding is the basic factor affecting the structure of agriculture and there exists vast disparities across states in India. The States with higher agricultural growth rates having relatively higher average size of holding except Uttar Pradesh, Punjab and Haryana states, the centre of agricultural growth in India, have the highest proportion of cultivated area under irrigation.

\(^{12}\)J.L.Sharma (1990): Journal- Agricultural Situation in India Volume 45 NO.7 PP.453-456 ISSN 0002-1679, Record Number 19911890011.
In Orissa, Madhya Pradesh, Bihar and Kerala, the use of fertilizers were less than the national average. These were the states which have recorded low growth rates in food grains production. Further, the irrigation facilities were also lower in these states compared to all-India level.

Regarding tractorization, the analysis showed that Punjab, Haryana and Uttar Pradesh have the highest intensity of tractorization compared to other states. The growth rates in food grains production along with the cropping intensity in each state indicate that the states with higher agriculture growth rates were also having higher intensity of cropping. A look at the percentage area irrigated and percent area under high yielding varieties of cereals indicates that these two variables are closely linked.

Siddiqi has introduced the method of unit area land classification. This method was developed by the Tennessee Valley Authority (TVA). This method involves factors relating to physical and human environment tabulated with the help of quantitative land classification and deductive method of land classification.\(^\text{13}\)

\(^{13}\)Siddiqi, N.A. Land Classification for Agricultural Planning: A Study in Methodology, Geographer, 1971.p.32.
1972, this method of study was carried out by Aparna Roy and Masjid Hussain in their case studies. De (1973) has introduced the method of measuring “Land Potential” through modern technique like “Remote Sensing and Aerial Photo-Interpretation and Geomorphic Studies.”\textsuperscript{14} L.S. Bhat has analysed the concept of planning from below i.e. village, block and district level for land utilisation planning.\textsuperscript{15}

P.K. Prasad in his paper on ‘Agricultural policy’ An Appraisal discusses the various aspects of Indian agriculture viz, infrastructural facilities, high inputs, credit facilities, marketing system and development of agro-based industries etc. According to him, there is need to reduced industrial protection and encourage agriculture for its commercial activities. The price policy must ensure the farmer to get remunerative prices for his product. Value addition in agriculture can only be achieved by concerted thrust in processing, marketing and storage facilities. Thus, the author


emphasised on the necessity of integration of backward and forward linkages which would help both industry and agriculture in a great measure.\textsuperscript{16}

In a developing country like India where the population explosion and low rate of capital formation and limited capital stock are the common features, the problem of choice of technique is also a big problem. Some economists advocate the adoption of labour-intensive technique from the employment point of view at the cost of rapid economic growth.

On the other hand, some economists have proposed to adopt capital-intensive technique for achieving faster economic growth at the cost of employment opportunities. Here Nobel Laureate Amartya Sen refused both the techniques of production for economic development of a developing economy like India.

He propagated land intensive technique for an agrarian economy like India both from the point of view of unemployment problem (particularly that of disguised unemployment) and rapid economic growth (by use of capital intensive goods like tractors,

fertilizers etc.). His new economic theory of development of land intensive technique seems to be more appropriate. His theory, in simple words is the introduction of cropping intensity in agriculture or intensification of land use.

The level of cropping intensity is determined by several factors. The most important factor is the availability of water from natural (rainfall) and or man-made resources (irrigation). However, the scopes for year round cropping activities in most states of India are severely constrained by the seasonal distribution of rainfall. So long as this natural constraint is relaxed, by developing irrigation facilities, the level of multiple cropping improves. The flexibility in selecting appropriate crop pattern is also enhanced when irrigation facilities make water available in a controllable manner farm to the farmers throughout the year. It would, therefore, be reasonable to hypothesise that a greater part of inter-state, or inter regional disparity in the level of cropping intensity could be due to the disparity in the pattern of development of irrigation facilities, both in qualitatively and quantitatively. In general the level of cropping intensity is higher in the regions with higher percentage of net sown area irrigated and with higher intensity of land use by irrigation
However, it is futile to expect a one-to-one correspondence between irrigation and cropping intensity.

The other crucial variable that determines the level of cropping intensity is the availability of labour. The characteristics of the farms according to holding size in India suggest that labour availability is an important determinant. The various farm management studies carried out in India showed that as the average size of holding increases, the average family size increases but not in the same proportion. As a result, land per capita will go up and population density declines with an increase in the holding size. In other words, an inverse relationship is established between cropping intensity and holding size. With modernization of agriculture, currently this relationship is undergoing changes. Tractorization and other labour-saving mechanical devices have altered this picture. Several other factors can also be listed, but generally speaking, there are basically three factors that determine the level of cropping intensity.

Firstly, supply of energy in the form of human labour, animal labour and mechanical devices, secondly, supply of water in the form of rainfall or irrigation and its distribution over the crop
year, and thirdly the physical limits imposed by the adopted cropping pattern on the duration of cropping activities during a particular crop year. The above discussion is indicative of the changes in cropping pattern. Cropping intensity will put more pressure on energy demand in the form of human, bullock, mechanical and fertilizers and pesticides. In this regard one can concentrate the existing literature available with respect to cropping pattern and cropping intensity.

One of the interesting study in this regard is by Mruthyunjaya and Pradhan Kumar (1989), who extensively worked on cropping pattern changes in Indian agriculture, to examine the changes in input use, productivity, cost of production, profitability and employment in crops. He identified and explained the cropping pattern changes, by suggesting ways and means for controlling the imbalance in the cropping pattern and thereby widening the base for crop production in India.17

The changes in cropping pattern in various states in India have been examined by collecting data on area, production, and yield of principal crops. The Directorate of Economics and Statistics, Government of India carried over a survey in regular intervals of five years, related to crop input, output, and cost of cultivation of principal crops in India.

The main findings from this study can be summarised as follows: area under paddy and wheat has continuously increased in many states at the cost of coarse cereals, millets, pulses, and in some areas, cotton. The reason for this growth, viz. technological support, price support, infrastructural support including markets and irrigation, subsistence requirements, lesser price and yield risk, are well known. The important cost to the society as a part of this development is the serious influence on cropping pattern, increased regional disparities, increased instability in production, and resulted in unplanned imports of commodities.

To remedy the situation, the el emeriti of the green revolution strategy have to be re-examined. The process, as discussed in this study, should include breeding the disease, pest, drought and flood resistance high yielding varieties of all crops
particularly attention to coarse cereals, millets, pulses and oil seeds. There is a need for exploiting the untapped potential (mostly dry land areas) and raising the economic potential (create awareness) of fertilizer use. It is also important to improve management of irrigation facilities, market experience and product diversification, land development and farming comprehensive price policy integrating products by products, input and markets (including international).

Mahendra Dev. S (1989) has analysed the variations in cropping intensity in Indian Agriculture. The main objectives of this study were to examine the factors influencing (a) the regional variations in cropping intensity at different time points since the early sixties and (b) the temporal variations in cropping intensity far selected districts in Andhra Pradesh, Maharashtra and Tamil Nadu. The data used for this study is taken from National Sample Surveys.

The results showed that, based on the pooled cross-section regression with the explanatory variables like cropping intensity on normal rainfall, percentage irrigation and tractorization. The results reveal that the first two variables seem to be important in explaining the inter-state and inter-regional variations in cropping intensity. With the introduction of intensity of land use with irrigation (GIA/NIA) variable in place of tractorization, irrigation variables became dominated in explaining inter-regional variations in cropping intensity. The estimates based on time-series data for selected districts also reveal the importance of irrigation. In particular the intensity of land use with irrigation on cropping intensity differs from district to district. This study suggests the policy side aspect also where in the emphasis on the agricultural development strategy in India was more on raising the yield of any particular crop per unit of land rather than increasing the total output per unit of land from all crops grown in a year.

D.V. Singh and D.N Sharma’s paper “Agricultural Production in India: Issues and Options” identifies three basic
issues of the performance of the agricultural sector as a whole. The first relates to instability of agricultural production while second to food security and finally, role of agriculture in economic growth. Keeping in view these crucial issues of agricultural development the paper aims to find out various reasons responsible for the growth of agricultural output in different states of India. The study on the basis of the growth rate analysis reveals that Indian agriculture is facing cyclical fluctuation in its production mainly due to its dependence on rainfall which has always been erratic and uncertain affecting the productivity of crops. The study on this issue suggests that till a major breakthrough in dry farming technology is achieved, there can be no hope of reducing instability in Indian agriculture. Regarding the second issue of the food security which directs attention to a key basic need of the poorest and most vulnerable groups the study suggests that there is need of intensification of agricultural production and for that a balance growth of all the crops suitable in the area should be geared up. The study further suggests that the need of the hour is to diversify

agriculture so that risk and uncertainty can be avoided. The recent growing feature of specialisation in agriculture sector particularly shifting of cereal crops to fruit and vegetables in hilly regions will definitely improve the purchasing power as well as quality of life of the farmers in general and small landholder in particular.

In Manipur neither up-to-date land records nor systematic data on land utilisation has been maintained. Only limited data are available in respect of the valley areas. However, some studies have mentioned about land use in Manipur. Government has brought out some such publications as Techno-Economic Survey of Manipur (1961)\textsuperscript{20} and Agricultural Census of Manipur (1970-71).\textsuperscript{21} The present chapter has attempted to make a brief review of the relevant literature on the cropping intensity and pattern of land utilization and its impact on the agricultural productivity. In the next chapter we will focus our attention to examine the problems and prospect in the better utilization of land in the valley areas of Manipur.
