CHAPTER- I

Introduction

i) Selection of the problem - general discussion,

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Chapter - I

Introduction

(i) Selection of the problem- General discussion

Agriculture is India's largest and broadest industry. The first and foremost measure of the place of agriculture in the Indian Economy is well reflected in the large income that flows out of this sector. It is very substantial amount from 50 percent to 60 percent. Yet another crucial part in respect of providing work and jobs to the people of Indian agriculture gets on top position.

It is increasingly becoming evident that the entire success of our planning to usher into a self sustaining economy depends on the country's ability to feed the every increasing population and to meet the growing requirements of domestic industries and the export market. The most important lesson which 20 years of planning offers us is, that the property of the country, entirely hangs on the prosperity of the agricultural sector. An efficient and developing agriculture would be a major factor in accelerating the pace of economic development. If agriculture stagnates, it will act not only as a brake on industrial expansion but also hamper real growth. An American economist has also
expressed the view that irrespective of whatever success India might achieve on the industrial front and in solving the balance of payment problem, its economic progress would depend largely on the development of agriculture.

Dr. B.R. Sen, former Director General of the United Nations Food and Agricultural Organisation has also expressed the same point of view as under:

"Agriculture is the natural base for the overall advancement of the majority of the developing countries and the industry is based on agriculture, a natural stepping stone towards industrial development on a larger scale."

It is quite patent that agricultural sector of our economy needs careful handling and planned stimulation as otherwise it can arrest the development of the entire economy. The importance of agriculture in the country's economy has been highlighted by the Planning Commission in the following words :-

"The pace of development in the agricultural sector sets a limit to the growth of industry of export and of the economy as a whole and constitutes a major condition for achieving economic and social stability and improving the levels of living and nutrition for the mass of the people."

It is obvious that there is hardly any possibility of substantial increase in the area of cultivation which appears to be the only way to boost agricultural production. In this connection professor Nicholas writes "Despite relative scarcity of land, India has tremendous opportunities for increasing yield per acre by modest capital expenditure on land saving techniques and a fuller utilisation of her abundant agriculture labour force."

Agriculture is an important industry like other industries. It also requires capital due to the peculiarities of agriculture, specially its uncertainties, its small unit
production, scattered operation, low returns, high rates of
rent and limited scope of employment. A large section of
farmers can not manage from one harvest to another
without recourse to borrowings.

For stimulating the tempo of agricultural production,
it is imperative that the farmers must be provided with
essential prerequisites like fertilizers improved seeds,
irrigation facilities, modern implements, marketing facilities
etc. It is obvious that without adequate and timely credit,
they would not be able to make use of these essential
inputs. Therefore, it is justified in the words of Lord
Mayo that:

"For generations to come the progress of wealth and
civilization must be dependent on her progress in agriculture.
There is perhaps no country in the world in which the
state has no immediate and direct interest in agriculture.
The government of India is not only a government but the
chief landlord."

This is why it has been truly said by the Administrative
Committee on agriculture:

".................. it is agriculture that is the mother
of all industries and the maintainer of human life."

The dry farming is an important phenomenon of the
district's rural economy as it would be observed in the
foregoing chapter. The farmers have generally adopted the
crops which have drought resistance character e.g. gram,
wheat, arhar, linseed, lentil etc. The gram, linseed, wheat
and lentil have emerged as special and commercial crops
as they bear low cost and profile good return. That is
why, the proposed study "Dry Land Farming- An Economic
Analysis in Banda District" may be beneficial to the farmers
and significant to those who plan and think for agricultural
development. An interesting clue may be visualised specially
for such places where dry farming is obvious.

(ii) General Features:

Agricultural Economy of Banda District

1) Location

Banda is one of the seven districts of Jhansi Division generally known as Bundelkhand Region of U.P. A large part of this region is drought prone and in some place even drinking water is not available in summers due to the drying up of drinking water wells. Therefore, the state government has made arrangement to supply piped water in Banda district to construct tanks for storage of water at Karwi under "Patha Jalkal Yojna" to drought prone area of Mau and Karwi Tahsils of this district.

The district is situated in the eastern part of Jhansi division and lies between 25-53 N and 25-55 N latitudes and between 80-07 E and 81-34 E longitude. On the north its boundary is Fatehpur district, while on its south lies the districts Chhatarpur, Panna and Satna of Madhya Pradesh. Allahabad district joins its eastern boundary and Hamirpur district joins the western boundary. As a matter of fact river Yamuna forms its northern boundary separating it from Fatehpur district (Map of the district is attached).

2) Physical Features

The district of Banda is clearly divided into two natural parts viz., Patha and Alluvial land. The former is a part of Vindhya Plateau covering Mau and Karwi subdivisions of the district. It is rocky and covered with forests, bushes, grasses and is drought prone. The agriculture in this pastoral type. Patha area consists of the following blocks:

a) Mau
b) Ram Nagar
c) Pahari
d) Manikpur, and
e) Chitrakoot

The latter part of the district is fertile alluvial plain in the northern part of the district. It comprises of the following blocks:

a) Badokhar Khurd
b) Mahua
c) Jasputra
d) Tindwari
e) Naraini
f) Bisanda
g) Baberu, and
h) Kamasin

The second part of the district can further be subdivided into two parts. The first area being in the valley and at the foot of hills of the Vindhyan hills and second subdivision is between rivers viz., Bargarh, Yamuna, Ken and Chandra. General slope of the area is south to North and number of rivers flow through this part and join river Yamuna at different places.

The expansion of Banda district from east to west is 147 kms. and from north to south 104 Kms. in length which is spread from east Bargarh to West of Mataungh and in North from Chandwara and in South upto Kalinjar. Banda district is situated between river Yamuna and range of Vindhyan hills leaving apart, part of it the rest part is high and low, stony and covered with forests. Its slope is from east to west.

According to physical features the district can be divided into four parts:

a) Western part near River Ken:

It includes the near by area of Ken and plane area towards west. Black soil is found here which is supposed superior for produce and fertility. This part covers maximum
part of Banda Tahsil.

b) **Plane land of Middle:**
This part consists of two tahsils—Naraini and Baberu. This part is mostly plane and even. As the ground is plane here, it is irrigated by canals. As the means of irrigation are available, the production of paddy is done on a large scale.

c) **The plane of Gunta and Bagen:**
The river Mandakini flows through this part. This part includes some part of Naraini, Karwi and Mau Tahsils. This area is covered with forests and is drought prone. Therefore this area is not fertile from agricultural point of view. The crop of this place is of low class. This is better for pasture than for agriculture.

d) **The South and Eastern part of Plateau:**
This part can be called "Vanasthali." Here is found the chain of Vindhyachal mountains. The soil here is stony due to it being a hilly area. The ground is not fit for agriculture. Thorny bushes are found here and the ground is uneven. This is higher than other parts. It includes some part of the Mau and Karwi Tahsil.

3. **Administrative and Development Divisions:**
This district administratively is divided into following subdivision:

a) Banda
b) Baberu
c) Naraini
d) Karwi, and
e) Mau

For purposes of development the district has been divided into 13 development blocks as under:

a) Banda
   i) Jaspura
   ii) Tindwari
b) Baberu
   i) Baberu
   ii) Bisanda
   iii) Kamasin

c) Naraini
   i) Naraini
   ii) Mahua

d) Karwi
   i) Pahari
   ii) Manikpur
   iii) Chitrakoot

e) Mau
   i) Mau
   ii) Ram Nagar

4) Social Features:

The population of Banda is 1865139 lacs. Out of which the number of literate is 528217 lacs. It is clear that number of literate is one third of the total population. The number of literate women is much less. Banda district is very backward in comparison to other districts of Uttar Pradesh due to want of education.

The main occupation of the inhabitants of the district is agriculture. About 71% of the total population lives in villages and 13% in urban area. In the district, specially in rural area, the social evils and economic inequality exist in its climax. The main reasons are inequality in the distribution of land, lack of the means of irrigation, social inequality and their dependence on agriculture for their livelihood, besides this—illiteracy, unemployment, untouchability, anarchy in society, blind faith, the old traditional religious and social inequalities are present in their crudest forms. All these general factors are prevalent in the whole district. Two main reasons are responsible for the above evils:

a) Lack of literacy in the district,

b) Inequality in the distribution of land
According to UNESCO only Basic Education (Social education and Adult education) is the only means of upliftment of man's emotional intellectual, moral and materialistic fronts. Due to the illiteracy prevailing in the rural area, the rich exploit the poor farmers. The allied people are becoming more rich having abundant means and the depressed class, carrying less of no means, is becoming poorer. The disparity is increasing day by day between the rich and depressed class. In the district in 1990-91 only 35% of the whole population was literate and the rest 65% still illiterate.

The problem of drinking water in the district is very serious. The patha area of manikpur block is highly affected by this problem. The 'Kols' of patha area are living in pitiable condition for the last many decades. Though the loan has been received from the world bank to make the drinking water available to this area, the government did not take solid steps to get rid of the problem of drinking water. Upto the year 1994-95, 474 handpumps have been installed in all, but 1201 inhabited villages still remain a prey to this problem. Most of the villages in the district are using drinking water from the wells as there are only two handpumps, that are not sufficient for the supply of drinking water.

Banda district is very backward in comparison to other districts of U.P. The social customs and culture prevalent in this district are different from those of other districts of the state in comparison to other districts of Uttar Pradesh the language and standard of living of people simultaneously is very different and low.

The main occupation of district is agriculture. Most of the people of this village depend on this occupation. They are poorer and have no other means of income so most
the people lead a very simple and hard life. Mostly they wear trouser and kurta or 'Dhoti and Kurta.' Backwardness of this district becomes more evident due to the fact that the inhabitants of this district, specially of rural area carry "Lathi and gun" in their hands. They feel proud in having gun with them and the society also looks upon them as very respectable persons whereas there is no such system in other districts of U.P. and if by the way such system is found in any district, the people do not hesitate to call them uncivilized.

One more special feature of this district is that men and women both eat betel nut, betel leaf and tobacco equally. They have become habituated to use these things. The main reason of this is illiteracy prevailing in this district.

Child labour and women labour occupy main place. The child labour engaged in agricultural work is on the top in U.P. whereas women labour holds the second position. Most of the activities connected with agricultural work are done by women because the men spend their time mostly in bad activities; in gossips in gambling and in drinking etc. The standard of life of most of the population of this district is very simple while others live below the poverty line.

Besides this, the population is fast increasing in rural areas. In 1901 the whole population of the district was 619186 lacs, but it reached the number of 1622718 lacs in 1991. All the attempts of family planning seem to be useless. The main reason behind this is illiteracy and hence the lack of civic sense.

5. **Economy:**

On the basis of geographical and economical configuration, the state is divided into regions. Bundelkhand itself is the economic region among other economic regions of U.P.
All the seven districts of this region are counted in the backward category. This region is treated as backward from economic point of view.

Banda is most backward and makes the whole of backwardness within the whole of backwardness. The economy of this district depends mainly on agriculture. The land is sloppy and stony one and gives poor yield per hectare. The small and medium sized farmers, who are large in number are unable to arrange short means of irrigation. The agriculture depends mainly on rainfall which is uncertain.

In the district in 1995 the daily wages of the agricultural labour was Rs. 35/- which is much less for them to make both ends meet. But these labourers got employment only for 189 days in a year and remained unemployed for the rest of the year. Besides this, in the agriculture sector, workers are employed in more than required number. In this way, in the district, seasonal unemployment and disguised employment are prevailing. Due to the meagre income both their consumption and savings are less. There is no effective demand due to less consumption. This is why means of production are not fully utilised and as result of this, investment is discouraged.

The percentage of industries is 1% to 2% in this district in comparison to U.P. as a whole. There are only two big industries in the district. First the spinning mill in Banda and second the glass factory in Bargah, which is unfortunately paralysed due to financial incapability. Besides this agro based industries such as Dal Mills, Rice Mills and cottage industries like oil crushing cum atta chakki, biri making, bamboo basket making, shoe making and wooden industry of Chitrakoot all these should be encouraged so that the per capita income may increase and standard of living of people may be improved.
<table>
<thead>
<tr>
<th>Year</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
</tr>
</thead>
<tbody>
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<td>1982</td>
<td>23.02</td>
<td>30.17</td>
<td>431.08</td>
<td>52.01</td>
</tr>
<tr>
<td>1983</td>
<td>83.06</td>
<td>256.00</td>
<td>126.07</td>
<td>213.00</td>
</tr>
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<td>1984</td>
<td>44.06</td>
<td>188.05</td>
<td>12.00</td>
<td>119.06</td>
</tr>
<tr>
<td>1985</td>
<td>55.07</td>
<td>32.24</td>
<td>172.06</td>
<td>192.00</td>
</tr>
<tr>
<td>1986</td>
<td>108.01</td>
<td>235.08</td>
<td>309.00</td>
<td>138.07</td>
</tr>
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<td>1987</td>
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<td>1988</td>
<td>127.00</td>
<td>192.00</td>
<td>304.00</td>
<td>100.00</td>
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<td>1989</td>
<td>155.00</td>
<td>117.00</td>
<td>158.00</td>
<td>117.00</td>
</tr>
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<td>1990</td>
<td>92.06</td>
<td>453.00</td>
<td>367.30</td>
<td>192.82</td>
</tr>
<tr>
<td>1991</td>
<td>107.03</td>
<td>141.09</td>
<td>398.40</td>
<td>149.20</td>
</tr>
<tr>
<td>1992</td>
<td>11.38</td>
<td>202.40</td>
<td>330.80</td>
<td>375.89</td>
</tr>
<tr>
<td>1993</td>
<td>38.38</td>
<td>100.48</td>
<td>202.40</td>
<td>379.38</td>
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<td>1994</td>
<td>118.54</td>
<td>343.81</td>
<td>293.31</td>
<td>81.04</td>
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<td>1995</td>
<td>30.78</td>
<td>232.92</td>
<td>474.98</td>
<td>134.24</td>
</tr>
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<td>1996</td>
<td>80.55</td>
<td>125.15</td>
<td>356.22</td>
<td>106.80</td>
</tr>
<tr>
<td>1997</td>
<td>85.24</td>
<td>132.00</td>
<td>168.20</td>
<td>190.90</td>
</tr>
</tbody>
</table>

Source: Flood Control Security Plan in District Banda, 1998
The natural calamity viz; flood often occurs in the district and causes great loss of economic power damaging and destroying the crops, houses, animals and also human beings.

6. Agricultural Systems

a) Rainfed Agriculture

Indian agriculture is the gambling of monsoon i.e. most parts of land are devoid of irrigating means and its agricultural productions are affected by rains. Banda also illustrates the same picture. The district adopted dry land practice of farming and more attention is paid to growing such crops which need little water. Whenever it rains in winter season the Rabi Crops give better yield otherwise as usual. This is why, the fluctuation in production levels, occurs naturally.

As an evidence in case of Banda, the percentage of irrigated area to total cropped area from 1984-85 to 1994-95 has gone from 20.06. to 28.06. Though the irrigation facilities are increasing yet 75% of the area which is cropped, remains dry. The huge amount of cropped area generally belongs to marginal and semi marginal farmers. Such situation is found in almost all other districts of the region because the geographical topography is almost similar.

b) Lack of Modern techniques:

The main occupation of 80% of the population is agriculture, Banda district is very backward in agriculture sector even today. Old traditional means are adopted in agriculture sector. There is complete lack of modern techniques. Low yields of dryland agriculture are due to the poor quality of and inadequate agricultural inputs, untimely field operations and inefficient crop production technologies adopted. The farmers of this district have been
### Table - 1.2
Comparative Account of Flood during the Past Years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water level of River Ken</td>
<td>110.85</td>
<td>109.00</td>
<td>113.27</td>
<td>108.75</td>
<td>107.85</td>
</tr>
<tr>
<td>Water level of River Yamuna</td>
<td>105.66</td>
<td>108.40</td>
<td>101.44</td>
<td>102.62</td>
<td>95.85</td>
</tr>
<tr>
<td>Danger Point River Ken</td>
<td></td>
<td>104.00</td>
<td>104.00</td>
<td></td>
<td>104.00</td>
</tr>
<tr>
<td>Danger Point River Yamuna</td>
<td></td>
<td></td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Numbers of effected villages</td>
<td>572.00</td>
<td>339.00</td>
<td>588.00</td>
<td>208.00</td>
<td>07.00</td>
</tr>
<tr>
<td>Population of effected villages</td>
<td>443216</td>
<td>252559</td>
<td>597485</td>
<td>226704</td>
<td>16794</td>
</tr>
<tr>
<td>Numbers of the villages</td>
<td>80</td>
<td>39</td>
<td>131</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Villages merged in water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effected area</td>
<td>317604</td>
<td>103996</td>
<td>213602</td>
<td>43093</td>
<td>1797</td>
</tr>
<tr>
<td>(in hect)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population of the villages</td>
<td>70494</td>
<td>4420</td>
<td>128131</td>
<td>24401</td>
<td></td>
</tr>
<tr>
<td>Villages merged in water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effected cropped area</td>
<td>122</td>
<td>399</td>
<td>55704</td>
<td>74247</td>
<td>29950</td>
</tr>
<tr>
<td>Estimated lost</td>
<td>19573080</td>
<td>13926000</td>
<td>12195300</td>
<td>213564</td>
<td>443500</td>
</tr>
<tr>
<td>Perfectly destroyed houses</td>
<td>125510</td>
<td>3806</td>
<td>6860</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Partly destroyed houses</td>
<td>14713</td>
<td>2365</td>
<td>6196</td>
<td>575</td>
<td></td>
</tr>
<tr>
<td>Estimated loss</td>
<td>30936394</td>
<td>11865000</td>
<td>21632590</td>
<td>112896</td>
<td></td>
</tr>
<tr>
<td>Man loss</td>
<td>3</td>
<td>2</td>
<td>35</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Animal Loss</td>
<td>72</td>
<td>15</td>
<td>359</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

using traditional and outdated farm equipment. These equipment not only perform poorly but also demand a lot of energy and time in production and post harvest operations.

For example even in ploughing with the wooden plough, the ploughman and the bullocks have to walk almost 66km. to complete one operation. This entails drudgery, requires more energy and perpetuates poor quality farm work as compared with the results when improved farm equipment are used. The poor quality and the low quantity of farm output are the handicaps of dryland agriculture. The low level of efficiency in energy utilisation owing to the use of traditional farm equipment is responsible for low productivity. But the rich farmers who have plenty of land or whose economic condition is good, use this technique. It is clear from the above details that the inhabitants of this district are quite ignorant of modern techniques. There are two main reasons for this -

i) Illiteracy among the inhabitants, and

ii) Mostly the Economic condition of the farmers' being poor.

Though the government tries from time to time to give knowledge to the farmers through electronic media to increase the use of fertilizer. Inspite of this their success is doubtful. In this way only a few farmers use fertilizer. In the district the degree of mechanisation is very poor. They neither use H.Y.V. of seed nor follow the specifications for the use of pesticides and insecticides. The use of N.P.K. is also poor e.g. the quantum used in Banda district.

Thus, the modernisation in agriculture here, is in irrigation specially very little and medium sized farmers who are large in number are far behind and usually follow the traditional farming.
c) Dry farming:

Economic condition of half developed countries depends on agriculture. Water plays important role to carry on agricultural operations easily. The area of Banda district is of dry nature so there is urgent need of water. To attain this aim the supply of water is done by the government tube wells, rivers, tanks canals and wells. The means of irrigation are not satisfactory, due to which the farmers of the district are unable to produce two crops and their farms lie useless for the rest of the time. Besides these two crops if some other crops are produced, they dry up due to improper supply of water. Here such crops are produced which require less water as wheat, gram, oilseeds (Lahi, Sarson, Til). Because of the facility of canal being available the crop of paddy is very good in the Naraini and Mahua block of the district. Thus only one crop is grown.

d) Agricultural Hazards:

The barriers in agriculture in the district are either man made or naturally bestowed. In the first category, like other places the agricultural labour is basically unskilled and unorganised and has little for its livelihood other than personal labour and secondly the mentality of work thinking is seen to have disappeared. People in the district lead a lethargic life. Thirdly the agricultural education or learning and adoption of techniques shares very little.

The natural hazards which affect the agricultural productions are:

i) Sloppy and stoney land.

ii) Extreme climate.

iii) Poor water resources.

iv) Dry Land farming-Rainfed agriculture, and

v) Natural checks floods and Droughts.
The above characteristics generally prevail in the district. The farmers accept the above challenges and do farming as its conditions enable and permit them.

iii) Climatic Variations:

Climate of the district is extreme. Summers are extremely hot and winters are severe. Summer season starts from the middle of March and lasts till first week of July, then rainy season starts to last by middle of October. Winter season extends from mid of October to mid of March. The hot winds laden with dust, commonly known as 'Loo' blow during summer season of the year. Temperature during summer ranges between 35°C to 50°C, while temperature during winter lowers to 2.8°C December and January are the coldest months of the year in the district.

Monsoon plays ducks and drakes with the district economy. The normal date of Monsoon in the district falls in the third week of June.

i) Rainfall:

Average annual rainfall of the district is 949.51 mm. and as regards the monthly rainfall, it is the maximum in the month of July. The mean monthly rainfall of the district is given in table No. 1.3.

ii) Temperature:

The monsoon plays ducks and drakes with the district economy. The month wise temperature is given in table No. 1.3.

There are fluctuations of extreme nature. The days are hot and nights are cold. May and June months are very hot, while December and January are very cold.

iii) Humidity and Vapour Pressure:

The humidity and vapour pressure in Banda district is of extreme nature. The maximum of it is 86% in the month of August and the minimum of maximum is 33% in the month
# Table No. 1.3

## Climatic Variation

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature (in °C)</th>
<th>Rainfall (in cm.)</th>
<th>Humidity</th>
<th>Vapour Pressure (m.b.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>Jan</td>
<td>32.2</td>
<td>2.8</td>
<td>20.86</td>
<td>76%</td>
</tr>
<tr>
<td>Feb</td>
<td>35.6</td>
<td>3.3</td>
<td>25.84</td>
<td>65%</td>
</tr>
<tr>
<td>March</td>
<td>41.1</td>
<td>9.8</td>
<td>0.85</td>
<td>48%</td>
</tr>
<tr>
<td>April</td>
<td>45.0</td>
<td>16.10</td>
<td>0.70</td>
<td>35%</td>
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<tr>
<td>May</td>
<td>47.6</td>
<td>19.2</td>
<td>0.80</td>
<td>33%</td>
</tr>
<tr>
<td>June</td>
<td>47.2</td>
<td>21.7</td>
<td>125.22</td>
<td>54%</td>
</tr>
<tr>
<td>July</td>
<td>43.3</td>
<td>352.81</td>
<td>83%</td>
<td>76%</td>
</tr>
<tr>
<td>Aug.</td>
<td>37.2</td>
<td>21.7</td>
<td>305.00</td>
<td>86%</td>
</tr>
<tr>
<td>Sep.</td>
<td>37.8</td>
<td>20.9</td>
<td>85.40</td>
<td>80%</td>
</tr>
<tr>
<td>Oct.</td>
<td>30.3</td>
<td>13.2</td>
<td>15.76</td>
<td>69%</td>
</tr>
<tr>
<td>Nov.</td>
<td>35.6</td>
<td>6.1</td>
<td>4.65</td>
<td>61%</td>
</tr>
<tr>
<td>Dec.</td>
<td>31.1</td>
<td>3.8</td>
<td>12.78</td>
<td>73%</td>
</tr>
<tr>
<td>Annual total of 47.8</td>
<td>2.8</td>
<td>949.51</td>
<td>64%</td>
<td>52%</td>
</tr>
</tbody>
</table>

or mean

Source: Based on Soil Survey & soil work in U.P. 1996-97
TABLE NO. 1.3/A CLIMATIC VARIATION

TABLE NO. 1.3/B CLIMATIC VARIATION
of May. This shows that there is a vast difference between the two.

The maximum of vapour pressure is 35.2% in the month of August and minimum of the maximum is 11.5% in the month of February.

iv) Review of Literature:

Agriculture is the dominant sector in the Indian economy. It accounts approximately three quarters of the labour force, one half of the national income three quarters of exports (if we include manufactured agricultural products).

Of late dry agriculture has received great attention from planners and scientists on account of the recent advances in agricultural technology. The dry farming areas have been characterised as those areas which receive 40 cm. to 100 cm. of annual rainfall and have less than 25 percent of sown areas under irrigation.

Since the inception of high yielding varieties programme in 1966 it has become a must that immediate steps should be taken to improve the lot of the people of dry farming areas. For, it was felt that any delay would accentuate the wide gap between the income of the farmers of irrigated and non irrigated tracts and ferment social unrest.

One of the side effects of the green revolution being witnessed in some parts the country is the increased concern for the problems of dry farming areas. This is as it should be because large parts of the country falling in arid and semi arid tracts are unable to take direct advantage of the new strategy of agricultural development for which assured water supply is the critical requirement. Besides, they will have to bear with permanently depressed agriculture due to recurrent droughts and famines. On the top of those, paucity of information about their problems and potential hinders evolution of a meaningful development strategy for
such areas. In this context the present study which tries to assess the scope and approach for improving agriculture in the dry areas of Mysore state is a welcome one.

The study is based on intensive investigation of physical (i.e., soil moisture etc.) and economic conditions of two chronically drought affected talukas, viz; Pavagada (Lumkur district) and Bagewadi (Bijapur District) in the dry belt of the state.

On the basis of the study of soils, topography, ground water resource, rainfall and cropping patterns in the two talukas the study has assessed the agricultural potential and has recommended development programmes (separately for two talukas) which focus on (i) extension of irrigation, (ii) adoption of soil conservation measures and (iii) changes in the cropping patterns.

It is observed that the extent of irrigation through exploiting ground water potential can be increased in Pavagada from 13 percent of the cropped area at present to 18 percent. In Bagewadi on the other hand not much can be added to the present extent of irrigation (only 3 percent of the cropped area) particularly because of the poor quality of water.

Hence in most parts of the dry areas, conservation of available moisture through contour bunding and its efficient utilization through adopting the cropping pattern to the availability of moisture is the only alternative for improving agriculture. The study recommends a ten year contour bunding programme to cover 90,000 and 1,10,000 hectares in Pavagada and Bagevadi respectively.

To ensure optimum utilization of available moisture, the study suggests intensification of cropping by replacing the existing long duration and low yielding crops by new short duration and high yielding crops in such a way that drought
spell (which normally occurs during mid June to mid August in Pavagade and during July-August in Bagewadi) is escaped, i.e., the drought period coincides with the slack period between two short duration crops.

In all 84 districts in the country are included in the category of dryland farming. Mahindragarh district of Haryana is one of them as the average rainfall in the district is only 60cm. and total irrigated area is only 11.4 percent of the total net sown area. Though the situation is similar in some parts of Gurgaon and Hissar districts of the state, Mahindragarh represents a typical dry farming region and because of this it was selected for the present study.

The green revolution in part of the country has generated confidence for attainment of self sufficiency on the food front in the very near future. With the introduction of High yielding varieties programme not only the productivity per unit of time could substantially be raised through adherence to multiple cropping programme. About 75 percent of the total cropped area in the country is rainfed. Also there exists diversity in the magnitude of rainfall from one area to another. This necessitates that proper attention should be given on examining the resource use efficiency of farmers in rainfed areas. Even in rainfed areas rainfall distribution is uneven.

In 1971, the 31st session of annual conference was held from 27th to 29th Dec. under the auspices of the Banaras Hindu University Varanasi- 5 (U.P.). The subjects for discussion were-

i) Problems of Dry farming
ii) Agricultural Prices : Problems and Policies
iii) Institutional credit for agriculture

The present research in connected only with the problems
of Dry farming and in the conference a number of papers were received concerning the above.

To avoid repetition in discussion and to facilitate critical scrutiny all the papers had been categorised as under :-

i) Papers pertaining to cost benefit analysis of converting dry areas into irrigated areas.

ii) Enterprise diversification in context of instability and growth and, development strategy for arid agriculture.

iii) Crop Insurance

iv) Financial aspects of adoption of dry farming Technology.

v) Problems of yield and income variability.

vi) Relative profitability of crop enterprises under dry and irrigated conditions.

vii) Papers dealing with miscellaneous problems not directly concerned with the agreed scope of the subject matter.

These papers attempt to estimate economic returns from the conversion of dry areas to irrigated areas. In one of these papers, a scholar, A. Sachidanandam estimates costs and returns from canal irrigation system of the Hirakund project which results in a loss to the farmers. H.K. Das Gupta, Prafulla Dass and his co-workers find in yet another paper that per hectare irrigation cost can be substantially reduced by full utilization of irrigation potential. J.P. Bhati, G.R. Singh and K.K. Verma use the extension demonstration date of Budaun district (U.P.) and experimental date on fertilizers only to show that per acre net returns from irrigated fertilized wheat came to be as high as compared to just Rs. 20 from un irrigated unfertilized wheat.
N.S. Jodha and S.D. Purohit properly set forth the problem of crop yield instability and survey the effects of weather variabilities on some major crops in the dry (arid) region of Rajasthan, M.K. Shingarey treats dry area as one which depends on rainfall and uses only yield and price data for a period of five years.

N.S. Krishnaswamy and K.V. Patel identify the variability of the known dry farming technology and estimate the magnitude of finance for its wider adoption. The authors contend that the available dry farming technology meets the viability criterion of simplicity, accept ability and feasibility in terms of input availability and profitability.

M.V. Nadkarni calculates the coefficient of variation for different crops in Maharastra to measure their yield uncertainty. It should be logical to expect that to the extent crop yield variability is due to variation in rainfall, irrigation would not only increase the average yields but also would reduce the year to year variation. B.B. Singh and S.P. Singh find that in Agra district (U.P.) drought resistant crops (bajra, gram, Arhar and oilseeds) command more area in dry than in irrigated farms.

L.R. Singh and U.K. Pandey study the cropping and the resource use efficiency in a dry farming district of Banda (U.P.) Human labour use is found to be excessive and accordingly one fourth reduction in its use is suggested to increase farm incomes by 10.2 percent. Permatma Singh and D.D. Gupta find farmers in the dry farming areas of Haryana State fully acquainted with new crop technology and any log in the dry farming areas of Haryana state fully acquainted with the new crop technology and any log in its adoption is ascribed to be lack of assured irrigation facilities.
V.P. Shukla also works out the optimum crop combination for a few rainfed farms in Jabalpur district (Madhya Pradesh) under the traditional and advanced technology. Ram Murti and V. Prasad find that under dry farming conditions in Banda district (U.P.) Bajra, Arhar + Urd and Jwar + arhar + urd could increase per hectare net income by 74.07 percent and 55 percent respectively. S.S. Kahlon and H.S. Sandhu identify dry farming zones in Punjab and make an interesting study of the zonal characteristics, moisture conservation methods and pattern input use and net profits from crops grown in these zones. Mercier J.R. and Riviere G. try to discuss "The economics of dry farming in Andhra Pradesh through rainfall stimulation."

On the basis of the papers a new package of dry farming technology was offered. The country's fourth plan envisages inter alia, soil and water management, water harvest, involving dry resistant practices. In this regard can be raised and discussed:

A) what has been the progress in the soil management water harvest, involving, drought resistant high yielding, short duration and photo intensive crop varieties for the dry farming areas?

B) what are the factors responsible for the slow progress in developing the new package of dry farming technology?

C) what are the financial requirements and what institution and administrative measures are necessary for the effective implementation of the new package of dry land technology?

Some papers suggest that provision of irrigation facilities in the dry farming areas is likely to increase farm incomes and farm labour employment through increased cropping intensity. If this is true, one may expect an
increase in the wage rates of farm labourers at least in the peak season and also a reduction in the income disparities between dry and irrigated areas. The economic aspects of converting dry areas into irrigated areas need to be concerned only with "productive" irrigation projects such as Nagarjuna Sagar project of Andhra Pradesh, Hirakund Project of Orissa, Cauvery Mettur irrigation system of Tamil Nadu, Tungbhadra project of Mysore state.

This requires a study of the Agro Economic factors responsible for the poor performance of agriculture in such rainfed areas for corrective government measures to ameliorate the farming conditions and to sustain the agricultural growth. This study is an attempt in this direction with special objectives which are:

1) To study cropping pattern in the region.
2) To estimate the input relationship and the resource productivity and to examine the resource use efficiency in the area. The present study is purposely being followed to the cause and effect as by land farming appears to be the natural and normal feature in the district.

v) Conceptional Framework:

The various technical terms and the concepts used in the study are being stated below:

a) Operational Holdings:
The area of land actually cultivated during the agricultural year under study, which is the unit of decision making and farm management, irrespective of the legal title (i.e., the nature of right in land) or location. The terms 'farm' or 'holding' used in the discussion refer to operational holding.

b) Size of Holdings:
The term 'size of holding' is taken in the sense of the net cultivated area.
c) **Cultivated area:**
It means the net sown area plus the area left fallow for a season or more, during the agricultural year.

d) **Cropped area:**
It is area actually sown or put under cropping programme, which is commonly termed as the net cropped area.

There are two other related terms:
i) area sown more than once or put under multiple or successive cropping and

ii) total cropped area, which is equal to the net cropped area plus the area sown more than once.

e) **Cropping Intensity:**
The concept to cropping intensity is taken in the sense of the degree of cropping. It is an expression of the ratio of the total cropped area to the net area sown or net cultivated area during an agricultural year.

\[
C.I. = \frac{\text{Total cropped area}}{\text{Net cropped area}}
\]

(If it is expressed in terms of indices, it is to be multiplied by 100)

f) **Farm family:**
It is composed of all the members of farm household inclusive of males, females and children. Those below 14 years were taken as children.

i) **Farm Family Workers:**
All adult male, female and children who work on the farm were treated as farm were treated as farm family workers.

ii) **Farm Workers:**
Include farm family workers and permanent farm servants.

g) **Man Days:**
The unit of work equivalent to 8 hours of work of
a male adult worker is treated as man day.

h) Animal Labour pair day:
Units of work equivalent to 8 hours work by a pair of drought animals it is synonymous to bullock on animal labour day or pair day.

i) Farm Assets (investment):
These include owned land, farm buildings (nonresidential) wells, live stock, implements and machinery.

j) Working capital:
It includes the value of seeds, manures and fertilizers, insecticides and pesticides.

k) Inputs:
These include:

i) Wages of hired labour (cash and kind).

ii) Imputed value of the family labour,

iii) Value of hired and owned animal labour,

iv) Value of seeds, manures and fertilizers, (farm produce and purchased).

v) Depreciation of farm buildings, machinery and implements.

vi) Rent paid for leased land.

vii) Rental value of owned land,

viii) Interest on owned fixed capital,

ix) Irrigation charges, land revenue, water rates, cess etc.

x) Interest on working capital

l) Output of gross income:
The value of total produce including main and by-product at harvest, prices for different products. Output refers to the physical (quantitative) aspect and gross income to its monetary value.

m) Cost concepts:
A number of cost concepts such as cost A1 cost A2,
cost B and cost c have been used in the analysis. The input items included under each category of cost are indicated below:

a) Cost A1 - it includes:
   i) Value of hired human labour,
   ii) Value of hired and owned bullock labour,
   iii) Hired machinery charges,
   iv) Value of owned machine labour,
   v) Value of seeds (both farm produced and purchased)
   vi) Value of manure (owned purchased) and fertilizers,
   vii) Value of insecticides and pesticides,
   viii) Depreciation on implements and farm buildings,
   ix) Irrigation charges,
   x) Land revenue, cesses and other taxes,
   xi) Interest on working capital including crop loans.


c) Cost B = Cost A2 + Imputed rental value of owned land (less land revenue paid there on) + Imputed interest on owned fixed capital (excluding land)

d) Cost C = Cost B + Imputed value of family labour.

The individual cost items included in total cost, i.e. cost c, can also be grouped into operational and fixed cost as under:

operational cost = family labour
+ value of hired human labour
+ value of hired and owned bullock labour
+ value of hired and owned machine labour,
+ value of seeds
+ value of manures and fertilizers
+ Water expenses
+ Interest on working capital

Fixed cost = cost C - operational cost