Chapter Three

Food Situation in Karnataka

Salient Features

Karnataka is one of the four southern states of India, the other states being Kerala, Andhra Pradesh and Tamil Nadu (see, Map 3.1). Karnataka - Magic region on Earth, Wales of India, as described by a western traveller - is endowed with rich abundant natural resources (Puttaswamiah, 1980). Karnataka is considered as a miniature of India as it exhibits most of the features of India in climate, rainfall, soil types, crops grown and variety of natural resources. The state is unique in the Indian sub-continent in having a wide range of agro-climatic conditions. Physiographically, the state may be divided into four regions, namely coastal region, malnad hilly region lying to the east of the western ghats, northern undulating plateau, and southern broad undulating plateau. Karnataka shares the wide climatic pattern of the country as a whole. The

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1There are other sets of classification of regions, viz., classification made by the Centre for Ecological Sciences, IISc, Gadgil, et.al (1987), and the region classification followed by the NSSO.
climate is tropical monsoon type as the state is exposed to both north-east and south-west monsoons.

Karnataka shares the wider agro-climatic pattern of the country as a whole. The climate is tropical monsoon type as the state is exposed to both south-west and north-east monsoons. The state receives its major share of rains from south-west monsoon. According to 1993-94 data, the state’s normal annual rainfall is 1139 mm. Across the districts, the rainfall ranges between 488 mm in the eastern and north-eastern parts of the state and 4985 mm in the western ghats and west coast. Despite a fairly high average of annual rainfall in the state, there are 11 districts, accounting for nearly 67 per cent of gross cropped area receives less than 750 mm of rainfall annually. The agricultural development of the state has to viewed in the above perspective. Each of the factors have been explained as follows.

The total area of the state is 1,92 lakh square kilometres. The population is about 4.45 crores as per 1991 census. It has increased from 2.35 crores in 1961 to 2.92 crores in 1971 to 3.71 crores in 1981. The percentage of rural population in total has remained around 70 to 75 percent over a long period of time. The soil, rainfall and climatic conditions of Karnataka are ideal for agriculture. The state has its forest wealth, coastal belt, the plantation pocket, dry and transition region for cereals and millets, the
predominantly paddy potential patches, sprinkled spots of sugarcane fields and capacious cotton belts, coconut groves and the aracanut gardens uniquely uphold the agricultural status of the state. The important crops grown in the state are paddy, ragi and jowar. Jowar has traditionally occupied the largest cultivated area. The other important crops are maize, wheat, cotton and sugarcane.

Karnataka has achieved fairly good level of economic and social development. Most of the districts rank below 100 out of the 372 districts in India according to Human Development Index, except the northern dry districts of the state (ISS, 1996). The state per capita income for the year 1992-93 has been Rs.2315 at 1980-81 prices compared to Rs.2239 at all-India level. The population under poverty line has reduced from 50.8 per cent in 1977-78 to 31.98 per cent in 1988-89. Where as, at all-India level, the rural poverty has reduced from 53.2 per cent to 37.5 per cent during the same period (Planning Commission, 1993). Similarly, the infant mortality is relatively lower at 69 per 1000 births as compared to 97 per 1000 births at all-India level.

\[\text{Data Source: Karnataka at Glance, 1994-95, for data on Karnataka and Economic Survey, 1995-96 for data on all-India.}\]

\[\text{Data Source: Department of Women and Child Welfare, Government of Karnataka.}\]
For the development of the state, several schemes were introduced from time to time. Many of them being centrally sponsored schemes. In agriculture, centrally sponsored schemes include National Pulses Development Programme, Oil Production Thrust Programme and Integrated Programme for Rice Development. The state government sponsored schemes include Sugarcane Development Programme, Agricultural Exhibition and Festival, Special Component Programme and Mini-Kit Scheme. Many rural development programmes are implemented mainly through centrally sponsored schemes. They include employment generation programmes, area development programmes, weaker section development and welfare programmes, minimum needs programme and other development programmes.

As per 1991 census, 69 per cent of the population lives in the rural area. Approximately 60 per cent of the work force are engaged in agriculture. Agriculture forms the backbone for the economic development of Karnataka. The share of the primary sector was around 50 per cent followed by 31 per cent of the secondary sector and 19 per cent of the tertiary sector. These are the features of a backward agrarian economy (see, Appendix 3.1). As is expected with process of development, the share of agriculture declined to nearly 27 per cent and share of secondary and tertiary sector has grown. Unlike the country's experience Karnataka has theoretically followed the pattern of shifts towards the secondary sector followed by the tertiary sector (see, figure
Sectors (in Percentage)

Years

1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991

Sectoral Composition of NSDP.
3.1). The state domestic product from agriculture (at 1980-81 prices) increased from Rs 2393.27 crores in 1980-81 to Rs 3047.68 crores in 1990-91 at 2.73 per cent per annum. In percentage terms its share in SDP has reduced from 42.65 percent in 1980-81 to 33.29 percent in 1990-91 (Table 3.1).

<table>
<thead>
<tr>
<th>Table 3.1 Net State Domestic Product (1980-81 Prices)</th>
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<tbody>
<tr>
<td>Sector</td>
</tr>
<tr>
<td>Agriculture</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Primary</td>
</tr>
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</tr>
<tr>
<td>Secondary</td>
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<tr>
<td></td>
</tr>
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</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Source: Central Statistical Organisation.

At the district level, the sectoral composition of income shows a similar picture. Appendix 3.2 shows the composition of district income sector wise at current prices for the year 1983-84. In 15 out of the 20 districts the income from primary sector is above the state average. Compared to 42.13 per cent for the state, income from the primary sector is highest in Kodagu district with 72.6 per cent followed by Chikmagalur district with 66.53 per cent. The income from primary sector is lowest
from Bangalore district with 10.6 per cent. It may be mentioned that Kodagu and Chikmagalur are predominantly plantation districts and Bangalore has a concentration

I. Land Use Pattern

<table>
<thead>
<tr>
<th>Table 3.2 Classification of Land - Karnataka (in '000 Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
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<td>Reporting Area</td>
</tr>
<tr>
<td>Forest</td>
</tr>
<tr>
<td>Land not Available for Cultivation</td>
</tr>
<tr>
<td>Permanent Pastures</td>
</tr>
<tr>
<td>Other Crops and Groves</td>
</tr>
<tr>
<td>Cultivable Waste</td>
</tr>
<tr>
<td>Other Fallows</td>
</tr>
<tr>
<td>Current Fallow</td>
</tr>
<tr>
<td>Net Sown Area</td>
</tr>
<tr>
<td>Gross Cropped Area</td>
</tr>
</tbody>
</table>

Note: * - Cropping Intensity.

of manufacturing industries. On account of being highly urbanised district, the share of tertiary sector is equally high as the secondary sector. In this section an attempt is made to bring out the salient features of agricultural development in the state.

The net area sown accounts for about 56 per cent of the total geographical area. Nearly 15 per cent of the geographical area is under forests which is situated in the western parts of the state. The area under forests has remained the same over a long period of time. The land utilization pattern is shown in Table 3.2.

The increase in the net sown area has been meagre in nearly thirty years between 1965-66 to 1993-94, registering a growth rate of 0.2 per cent per annum only. Its share in the total geographical area has increased from accounting for 54.23 per cent to 56.63 per cent during the same period. However, the increase in net sown area over the years has come about through decrease in area under pastures, other crops and groves, cultivable waste and other fallows. Even the growth in the gross cropped area is not very significant. It has grown at a rate of around 0.5 per cent per annum thus, showing an increase in the cropping intensity from 1.04 to 1.15 during the same period. The land not available for cultivation has increased by nearly one percentage point. There is a decrease in the fallow and cultivable waste land by 1.36 per cent. There is still a sizable proportion of area under fallow and uncultivable land that can
be brought under cultivation.

**Cropping Pattern**

The state of Karnataka is ideally located with favourable agro-climatic regions and suitable cropping patterns for achieving an impressive performance in the country. A

<table>
<thead>
<tr>
<th>District</th>
<th>Paddy</th>
<th>Ragi</th>
<th>Jowar</th>
<th>Wheat</th>
<th>Pulses</th>
<th>Groundnut</th>
<th>Sugar</th>
<th>Cotton</th>
<th>Total</th>
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</thead>
<tbody>
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<td>0.00</td>
<td>0.00</td>
<td>25.04</td>
<td>5.7</td>
<td>0.52</td>
<td>0.00</td>
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</tr>
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<td>Belgaum</td>
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<td>0.44</td>
<td>35.06</td>
<td>5.96</td>
<td>13.51</td>
<td>12.50</td>
<td>12.51</td>
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</tr>
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<td>10.36</td>
<td>33.69</td>
<td>0.32</td>
<td>10.66</td>
<td>13.77</td>
<td>1.08</td>
<td>22.12</td>
<td>100.00</td>
</tr>
<tr>
<td>Bidar</td>
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<td>0.00</td>
<td>36.26</td>
<td>2.87</td>
<td>45.57</td>
<td>3.43</td>
<td>5.83</td>
<td>0.87</td>
<td>100.00</td>
</tr>
<tr>
<td>Bijapur</td>
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<td>0.00</td>
<td>57.89</td>
<td>6.07</td>
<td>16.80</td>
<td>12.12</td>
<td>2.61</td>
<td>4.32</td>
<td>100.00</td>
</tr>
<tr>
<td>Chickmagalur</td>
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<td>32.14</td>
<td>11.89</td>
<td>0.06</td>
<td>17.32</td>
<td>4.42</td>
<td>1.02</td>
<td>1.02</td>
<td>100.00</td>
</tr>
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<td>Chitradurga</td>
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<td>13.91</td>
<td>0.10</td>
<td>11.80</td>
<td>27.67</td>
<td>0.90</td>
<td>8.47</td>
<td>100.00</td>
</tr>
<tr>
<td>DakshinKarnad</td>
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<td>0.00</td>
<td>0.00</td>
<td>6.28</td>
<td>0.18</td>
<td>1.10</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Dharwad</td>
<td>8.54</td>
<td>0.97</td>
<td>27.80</td>
<td>8.40</td>
<td>14.49</td>
<td>15.11</td>
<td>0.41</td>
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</tr>
<tr>
<td>Gulbarga</td>
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<td>0.02</td>
<td>42.82</td>
<td>3.53</td>
<td>38.33</td>
<td>12.18</td>
<td>0.43</td>
<td>0.90</td>
<td>100.00</td>
</tr>
<tr>
<td>Hassan</td>
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<td>1.92</td>
<td>0.63</td>
<td>1.58</td>
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</tr>
<tr>
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<td>0.21</td>
<td>0.00</td>
<td>0.00</td>
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</tr>
<tr>
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<td>0.03</td>
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<td>1.17</td>
<td>0.03</td>
<td>100.00</td>
</tr>
<tr>
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<td>37.39</td>
<td>2.34</td>
<td>0.00</td>
<td>19.94</td>
<td>4.21</td>
<td>10.00</td>
<td>0.00</td>
<td>100.00</td>
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<tr>
<td>Mysore</td>
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<td>25.77</td>
<td>16.35</td>
<td>0.00</td>
<td>23.36</td>
<td>8.17</td>
<td>2.12</td>
<td>7.03</td>
<td>100.00</td>
</tr>
<tr>
<td>Raichur</td>
<td>11.12</td>
<td>0.00</td>
<td>43.39</td>
<td>2.44</td>
<td>14.28</td>
<td>17.53</td>
<td>0.18</td>
<td>11.06</td>
<td>100.00</td>
</tr>
<tr>
<td>Shimoga</td>
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<td>11.59</td>
<td>8.51</td>
<td>0.00</td>
<td>5.55</td>
<td>6.10</td>
<td>4.04</td>
<td>10.54</td>
<td>100.00</td>
</tr>
<tr>
<td>Tumkur</td>
<td>7.49</td>
<td>7.82</td>
<td>2.98</td>
<td>0.00</td>
<td>15.89</td>
<td>35.39</td>
<td>0.33</td>
<td>0.10</td>
<td>100.00</td>
</tr>
<tr>
<td>UttarKarnad</td>
<td>82.88</td>
<td>0.29</td>
<td>0.39</td>
<td>0.00</td>
<td>2.14</td>
<td>3.60</td>
<td>1.85</td>
<td>8.85</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>13.66</td>
<td>13.48</td>
<td>27.05</td>
<td>2.86</td>
<td>18.84</td>
<td>13.70</td>
<td>2.53</td>
<td>7.87</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Source:** Bureau of Economics and Statistics, Karnataka.
variety of crops are grown in the state. The state has its forest wealth, the coastal belt, the plantation pocket, the dry and transition region for cereals and millet, the predominant paddy potential patches, the sprinkled spots of sugarcane fields, the capacious cotton belts, coconut groves and the arecanut gardens uniquely uphold the agricultural status of the state. The important crops grown in the state are paddy, jowar, and ragi. Jowar has been traditionally occupied the largest cultivated area. The other important crops are maize, wheat, cotton and sugarcane (see, Table 3.3). From the above table it is observed that, each of the crop is spatially across the different regions. Paddy is an important food crop of the state, concentrated in two regions, i.e., southern region and coastal and hilly region. It is cultivated twice or thrice in a year, i.e., kharif, rabi and summer seasons depending on various factors. Jowar is another important food crop largely grown in the northern districts as a rainfed crop. Though hybrid maize is grown at any point of the year it is mainly a rainfed crop grown during the second season. Ragi is the staple food crop apart from rice in the southern region, central and coastal and hilly regions. This is also a rainfed crop with local variety and in regions with good irrigation facility. HYV is used. Wheat is an important crop confined to the northern districts of the state. It is ideally suited in black cotton soil for dry cultivation. Mexican varieties are recommended with irrigation. Sugarcane is one of the important cash crops of the state. This is a highly water and fertilizer intensive crop. Almost 100 per cent of the sugarcane is under irrigation. Cotton is another important cash crop which gained importance during the late fifties when the Tunga Bhadra canal was constructed in Raichur district. Cotton was treated as a rainfed crop and grown mainly in the dry regions, after the canal was
initiated, with better yields, it has gained lot of importance. For example the major
crops in Raichur districts have been cotton and paddy and nearly 30 per cent of the
area under cotton is irrigated.

Area, Production and Yield of Food and Non-Food grains

Analysis has been made on growth of area, production and yield of major crops
namely, rice, ragi, jowar, pulses, groundnut, cotton and sugar cane. The area covered
under these crops constitute nearly 85 per cent of the gross cropped area. The analysis
would given an insight into the changing priorities of the cultivators over a given
period of time i.e., 1955-56 to 1989-90, which is divided into two periods, viz., 1955-
56 to 1970-71 (Period I) and 1970-71 to 1989-90 (Period II). The tables on growth
rates and coefficients of variation of major crops are given region/district wise for the
two periods mentioned above.

Area

The change in area has been marginal for the major crops except in the case of sugar
cane (see, Appendix 3.3). At the state level, the growth in area under total food grains
have reduced between period I and period II, except in the case of ground nut and
sugarcane (Tables 3.4A and 3.4B).
<table>
<thead>
<tr>
<th>District</th>
<th>Rice</th>
<th>Ragi</th>
<th>Jowar</th>
<th>Pulses</th>
<th>Food grain</th>
<th>Cotton</th>
<th>Ground nut</th>
<th>Sugar cane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangalore</td>
<td>0.52</td>
<td>0.45</td>
<td>1.50</td>
<td>0.37</td>
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<td>0.00</td>
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<td>0.84</td>
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<td>0.46</td>
<td>1.97</td>
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<td>1.46</td>
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<tr>
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<td>0.38</td>
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<td>Dakshina Kannada</td>
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<td>0.00</td>
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<td>0.42</td>
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<td>Northern Dry Region</td>
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<td>Dharwad</td>
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<td>0.79</td>
</tr>
<tr>
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The picture is quite similar at the district level. The increase in area under sugar cane is phenomenal. The growth can be attributed to the growth in irrigation supported by the economic and institutional factors. In addition, there was a shift in cropping pattern from coarse cereals to paddy and sugar cane, through increases in cropping intensity of cereal crops. There has been wide variations in the growth rates of cereals, i.e., ragi and jowar, across the districts. It is comparatively less in the case of rice. But the variability in the area under the crops over the mentioned period has been insignificant. In the case of total food grains, the variability is as low as three per cent and varied from 6 to 9 per cent in the case of cereals and pulses (see, Tables 3.5A and 3.5B).

Production

The growth of production of major crops in the state was moderate. The index of total food grains at the state level, with 1970-71 as the base year, increased to 122.83. The increases were high for rice, ragi, cotton and sugar cane. It was comparatively lesser in the case of jowar and ground nut (Appendix 3.4).

At the district level, wide variations are observed in the growth rates of production across the districts (refer Tables 3.6A and 3.6B). The inter-temporal variation in the case of food grains varied from 12 per cent to 43 per cent. The variations were comparatively higher for jowar, rice, ground nut and cotton (refer Tables 3.7A and
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**Yield**

The major factor contributing to the increase in production levels of major crops is
higher growth rates in the yield of crops, except in the case of sugar cane (Tables 3.8A and 3.8B).

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Increase area under irrigation, high yield variety seeds and fertiliser use attribute to the increase in yield rates. Substantial increase in yield rates is noticed for jowar, cotton and total food grains. In the case of other crops the yield had reached maximum.
levels (see, Appendix 3.5). There are inter district and inter temporal variations in the yields of crops (Tables 3.9A and 3.9B)

Table 3.9A. District Wise Coefficient of Variation of Yield of Major Crops - Period I

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Use of Modern Inputs

The higher agricultural production in the state can be attributed to increases in yields. The growth in the yields of crops have mainly been due to improvement in the technological factors and institutional factors. The technological factors include credit facility, size of land operation and agricultural extension. Each of the factors have been discussed as follows.

Technological Factors

High Yield Variety Seeds:- Seed is one of the most important inputs contributing considerably towards increased agricultural production. The Department of Agriculture implemented schemes such as Intensive Agricultural Area Programme and Intensive Agricultural District Programme in order to increase the agricultural production in the state. As a part of the scheme, to insure proper availability of hybrid and HYV seeds, 56 seed farms were setup during the second plan period and another 27 during the third plan period. They were distributed to the registered seed growers for multiplication and the resultant known as registered seeds were inturn supplied to the farmers. The total quantity of seed sold increased from 43 thousand quintals in 1965-66 to 20.66 lakh quintals by 1979-80. The area under HYV's increased from 66.04
thousand hectares in 1966-67 to 9.53 lakh hectares in 1973-74 and further to 20.03 lakh hectares in 1979-80. In 1986-87 the area under HYV’s was around 25.78 lakh hectares. Maize crop was totally brought under HYV’s in the early seventies and paddy and jowar were the other crops with significant area under HYV’s.

With increase in area under irrigation, the growth in area under high yield variety seeds was rapid in the seventies. The increase in area under high yield variety seeds was marginal in the eighties. The growth reached a peak of 30.63 lakh hectares in 1983-84 and increased to 33.57 lakh hectares in 1993-94, accounting for 28.88 per cent and 30.64 per cent of total area sown respectively.

Irrigation: The main rivers of Karnataka are Tungabhadra, Krishna and Kaveri. The other rivers are Ghata Prabha, Mala Prabha, Kabini, Nethravathi, Kali and Sharavathi. Out of 102 lakh hectares of net sown area the state, 12.34 lakh hectares of land was irrigated during 1968-69 which constitutes only 12.27 per cent of the net sown area. By 1974-75 the major and minor irrigation projects which were taken up during the first and second five year plan period were completed. With that 16.6 hectares of land were irrigated. By 1985-86 an additional 16.75 lakh hectares were irrigated. This includes the tank and well irrigation. Canal irrigation, on an average, forms 35 per cent of the total irrigation followed by tank and well irrigation.
The extent of irrigation is 21.56 per cent of gross cropped area as per 1993-94 data. This is much lower than the all-India level of 30 per cent. There was a good progress made in extending the irrigation facilities in the state from seven per cent during the first plan period to nearly 16 per cent in the fifth plan period and 21.4 per cent by 1984-85. Since then, the percentage of area irrigated has been almost stagnant, and increased marginally to 21.56 per cent in 1993-94.

The agricultural production in the state is largely dependent on the rainfall. As mentioned earlier, nearly 65 per cent of the state receives less than 750 mm of rainfall annually. The share of irrigation through canals is only 40 per cent. Irrigation through tanks, wells and other sources account for the rest 60 per cent. The rivers in the state are mostly rainfed. Thus, irrigation of major types is dependent on the rainfall.

**Fertilizers:** Trials of application of Ammonium Sulphate on paddy and coconut were carried out during 1916-17. By the end of first five year plan about six thousand tons of fertilizers were distributed which increased to 22 thousand tons by the end of second five year plan period. 2.04 lakh tons of fertilizers were distributed in 1974-75 and a target of 5.65 lakhs was reached in 1986-87. As per some of the field studies done, apart from chemical fertilizers, organic manures like compost, green manure are generally used by small and medium farmers.
The growth in fertiliser use in the state has been impressive. It increased from 1.53 lakh tons in 1973-74 to 8.22 lakh tons in 1993-94. Despite the low level of irrigation, the intensity of fertiliser use had been the third highest in the country (NCAER, 1979). The per hectare consumption has been on par with the all-India average.

**Institutional Factors**

The institutional factors have played an important role in use of fertilisers and high yield variety seeds. The two main factors are credit facility and agricultural extension. The land holding pattern is also fairly an important factor. Each of the factors have been explained as follows.

**Credit Facility:** The credit facility refers to loans provided for purchase of agricultural inputs. The agricultural credit is provided mainly by the Agricultural Co-operative Credit Societies. Agricultural loans of three types namely short term, medium term and long term loans. The purchase of agricultural inputs is categorised under short term loans. The period of repayment of loans is 12 to 15 months from the date of loan obtained. The short term credit in the state had a growth of nearly 10 per cent per annum, almost on par with the rate of growth of fertiliser consumption.
Extension: Agricultural extension work in the state began during the end of last century and beginning of this century. Schemes were started for practical training in schools; agricultural schools were started in 1911-12 onwards and agricultural college at Hebbal, Bangalore, was started. To teach the use of agricultural machinery, seeds, and other inputs like pesticides, they were demonstrated by the government agencies in close cooperation with the owners of the field. During the plan periods, two agricultural colleges and seven agricultural schools were set up. Gram sevak training centers were also set up where gramsevaks and gramsevikas were employed to train the farmers. Block demonstrations were introduced as a new innovation envisaging a community approach to extension work for bringing about efficiency in management of inputs. This gathered momentum from 1974-75 onwards and spread to all the districts of the state. The state department of agriculture has played a vital role in mobilizing farmer’s participation and in co-ordinating extension efforts of University of Agricultural Sciences, and the participating input agency.

The breakthrough in the agricultural technology was diffused through a programme known as Training and Visiting System (T&V system) in all the districts of the state. The main objective of the T&V system were to bring more area under high yield variety seeds, provide technical expertise on water and soil management and provide help to marginal and small farmers in obtaining inputs.
Land Holdings: - The total number of holdings in the state were 38.1 lakh in 1976-77 with an area of 11.36 million hectares. According to 1976-77 census, 84 per cent of the holdings were less than 5 hectares. The maximum number of holdings lie in the range of 1 to 2 hectares comprising of 23 per cent of the total holdings. The operational holding is skewed towards the small and marginal farmers. The number of holdings in the range of 1 to 2 hectares was 25.11 in per cent in 1980-81 compared to 23 per cent in 1976-77. The percentage of holdings below 2 hectares increased from 56.74 per cent in 1970-71 to 60.49 per cent in 1980-81. The average size of land holding however, reduced drastically over a period of time. It has reduced from 3.20 hectares per holding in 1971 to 2.31 hectares in 1991. Similarly, the skewedness has has reduced in favour of the small farmers i.e, 1 - 2 hectares, during the same period. This is despite the fact that marginal and small holdings predominate.

In 1971, the number of holdings with less than one hectare accounted for 30.42 per cent, operating 4.83 per cent of land. The number of holdings increased to 40.57 per cent of total holding by 1991, operating on 8.70 per cent of total land. Similarly in the case of large holdings, above 10 hectares, the number of holdings reduced from 6.16 per cent to 2.31 per cent and the share of area reduced from 31.68 per cent to 15.99 per cent between 1971 and 1991.
Others: With less than 25 per cent of irrigated area in the state, large proportion of the cultivated area is rainfed. In order to improve the agricultural performance, programmes were adopted to improve the farming techniques. The watershed development programme (WDP) was introduced in 1982-83. The main objectives of the programme were to (i) improve the productivity of the soil under rainfed conditions through improved soil and water management practices; (ii) improve stability of crop yields through proper runoffs water management; (iii) restore ecological balance through resource conservation, afforestation and pasture land development. The programme is coordinated by the Dry Land Development Board with the technical help of the Department of Agriculture, mainly to classify the lands for agriculture, horticulture and forestry.

Economic Factors

The economic factors played a catalyst role in the use of new agricultural technology. The two main factors were the agricultural price policy and the crop insurance.

Crop Insurance: The Government of India introduced crop insurance covering the entire country in order to protect the farmers during crop failures. Major crops including paddy, ragi, jowar and ground nut were covered under the scheme. The beneficiaries of the scheme included all the farmers obtaining crop loans from co-
operative credit societies, regional rural banks and other commercial banks.

Agricultural Prices: The Agricultural Price Commission (later, Commission for Agricultural Costs and Prices (CACP)) is the apex body which recommends the procurement and minimum support price of all important cereals, pulses and other cash crops each year. The Government of Karnataka had taken the initiative of offering higher than those recommended by the CACP. It was later withdrawn on the advice of the central government (Madiah and Ramapriya, 1989, p.43).

Food Situation

Karnataka has been at the threshold of self sufficiency in food grains. At the state level, the growth rates of food grains production and population are almost equal. There is a steady decline in the availability of cereals and pulses as shown Figure 3.2. In addition to the decline, there is a substantial inter-temporal variation in the availability of food grains (see, Table 3.10). The centrally sponsored rural development programmes include Integrated Rural Development Programme, Jawahar Rozgar Yojana, Training of Rural Youth for Self Employment and Integrated Child Development Scheme. The state sponsored schemes include Negilubhagya - providing

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"Data on total food grain production is taken as a proxy for total food grain availability."
Per-Capita Availability of Foodgrain - Karnataka

Figure 3.2
ploughs on loan, Bhagyajyoti - rural electrification scheme, Rural Employment Guarantee Scheme, Watershed Management Programme, Pension to the aged and handicapped people, Maternity allowance to agricultural labourers, house sites for

Table 3.10. Per Capita Availability of Foodgrains - Karnataka

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Note: Calculated from Production Figures.
rural poor and Drought Relief Scheme. The Public Distribution System is well established in both urban and rural areas.

In Karnataka, only about 25 per cent of total cultivated area is irrigated. In addition, 60 per cent of state’s total cultivated area receives less than 700 mm of rainfall annually. In order to improve the farming conditions in the rainfed areas, Watershed Development Programme (WDP) was introduced. The main objective of WDP was to improve productivity through improved soil and water management practices. Secondly, to restore ecological balance through resource conservation, afforestation and pasture land development.

Programmes pertaining to specific crops - rice, sugarcane, pulses and oil seeds - have been introduced by the Department of Agriculture in the state. The agricultural research stations and agricultural universities introduce new varieties of crops and seeds. The Agricultural Extension help in implementing new varieties of crops and seeds on the farms. The programme of certain crops, for instance, cowpea, is for region with low rainfall, since it is a drought resistant variety. Oil seeds such as sunflower is encouraged in rainfed areas.
Earlier to 1980, the Government of Karnataka used to procure paddy or rice directly from the farmers in addition to the millers and traders. Presently, the procurement is being carried out from the traders and millers, where in one-third of total quantity traded needs to be sold to the government as levy at the procurement price. The rice millers are given the incentive of trading a quantity equivalent to the quantity of levy sold to the government. When the difference between procurement and wholesale price is high, profits are reduced. To compensate the reduction in profits through levy operations, the wholesale prices in the open market increase.

To distinguish the households between targeted households from the rest, the targeted group are provided with green ration cards and saffron ration cards for the rest of the households. The special subsidy is provided to households with annual income of less than Rs.3500 per annum. The scheme has been extended to the urban poor in small towns with less than 40,000 population. The additional subsidy to the targeted group is channeled through the panchayat raj system. Due to financial constraints, the targeted group is very limited.

Presently, jawahar rozgar yojana, is a central government sponsored scheme and in addition, Government of Karnataka has introduced Rural Guarantee Employment Scheme. For the government it involves a large sum of money, but at the household
level, the effect is not similar. This is because, at the village level, the people to be satisfied are many and hence benefits on average 7 to 10 days per year.

To conclude, it is observed that at the state level, there was decent growth in foodgrain production in the seventies. Despite the growth in production, there was a constant decline in the per capita availability in foodgrains. However, the per capita availability has been more than the norms. The new seed technology was adopted, but the gains were not uniform across the districts in the state. This is corroborated by the high inter-district variations in yields of crops and across time (Vani and Vyasulu, 1996, p.A82-83). There is a wide range of rural development programmes, varying from agricultural development programmes to employment generation programmes, that have been implemented in the state. The programmes include both, state government initiated as well as centrally sponsored schemes.