CHAPTER 3
CHAPTER THREE

ACHIEVEMENTS

Introduction

During the last three decades of planning (1950-80) although Karnataka has made some progress signs of lop-sided development have also come to the surface. The widening gap between the rich and the poor as well as glaring regional imbalances are at the root of the dissatisfaction. The developmental efforts during the five year plan periods have resulted not only in imbalances in sectoral growth rates but also in the levels of development among the different regions. The following Table gives the Composite Index (CI) of development at the end of 1980 as well as at the beginning of the Second Five Year Plan in 1960-61. (See table No.4).

Although the levels of development cannot be strictly measured at the end of each five year plan, it would be possible to assess the progress at decadal intervals. The Standard Deviation (SD) given in the Table 4 shows that the gap between the developing districts and the backward districts is narrowing. During the first decade of 1961-71, the SD shows a difference of 11.87 as compared to 5.02 during the next decade 1971-80 thereby showing a decadal variation which implies that the gap between the developed and the backward districts is slightly narrowed down. However, it is interesting to observe that the Composite Index (CI) shows that 10 out of the 19 districts still remain backward with a CI below the State average of 100 at the end of 1980 as against 9 districts in 1971-72, and only 8 districts in 1960-61. This shows that

42
### TABLE-4
**COMPOSITE INDEX* OF DEVELOPMENT**
**KARNATAKA 1960-61 - 1979-80**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>District</th>
<th>1960-61</th>
<th>1971-72</th>
<th>1979-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>BANGALORE</td>
<td>218.00 (2)</td>
<td>206.01 (1)</td>
<td>198.57 (1) **</td>
</tr>
<tr>
<td>2.</td>
<td>BELGAUM</td>
<td>91.12(12)</td>
<td>95.06(11)</td>
<td>91.97(12)</td>
</tr>
<tr>
<td>3.</td>
<td>BELLARY</td>
<td>89.23(14)</td>
<td>83.90(15)</td>
<td>94.98(11)</td>
</tr>
<tr>
<td>4.</td>
<td>BIDAR</td>
<td>64.28(17)</td>
<td>86.85(14)</td>
<td>82.11(17)</td>
</tr>
<tr>
<td>5.</td>
<td>BIJAPUR</td>
<td>71.66(16)</td>
<td>77.38(18)</td>
<td>87.02(15)</td>
</tr>
<tr>
<td>6.</td>
<td>CHIKMAGALUR</td>
<td>123.74 (7)</td>
<td>92.66(12)</td>
<td>90.16(14)</td>
</tr>
<tr>
<td>7.</td>
<td>CHITRADURGA</td>
<td>100.24(11)</td>
<td>104.00 (9)</td>
<td>101.36 (9)</td>
</tr>
<tr>
<td>8.</td>
<td>DAKSHINA KANNADA</td>
<td>230.21 (1)</td>
<td>187.04 (2)</td>
<td>176.69 (2)</td>
</tr>
<tr>
<td>9.</td>
<td>DHARMAD</td>
<td>118.54 (8)</td>
<td>103.19(10)</td>
<td>96.28(10)</td>
</tr>
<tr>
<td>10.</td>
<td>GULBARGA</td>
<td>60.10(19)</td>
<td>63.19(19)</td>
<td>65.77(19)</td>
</tr>
<tr>
<td>11.</td>
<td>HASSAN</td>
<td>90.03(13)</td>
<td>87.21(13)</td>
<td>91.91(13)</td>
</tr>
<tr>
<td>12.</td>
<td>KODAGU</td>
<td>124.15 (6)</td>
<td>107.79 (7)</td>
<td>105.84 (7)</td>
</tr>
<tr>
<td>13.</td>
<td>KOLAR</td>
<td>136.53 (4)</td>
<td>129.65 (4)</td>
<td>103.81 (8)</td>
</tr>
<tr>
<td>14.</td>
<td>MANDYA</td>
<td>114.70(10)</td>
<td>111.96 (6)</td>
<td>118.87 (5)</td>
</tr>
<tr>
<td>15.</td>
<td>MYSORE</td>
<td>124.60 (5)</td>
<td>123.35 (5)</td>
<td>124.45 (3)</td>
</tr>
<tr>
<td>16.</td>
<td>RAICHUR</td>
<td>63.04(18)</td>
<td>80.53(17)</td>
<td>80.72(18)</td>
</tr>
<tr>
<td>17.</td>
<td>SHIMOGA</td>
<td>180.15 (3)</td>
<td>141.07 (3)</td>
<td>120.44 (4)</td>
</tr>
<tr>
<td>18.</td>
<td>TUMKUR</td>
<td>84.52(15)</td>
<td>83.47(16)</td>
<td>85.91(16)</td>
</tr>
<tr>
<td>19.</td>
<td>UTTARA KANNADA</td>
<td>118.24 (9)</td>
<td>106.17 (8)</td>
<td>106.00 (6)</td>
</tr>
</tbody>
</table>

**KARNATAKA CI**

<table>
<thead>
<tr>
<th></th>
<th>1960-61</th>
<th>1971-72</th>
<th>1979-80</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Standard Deviation**

|       | 49.32   | 36.84   | 32.28   |


* Composite Index (CI) derived from 22 selected Indicators of Development. See Appendix for Indicators.

** Figures in bracket indicate Rank also see Draft Fifth Five Year Plan (1974-79), Planning Department, GOM. Pp.870-79, 1973.
'though the regional imbalances are being reduced, it is to be noted that the imbalances still persist'. It can be summed up that 'in the process of development, while some districts have shown faster rate, some have not been able to maintain their relative position'. It is also a matter of grave concern that with every increase in plan investments, the number of districts below the State average, (CI 100) is gradually increasing thereby indicating a negative growth in some districts, in the relative sense of the term. For instance, the position of Chikmagalur was 7 with a CI 123.74 and it came down to 12 with CI 90.16 in 1979-80. Similarly, the district of Gulbarga has remained at Rank 19 all through 1960-61 to 1979-80. See Table 3 for the relative positions of the districts.

The progress made by the Old Mysore State before Independence has been of no avail since a large tract of the initially economically backward and neglected areas of the neighbouring States of Bombay, Hyderabad and Madras, came into the administrative fold of the New State of Mysore, now renamed as 'Karnataka'. Even after the implementation of the four Five Year Plans (FYP), 'it is sad to note that ten districts are below the State average or even backward in some respect or the other, and some districts are conspicuous by being backward in most of the indicators'. Persistent imbalances in regional growth and income call for a detailed spatial analysis of the developmental efforts and for locating the areas of rapid growth and sluggishness. There is a need to pin-point the developmental problems of the lagging regions.

44. Ibid, p.11 and p.85.
The Five Year Plans: Although 'planning for economic development' was mooted by the Great Engineer Statesman Bharata Ratna Sir. M. Visveswaraya at the beginning of the Century, it is only after Independence, the First Five Year Plan was started in 1950-51. But, the new Integrated State of Mysore was formed on November 1, 1956 and for all practical purposes, the Second Five Year Plan 1956-61 marks the beginning of the FYP in Karnataka. The First Five Year Plan (FYP I) covered the erstwhile Old Mysore State and it had a modest outlay of Rs. 475.80 million. The plan allocation for the FYP II (1956-61) was Rs. 1484.70 million. The third Five Year Plan 1961-66 had an allocation of Rs. 2462.20 million. Thus, a sum of Rs. 4422.30 million of plan allocation was made for Karnataka and the expenditure during this period was Rs. 4446.90 million. Subsequently, three annual plans 1966-67-68-69 were implemented instead of the Fourth Five Year Plan due to the Chinese Invasion in 1962 and the Indo-Pakistan Conflicts in 1965 and the recurring droughts in 1966 and 1967. The plan performance was greatly affected during this period. The outlay for the three Annual Plans was Rs. 1646.40 million and the expenditure was, however, Rs. 1909.60 million. A sum of Rs. 3500.00 million was provided as the outlay in the Fourth FYP (1969-74) and the outlay for Fifth FYP 1974-79 was Rs. 9976.70 million. But, the FYP V was abruptly terminated at the end of March 1978, and 1978-79 was treated as Annual Plan. The proposed Sixth Five Year Plan 1978-83 did not materialise due to the change in the central leadership and the change in the Planning Commission. The Year 1979-80 was also treated as Annual Plan. Thus, there was lot of confusion in the minds of the planners and the Five Year Plans did not run their full scheduled five years; there was even a suggestion to declare 'plan holiday' and the 'Rolling Plan' was mooted.
The Table in Appendix II gives the details of plan allocations since the beginning of the First Five Year Plan in 1951 upto 1980. The total outlay in all the FYPS and Annual Plans comes to Rs.26,852.00 million and the expenditure stands at Rs.24,448.70 million. The plan performances can be assessed to some extent from the percentage utilisation of the plan funds. The actual expenditure of the outlay i.e., 'the development effort, is one of the indicators if not the only indicator. In this context, the percentage utilisation is only 91.08 for the entire plan period. The Rate of plan investment is given in the following Table. (See Table No.5)

<table>
<thead>
<tr>
<th>Plan</th>
<th>Years</th>
<th>Investment in Rupees Million</th>
<th>Rate per annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five Year Plan (FYP)</td>
<td>1951-1966</td>
<td>4422.30</td>
<td>294.82</td>
</tr>
<tr>
<td>I, II &amp; III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Plans</td>
<td>1966-1974</td>
<td>5146.40</td>
<td>643.30</td>
</tr>
<tr>
<td>FYP V &amp; Annual Plans</td>
<td>1974-1980</td>
<td>17283.30</td>
<td>2885.50</td>
</tr>
<tr>
<td>All Plans TOTAL</td>
<td>1951-1980</td>
<td>26,852.00</td>
<td>895.66</td>
</tr>
</tbody>
</table>


All through the planning exercise in India in general and Karnataka in particular, the strategy of sectoral investments constitutes the major thrust to achieve the set goals and objectives which include economic prosperity with equity and social justice as also reducing regional imbalances.
The following Table gives the Sectoral Investments - Plan Outlay and Expenditure under the Five Year Plans and Annual Plans from 1951 to 1980.

Table No. 6

SECTORAL INVESTMENTS - OUTLAY AND EXPENDITURE
1951-1980

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Sector</th>
<th>Outlay (Rupees Millions)</th>
<th>Expenditure (Rupees Millions)</th>
<th>Utilisation % of % of outlay Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Agriculture and Allied Activities</td>
<td>4556.20</td>
<td>4323.00</td>
<td>94.88</td>
</tr>
<tr>
<td>2.</td>
<td>Co-operation</td>
<td>942.00</td>
<td>999.80</td>
<td>106.14</td>
</tr>
<tr>
<td>3.</td>
<td>Irrigation and Power</td>
<td>13,173.00</td>
<td>11,378.00</td>
<td>86.15</td>
</tr>
<tr>
<td>4.</td>
<td>Industry and Mining</td>
<td>1,380.20</td>
<td>1,445.50</td>
<td>104.72</td>
</tr>
<tr>
<td>5.</td>
<td>Transport and Communication</td>
<td>1,547.80</td>
<td>1,697.50</td>
<td>109.63</td>
</tr>
<tr>
<td>6.</td>
<td>Social Services</td>
<td>4,993.10</td>
<td>4,495.00</td>
<td>.90.02</td>
</tr>
<tr>
<td>7.</td>
<td>Miscellaneous:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economic Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>26,852.00</td>
<td>24,448.90</td>
<td>91.05</td>
</tr>
</tbody>
</table>

FIG. No. 15 PLAN ALLOCATIONS
An analysis of sector-wise investment reveals that the maximum investment (49.06%) of the total plan outlay has been made in irrigation and power sector, followed by social services (18.60%) and agriculture and allied activities (16.97%). Even if another 3.51% is added up, which has been spent on rural development and co-operation, it works out to 69.54%. Even with this, it appears that the emphasis has been misplaced since 69.7% of the population live in rural areas. Further, the Gross National Product (GNP) contributed by agriculture sector is the highest 52.36%. Hence, the expenditure on agriculture and rural development should have been in appropriate ratio in the interest of creating a strong rural economic base. (See Table No.6). This speaks about the share of each sector in the total plan outlay and the real achievement in each sector in terms of physical achievement is taken up in the following analysis.

SECTORAL ACHIEVEMENTS:

The State Government has conceded that 'it is impossible to find out the progress achieved in a particular district or a particular Taluk during a specified period'. It is hazardous to attempt a sector-wise Plan-to-Plan analysis of Plan investments and assess physical achievements at Taluk or Block level. Under these assumptions, the State Government have worked out a district-wise assessment of levels of development based on 22 selected indicators. The indicators of development selected by the State Planning Department is given in Appendix III. Even the Institute of Social and Economic Change (ISEC), Bangalore has attempted a district-wise assessment based on selected indicators of socio-economic development. But a more comprehensive economic-geographic analysis of the same has been attempted down to the Taluk level in this study and the results are quite revealing. A summary observation is given here before a detailed analysis is given later in Chapter IV.

47. Ibid, Draft Five Year Plan 1978-83.
It has been observed that there are inherent defects in the assessment of socio-economic development made in the documents and some of the scholarly studies made so far.

Most of the economists prone to think that per capita income, Railway route length, number of educational institutions and number telephones, etc would serve as indicators of development. But per capita income has now been proved to a dubious indicator in assessment of levels of development. So also, the railway route length since most of the trains do not make a halt in many rural settlements and many times, there are no railway stations at all. Even with regard to telephones, most of the time these instruments are kept under lock and key and are not available for use. Even the educational institutions do not serve any purpose since admissions are highly restricted. Hence, many of these studies suffer from defects. However, in the absence of any bench mark studies, some of the available works have served some purpose. Bhoothalingam has rightly observed that 'more often than not, progress is measure in terms of money spent rather than work done in right order'. Increase in per capita allocation of plan funds has also been of no avail since there is a declining purchasing power of the Rupee and growth in population has contributed to widen the gap making the poverty syndrome persist. (See Chart 1)

Under-utilisation of the outlays and the absence of a suitable plan implementing machinery are serious shortcomings. Boothalingam has also observed that 'for a realistic approach, a more pragmatic organisational and institutional change is necessary'.

49. Ibid, VKRV RAO.
51. Ibid,
In fact, it would be more pragmatic to constitute an autonomous Regional Development Corporation so that all developmental activities can be entrusted to a single expert body, which can not only formulate but also execute and evaluate plan programmes more effectively.

As already pointed out, planning exercise at present is to fix the target in terms of 'growth rate' for each sector and, invariably these are founded on unrealistic calculations and defective data base. In fact, fixing the 'growth rate' has been the major exercise in the Planning Commission since Independence and so far they have not taken the actual physical growth rate into account. The increase in population, decline in the purchasing power of the rupee, the rate of inflation, project escalation costs, role of unaccounted or black money, regional imbalances and inequity in distribution or the other parameters which do not find appropriate remedial measures in the present planning techniques. Thus, the present economic planning leaves much to be desired, and it is appropriate that a spatial planning is mooted here.

While the SW Monsoon continues to play havoc with agricultural productions, inadequacy of funds and lack of power resources retard the growth of the key sectors in potential regions of growth. Actually the Budget speech of 1980 reiterated a 5% growth rate during the sixth Five Year Plan 1980-85 and ignored that not even a 3.65% growth rate could be achieved during the entire planning period 1951-80. In fact, Adiseshaiah has pointed out that 'the growth rate figure suffers from serious defects such as incompatibility, defective selection of base years, irrelevance to actualities, and finally he has come to the conclusion that development is not 'economic growth' that can be measured in terms of growth rate.'

A regional or spatial accounting system does not exist as yet and in an open economy under a Federal State-Centre relationship with different schedules of State List, Central and Concurrent Lists of decarcation of powers, it is difficult to trace the complex flow pattern of public funds. The exact nature of the operation of funds is also difficult to assess and as such the temptation to analyse this criss-cross regional flow has been desisted here. On top of it, there has been a change in the basic approach to regional and socio-economic development in recent years. It has been emphasised that 'the traditional measures of national economic progress, growth in GNP, cannot reveal the extent to which the fruits of that growth is shared; the GNP is an average measure and as such it bears no relation to the health and well being of the people, about the internal distribution of the GNP and the extent to which it is also to provide the basic needs of the people'.

Thus, 'a fascination with the growth rate of the GNP along with the concomitant extraordinary role assigned to non-human capital...have conspired to produce failure on a grand scale'.

On the other hand, the International Labour Organisation (ILO) has been actively promoting a 'basic needs approach' to economic development. As ul Huq has put it, 'the objective of development must be viewed as a selective attack on the worst forms of illiteracy, squalor, unemployment, and inequalities, poverty, malnutrition and diseases'. Further, rapid industrialisation has brought in its wake growing slums and damage to the quality of physical environment and also new social problems with it. Huge investments on industrial developments has caused growing regional disparities and widening gaps between the haves and the have-nots. Monetisation of rural inaccessible areas has only helped further exploitation and siphoning of funds in the guise of

mobilisation of resources. The evil effects of unearned incomes in unscrupulous hands have made all the aims and objectives of planning meaningless. There is a wide gap between the ideals held by the planners and the actual economic development and social welfare achieved by the administrators. The effect of economic maladies are permeating down to the grass root level of rural communities, and the corrective measures are no where in sight. These aspects bring out the need for a proper reconciliation between the economic policies and spelt objectives of social and economic welfare.

**Infrastructure:**

In any developmental effort, the basic approach is to strengthen the infrastructural facilities, in order to step up regional development. Lack of facilities like irrigation, power, transport and marketing are the major constraints which have affected the tempo of development. Thus, it is clear that the priorities in plan allocations should go to development of infrastructure. Much of the regional imbalances observed today is credited to the absence of, or to the inadequacy of these essential inputs. The benefits of irrigation could not be fully utilised due to the power shortage, and so also, the industries could not work to their rated capacity, thereby incurring national loss. Lack of goods roads affect the easy and cheap and quick movement of raw materials and finished goods and this more often adds to the costs of the resources. It is also observed that the inefficiency and inadequacy of the facilities like marketing, banking and finance, insurance and communication, have adversely affected the tempo of development of Karnataka. Hence, it is very important to assess the 'levels of development' of infrastructural facilities in Karnataka under the following aspects.
Water Resources:

Karnataka is a high subdued plateau bordered by the Sahyadri or the Western Ghats on the west which constitutes the catchment area. The highridges run close to the Arabian Sea reaching high altitudes of more than 2000 metres and help producing the orographical rainfall from the SW Monsoon. As a watershed, the Sahyadri produce a number of major east flowing rivers like the Cauvery, the Krishna and its tributaries, the Godavari and its tributaries which drain the hot-dry interior plateau while some of the west-flowing rivers like the Kalinadi, the Sharavati, the Gangavalli, the Bedthi, the Netravati and the Gurpur flow in short but swift flash floods during the SW Monsoon in rapids and Falls cutting through the Sahyadri, thereby creating a great hydro-electric potential for Karnataka.

The water resource potentials for the development of power and irrigation in Karnataka have been assessed by the Central Water and Power Commission (CWPC) and the hydrological surveys as well as underground water potential surveys have already been completed. It is sad that only 10% of the power potential and 40% of the irrigation potential have been developed even after three decades of planning. Besides, there is a vast scope for development of some of the water sources for inland navigation, fisheries, recreation and tourist industry.  

In the northern Maiden, the lower courses of the River Krishna and its tributaries are slightly broader and the plateau edges have conspicuous escarpments. The rivers flow in rapids and falls and, floods are not rare. Hence it has been felt necessary that all the available water resources are to be fully harnessed.

In the Southern Maidan, the River Cauvery is the only source to meet the irrigation and power needs. The small and medium tanks were built by the people in the past. There are more than 20,000 tanks in Karnataka and most of them in the southern plateau, but most of these are have dried up in recent years due to failure of SW Monsoon. Even ground water recharge has been depleted and the wells are going dry. In short, the ecological balance has been disturbed by the reckless felling of trees and exploitation of forests. The districts of Kolar, Tumkur, Chitradurga and Mandya have experienced large scale water scarcity on the one hand and soil erosion at an accelerated rate in recent years, on the other.

A massive investment of Rs.11,378.40 millions have been made under irrigation and power development during 1951-1980. Of this, the investment in irrigation accounts for Rs.783.43 millions and the benefit accrues is to 2.108 millions of hectares. The power sector has taken away a lion's share of the investments and the benefit accrued in terms of installed capacity at the end of 1980 is of an order of 1334.81 MW. The salient features of irrigation and power development according to the location of the projects is given in Appendix IV.

Development of Irrigation

The Irrigation Commission (1972) has put 54% of the total geographical area of Karnataka covering 88 taluks out of the 175 as under 'drought-pronearea'. The coefficient of variation (CV) is put at 30% and the population affected by it is about 48%. Only about 9% of the total geographical area of the State comes under high rainfall zone and another 24% under medium rainfall zone recording 750 mm. to 1150 millimetres. Thus, the area that falls under low rainfall with less than 750 mm. is about two-thirds of the total area. The ground water and surface water potential is estimated to be 9.0 million
acre feet and in range of 20% to 60% of rainfall. Out of the available 1.23 million hectare metres of potential, the developed resources is only 0.29 M. Ha. M. (23.58%).

Thus, the State has been put under the category of 'areas exposed to a high degree of risk from drought and famine' and as much as 54% of the State area get low rainfall of less than 700 mm. and is affected by recurring droughts. Extreme aridity and failure of rains is common in most of the districts except in Kodagu, Uttara Kannada and Dakshina Kannada, and parts of Shimoga, Hassan and Chikmagalur. Even large parts of the Malenadu tracts are not outside the grip of droughts and the taluk of Kadur in Chikmagalur has recorded lower than normal for almost 25 years.

The utter neglect of the peripheral districts of the erstwhile Bombay Province, the princely State of Hyderabad and the Madras Presidency have been mainly responsible for the present acute scarcity of water in the districts of Bijapur, Bidar, Gulbarga, Raichur, Bellary and Kolar. The districts of Tumkur and Chitradurga do not possess any large perennial rivers and only a few rainfed streams provide some water to tanks. Inspite of these limitations, the Vani Vilas Sagara was constructed to store as much of rain water as possible during the early part of the century. Numerous tanks were built and their maintenance was scrupulously attended to during the rule of Maharaja of Mysore. More than 25,000 tanks were built in Old Mysore area and the two large irrigation works, viz the Vani Vilasa Sagara (1907) and the Krishna Raja Sagara (1911) stand testimony to the ingenuity of the former rulers and their administrators. The famous Kanna, Marconahally, Byramangala, Tippagondanahally water supply works are important as source of water supply to the city of Bangalore (Popn. 3.00 million 1981)
FIG No.16 Growth of Irrigation
Prior to 1947, the major water works of the Krishna Basin such as the Dhoopdal Weir irrigated 0.041 million hectares whereas the water works of the Cauvery Basin in the south irrigated 0.146 million hectares. This clearly brings out the regional disparity existed in Pre-Independence days. Only the Dhoopdhal Weir and the Gokak Channel in Belgaum District was of some importance and the rain water and flash floods were channelised to develop irrigation in a small tract.

Development of irrigation during 1950-80 is clearly brought out in the following Table No.7. The principal types of irrigation in Karnataka are Canals (35.73%), Wells (24.62%) and the Tanks (30.07%) and the canal irrigation is getting a upper hand during the recent years as most of the major and medium irrigation projects are completed and their benefits have started flowing. Net area irrigated is given in Appendix I. Both the districtwise and talukwise data are given for reference. According to the Draft Sixth Five Year Plan only 37% of the ultimate irrigation potential has been exploited so far and a number of inter-State water disputes are coming in the way of proper utilisation of the available water resources.

At the end of the First Five Year Plan 1951-56, the district-wise irrigation data show that Raichur, Gulbarga, Bellary and Bidar all had less than 0.16% of their respective net area sown under irrigation. This is a very small figure against the climatic background and the need for irrigation in these districts. Although Kodagu district had a very small area under irrigation to its net area sown, the need for irrigation is not very acute here. So also, is the case of the district of Uttara Kannada where only 0.23% of the net area sown is irrigated; both these districts receive more than 1000mm. of rainfall. Among the other districts, Belgaum, Dharwad, Chikmagalur, Mysore, Mandya, Kolar, Tumkur, Hassan
and Dakshina Kannada have large percentage of their respective net area sown under irrigation i.e., 0.45%, while Shimoga district has the highest 0.82% of its net area sown under irrigation. (See Map Figure No.17) But no district has at least 1.0% of its net area sown under irrigation and this speaks of the extremely low level of irrigation development before the Five Year Plans actually started in Karnataka.

TABLE No.7

Development of Irrigation 1951-80

Investments & Achievements

<table>
<thead>
<tr>
<th>Plan Period</th>
<th>Investment (in Rupees Physic)</th>
<th>Achieve-</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Millions) cal Ac ments(in</td>
<td>ments hectares)</td>
<td>of net</td>
</tr>
<tr>
<td></td>
<td>Total hieve Million area</td>
<td>sown</td>
<td></td>
</tr>
<tr>
<td>Major &amp; Minor</td>
<td>Cumulative</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Maj.&amp;Med.Min.</td>
<td>Project Irrigation</td>
<td>Proje Irri</td>
</tr>
<tr>
<td>First Plan(1951-56)</td>
<td>372.7</td>
<td>41.5</td>
<td>414.2</td>
</tr>
<tr>
<td>Second Plan(1956-61)</td>
<td>298.2</td>
<td>50.8</td>
<td>349.0</td>
</tr>
<tr>
<td>Third Plan (1961-66)</td>
<td>339.9</td>
<td>157.9</td>
<td>497.8</td>
</tr>
<tr>
<td>Annual Plans(1966-69)</td>
<td>337.4</td>
<td>131.8</td>
<td>469.2</td>
</tr>
<tr>
<td>Fourth Plan(1969-74)</td>
<td>1390.0</td>
<td>230.3</td>
<td>1620.3</td>
</tr>
<tr>
<td>Fifth Plan(1974-78)</td>
<td>1883.6</td>
<td>372.1</td>
<td>2255.7</td>
</tr>
<tr>
<td>Annual Plans(1978-80)</td>
<td>1920.4</td>
<td>307.7</td>
<td>2228.1</td>
</tr>
<tr>
<td>Total (1951-80)</td>
<td>6542.2</td>
<td>1292.1</td>
<td>7834.3</td>
</tr>
</tbody>
</table>

KARNATAKA
NET AREA IRRIGATED

20 10 0 20 40 60 80 100 KM.

(in percentage of net area sown)
The position in 1979-80 in respect of irrigation brings out clearly that the net area irrigated increased from 6.85% in 1955-56 to 12.89% in 1969-70 and 21.64% in 1979-80. Although the figures appear impressive in terms of percentage performance, the extremely low level of development and the drought-prone conditions of the State make the feel the need for strengthening the irrigation facilities in the State. But it is a matter of great satisfaction that the major and medium irrigation projects under the Krishna Basin have greatly relieved the acute famine conditions particularly in Raichur, Bellary, Bijapur and Gulbarga districts.

It is stated that, 'high priority has been accorded to the development of irrigation since 1951'. Although a sum of Rs.7834.30 millions have been spent on irrigation, the percentage of area irrigated to the total cropped area 21.64 and it works out to 191.92% to the net area sown. This is below the national average of 24% and it should be remembered here that, as a drought-prone area Karnataka's need for irrigation is much more than the neighbouring States which are putting larger claims for sharing the waters of the Rivers Krishna and the Cauvery.

Further, as regards the physical achievements in respect of the major and medium irrigation projects as well as the minor irrigation works, it is important to note that as much as 80% of the irrigation out lay has been made for the major and medium projects and the irrigation benefits gained is less than 56% of the total. In a sense, the benefit derived from minor irrigation works is nearly two times that of the major and

57. Ibid, DFYP p.491
## TABLE No. 8

### Development of Irrigation: Major Irrigation Projects

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Project Location</th>
<th>Location (District)</th>
<th>Estimated Cost (Rs. Million)</th>
<th>Irrigation potential (million Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tunga Bhadra (1945-79)</td>
<td>Bellary Near Hospet</td>
<td>768.00</td>
<td>0.36</td>
</tr>
<tr>
<td>2.</td>
<td>Bhadra Reservoir (1949-79)</td>
<td>Shimoga</td>
<td>580.00</td>
<td>0.11</td>
</tr>
<tr>
<td>3.</td>
<td>Ghataprabha Stage I (1949-79)</td>
<td>Belgam</td>
<td>856.70</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>Stage II (1956-77)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Malaprabha (1960-1981)</td>
<td>Belgam</td>
<td>1620.90</td>
<td>0.21</td>
</tr>
<tr>
<td>5.</td>
<td>Upper Krishna (1963-83)</td>
<td>Bijapur</td>
<td>2836.50</td>
<td>0.43 Stage I</td>
</tr>
<tr>
<td>6.</td>
<td>Kabbini Reservoir (1948-79)</td>
<td>Mysore</td>
<td>790.00</td>
<td>0.04</td>
</tr>
<tr>
<td>7.</td>
<td>Hemavati (1964-83)</td>
<td>Hassan</td>
<td>2400.00</td>
<td>0.26</td>
</tr>
<tr>
<td>8.</td>
<td>Harangi (1964-79)</td>
<td>Kodagu</td>
<td>850.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>Rs. 11,123.20</td>
<td>1.82</td>
</tr>
</tbody>
</table>

| 10.     | Hipparagi Barrage* | Bijapur            | 448.30                       | 0.05                                    |
| 11.     | Bennithora*        | Gulbarga           | 150.00                       | 0.24                                    |

| A. ALL MAJOR PROJECTS TOTAL: | Rs. 11,731.50 | 2.11 *Newly Proposed |
| B. ALL MEDIUM PROJECTS       | 1,198.30      | 0.02                  |
| C. ALL MINOR IRRIGATION PROJECTS | 6,000.00     | 2.13 million hectares |

**Grand Total: Rs. 18,930.30 2.13 million hectares**

*Source: Government of Karnataka (1981): Irrigation Projects in Karnataka, Irrigation Department, Bangalore, p. 7*
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>District</th>
<th>1955-56</th>
<th>1979-80</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dakshina Kannada</td>
<td>6.42</td>
<td>5.20</td>
<td>Very Heavy Rainfall Zone</td>
</tr>
<tr>
<td>2.</td>
<td>Uttara Kannada</td>
<td>3.36</td>
<td>1.47</td>
<td>Rainfall Zone</td>
</tr>
<tr>
<td>3.</td>
<td>Kodagu</td>
<td>0.73</td>
<td>0.95</td>
<td>(Above 2000mm)</td>
</tr>
<tr>
<td>4.</td>
<td>Shimoga</td>
<td>11.97</td>
<td>8.72</td>
<td>High Rainfall Zone</td>
</tr>
<tr>
<td>5.</td>
<td>Hassan</td>
<td>6.13</td>
<td>3.81</td>
<td>Zone</td>
</tr>
<tr>
<td>6.</td>
<td>Chikmagalur</td>
<td>8.61</td>
<td>1.98</td>
<td>(1000 to 2000mm)</td>
</tr>
<tr>
<td>7.</td>
<td>Bidar</td>
<td>1.17</td>
<td>1.69</td>
<td>Moderately High Rainfall Zone</td>
</tr>
<tr>
<td>8.</td>
<td>Belgaum</td>
<td>6.72</td>
<td>10.26</td>
<td>Zone</td>
</tr>
<tr>
<td>9.</td>
<td>Bangalore</td>
<td>5.69</td>
<td>5.50</td>
<td>Low Rainfall Zone</td>
</tr>
<tr>
<td>10.</td>
<td>Mysore</td>
<td>6.57</td>
<td>6.15</td>
<td>Zone (800 mm to 700 mm.)</td>
</tr>
<tr>
<td>11.</td>
<td>Kolar</td>
<td>6.28</td>
<td>5.20</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Gulbarga</td>
<td>2.34</td>
<td>1.98</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Mandya</td>
<td>8.03</td>
<td>6.89</td>
<td>Very Low Rainfall Zone</td>
</tr>
<tr>
<td>14.</td>
<td>Dharwad</td>
<td>7.15</td>
<td>6.23</td>
<td>(700 mm to 600 mm.)</td>
</tr>
<tr>
<td>15.</td>
<td>Tumkur</td>
<td>6.42</td>
<td>3.96</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Raichur</td>
<td>1.46</td>
<td>9.16</td>
<td>Extremely Low Rainfall Zone</td>
</tr>
<tr>
<td>17.</td>
<td>Bellary</td>
<td>2.34</td>
<td>6.81</td>
<td>(Below 600 mm.)</td>
</tr>
<tr>
<td>18.</td>
<td>Bijapur</td>
<td>3.21</td>
<td>8.21</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Chitradurga</td>
<td>5.55</td>
<td>6.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>State Average</td>
<td>6.85</td>
<td>13.65</td>
<td></td>
</tr>
</tbody>
</table>

Note: Irrigation development in the High and Very High Rainfall zones is not very satisfactory; however, the need for irrigation is not very pressing here. On the other hand, the extremely low rainfall zone has shown improvement. But, the low and very low rainfall zones need better irrigation in the light of their unsatisfactory levels of development of irrigation. Priority need be given to these zones.
medium projects at almost half the cost. It has also been observed that 'during the Second Five Year Plan period 1956-61, the additional foodgrains production achieved was 0.047 million tonnes as against 0.993 million tonnes from minor irrigation works'. There is considerable equity in distribution of irrigation benefits under minor irrigation since the works are small and can be implemented in rural inaccessible and even the tribal areas where the need for irrigation is more urgent.

Thus, there is need for a reconsideration of the priorities in irrigation and it has been proved that the minor irrigation works are more beneficial than the large and medium irrigation projects.

As regards the major and medium irrigation projects, there are, in all, 9 major and 20 medium irrigation projects located in Karnataka and some of these are still in progress for the last 20 years, as is the case of Upper Krishna Project. The list of major and some of the more important medium irrigation projects is given in Appendix VII. It gives the project gestation period, the cost and the irrigation benefits. But it should be reiterated here that the unduly long period of construction has led to cost escalation and ultimately the cost-benefit ratio worked out at the beginning of the project becomes meaningful. Further, the life span of the projects estimated at the beginning has also turned out to be meaningless since the rate of soil erosion in the catchment area and the silting of the reservoir beds are much higher than anticipated. For instance, the Tungabhadra Project was expected to last for 90 years and on a revised estimates the life span was put at 30 years. In fact, a recent estimate puts it at only 15 years and this estimate is more realistic based on the silting rate and other technical data.

On the one hand, the projects costs are huge and benefits are meager; and on the other hand, the beneficiaries

are generally rich people who own large land holdings under the command area. Thus, the benefit will not go to the really poor and the needy. The rehabilitation of the displaced persons from the project sites also call for reconsideration of the whole issue. It is now felt that it is wiser to spend smaller sums on minor irrigation works in as many locations as possible in order to fully exploit the underground water resources as well as for storing rain water in modern ways, rather than spend huge sums on major irrigation projects.

The full benefits of the irrigation projects have not reached the farmers in the absence of completion of the field channels and the canal works in most of the projects. Also, the farmers need training in the use of irrigation water under dry climatic conditions particularly in the black soil regions. Many farmers have already lost their valuable agricultural land due to calcification and large scale soil erosion under flooding of fields. It also true that the major irrigation projects have submerged vast mineral and forest belts as also fertile agricultural fields in the low-lying areas and the compensation given to displaced persons is too meagre to make them economically independent. Further, there are the socio-logical, psychological, and other problems of readjustments to new environment on displacement from their homelands.

As regards the underground water potential, it is estimated that 9,718 million cu. metre of water is added to ground water storage in any year of normal rainfall. So far, only about 27% of this ground water resource is utilised and almost 7,130 million cu. metres is yet to be harnessed. This amounts to almost 73% of the total resource potential and at least 1.80 million hectares can avail of this potential resource from ground water reserves. Thus, there is an urgent need for a careful reconsideration of all the aspects of irrigation development in its proper perspectives. There is need for a careful reconsideration with regard to ecological
balance since many new projects have been stalled by the local inhabitants on the ground that these major and medium projects are destroying the forests and a threat to many species.

There is a growing awareness in regard to the deteriorating physical environment and the people have obstructed the Bedthi Hydel project. There has been considerable opposition to many other irrigation and power projects on the same grounds. But the more serious opposition has come from the newly irrigated tract under the Malaprabha Project due to inadequacies of water supply and levy of water taxes.

Minor Irrigation:

The State Government has come in a big way to assist the farmers to develop their water resources through lending of money to sink irrigation wells through Land Development Banks. Many Lift Irrigation Schemes have also become very popular. There is growing awareness among the farmers with regard to development of irrigation on small scale with the help of geologists locating the ground water sources.

There are 26,845 tanks in southern Mysore Plateau and another 9,362 tanks in coastal region. The number of tanks in northern Basalt Plateau is, however, very small, numbering 1675. The repair and maintenance aspects of these thousands of tanks which once made the rural Karnataka self-sufficient have now become a serious problem due to long neglect. In the absence of annual desilting and repair of breaches in tank bunds and the sluice gates, many tanks have become obsolete. There is an urgent need for providing sufficient funds for maintenance of tanks and periodic inspection of these tanks by experts. In fact tanks are the only surer means of storing rain water. Tanks contribute 30.07% of the total irrigation water next only to canals (35.73%).
Wells are important in northern Karnataka just as the tanks in southern Mysore plateau. Nearly 25% of the total irrigation is derived from wells. The number of irrigation pumpsets energised is a good indicator of minor irrigation development and it stand at 0.29 million and the number of diesel pump sets are not included here. In the light of rapid development of well irrigation, there is now a need to make an in-depth study of the impact of exploitation of ground water reserves on the future of water resources, especially the aspect of conservation and maintenance of water table.

POWER RESOURCES

Hydroelectricity is the major source of power in Karnataka since almost 99% of the power generated comes from hydel stations. A thermal power station has been set up near Raichu only recently and plans are afoot, amidst lot of protest from the people of Uttarakhand district, to set up a nuclear power station at Kaiga near Karwar. There is acute dependence on hydroelectric power and the failure of SW Monsoon cause low water level in the reservoirs. A 100% power cut is not uncommon in the State. 'Energy generated in Karnataka during 1979-80 was 5,584 million units as against the demand for 9,539 million units' and a part of this is also supplied to Goa also'. The deficit of nearly 42% is met by drawing power from the neighbouring States of Tamil Nadu, Maharastra and Kerala. Thus, the State has to invest large amount of plan allocations for development of power.

The plan investments on development of power is of an order of Rs.3,544.10 million during 1951-80. Although more than 50% of the total plan outlay has gone for development of irrigation and power, the irrigation sector has got the lion's share of the outlay and only one-third of the sectoral outlay has gone to power development. The important hydroelectric projects in Karnataka and their installed power generation capacity is given in the Table below. (See Table No.10) and shown in Map. See Map(Fig.No.18 & 19)
### TABLE No.10

**INSTALLED CAPACITY OF POWER GENERATION STATIONS**

(Generating Capacity in Mega Watts)

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Station</th>
<th>Location</th>
<th>Installed Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sharavati (Hydro-electric)</td>
<td>Jog (Shimoga)</td>
<td>910</td>
</tr>
<tr>
<td>2.</td>
<td>Kalinadi (Hydro-electric)</td>
<td>Ambica Nagar (Uttara Kannada)</td>
<td>891</td>
</tr>
<tr>
<td>3.</td>
<td>Mahatma Gandhi (Hydro-electric)</td>
<td>Jog (Shimoga)</td>
<td>120</td>
</tr>
<tr>
<td>4.</td>
<td>Tunga Bhadra (Hydro-electric)</td>
<td>Hospet (Bellary)</td>
<td>99</td>
</tr>
<tr>
<td>5.</td>
<td>Lingananakki</td>
<td>Shimoga</td>
<td>55</td>
</tr>
<tr>
<td>6.</td>
<td>Shivasamudram (Hydro-electric)</td>
<td>Shimsha Maddur (Mandya)</td>
<td>59</td>
</tr>
<tr>
<td>7.</td>
<td>Bhadra (Hydro-electric)</td>
<td>Shimoga</td>
<td>33</td>
</tr>
<tr>
<td>8.</td>
<td>Munirabad</td>
<td>Near Hospet (Raichur)</td>
<td>27</td>
</tr>
<tr>
<td>9.</td>
<td>Raichur Thermal</td>
<td>Raichur</td>
<td>17</td>
</tr>
<tr>
<td>10.</td>
<td>Kaiga (Nuclear)</td>
<td>Karwar (Proposed)</td>
<td>20</td>
</tr>
<tr>
<td>11.</td>
<td>Varahi (Hydel)</td>
<td>(Under consideration)</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Sedthi (Hydel)</td>
<td>(Under consideration)</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Upper Krishna</td>
<td>Narayanapur Bijapur</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Upper Krishna</td>
<td>Alamatti (Bijapur)</td>
<td></td>
</tr>
</tbody>
</table>

**GRAND TOTAL**


Government of Karnataka, Draft Five Year Plan,
As it is evident from Table No. 8 the hydroelectric power resources of Karnataka are very meagre and already the gap between supply and demand is quite large. (See Fig. No. 15.) The demand for energy is 5,458 and it would be almost the double if the planned industrial expansion takes place. The per capita consumption of power in Karnataka is much higher with 158 units against the National average of 90 units. It was only 34 units (KWH) in 1956 in Karnataka against 21 KWH of all India average per capita. Thus, Karnataka stands at a higher footing than the country as a whole despite the meagre resources.

Industries consume almost 58% followed by irrigation and domestic consumption, commercial and public utilities. The transmission losses are put at 15.65% but it exceeds 20% if loss in transit and pilferages are taken into account. Since 1 unit of power generation costs as much as a Rupee and even 1% loss brings a loss of Rs. 10,000 Millions, the figure is frightening. It has been remarked by the World Bank team that the efficiency of electricity administration is the poorest in India in general & Karnataka in particular. Unless steps are taken immediately to stop pilferages and minimise transmission loss to a bare minimum of 5% only, the power position shall continue to be a matter of anxiety. Since the power sector is the key sector on which all other sectors depend for their full capacity utilisation, the desired annual growth rate of 5% cannot be achieved.

Alternative Energy Sources: These are development of bio-gas, solar power, wind power and tidal power. In the light of shortage of oil and coal in Karnataka, the only feasible
source appears to be development of solar power on a large scale since the number of sunny days exceed 200 in a year. This needs appropriate technology and already efforts are being made in this direction. The first railway station where the signals are operated on solar power in India is in Karnataka, Kolar district. Bangalore is fast developing solar heaters and it may be economically feasible and operationally successful in the coming years. Bio-gas has also become very popular with the rural people who are given a subsidy to construct the bio-gas plants. Wind power is also in its early stage and a number of farmers are going in for the wind mills to lift water. The costs are also economically feasible since a wind mill costs about Rs. 7,500 and can lift about 75,000 gallons of water per day. Since the number of windy days are also considerable, about 100, it is feasible in rural areas.

Nuclear power has become a highly debatable proposition in recent years. There is a growing awareness of the consequences of nuclear accidents and people are organising camps to educate the people about the myth of 'atomic energy for peaceful uses' and now, the State Government of Karnataka is in a difficult position to accept the location of 200 MW nuclear power plant at Kaiga in Karwar. The nuclear Reactor would no doubt release the acute power shortages in the State but the people have posed serious questions about the safety in case of nuclear accidents.

Tidal power as a very lucrative alternative energy source is worth consideration. The western coast of Karnataka is exposed to SW Monsoon from June to September and another two to three months, the sea will be quite rough. The tidal waves form a very attractive source of power if the appropriate technology is developed. Till then the cowdung is the only major source contributing 60% of fuel requirements of the rural
community. Cutting fuel wood has also assumed frightening proportions causing ecological imbalances.

Transport

'In space, distance becomes the language alternatively of human relations and human alienations'. Spatial distance is the cause of economic function and it should be overcome by a very concerted effort to provide a very cheap and efficient means of transport. The lack of efficient means of transport is still a major constraint in the economic development of backward regions. 'Developments in transportation have a pronounced effect on the spatial dimensions of the economic system as well as increasing the general level of interaction within the system and between the systems; such developments profoundly alter space relationship'. Besides, transport costs influence industrial and regional development. The tempo of social and economic development or change is also determined by the accessibility and transport efficiency factors. Thus, a high priority has to be accorded to the development of transport in the regional development planning.

Karnataka has the advantage of coastal shipping transport, besides, road, rail and air transport. Inland water transport and air transport have not been fully exploited and the road development in the State is quite significant. The railway transport is very poor; even with regard to the development of ports and harbours the same situation exists. Both these are in the Central sector and the State has very little control in the matter. As a result, the transport development is very sketchy in the State.


(i) Roads:

Road development has assumed much greater importance in the absence of better rail links and, even where it is available, the roads are more convenient as a means of land transport than the railways. Both in terms of transport costs and efficiency in door-to-door service, the road transport system has definite advantages over the railways, particularly within 300Kms.

'In about 1800 A.D. there were no roads to speak of in any part of the State..., and there was not a single cart road in the now advanced districts of Dakshina Kannada, Kodagu, Mysore, Belgaum and other areas of Karnataka'. Before the State reorganisation in 1956, the total road length was only 3,358 Km. The Nagpur Plan envisaged the construction of the National Highways to connect all State Capitals with the National Capital. The 20 Year Plan 1961-81, prepared by the Chief Engineers' Conference shifted the emphasis from the construction of Highways to the construction of rural roads. Later, the Sinha Commission presented a perspective Plan for 1969-89 where in the first preference for road development was given to the Integrated Area Development Programme (IADP). Next preference would go to the construction of roads in backward areas where no other means of transport are available. It is interesting to note here that the preferences are just the opposite to the actually desired objective, since the villages which do not have any means of transport ought to have been given the first preference followed by the backward regions and the like.

Growth of traffic during the last three decades 1950-80 is quite revealing. While there has been an increase in long distance traffic over the National Highways (NH) from 5% to 18% the increase in traffic over short distances within 50 Kms. is 56% during the first half of the last decade. There is also a brisk economic activity in the intermediate towns, as is evident from the increase in the volume of traffic over a medium distance of 50 Kms. to 300 Kms. However, there is a decline in short distance haulage within 50 Kms. by automobiles but the same is still hauled by bullock carts, especially within 20 Km. distance.

As per the Census of Traffic Survey in Karnataka 1981, the volume of traffic has increased at an average rate of 100% every five years since 1961. There is a 7.8% increase in vehicular traffic on the National Highways NH Nos. 4, 4A, 7, 9, 13, 17, and 48. In respect of the State Highways, the percentage increase is 5% to 6% per annum while the highest increase has been recorded in respect of village roads with 19.12% and it is here that a significant change is emerging.

Almost 80% of the traffic is short distance traffic as they originate and terminate within a distance of 50Km. This is indicative of a spurt in economic activity in rural areas. The percentage of traffic flow beyond 300Km. is only 2% and it is sad that huge sums of money go in for construction and maintenance of these National Highways at the cost of large number of rural roads, thereby scuttling the rural economy. Since the traffic is rural to urban oriented, i.e., carriers are engaged in moving materials and foodgrains from rural areas to large urban centres and bring very little back to the villages, the rural economy is exploited causing urban enrichment and rural impoverishment.
The Plan Outlay for Transport Development from 1951 to 1980 was of an order of Rs.1547.80 millions. The average percentage share in the total outlay has been just over 5% in the Second Five Year Plan 1956-61 to Sixth Five Year Plan and Annual Plans 1974-80. (See Appendix III)

Development of road transport in Karnataka during 1951-1980 is quite significant as could be seen from the total length of 22,185 Km. of surfaced roads in 1951 which increased to 65,200 Kms. in 1980. It is also significant to note that the length of unsurfaced roads decreased from 48.94% in 1951 to 28.95% in 1980. This is a very satisfactory trend. The length of road per 100 sq.Km. has increased from 22 to 42 during this period. However, it is important to note that more than 66% of the roads in Karnataka are rural and the condition of these roads need better deal in the hands of the Public Works Department (PWD) who is in overall control of roads in the State.

Most of the rural roads are unsurfaced and as much they are unserviceable during the Monsoon. Further, many roads need bridges and culverts and thus, the effective use of roads is limited to fair weather season. Thus, it can be stated that a little over 93,000 Kms. or 58% of the total length comes under fair weather category and the remaining 42% under all-weather roads. Nearly 10% of the villages are not connected by any short of roads and this is a matter of anxiety in the light of rapid strides made in the case of urban roads.

The regional disparities in road development are evident from the Table No. 11 which gives the details of road development in the different districts of the State. An analysis reveals that Mandya district has 130 Kms. of road length per 100 sq. Km. which is the highest in the State. The State average is 49 Kms. per 100 sq. Km. and the districts that stand above this average are Bangalore (74), Mysore (68), Shimoga (63), Kolar (62), Kodagu (59), Hassan (58) and Chikmagalur (49). The rest of the districts are below State average and the worst placed are the districts of Gulbarga and Bidar with only 6 Kms per 100 sq. km in 1956 and 44 Kms and 26 Kms in 1980, respectively.
Among the districts which show poor performance are: Bijapur (17 to 35), Bellary (13 to 37) and Raichur (8 to 34) and in regard to their respective size the road length in the district is very low. Although the percentage performance given in net variation in percentage for 1956-80 gives some idea about the efforts made by the Public Works Department, it is needless to emphasise here that the Department has not given the due weightage to the backwardness of these districts while investments are made for road development here. Much more serious concerted effort is needed.

The road length under the various administrative control such as the Taluk Development Board (25.19%), the State Forest Department (2.52%), and the Irrigation Department (5.29%) besides the Public Works Department (P.W.D. 67%) is another matter of consideration. Here, the Taluk Development Boards are starved of funds and they have to shoulder much responsibility of maintaining the rural roads while the forest department has no dearth of funds and the road length is small.

Accessibility of Villages: The most important aspect of road development is road connectivity or accessibility of settlements, particularly the rural settlements in inaccessible areas. In this respect, the percentage of villages without any roads given in Table no.10 is an indicator of development. The districts of Hassan (17), Uttara Kannada (22%) Belgaum (12%) and Chitradurga (10%) which are considerably large in area have large percentage of villages without any roads. Similarly, the percentage of villages with Katcha non-motorable roads that can be calculated from the given figures in Table No.11,
## TABLE No.11
ROAD DEVELOPMENT IN KARNATAKA
1956 - 1980

<table>
<thead>
<tr>
<th>S.No.</th>
<th>District</th>
<th>Percentage of Villages Road Length</th>
<th>Road Length</th>
<th>Net Variation Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Connected by all weather Roads</td>
<td>No Roads</td>
<td>Fair weather Roads (motorable)</td>
<td>1956</td>
</tr>
<tr>
<td>1.</td>
<td>Kodagu</td>
<td>88</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>2.</td>
<td>Dakshina Kannada</td>
<td>72</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>3.</td>
<td>Mandya</td>
<td>68</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>4.</td>
<td>Belgaum</td>
<td>66</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>5.</td>
<td>Bellary</td>
<td>61</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>6.</td>
<td>Mysore</td>
<td>60</td>
<td>4</td>
<td>26</td>
</tr>
<tr>
<td>7.</td>
<td>Dharwad</td>
<td>60</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>8.</td>
<td>Chitradurga</td>
<td>54</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>9.</td>
<td>Bijapur</td>
<td>54</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>10.</td>
<td>Shimoga</td>
<td>53</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>11.</td>
<td>Kolar</td>
<td>42</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>12.</td>
<td>Tumkur</td>
<td>43</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>13.</td>
<td>Chikmagalur</td>
<td>42</td>
<td>2</td>
<td>47</td>
</tr>
<tr>
<td>14.</td>
<td>Bangalore</td>
<td>42</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>15.</td>
<td>Raichur</td>
<td>36</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>16.</td>
<td>Uttara Kannada</td>
<td>35</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>17.</td>
<td>Gulbarga</td>
<td>34</td>
<td>1</td>
<td>41</td>
</tr>
<tr>
<td>18.</td>
<td>Bidar</td>
<td>30</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>19.</td>
<td>Hassan</td>
<td>29</td>
<td>17</td>
<td>36</td>
</tr>
</tbody>
</table>

is also a pointer. Such roads need conversion into all-weather motorable roads. Thus, there is need for development of rural roads on high priority and much remains to be done in this regard.

(ii) Railways

The first railway line in Karnataka connected Bangalore with Jalarpet and to Madras as early as 1859 and since then the development of railways is sketchy. The rail length is less than 10 Kms. per 1000 sq.Km in Dakshina Kannada, Raichur and Kamkur Districts. Practically there was no railway in the three districts of Dakshina Kannada, Chikmagalur and Kodagu until the new Hassan Mangalore railway line was completed. Uttara Kannada district has no railway till this date although the Hubli-Karwar railway survey work was completed in 1880s.

There are a number of dead-ends like Talaguppe, Kottur, Rayadurga which could be developed economically. The coastal region has no rail link. There are many taluks which have no rail link whatsoever and even where some railway line passes through, there are no halts for fast trains and many taluks do have railway but without any railway stations. In fact, in one of the Constituencies the Parliament election was boycotted to demand for a railway station. Surprisingly, the route length of railway is taken as an indicator of development in most of the economic analysis. It is found that in the absence of railway stations in many taluks the available rail length is of no use.

There are many agri-commercial towns like Sokak, Mahalingpur, Jammkhandi, Ilkal-Hungund in the districts of Belgaum and Bijapur where there are not rail facilities to move the agricultural produce and raw materials. Similarly, there are towns like Kunigal, Malavalli, Madikeri in the southern Maidan which do not have rail facilities. Even the road facilities are poor and most of the Highways run parallel to the Railway and thus there is competition rather than complementarity between road and rail transport.
The Road and railway maps along with the map of road accessibility given here shows the nature of transport development in Karnataka. Northern Karnataka Plateau has a skeletal network of railway as well as roads and the road accessibility is poor. Similarly, much of Dharwad, Belgaum, Hassan and Chikmagalur, Kodagu, Dakshina Kannada and Bijapur districts have poor accessibility. Here the accessibility factor has been assessed on the basis of the number of villages in each taluk without any roads and the percentage of settlements without (i) motorable roads, (ii) any sort of road connection, and (iii) with fair weather motorable roads. Presently, there are 19 cities with population of more than 1.1 million and the number of towns in the population range of 20,000 to 50,000 are and all these settlements are located within a range of 25 km. from the nearest railway stations, notwithstanding that most of them are located on the Railway route. However, the number of settlements that are inaccessible to railways includes 27 small towns and townships in the population range of 1000 to 10,000, 12 towns in the range of 10,000 to 20,000 and 3 large towns with 20,000 to 50,000 population. (See Fig. No. 20&21)

The newly constructed Hassan-Mangalore railway line fulfilled the long-felt need for connecting the New Mangalore Port with its hinterland; but it is still bogged down with numerous technical problems like landslides and disruption of transport during the SW Monsoon. However, it is a great technological feat that the railway engineers have achieved in the implementation of this Western Ghat Railway Project. A similar challenge awaits the engineers when they take up the Hubli-Karwar Railway. The existing and proposed railway line are shown in map. (See Fig. No.22)

The economics of rail transport particularly in the long-distance haulage of iron ore, manganese has been discussed at length by various expert committees and there is no single voice
of dissent regarding the indispensibility of the Hubli-Karwar railway. The project would open the vast hinterland of the north Karnataka Plateau and connect it to Karwar, one of the most beautiful natural ports in the world as some Japanese experts have put it. As at present, the iron ore is being transported all the way from Hospet (Sndur and Donimalai) to Vishakapatnam and Madras ports via Guntakal, over distances ranging from 600 Km. to more than 1000Km, whereas the same could be easily hauled within 150 Kms. via Hubli. Even the existing Birur-Falaguppa railway line could be easily extended to Bhatkal and Karwar. The survey work has been completed for most of these lines, but the projects are held up on the grounds of economic feasibility and paucity of funds. But there is no doubt regarding the profitability since the development of railways will have far-reaching all-pervassive social and economic cumulative advantages to the people of these backward regions. Integrated development demands a long term perspective planning, especially development of cheap and efficient means of transport.

Geographical inertia and centuries-long isolation of the coastal people have significantly affected the tempo of social and economic development of the region and the interaction between the coastal people and the Malenadu Tracts as well as the interior Plateau or Maidan has been extremely poor. This aspect needs a careful consideration while plan allocations are made amongst the various diverse geographical regions. There is need for a re-alignment of routes which now converge at Bombay and Madras.

(iii) Inland Waterways:

About 445 Km. of navigable waterways of which 285 Km. of waterways can be developed. Another 160 Km. of canals are vanigable and when fully developed, the present inaccessible farms can be connected to markets and canals are ideal source
of cheap means of transport at present. It is proposed to develop 72 inland waterways and ply 590 ferries at an estimated cost of Rs.540.00 Million. However, this depends upon the availability of central assistance as also the availability of technical men and equipment. Already, a distance of 120 Km. of canal from Gangavati to Raichur is navigable and 70,000 tonnes of goods can be moved over this waterway.

One of the major problems facing the development of inland waterways is the lack of interest since it is considered a slow and inefficient. It is not the question of speed but the very nature of the means of transport calls for innovation. Inland waterways can be developed into a very attractive trade if a few fibre-glass boats and steamer launches are introduced into the navigable canals and pick-up stations are established at key points. Farm products such as fruits and vegetables and farm surpluses can be moved to weekly market centres and regulated markets effortlessly at cheaper rates. This task can be entrusted to unemployed engineering graduates, particularly those who are specialised in transport and mechanical engineering. Kumaran has convincingly argued that it is not the speed that is relevant but the 'total delivery time from the point of origin to the point of destination' and it would be definitely cheaper to transport goods by means of water transport than by road or rail.

Karnataka Government established a Shipping Corporation and soon found it an uneconomic venture and closed it down. This shows the poor insight into development problems and the sheer inefficiency of the persons handling such important establishments.

Development of inland waterways got an impetus on the recommendations of the Gokaula Inland Water Transport Committee (1959). Accordingly, the State Government should maintain the ferries regardless of the expenditure and profit and the system of auctioning the ferries be discontinued. The
Responsibility should be fixed with the Panchayats. These recommendations have been endorsed by Bhagavati Committee, 1970, who have further recommended that the operation of ferries should be under the technical control of the Department of Ports and Harbours.

Karnataka has set up an Inland Water Transport Organisation (IWTO) under the Directorate of Ports and Inland Water Transport (IWMT). A beginning has thus been made during the Fourth Five Year Plan and 7 ferries managed by the Public Works Department (PWD) and 8 ferries operated by the Taluk Development Boards (TDBs) have been brought under the IWTO. Non-availability of funds has been reported to be the main cause for the operation of 29 ferries on lease basis. A sum of Rs.3.50 Million has been provided for IWTO under the FYP IV (1974-78) out of which only a sum of Rs.2.49 Million has been utilised. This shows that money is not the sole criterion in development efforts and much of the effort should come from the expertise, ingenuity, technical knowhow and innovation diffusion under efficient leadership of the Directorate.

Nearly 33 navigational schemes are proposed to be taken up for modernisation during the Revised FYP VI (1980-85) at a cost of Rs.2.57 Million. Ancillary schemes like the provision of technical facilities, workshops, and repair facilities of the mechanical boats, traffic and hydrographic surveys and provision of life saving appliances and navigational aids are under study.

The much needed transport facilities in the newly irrigated districts of Bellary and Raichur by way of development of inland navigation when fully developed would also remove regional imbalances. The following urgent steps are needed in order to improve the existing infrastructure in these districts: 1. Construction and operation of floating crafts should be undertaken on the lines of those existing in Goa.
2. Creation and maintenance of navigable channels and other infrastructure under a capable organisation; 3. Installation and maintenance of navigational aids to navigation; 4. Terminal facilities such as loading and unloading, berthing, storage Godowns and such others; 5. Further, management of water transport business and other regulatory business are also essential. These would go a long way in changing the very structure of transport in the Command Areas.

iv) Air Transport

Development of air transport in Karnataka is still in its infancy. Except for a link of Bangalore with Bombay, and another with Hyderabad and Coimbatore, there is no other link within the State. After a great deliberation with the Centre, a new link was established between Bangalore and Belgaum. There are a number of large towns of historic importance and tourist interest which need immediate air links. (See Map.) Even the work started on the construction of an airport for the commercial city of Hubli-Dharwad was abruptly stopped. Hence, it is clear that the development of air transport, like the railway, is also under the central list and the State has very little scope for initiative and drive in the matter.

Agricultural Development

In the first place, 'development is inevitably a normative term and in order to achieve the aim of the full development of the potential of human personality, enough food is absolutely essential'. Food production is the main concern and more so of the developing countries like India in general and Karnataka in particular where it is imperative that food production has got to keep pace with the growth of population. Agriculture and allied activities which are directly concerned with the production

of food and the basic raw materials for industries still predomi-
nate the economic activities. By the definition of agri-
culture is concerned with the utilisation and where possible
the improvement of the natural genetic and growth process of
plant and animal life, to the end that these processes will
yield the vegetable and animal products needed and wanted by
man.

Karnataka has derive topographical, climo-edaphic condi-
tions which makes it a show place for botonical and livestock
resource development. Practically all types of agriculture
ranging from 'jhum' cultivation to modern plantation agriculture
and ranging from wet land to dry land cultivation, are found
here. The complex interaction of the three basic elements-
climatic, soil, topography play a large part in influencing the
spatial pattern of agricultural production. At least one or
the other taluk in each district of the State emerge as a high
yielding taluk and thereby prove the strong rural economic base
that the State can be proud of. Rice, jowar, ragi, wheat, cotton,
sugarcane, grams, tur, oilseeds, tobacco, coffee, cardmum, pepper
and chillies, onion and potatoes, mulbery and coconut, arecanut,
banana, cocoa and rubber constitute the variety and pattern here.
The State can be proud of. Rice, jowar, ragi, maize, wheat, cotton,
sugarcane, varieties of grams and tur, oilseeds, tobacco, onion,
chillies, potatoes, mulbery, coffee, tea, pepper, cardmon and
rubber, banana, arecanut and coconut, rubber and cocoa constitute
the range of agricultural products and the pattern of agriculture
in Karnataka. There are the aspects of modernisation of agricul-
ture, supply of inputs including an assured supply of water,
irrigation techniques, tools and equipment, better seeds, farm
machinery, etc. There are factors like the high incidence of
adult illiteracy, the preponderance of religious and blind faith,
poor economic transport and market facilities and a reasonable
support price for the produce which have greatly affected affec-
ted development of agriculture to the desired level of modern

---


66. Lloyd and Dicken, p.69.
scientific levels. There are barriers to smooth diffusion scientific and technological innovations. With such a background, it is noteworthy that there has been a substantial gain in certain fields of this vital area of human activity. The following Table No. 12 brings out the physical achievements in the agriculture sector and the crop-wise production data is given in Appendix V.

The achievements in respect of production of foodgrains can be worked out in terms of per capita availability, although it is not the home production only that goes into the distribution system in the State. In 1951, it was 198.13 Kg as against 194.44 Kg as per triennial average of per capita availability and it puts Karnataka in a bad state. But here again, it is important to note that not all the increase in population is a natural one and much of it is by immigration and thus it is misleading. Increase in the yield is a much surer way of measuring agricultural prosperity and the increasing returns from land is thus a better indicator of development.
TABLE NO.12

PHYSICAL ACHIEVEMENTS IN AGRICULTURE

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>Unit</th>
<th>1951</th>
<th>1979</th>
<th>Net Variation in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Area under Forests</td>
<td>% of TGA</td>
<td>18.31</td>
<td>19.20</td>
<td>+ 0.89</td>
</tr>
<tr>
<td>2.</td>
<td>Total Cropped Area (TCA)</td>
<td>% of TGA</td>
<td>54.00</td>
<td>58.38</td>
<td>+ 4.38</td>
</tr>
<tr>
<td>3.</td>
<td>Net Area Sown (NAS)</td>
<td>% of TGA</td>
<td>52.31</td>
<td>54.20</td>
<td>+ 1.89</td>
</tr>
<tr>
<td>4.</td>
<td>Net Area Irrigated</td>
<td>% of NAS</td>
<td>6.88</td>
<td>13.65</td>
<td>+ 6.77</td>
</tr>
<tr>
<td>5.</td>
<td>Area Under Foodgrains</td>
<td>% of TCA</td>
<td>71.79</td>
<td>72.24</td>
<td>+ 0.45</td>
</tr>
<tr>
<td>6.</td>
<td>Area under Commercial Crops</td>
<td>% of TCA</td>
<td>24.24</td>
<td>26.76</td>
<td>+ 2.52</td>
</tr>
<tr>
<td>7.</td>
<td>Area under HYV</td>
<td>% of NAS</td>
<td>16.00</td>
<td>23.00</td>
<td>+ 7.00</td>
</tr>
<tr>
<td>8.</td>
<td>Area under HYV Cereals</td>
<td>% of NAS</td>
<td>31.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>Production of Foodgrains:</td>
<td>in Million Tonnes</td>
<td>3.84</td>
<td>7.50</td>
<td>+93.31</td>
</tr>
</tbody>
</table>


From an analysis of the investment of plan funds in agricultural development and the physical achievements in the agriculture and allied activities sector, it is revealed that a huge sum of ₹455.20 millions have been provided for and the performance is 94.88% as could be seen from the actual expenditure of ₹4323.00 millions during 1951-80. As regards the production of foodgrains the increase is 88.42%, oilseeds 51.57%, but the pulses have shown a negligible increase. The most significant increase is in respect of cereal production which has recorded an increase of 99.45%.

Production per hectare of cultivated area has shown an increase of 187.27%. The production has increased from 0.55 to 1.03 tonnes. The foodgrains as a whole have shown a 83% increase over the 30 years. But the declining per capita food production during 1951-80 brings out both the bliss of agricultural produc—
ction and the blisters of population growth. This also makes it amply clear that any increase in the production of foodgrains will not automatically bring down either the per capita availability or the market prices of the commodity as is evident from the huge influx of outside population into the State on the one hand and the five fold increase in prices of the foodgrains on the other.

However, it is quite significant to note that agricultural production has shown increase despite the large areas, almost 66% reeling under drought year after year at frequent intervals during the last 30 years. 96 out of the 175 taluks are affected by drought or scarcity conditions in 3 out of five years. The Chart (See Fig. No. iv) shows the fluctuations in production of foodgrains and the rainfall during the last 30 years.

Cropping Pattern:

Of the total cropped area food crops occupy 65.57% of which the cereals account for 55.66% and the remaining pulses. The three major commercial crops, viz sugarcane, groundnut and cotton occupy 18.50%. The area under the High Yielding Varieties (HYV) is 24.65% of the total area under food crops. Hence, the area under traditional agriculture is still as high as 75.35%. The HYV share of jowar is 19.05%, followed by Ragi 10.81% and Rice, 10.49%.

There is a clear-cut regionalisation among the three major cereals with one of the cereals dominating the region as the first ranking crop. Jowar ranks first in the northern Maidan, ragi in the Southern Maidan, and rice in the coastal region and the river valleys of the Malenad tracts as well as the lowlying flood plains and valleys of the Maidam. Bajre (5.84%), minor millets (4.02%) and wheat (3.63%) are some of the other important crops that share 13.49%. Wheat has almost
invaded the cooler black soil tract of Belgaum, Dharwad and Bijapur districts, where 0.13 million hectares is under the crop. It is a winter crop.

Zimmerman has emphasised the complex interaction of the three basic elements—climate, soil and topography, which influence the spatial pattern of agricultural production. Almost all the vegetable and animal products needed by man are obtained from agricultural and allied activities. A such, not only the largest proportion of the total work force (69.8%) is engaged in agriculture and allied activities, but the largest proportion of the cultivated land is also under food crops. It amounts to 65.57%. Incidentally, it is the agricultural sector that contributes a major share of the State Income (52.36%) whereas the secondary and tertiary sectors contribute about 21.3% and 26.51% respectively.

Agricultural Development:

Karnataka has achieved significantly higher yield levels of several major crops in the Country. The achievements in respect of higher yields are given in the Table No. 13 along with the crop area and production of selected crops for the period 1956 and 1980. (See Table No. 13). Rice yield has reached 2051 Kg. per hectare in Karnataka as against the all-India average of 1082 Kg. per hectare on triennial basis. Similarly, maize has recorded 2249 kg. per hectare (India: 970 kg/hectare) ragi 1356 kg per hectare (India: 1047 kg/hectare) and jowar 923 kg/hectare as against all India triennial average yield of 688 kg. per hectare. Sugarcane and small millets also show higher yields. See Table No. 12.

In case of all the crops except cotton, the yields in Karnataka were higher than the average for India during 1979-80.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rice</td>
<td>0.88</td>
<td>1.08</td>
<td>1330</td>
<td>2051</td>
<td>1.18</td>
<td>2.23</td>
<td>22.73</td>
</tr>
<tr>
<td>2.</td>
<td>Ragi</td>
<td>0.93</td>
<td>1.12</td>
<td>1356</td>
<td>0.90</td>
<td>1.44</td>
<td>20.43</td>
<td>60.00</td>
</tr>
<tr>
<td>3.</td>
<td>Jowar</td>
<td>2.67</td>
<td>1.97</td>
<td>370</td>
<td>923</td>
<td>0.95</td>
<td>1.67</td>
<td>-26.22</td>
</tr>
<tr>
<td>4.</td>
<td>Bajra</td>
<td>0.57</td>
<td>0.60</td>
<td>-</td>
<td>445</td>
<td>0.16</td>
<td>0.25</td>
<td>5.26</td>
</tr>
<tr>
<td>5.</td>
<td>Maize</td>
<td>0.01</td>
<td>0.16</td>
<td>-</td>
<td>2249</td>
<td>0.01</td>
<td>0.45</td>
<td>1500.00</td>
</tr>
<tr>
<td>6.</td>
<td>Wheat</td>
<td>0.31</td>
<td>0.38</td>
<td>220</td>
<td>647</td>
<td>0.07</td>
<td>0.26</td>
<td>22.58</td>
</tr>
<tr>
<td>7.</td>
<td>Minor millets</td>
<td>0.52</td>
<td>0.41</td>
<td>-</td>
<td>0.15</td>
<td>0.23</td>
<td>-21.15</td>
<td>53.33</td>
</tr>
<tr>
<td>8.</td>
<td>Oilseeds</td>
<td>1.19</td>
<td>1.32</td>
<td>580</td>
<td>7433</td>
<td>0.69</td>
<td>0.84</td>
<td>10.92</td>
</tr>
<tr>
<td>9.</td>
<td>Cotton</td>
<td>1.15</td>
<td>0.99</td>
<td>107</td>
<td>145*</td>
<td>0.30</td>
<td>0.71</td>
<td>-13.91</td>
</tr>
<tr>
<td>10.</td>
<td>Sugarcane</td>
<td>0.05</td>
<td>0.15</td>
<td>62.2</td>
<td>72**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


* Limit: ** Tonnes G = Groundnut - NA NOT AVAILABLE
In case of rice, wheat, tur and cotton, there has been an increase in yields since 1970-71. The average yields of wheat, cotton and groundnut in the State are less than the All-India average during 1979-80. Maize has shown a decline in yield. The seasonal conditions are highly variable and the performance of agriculture has to be assessed in this background. The State is yet to attain self-sufficiency in pulses and oilseeds although such a condition is not emphasised by the National Council of Applied Economic Research (NCAER) in its Techno-economic survey of Karnataka.

AGRICULTURAL PRODUCTION:

In Karnataka as a whole, rice occupies the first place in respect of production although it ranks second in the area and contributes 31.89% of the total foodgrain production as the lead crop. It is followed by jowar 23.93%, ragi (17.25%), and pulses (8.83%). In area, rice has only 14.83% as compared to jowar 25.04%, pulses 17.87%, and ragi 13.02%. Thus, the rank order has changed. It is significant to note here that 14.83% of the area produces 31.89% of rice production in Karnataka. But in respect of pulses 17.87% of the area produces only 8.83% of the production due to low yields, but the pulses command a higher market price than rice. Jowar occupies 25.93% of the total cultivated area which produces about 23.93% of the total foodgrains and the position of ragi is also no better since 17.25% of cultivated area produces only 13.02% of foodgrains. Thus, the yield factor is very important in this spatial analysis which should improve in case of ragi and jowar. Area and production of selected crops is given in Table No.13 and it brings out clearly the trend of agricultural production since the beginning of the Second Plan in 1956 to the year 1979-80.
AGRICULTURAL ZONES

The number of taluks with rice as the 'lead crop is 45 as against 49 taluks for ragi, 64 taluks for jowar and only 17 taluks for pulses. (See Maps Fig Nos. 26-29). The zoning of these crops is distinct. The coastal and the Malenadu tracts are dominated by rice and monoculture almost prevails in the coastal taluks. Pulses occupy the river valleys of the Bhima, the Don, and the Manjra and the 'lead' districts are Bidar and Gulbarga. These two regions are quite distinct in all respects physiographically, climatologically and edaphically. (See Map. Fig No. 25)

While jowar dominates the northern Plateau, ragi occupies most of the dry parts of the southern Maidan. These four crops - rice, ragi, jowar and pulses, break off in a distinct zonation by the climo-edaphic factors. While the pulses dominate the dry climate of the north, the rice predominated the wet western coast. Jowar and wheat dominate the northwestern parts. The drought-resistant ragi is acclimatised to the red loams and sandy soils of the south and southeast, while the clayey low lands with better irrigation are taken over by rice here. The black cotton soil tracts of the north-central and northern parts are dominated by jowar.

AGRICULTURAL CONCENTRATION

While rice is an irrigated crop, ragi and jowar are dry crops and depend on the Monsoons. Both behave well with the slightest punctuality of the Monsoons and fail with the erratic ones. Very high fluctuations are evident from the Graph (See fig No. 4)

There are very interesting points which put some of these 'lead' crops into the limelight. For instance, just 9.42%
of the rice area in 8 taluks produces as much as 17.70% of the State's total rice production. Similarly, 9.63% of the jowar area in just 10 taluks produces as much as 18.50% of the State's total jowar production. These are evidently the high yielding taluks which could be developed to advantage. The 'lead' taluks under each of the 'lead' crop is given in Agricultural (Appendix v) and the high yielding taluks are shown in Map. (See Fig No.25) But a majority of the ragi and pulses taluks show low yields and these are invariably the taluks which are frequently affected by droughts and scarcity. For instance the years 1956, 57-59, 61-62, 1965-66, 1968-69, 72-73, 75-78 and 79-80 were drought years.

Agricultural Yields

The trend of yields over time is a good measure of an area's agricultural development performance. Here again, a sound data base is lacking and absolutely no such comparable data at taluk level is available as yet. There are record harvests in years of generally poor agri-crop years. This should reflect on the effect of distribution of rainfall on agriculture in Karnataka.

Karnataka with 3.01% of the total rice land in India ranks tenth in the country and in production it ranks 9th with 4.8% of total rice production. But in average yield, it ranks second with more than 5000 kg. per hectare, only next to Gujarat. With regard to jowar, Karnataka with more than 18% of the country's total production ranks second only to Maharastra, that too with just 12.4% of the total area under jowar. Thus, Karnataka tops in respect of yield in India. Again, the State with 41.9% of the country's ragi area and 39.4% of the total ragi production ranks first. As the NCAER gas put it, 'self-sufficiency need not be the criterion in deciding the strategy for development of agriculture in any State'.

68. NCAER: Techno-economic Survey of Mysore State, New Delhi, p.28.
GOVERNMENT OF KARNATAKA
IRRIGATION MAP
OF KARNATAKA
SHOWING
MAJOR & MEDIUM IRRIGATION PROJECTS

SCALE: 1 INCH = 10 MILES

SOOKHAN BASIN
A MAJOR IRRIGATION PROJECTS
1. K. Raja
2. K. Shankar
3. K. Pushkar

BHARATA BASIN
A MAJOR IRRIGATION PROJECTS
1. Krishna
2. Cauvery
3. Tunga
4. Kalyan
5. Krishna
6. Cauvery
7. Tunga
8. Kalyan

CANNES BASIN
A MAJOR IRRIGATION PROJECTS
1. Krishna
2. Cauvery
3. Tunga
4. Kalyan

VANAYAN BASIN
A MAJOR IRRIGATION PROJECTS
1. Krishna
2. Cauvery
3. Tunga
4. Kalyan

WATERWAYS
1. Krishna
2. Cauvery
3. Tunga
4. Kalyan

INDEX
1. GOVERNMENT OF KARNATAKA
2. IRRIGATION MAP
3. SCALE
4. SOOKHAN BASIN
5. BHARATA BASIN
6. CANNES BASIN
7. VANAYAN BASIN
8. WATERWAYS

TAMIL NADU
ARABIAN SEA
KARNATAKA
CROP REGIONS

RAGI
JOWAR
RICE
SUGARCANE
COTTON
WHEAT

BOUNDARIES:
STATE -- DISTRICT -- TALUK
KARNATAKA
HIGH YIELDING TALUKS

INDEX
- Rice
- Jowar
- coconut
- pulses
- plantation crops
- Ragi

BOUNDARIES:
STATE — DISTRICT — TALUK —
Further, in most of the crops, Karnataka is a low yielding State as a number of natural factors are adversely affecting crop production. Soils are heavily leached in Malenadu tracts and soil erosion is rampant in the dry interior north Maidan. Moreover, as a plateau, country, the soils are not deep and they lack humus. In places, the soils are acidic and deficit in most of the much-needed soil nutrients for plant growth. Heavy manuring is required but the corresponding quantity of water is lacking since high-energy manuring has to be adequately compensated with water. Hence, farmyard manure is the only solution. Much of the interior plateau is too open for wind action under hot and dry conditions. In Bijapur district alone, winds erosion has caused depletion of natural soil by 45% to 60% and there is an urgent need for checking this by appropriate soil conservation measures. A well planned cropping pattern should aim at a priority for cereal and pulses followed by cash crops preferably, oilseeds, cotton and sugarcane, or tobacco depending upon the suitability of the soils.

PERCAPITA CONSUMPTION

The per capita cereal consumption has increased from 173 Kgs. in 1955-56 to 188 Kgs. in 1979-80. The position with regard to pulses and oilseeds has remained static at 22 Kgs. per annum, despite an increase in production from 0.38 million tonnes to 0.79 million tonnes during the same period. The increase in population has off-set the increase in production of oilseeds and pulses and hence the nutritional deficiency continues.

The cereal requirement for the 1990s' is more than 10.00 million tonnes as against the actual production of 7.50 million tonnes in 1980. The pulses requirement would be of an order of 1.60 million tonnes as against the actual production of 1.30 million tonnes during the same period and this marginal deficiency can be made good by adopting the appropriate strategies.
The overall deficit in cereal and pulses would be of the order of more than 2.80 million tonnes by 1990, and would increase further in view of the unchecked rate of population growth. It is due to the neglect of cultivation of oilseeds, the per capita is only 6 kgs. per annum and it has remained static over the last twenty-five years. The requirement is of the order of 1.05 million tonnes as against the actual production of only 0.70 million tonnes in 1980.

THE HIGH YIELDING VARIETIES OF SEEDS (HYV)

The HYV seeds have been introduced under the Intensive Agriculture Development Programme (IADP) financed by the World Bank. So far, only 25% of rice, 18% of Jowar, and 12% of ragi lands have come under the HYV seeds. The wheat area is small but the HYV is 17%. This indicated the scope for further intensive development of agriculture. But the HYV seeds need more water and fertilisers than the traditional seeds, but unfortunately both are lacking in Karnataka in large tracts. As it stands, rice (64.1%), followed by maize (12%) takes away a lion's share of the available irrigation water. The other crops like jowar (3.4%), bajra (2.3%), wheat (6.9%), groundnut (6.5%), and cotton (4.3%) take a smaller share of the irrigation. There is need for very scientific planning in the Command Areas (CAs) of the new irrigation projects and the approved cropping pattern should be strictly enforced. Potentials in agriculture should be fully utilised in order to meet the increasing demand for cereals pulses, oilseeds as well as industrial raw materials like cotton, mulbery and tobacco.

SPATIAL DISPARITIES

An analysis of the district-wise data on the agricultural production is not adequate to indicate the regional variations due to wide disparities in the factors of production within the districts. There is also non-comparability of data due to not only the non-availability but also due to spuriousness where
At the outset, there is a general decline in agricultural production performance since the 1970s due to recurrent droughts and scarcity conditions in most of the districts. Three districts viz Dakshina Kannada, Mandya and Bidar have shown a positive variation in the range of 7.0% to 15.0%, while the rest of the seventeen districts have shown negative variations. It is worthwhile to note that eight districts show a decline in production exceeding 30%. These are Tumkur, Shimoga, Mysore, Chikmagalur, and Bellary in the southern Maidan and the other three districts are Belgaum, Dharwad and Gulbarga in northern Maidan. Another five districts have shown decline in the range of 20% to 30%. Only three districts have shown less than 20% of decline in 1976-77 over the period 1970-71 production level. A crop-wise analysis reveals the following:

(a) Jowar: In respect of jowar area, the overall increase for the State is only 1.49%. The districts that have gained in area are: Hassan (75.6%) and Chitradurga (53.26%), Tumkur (48.02%) Mysore (23%) during 1956-77. The variation in production is as much as 991.44% in Hassan followed by Bidar 144.86%, Tumkur 110.95%, Dharwad 63.96%, Chitradurga 30.67%, Raichur 15.49% and Mysore 8.98%. All the other districts have shown a decline in production.

While the average yield of jowar is 444 kg. per hectare, the HYV has given an yield of 2008 kgs per hectare in Karnataka as a whole. The district of Dharwad has recorded the highest yield of 3,613 kg/ha, followed by Mandya 2,532 kg/ha. The districts of Raichur, Bijapur and Belgaum have produced more than 2000 kg/ha, while the highest production of the local varieties stand in the range of 500 kg/ha. Belgaum and Bellary which fall within the jowar zone, lag behind Shimoga in yield. The above analysis brings out clearly the wide fluctuations in respect of area and production of jowar in Karnataka. A very
high yield is indicative of the suitability of the crop to the region, but the declining area in this zone needs be investigated. The increasing trend in the core region is a sign of the rapid development of agriculture in respect of jowar.

(b) Ragi: So far as ragi is concerned, Bellary is emerging as the leading district with 90.89% increase in area and a 121.87% increase in production. But Chitradurga district has the highest increase in production (363.75%) as against an increase of only 48.12% in area. Kolar, the traditional ragi district has shown a 15.27% increase in area and 136.7% in production compared to 14.35% increase in area and 35.91% in production in Mandya district, another conventional ragi producer. Mysore district has shown a 4.61% increase in area and 84.26% increase in production. On the other hand, Tumkur has shown an increase of 15.69% in area and 44.74% in production. The district of Dharwad has less than 1.0% increase in area but has shown an increase in production by 73.75% although it lies outside the conventional ragi belt. Belgaum which lies within the conventional ragi belt, has a decline of 20.03% area and 20.32% production. This shows stagnation in respect of yield and decline in area and production. Bangalore district in Mysore Plateau shows only 23.37% increase in area, but a 161.99% increase in production. Of the remaining two districts-Chikmagalur in the core area shows a decrease of 4.04% in area and 5.23% decrease in production, while Shimoga district has recorded a 15.59% increase in area and 44.79% increase in production.

Very high yields of ragi are reported from Tumkur, Belgaum, Dharwad and Mandya districts with more than 500 kg/ha, followed by Chikmagalur 498 kg/ha. While the average yield is 465 kg/ha, for the State. The HYVs have higher yields of more than 1230 kg/ha., in Kolar, Chitradurga and Tumkur districts, followed by Bangalore (1,152 Kg/ha.) and Dharwad (1,133 kg/ha.)
(c) Rice: The position of rice as a lead crop among cereals is evident in the area, production and yield and the district of Raichur has emerged as the 'lead' district with a 249.41% increase in area, followed by Kolar and Chitradurga, both outside the conventional rice zone, showing more than 120.0% increase each, while Shimoga, Mysore and Kodagu show a marginal increase of 8.0% to 16.0%. All other districts show a decline in area in 1976-77 over the 1955-57 figures. Increase in production is also noteworthy only in respect of Raichur 251-52%, Chikmagalur 255.27%, Bellary 323.74%, and Tumkur 545.96%. Belgaum shows only 45.36% increase in production as against a decline in its area under rice by 6.84%. Dakshina Kannada, the conventional rice zone has only 16.68% increase in production as against a decline in its rice area by 21.27%. The position of Uttara Kannada, another conventional rice zone district, it is still poor with a decline in production by 11.23% as against a gain of 0.36% of area.

Surprisingly, the conventional rice district of Mandya also shows a decline in both area and production with 21.67% and 3.53%, respectively. Thus, in all the conventional rice districts, Mandya in the southern Maidan and the two coastal districts, there is very little change in area and production during 1955-60, as they have reached saturation level. But the position of rice in Raichur, Chitradurga and Kolar districts is quite encouraging. It should be clear that a decline in area with an increase in production is an indication of progress, while an increase in area with declining production, or even an increase in production, is not that satisfactory. In fact, it is the ultimate objective to attain an increase in production with as little or no increase in area under the crop as possible, so that better diversification and economics can be achieved.
KARNATAKA

RICE

(Area in $)$ of net area sown

KARNATAKA

WHEAT

(Area in $)$ of net area sown

[Map of KARNATAKA showing the area in $)$ of rice and wheat cultivation]
In respect of yield of rice, the position of Karnataka with a 2,345 Kg./Ha. is better than the all India average of 1,151 Kg./Ha. The 'lead districts' are: Mandya 2,660, Bellary 2,720, Raichur 2,044, Chitradurga 2,009, Dakshina Kannada 1,747 and Uttara Kannada 1,187 kilograms per hectare. An intensive development in the latter two districts is imperative since these are the conventional rice districts suitable for rice but show very low yields at present. In fact, more than 70% of their net area shown is under rice and it is a monoculture. Thus, there is need for a closer look into the problem of low productivity of rice in the coastal region.

(d) Pulses: Pulses provide the much-needed protein and as such there is a great demand for a variety of pulses. Next to the three cereals zones, the pulses zone needs a careful analysis in respect of area, production and productivity. Pulses occupy a small tract of the drought-prone areas and still dominate the agricultural scene. Although the area under pulses is limited to a meagre 30,000 to 35,000 hectares, particularly in the districts of the southern Maidan-Mandya and Kolar, these have shown an increase during 1956-77 both in area (235% to 245%) and production (75% to 175%). Mandya has a higher production.

The conventional pulses zone comprises Bidar and Gulbarga districts in the northern Maidan which possess a high incidence of droughts. Still pulses dominate as dry crops in these two districts and Bidar, having 0.10 million hectares, and Gulbarga with 0.24 million hectares, constitute the 'lead' districts. These two districts have shown an increase of 110% in area under pulses during 1956-77. The position is widely fluctuating in other districts. As staple food crops in many districts, pulses cultivation techniques and priority has to be given to the pulses zone in agricultural planning.
An analysis of the above shows that there is ample scope for improvement of agriculture, particularly increasing the yields through better inputs and scientific farming practices in almost all the crops. Efforts shall have to be made to increase the yield in core regions and gradually spread to their respective peripheral regions in all the cereals and pulses zones and thereby a balanced development can be easily achieved.

The overall performance of agriculture in Karnataka gives an indication of the economic health of the rural areas. In this respect, the position is none too satisfactory. The net income per hectare of cultivated area is about ₹3,600 which gives a paltry sum of ₹631.58 ps. per year for a family of 5.7 persons depending on small farms. This works out to ₹73 ps. per head per day and obviously, more than 80% of the farmers in many taluks who own less than 2 hectares fall below poverty line of ₹4,000. Despite their social status as land owning farmers, their income does not exceed ₹3.46 ps. per head per day. This should throw some light on agricultural development and help set right the pitfalls in agricultural planning.

**Agricultural Efficiency**

Karnataka has diverse topographical and agroclimatic conditions which make cultivation of a variety of crops possible. Crops ranging from fruits like grapes, oranges and citrus to cereals like wheat are raised; besides, Karnataka has a place of pride in cultivation of coffee. The fundamental difficulty in measuring agricultural efficiency in different parts is thus obviously on account of the range and variety of crops. Agricultural efficiency, as a concept, means the degree to which the economic, cultural, technical and organizational variations, i.e. the man made framework of farming, are able to exploit the physical resources of the area for agricultural production.
'The spatial variation in physical output from the soil are
the result partly of natural environmental combination and
partly of the combinations of human activities'.

METHODOLOGY: Farm harvest price and the purchasing capacity
of the farmers derived from their agricultural avocations are
the two basic tenants on the basis of which one can measure
the agricultural efficiency of a region. It is ultimately
this money that goes to determine the poverty line and the
economic status of the farmers above or below this line. This
parameter has been built into the model provided here. The
Rupee value of per hectare return of an average small and
Marginal Farmer and Agricultural Labourer (SMFAL) is taken into
account in the computation of the Performance Index (Ip).

The Performance Index (Ip):

The maximum efficiency of performance can be worked out
by taking the actual yield in the taluk cropwise. This perform­
ance index (Ip) is a very simple but efficient technique in
finding the agricultural efficiency of a region. It is also an
indicator of the potential of the region and the gap between
the actual productivity and the potential gives the efficiency
limit. While the performance index (Ip) is the real state of
affairs, the optimum or the desired level of development can
be fixed and a realistic plan can be formulated to develop
agriculture in different regions. Based on the assumption that,
given the required amount of inputs such as assured supply of
water, better seeds, farmyard manure, fertilisers and
pesticides, improved tools, scientific guidance and attractive
support prices for the produce, there exists a certain maximum
capacity of land which would be the best exploited by hard
working labour to the best of their ability. But such an optimum
condition rarely exists with the result that the performance
falls short of the achievements on any 'model farm'. Thus,

P-252. Also see, A new Technique for Measuring Agricultural
the performance index (Ip) can be calculated on the basis of
the following formula:

\[
\text{Performance Index } Ip = \frac{Y_{ij}}{Y_o} \times 100
\]

\[
\text{also, } Ip = \frac{Y_c}{c} \times 100
\]

Where, \( Y_{ij} \) represents yield of the \( i \)th crop in \( j \)th
district, and
\( Y_o \) represents the optimum yield.

As Seers\(^70\) has observed, 'together, the performance
index "and the per acre gross value composite productivity index
will help to put the agricultural efficiency of a region in
ranking order'.

Performance Index can be separately calculated for the
food crops and the non-food crops in order to arrive at a more
meaningful assessment of the agricultural efficiency of the
region. As Seers has reiterated, 'enough food is absolutely
essential, and there is need for giving a high priority for
food in the development programmes'.\(^71\) Hence, the Ip for food
crops and non-food crops have been calculated for the 175 taluks
of Karnataka by taking into account the farm productivity,
harvest price and regional variations. The results are given
in Appendix-VI and the same have been shown in Map. See Fig.

While the performance index of individual crops, it out
the performance in respect of that particular crop, it is not
possible to assess the overall agricultural efficiency by Ip only.
Various authors have suggested that the 'crop combination
techniques' as a necessary exercise in this context. According
to Weaver's method,\(^72\) the group of crops arranged in a ranking

---

70. Ibid., p.
order, distribution of which deviates the least from the mean values of the theoretical statistical model of combination of patterns, is recognised as the valid combination for the area under study. Test of minimum variance for each possible group is calculated to find out the least deviation from the accepted norm. This model has a certain inherent weakness and has been criticised by Ayyar, Ahmad, Siddiqui, and many others such as Shafi, Bhatia and Sinha. Some of them have tried to modify the same. While Dudley Stamp has inducted 'the carrying capacity' of the land, Jasbir Singh has taken the calorific value of the food crop in order to bring out the efficiency of the crops in feeding the people. The per acre Gross value of productivity has been presented by Sharma.

Sharma's per acre gross value of productivity formula gives due weightage to the importance of various crops as reflected by the relative percentage of the area under the crop to the total cropped area under the total number of crops. Adopting a uniform price, it has been possible to aggregate the per acre physical productivity for the 175 taluks of Karnataka in this analysis. However, it would be better to take the optimum capacity of the per acre, or hectare productivity under the crop instead of the State average and assess the performance of the individual farm unit. This will be a more realistic approach and will help assess the region's economic health in a more pragmatic way.

The performance index (Ip) of the value of 1.0 or below 1.0 should indicate the relative deficiency and the consequent inability to contribute its share while the Ip of 1.0 plus indicates the surplus. The detailed values are given in Appendix (See Appendix V). In respect of food crops, there is a balanced regional distribution. The taluks of the southern Maidan, in the Cauvery Basin, show an Ip of 2.0 and above. This region is

75. Sharma, P.S.( ): Agricultural Regionalisation of India.
followed by the taluks of Kolar district in Pennar Basin. Both these fall in the ragi zone with rice and sugarcane as dominant irrigated crops, and potato, groundnut and pulses as supplementary crops.

The second important region is the Tunga Bhadra Basin where irrigation is efficient. Here ragi, rice, sugarcane, are important and these are followed by jowar, oilseeds and pulses. This is one of the major surplus areas of the State.

The third important region is located in the Ghataprabha Basin where the rainfall is good and where irrigation facilities are well developed. Here again, rice, wheat, sugarcane, jowar, ragi, oilseeds and pulses occupy the cropping pattern. The soils are fertile as compared to the southern Madan taluks and some of the taluks in Belgaum are surplus.

Outside the three major regions, there are a few taluks in the Malenadu tracts and in the Upper Krishna Basin which are surplus ones. The newly irrigated tracts under the Malaprabha Basin have been slowly emerging as surplus taluks with wheat, cotton, jowar, chillies, etc.

In respect of non-food crops, the picture is not very encouraging since most of the taluks including the ones in which there is assured water supply, do not show much promise and these require an in-depth study as to the causes. However at the outset, the vagaries of the Monsoon and the low fertility of soils are mainly responsible for low efficiency here. Very few taluks emerge as surplus ones. They are: Belgaum in Ghatprabha Basin, the taluks of Bhadra Basin, and the taluks of the Cauvery and the Tunga Bhadra Basin. These show low values.
The dominant crops under the non-food crops are cotton, sugarcane, tobacco, oilseeds (mostly groundnut, sesame and sunflower) and chillies. Most of these directly enter the market and their surplus indicates a flourishing local market.

**Table No. 14**  
**INDUSTRIAL PRODUCTION**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Unit</th>
<th>1956</th>
<th>1980</th>
<th>Net Variation in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron and Steel:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Pig Iron</td>
<td>Tonnes</td>
<td>62,560</td>
<td>71,056</td>
<td>+ 13.58</td>
</tr>
<tr>
<td>(b) Ingot Steel</td>
<td>&quot;</td>
<td>37,529</td>
<td>119,839</td>
<td>+ 219.32</td>
</tr>
<tr>
<td>(c) Finished Steel</td>
<td>Tonnes</td>
<td>34,834</td>
<td>93,306</td>
<td>+ 169.29</td>
</tr>
<tr>
<td>(d) Ferro alloys</td>
<td>Tonnes</td>
<td>15,107</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td>Million Tonnes</td>
<td>0.558</td>
<td>1.47</td>
<td>+ 163.44</td>
</tr>
<tr>
<td>Sugar</td>
<td>&quot;</td>
<td>0.05</td>
<td>0.29</td>
<td>+ 480.00</td>
</tr>
<tr>
<td>Vanaspati</td>
<td>Tonnes</td>
<td>4,023</td>
<td>2,549</td>
<td>- 36.64</td>
</tr>
<tr>
<td>Paper</td>
<td>Tonnes</td>
<td>33,735</td>
<td>65,827</td>
<td>+ 95.13</td>
</tr>
<tr>
<td>Aluminium</td>
<td>Tonnes</td>
<td>-</td>
<td>39,080</td>
<td></td>
</tr>
<tr>
<td>Textiles:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Cotton Cloth</td>
<td>Million Mtrs</td>
<td>79.87</td>
<td>95.65</td>
<td>+ 19.76</td>
</tr>
<tr>
<td>(b) Silk Fabrics</td>
<td>Thousand Mtrs</td>
<td>81.00</td>
<td>90.30</td>
<td>+ 11.48</td>
</tr>
<tr>
<td>Beer</td>
<td>Thousand Letres</td>
<td>4,000</td>
<td>12,000</td>
<td>+ 200.00</td>
</tr>
<tr>
<td>Sandalwood oil</td>
<td>Thousand Kgs</td>
<td>74.00</td>
<td>44.30</td>
<td>- 40.14</td>
</tr>
</tbody>
</table>
INDUSTRIAL DEVELOPMENT:

'Industrialise or perish' was the dictum of Sir M.V. who steered the economic development of Mysore during the early part of the present Century. Under the benevolent rule of the Maharaja of Mysore, he had a free hand to execute the plans to develop hydro-electric power from Shimsha and Shiva-samudram as well as Mahatma Gandhi Hydro-electric Power Station at Jog, to develop irrigation from the River Cauvery by the creation of the world-famous KrishnaRaja Sagara and its Brindavan Gardens, setting up a iron and steel works at Bhadravati utilising the iron ore of Kemmannugundi, and the establishment of a paper mill and cement plant at Bhadravati, a sugar mill in Mandya, a sandal oil factory at Mysore and a number of silk filatures and silk spinning mill at Channapatna, etc. This should drive home the fact that even before Independence, Old Mysore State was a pioneer in industrial development.

After Independence, the Five Year Plans were started under the guidance of the National Planning Commission (NPC), New Delhi. The total plan investments under Industries sector for 1951-1980 is of the order of Rs.1,445.50 millions including mining. This is hardly 5.0% of the total plan outlay and this should indicate the priority given for industrial development in the State. By and large, industrial development has not taken place in commensurate with the resource endowments of the State. The Old Mysore State was first in first among the States of the whole of the British Empire and now it is one of the least developed in this respect.

Under the policy of 'mixed economy' and the Government of India Industrial Policy 1948 and the policies announced subsequently, the private sector had to develop a wide range of capital goods industries and the consumer goods such as cement, sugar, paper, alluminim, electrical and mechanical engineering goods, food processing and textile industries. The public sector has entered areas reserved for the private sector with the result that the private sector made huge profits while the public sector became
a liability incurring huge losses year after year. In the words of former President N. Sanjeeva Reddy, ‘it had to be established that the mixed economy concept which India accepted as a matter of policy was the most suitable for us’. The Industrial Policy statement of 1980, clearly lays down the socio-economic objectives to promote industrial development in an orderly way. But now it is felt that the ‘mixed economy’ concept has been working at cross purposes, especially in the light of the spelt objectives of establishing equity and social justice as well as achieving a balanced regional development.

Profit maximisation is the accepted principle of private enterprise and the consequences of any industrial development under private sector will ultimately end in concentration of wealth in a few hands and in a few areas of rich resources. Karnataka is no exception to these.

Even as early as 1902, industrial development started in an orderly way so that the Government could start a number of factories on their own under the Department of Industries and commerce in Mysore. Yet another noticeable feature of this industrialisation is that a number of factories were started in the industrially backward areas of Malenadu – Shimoga district. The wide distribution of silk filatures and textile mills shows a balanced regional development and a healthy regional policy. But, after Independence, particularly under the Five Year Plans, more than 40% of the industries came to be highly concentrated, particularly in and around Bangalore City.

---

NUMBER OF FACTORY UNITS IN '000.
GROWTH OF INDUSTRIES:

During the last three decades 1950-80, there has been no structural change in the economy of Karnataka. The percentage of industrial workers has remained more or less around 10%. Thus, it has remained static. The rapid increase in the number of industrial units from 1635 employing 0.172 million workers in 1956 has no doubt increased to 8,581 number of units with 0.415 million workers in 1980 thereby showing a small annual increase of 6.43%. But this has been of no avail since there is no structural change in overall distribution of the workforce among the various sectors. Increase in population has offset the marginal increase here.

The physical achievements by way of increase in production is given in the following Table No.14. But the actual increase in contribution of the industrial sector to the State Income is 21% showing a 1.06% of annual increase at 1956 prices. These things make a sad reading of the industrial development of the State. Unless a more pragmatic industrial policy is mooted, there is no scope for any change in the present situation.

INDUSTRIAL STRUCTURE

There is a three-tier industrial structure with the large and medium sized industries at the apex, the small industries in the middle and the broad-based village industries and handicrafts at the bottom or household level. This structure is, however, not appropriately integrated with the necessary forward and backward linkages in technology feedback with the result that each one has remained completely independent of the other. It is strange that even the small scale industries designed to meet the ancillary supplies of the large industries have remained isolated thereby facing the problem of marketing their products.
In fact, any scientific and technological development is one should have been transferred down to the household industries level thereby achieving the much-needed sophistication and diversification badly required at the present stage of industrial development in India. An integrated development of three-tier industrial establishments would have brought a total revolution. Karnataka has a reputation for a number of handicrafts and village industries since very early times. All these have been of no avail at present.

**PERFORMANCE OF LARGE INDUSTRIES:**

The industrial policy of the State Government is to develop the infrastructure and encourage investments in industries. It is rarely the policy to start new factories on their own. However, liberal capital investments are forthcoming from the State Government in the form of shares, grants and subsidies. Except for a summary assessment of the performance of some of the prominent industries in the form of increase in production, it is not possible to assess the actual development and performance of large industries in Karnataka. The following Table No.15 gives the details of employment and value added by selected industries (See Table No.15).
# TABLE NO. 15

**INDUSTRIAL DEVELOPMENT**

(Selected Industries)

1978

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Industry</th>
<th>No. of Units</th>
<th>No. of Reporting Units</th>
<th>Value added (Rs. in Thousands)</th>
<th>Percentage Share of Total Industrial production by value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Electricity</td>
<td>12</td>
<td>32,800</td>
<td>321.36</td>
<td>15.04</td>
</tr>
<tr>
<td>2.</td>
<td>Radio, TV &amp; Electronics</td>
<td>12</td>
<td>17,000</td>
<td>283.80</td>
<td>13.28</td>
</tr>
<tr>
<td>3.</td>
<td>Cotton Spinning, Weaving, etc. (Mill Sector)</td>
<td>33</td>
<td>36,500</td>
<td>278.34</td>
<td>13.03</td>
</tr>
<tr>
<td>4.</td>
<td>Motor Vehicles, Scooters, etc.</td>
<td>16</td>
<td>12,100</td>
<td>153.63</td>
<td>7.19</td>
</tr>
<tr>
<td>5.</td>
<td>Electrical Industrial Machines</td>
<td>12</td>
<td>10,000</td>
<td>123.12</td>
<td>5.76</td>
</tr>
<tr>
<td>6.</td>
<td>Iron and Steel Industry (Mini Plants)</td>
<td>14</td>
<td>16,850</td>
<td>101.66</td>
<td>4.76</td>
</tr>
<tr>
<td>7.</td>
<td>Machine Tools</td>
<td>18</td>
<td>9,500</td>
<td>94.93</td>
<td>4.44</td>
</tr>
<tr>
<td>8.</td>
<td>Paper and Paper Board</td>
<td>8</td>
<td>7,700</td>
<td>86.87</td>
<td>4.07</td>
</tr>
<tr>
<td>9.</td>
<td>Drugs and Pharmaceuticals and Perfumes</td>
<td>20</td>
<td>2,200</td>
<td>55.00</td>
<td>2.57</td>
</tr>
<tr>
<td>10.</td>
<td>Cigarettes, etc.</td>
<td>3</td>
<td>2,300</td>
<td>48.00</td>
<td>2.25</td>
</tr>
<tr>
<td>11.</td>
<td>Sugar</td>
<td>12</td>
<td>7,200</td>
<td>44.71</td>
<td>2.09</td>
</tr>
<tr>
<td>12.</td>
<td>Cement, lime and Plaster</td>
<td>5</td>
<td>3,900</td>
<td>44.52</td>
<td>2.08</td>
</tr>
<tr>
<td>13.</td>
<td>Aluminium</td>
<td>4</td>
<td>1,300</td>
<td>38.72</td>
<td>1.81</td>
</tr>
<tr>
<td>14.</td>
<td>Malt, Liquors, (Beer, etc.)</td>
<td>3</td>
<td>1,100</td>
<td>31.26</td>
<td>1.40</td>
</tr>
<tr>
<td>15.</td>
<td>Printing, Publishing and News Papers Pub.</td>
<td>20</td>
<td>2,200</td>
<td>30.00</td>
<td>1.40</td>
</tr>
<tr>
<td>16.</td>
<td>Vanaspati, Paints, etc.</td>
<td>19</td>
<td>2,000</td>
<td>27.01</td>
<td>1.26</td>
</tr>
<tr>
<td>17.</td>
<td>Plywood, furniture etc.</td>
<td>14</td>
<td>4,500</td>
<td>18.50</td>
<td>0.87</td>
</tr>
<tr>
<td>18.</td>
<td>Porcelains &amp; Chinawares, etc</td>
<td>4</td>
<td>1,700</td>
<td>13.90</td>
<td>0.65</td>
</tr>
<tr>
<td>19.</td>
<td>Cashewnut Processing</td>
<td>11</td>
<td>4,700</td>
<td>11.35</td>
<td>0.53</td>
</tr>
<tr>
<td>20.</td>
<td>Silk Textiles</td>
<td>23</td>
<td>4,300</td>
<td>8.90</td>
<td>0.42</td>
</tr>
<tr>
<td>21.</td>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annual Survey of Industries, Govt. of Karnataka, 1973-74.
A brief account of the nature and trend of development of a few selected large industries is discussed here in order to highlight the need for an integrated balanced regional development in the State.

i. Iron and Steel: The Mysore Iron and Steel Works, now renamed as the Visveswaraya Iron and Steel Ltd. (VISL) was started in Bhadravati 1923, and the plant had an initial installed capacity of only 30,000 tonnes. Now, the Steel Plant is fully modernised with an electric arc furnace in the place of charcoal furnace, and the installed capacity has been raised to 0.20 million tonnes. The VISL specialises in the manufacture of a variety of steels

contd....
in addition to the manufacture of pig iron and finished steel. Abundant iron ore from Kemmannugundi in the Baba Budan Ranges and the limestone, manganese, chromite available closeby, attached Visveswaraya to set up the factory here, but the present-day planners did not come forward to expand this factory to a 2.00 million tonne capacity and this shows the pitfalls in the planning. On the other hand, two new steel plants were proposed a decade ago and none ever materialised.

As compared to the large-sized steel plants of the Eastern Sector, the VISL is very small. But an opportunity is lost when the new expansion schemes did not contemplate on large installed capacity. The available iron ore from Kudremukha nearb, and Sharavati hydel power could have been a base here instead of the proposed Vijayanagara Steel Plant to be located at Torangal near Hospet, or a coastal, Mangalore Steel Plant suggested by some experts. Anyway, Karnataka needs a large iron and steel manufacturing unit of a atleast a 4.00 million tonne capacity to fully utilise the available mineral resources.

ii. Textiles: Karnataka has a well established textile industry manufacturing cotton, silk, woolen and polyfibre goods and the silk industry has earned a place of pride as a foreign exchange earner. The textile mills are well distributed all over the State. (a) Cotton Textiles: The first cotton textile mill was started at Mysore in 1888 and now there are 15 composite textile mills and 10 spinning mills in the State; many more are in the offing. There is a parallel handloom sector placing a high demand for cotton and nearly 90% of the cotton grown in the State is either locally consumed or exported to Bombay. The handloom sector is as old as the history and culture of Karnataka and there are 100% weaving settlements and a high degree of specialisation is conspicuous. While every effort is being made to develop the handloom sector, the large scale modern mills are also being encouraged to fully utilise the available resources. Some of the cotton spinning and weaving mills are in the co-operative sector while many others are in private hands.
Bangalore, Mysore, Davangere, Gulbarga, Bijapur, Belgaum, Hubli-Dharwad, Bellary have all developed as major textile manufacturing centres. About 33 cotton spinning and weaving mills employ 0.37 million persons and produce around 82.00 million metres of cloth. The production of cloth in the mill sector has not shown much variation over the last three decades. Only 1965 production year has a record of 95.00 million metres of cloth production and the rest around 80.00 million metres.

iii. Silk Textiles: Twenty four silk filatures, weaving and spinning mills produce 90.30 thousand metres of silk materials and in 1956, the production was 81,000 metres of silk textiles. This shows a marginal increase over the three decades.

iv. The Woolen Industry: There are 4 large woolen manufacturing units and as such have not gained much prominence, although it is significant that in a tropical climate woolen manufactures have been making headway in the form of woolen blankets, shawls, suitings and over-alls and sweaters. The Bangalore unit had a very lucrative market since the beginning and made huge profits during the world war days. Now, most of the mills are in a state of doldrums. The industry has not made any attempt to diversify or modernise in recent years.

An integrated textile industrial policy is yet to be formulated; if any progress is anticipated, it is to be in the field of increasing number of units but not in any other fields like blending of yarns or diversification. As at present, the textile industry occupies a high position next only to the electric and electronic industry by value added by manufactures.
Other Industries: Paper, cement, vanaspati, sugar are some of the other important industries that have made significant strides in recent years. The distribution of these units is shown in Map and the production figures are given in Table No. 14. As regards, the spatial distribution of industries, no industry is as widely scattered as the sugar industry. Still Belgaum district emerges as a dominant one with almost 25% of the State's units located here. Belgaum is also emerging as a textile centre, automobile workshop centre and a centre for processed foods, alluminium and electronics. Structurels and fabrications have entered in a big way and many ancillary industries have sprouted in recent years. The sugar industry has carried industrialisation to almost the sugarcane fields and should now activise other industries.

The paper mills are located in the Malenadu transition belts along forest fringes as in Bhadravati, Dandeli, Nanjangud, Mysore. Dandeli and Bhadravati have large potential and show promise. But the supply of raw material has already become a serious problem in addition to the shortage of power. A caustic soda factory at Binaga near Karwar, a chemical and fertiliser factory at Mangalore and the newly proposed oil refinery at Mangalore and the sponge iron factory closeby, are the other important units.

A number of medium and small cement manufacturing units have come up in different parts of the State. Bhadravati, Audityapatna near Tumkur, Bagalkot, Lokapur, Talikoti, Gadi, Shahabad and Karaganta are some of the locations giving rise to a small localised zone in the north Maidan, except the two southern locations. In the absence of a clear-cut policy of industrialisation of Karnataka either in a long-term perspective plan or in the Five Year Plans, there is no organised spatial development planning as yet.
Large scale industrialisation has come to much abuse in the hands of capitalists who have exploited the available natural and human resources with utter disregard for the welfare of the local people and ecological balance. Large scale water pollution in the case of Dandeli and Harihar, air pollution in the case of Belgaum, Bagalkot and Tuinkur, and other nuisances created by these factories in Bangalore have already become serious problems. High incidences of human diseases, cattle diseases, damage to coconut plantations and water pollution have assumed larger dimensions than hitherto anticipated. Now, there is a rethinking on the very concept of large scale industrialisation as a strategy of development.

'The industrialisation strategy should change in favour of small scale plants to eradicate unemployment of rural illiterates'.77 As at present, nearly 47% of the total industrial units are of large and medium size and the remaining are small and village industries. It would be feasible to develop the latter and thereby develop skills at the grass root level with low capital input and power. The large industries are highly capital-intensive, high energy-based and generate very little employment opportunities. For instance, the Indian Aluminium Industry at Belgaum, set up at a cost of Rs.2000.00 million has not provided employment to 2000 persons. Rather, under Indian conditions, there is no other go but to turn towards rural industrialisation based on appropriate technology and alternative energy sources. Already the new Vijayanagar Steel Plant is postponed on one pretext or the other; if shortage of power is one of the reasons this year, lack of capital the next year, and want of appropriate technology the next year, are the pretexts under which the project is postponed. One can read between lines here.

INDUSTRIAL ESTATES

As a first step, the industrial estates were set up in a number of districts with the twin objectives of balanced regional development and dispersal of industries. Towards planned urban growth, it was considered desirable necessity to set up these industrial estates on the outskirts of cities and towns where industrial potentials such as labour, market, raw materials and utilities exist. Well designed lay-outs with all the necessary infrastructural facilities such as roads, water supply, power and sheds have been provided. But in the early years, the plan failed to attract the entrepreneurs since the industrial estates were far away from their residences and involved transport costs. Further, there was no binding on the large industries to co-operate with the small entrepreneurs with the result there was no co-ordination. Many industrial sheds were found to be vacant and in some sheds the non-industrial activities appeared counter to the desired objectives.

The total number of sheds in the industrial estates region-wise is as follows: The southern Maidan had 131 sheds with Bangalore as the highest (87) followed by Ramanagaram (12), Mysore (16) and Tumkur (15). The northern Maidan had 162 sheds prominent among them being Belgaum (48) Hubli (60), and Gulbarga (16), and Bijapur (26), Raichur (6), Bellary (6). In a way, the industrial estates paved the way of rural industrialisation since the required infrastructure was easily forthcoming. But the desired objective of providing assistance to self-employed technical persons and the development of the ancillaries to the locally established large industries remained a distant dream.

Many big industrialists and rich business people took the advantage of the industrial shed to locate their godowns and thus it benefited the rich persons more than the poor and the deserving young entrepreneurs for want of requisite capital and technical
know-how. All these show that proper planning has not gone into the projects. Anyway, it is too early to properly assess the impact of the Industrial estates on the industrialisation programmes.

SMALL SCALE AND VILLAGE INDUSTRIES:

The small scale and village industries constitutes the backbone of rural non-agricultural economy and it is quite strong in some taluks but it is equally frail in most of the taluks. A clear picture emerges from the Map (Map No. 19) in which all the large, medium, small and village units are shown and this should give an idea as to the need for an integrated approach to industrial development programmes.

The number of small scale industrial units increased from 3230 in 1956 to more than 20,000 in 1980. Bangalore district has the largest number of units (1,900), followed by Dharwad (1,370), Dakshina Kannada (1,280) and Chitradurga and Mysore having 1,200 units each. Other important districts are Tumkur and Kolar (850) each, Belgaum (712), Shimoga (700) Bijapur (600) and Uttara Kannada (513). The Government of Karnataka have already taken steps to identify the artisans and give them all possible help to revive their rural handicrafts. But a number of problems such as availability of raw materials, power and organised market are still there. For instance, even bamboo is not available sources. Similar cases of non-availability of sandalwood, matchwood, soapstones, ivory, horns, etc. are reported during the author's field work of rural areas. Kumta, Honnavar, Sirsi, Sagar, Channapatna, Gokak and Khanapur are some of the important centres of crafts where the problems need an in-depth analysis.