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Irrigataion And Economic Development

A Comparative Regional Analysis of Karnataka State

ABSTRACT

The economic development of Karnataka is mainly dependent on the development of agriculture. Irrigation is the main infrastructure for development of this vital sector. The modernization of agricultural practices vis-à-vis increase in productivity of crops cannot be conceived in absence of assured irrigation facilities. The importance of irrigation development in a State like Karnataka therefore, needs no special emphasis. Like other leading States in India, the programmes for development of irrigation in Karnataka has been launched under two heads, viz., Major, Minor & Medium Irrigation. The present paper attempts to identify the irrigation and agricultural development disparities in the state, regions which beset within the purview of other regions of the state and provide justification for renewed and reinforced as well as developmental focus on this region.

1. INTRODUCTION

Irrigation through canals, wells and other sources is considered as a catalyst of economic development of a country. Numerous studies have confirmed on the role of irrigation in increasing crop productivity, intensity of cropping in India since the evolution of planning. However, it also helps in reducing instability in crop production, changes the cropping pattern in favour of high valued crops, reduces inequality in income among various section farmers in the society. Simultaneously, some scholars pointed out that the inequity in sharing gains of development resulting from investment in irrigation and some drew attention to the increase instability of farm output. Irrigation is not certainly considered as blessings on the mankind. Its side effect in the shape of water logging and salinity within the large canal commands have been considered as one of the important negative impact on the farms output. Based on the theoretical framework, the financial, economic, social and environmental aspects of the project are analysed by applying the familiar cost-benefit analysis technique.

The economic development of Karnataka is mainly dependent on the development of agriculture and irrigation is the

main infrastructure for development of this vital sector. The modernization of agricultural practices vis-à-vis increase in productivity of crops cannot be conceived in absence of assured irrigation facilities. The importance of irrigation development in a State like Karnataka therefore, needs no special emphasis. Like other leading States in India, the programmes for development of irrigation in Karnataka has been launched under two heads, viz., Major & Medium Irrigation and Minor Irrigation. While the Irrigation Schemes are classified as Major, Medium and Minor, they are categorised as Surface Flow, Surface Lift (For Major / Medium and Minor) and Ground Water Lift (for Minor only).

At present three Departments, viz. Irrigation, Agriculture and Panchayat & Rural Development are associated with development of irrigation facilities in the State. While the Irrigation Department, which is the Nodal Department for development of irrigation in State, executes and maintains Major, Medium and Minor Irrigation Schemes, the irrigation works of the other two departments are confined to Minor Schemes only. It may further be mentioned that the Karnataka State Minor Irrigation Development Corporation

(ASMIDC) Ltd. was also earlier closely associated with the development of Minor Irrigation in the State by installing Private Shallow Tube Wells (STWs) and Low Lift Points (LLPs) through provision of institutional finance upto 1992-93. But its field works have since remained suspended due to stoppage of institutional finance.

Karnataka is one of the leading states in the country in terms of growth and development measured in all development indices, it has not been able to ward off the problems of regional imbalance therein. Although, historical antecedents like carving the state areas from adjoining states, differential degrees of fertility, climatic conditions, rainfall and natural resources are considered as factors, responsible for regional differences in pace and the level of development efforts need to be made to set right these imbalances by deliberate and purposive plans and allocation of developmental resources accordingly. The present paper attempts to identify the irrigation and agricultural development disparities in the state, regions which beset within the purview of other regions of the state and provide justification for renewed and reinforced as well as developmental focus on this region.

2. LAND UTILIZATION IN KARNATAKA

Out of the total geographical area 1, 90, 49,836 hectares, the Gross Cropped Area of Karnataka is 1,24,38309 hectares

(2006-07). Against this, the ultimate irrigation potential i.e. the ultimate Total Net Irrigation Potential (Annually Irrigable Area) to be created is assessed at 2946310 hectares, which constitutes 15.46 per cent of the Gross Cropped Area. Utilization of land in Karnataka is not homogeneous. The total geographical area of the state is 1, 90,49,836 hectares, the land utilization pattern in the state can be understood by Table-1.

The table reveals that the net area sown in the state is 1,24,38,309 hectares and it accounts 52.85% of the total geographical area (61.14 lakh hectares in NK region and 41.44 lakh hectares in SK region). On the other hand, 46.15% of the geographical area is distributed to other activities like, forest (16.08%), land not available for cultivation (11.01%), other un-cultivated land (9%) and fallow land (10%). But, geographical area is not equal distributed between SK and NK regions. NK region has highest geographical area than the SK region. Where as 44.36% of geographical area in HK region to the total NK region geographical area. Forest, land not available for cultivation and other un-cultivable land is more in SK region than NK region but fallow land and net are sown area is more in NK region than the SK region. HK region has less in all activities of land utilization in NK region. It shows nature also created regional disparities in the state.

3. MAJOR AND MEDIUM IRRIGATION SCHEMES IN KARNATAKA

Table-1

Land Utilization in Karnataka, 2006-07 (Hectares)

Activities	Karnataka	South Karnataka	North Karnataka	Hyderabad Karnataka
Total Geographical area	1,90,49,836	92,36,720	98,13,116	43,53,507
Forest	30,71,833	16,27,977	14,43,856	2,41,431
Land not available for cultivation	21,50,894	13,92,316	7,58,578	3,90,484
Other un-cultivated land	16,42,609	13,34,889	3,07,720	1,90,989
Fallow land	20,80,038	9,93,663	10,86,375	6,58,129
Net area sown	1,24,38,309	45,82,552	78,55,757	35,64,029

Source: Karnataka at a Glance, 2007-08, pp. 32-38.

Different crops require different quantities of water supply throughout the growing period. The total water requirement of a crop varies from 10.6 acre-inches for mustard to 95.0 acre-inches for sugarcane. Quantity of water for other crops are; linseed 12.7 acre-inches, barely 14.1, wheat 14.8, maize 17.8, Jowar 25.7, groundnut 26.1, chilies 38.8, paddy 41.7 and cotton 42.2 acre-inches.

The state has five major river basins, namely Krishna, Cauvery, Godavari, several west flowing rivers and north and south pennar. Of the total estimated yield under catchments rainwater of 98,406 million cubic meter about 48,000 mn. cum, of water is economically utilized within the state. The development of major and medium irrigation system is based on the field situation at the river basin.

River Krishna has highest irrigated area under planned and ongoing projects, which compared to other river basins. The area of 39.89% are balanced of major ongoing projects and 71.13% of area is balanced in medium ongoing projects, when compared to Cauvery basin it is very less i.e., 38.64% area is balanced in major and 49.93% area in medium ongoing projects. The ongoing and medium projects are very high in Krishna river basin compared to Cauvery river basin due to lack of administration, corruption and political influences. In Godhavari river basin, the entire potential is to be exploited. On an average, both the Krishna and Cauvery river basins 38 to 39% of the potential under ongoing major irrigation projects. The ongoing medium irrigation projects in both Krishna and Cauvery river basins the area of 71% and 50% are yet to achieved. According to Nanjundappa Report on "Regional Imbalance", the remaining area of 11.62 lakh hectares can be covered under major and medium irrigation schemes, at an additional cost of Rs. 13,088 crores. These

projects can be fully implemented in several districts of Krishna and Cauvery river basins.

4. MINOR IRRIGATION SCHEMES IN KARNATAKA

Minor irrigation schemes consists of tanks, lift irrigation, anicuts, pickups, bhandaras, salt water exclusion dams, vented dams etc. under minor irrigation schemes, the other water related problems can be solved. The minor irrigation schemes can be implemented in 9,25,645 hectares. The area of 75 to 79% of the minor irrigation schemes are implemented in South Karnataka region, but the area of 24.21% is implemented in North Karnataka region.

Status of development in all irrigation schemes is expressed in the Table-1 by taking into consideration of three indicators of North and South Karnataka region. Efforts should be made to achieve better utilization of the existing irrigation potentials by the figure showed in the below table. In NK region 70% of the estimated costs have been already incurred, only 32% is utilized. Still a significant potential area is left in NK region to raise the been quite low as shown in Table-3. During the last three years there is a major progress in the irrigation front. As against the total area of 3.6 lakh hectares in 1997-98, there is a increase of 26.72 hectares, the net area irrigated in 2001. The share of irrigated land in NK region has been relatively improved. But the HK region lagging behind the state as well as SK and NK regions i.e., only 37.86% net irrigated area to the total net area irrigated in NK region, it can be understood by the following table.

5. NET AREA IRRIGATED IN KARNATAKA

There is serious problem with the irrigation schemes when it comes in implementation. Against the irrigation potentials created the actual utilization has been quite low as shown in Table-3. During

the last three years there is a major progress in the irrigation front. As against the total area of 23.6 lakh hectares in 1997-98, there is an increase of 26.72 hectares, the net area irrigated in 2001. The share of irrigated land in NK region has been relatively improved. But the HK region lagging behind the state as well as SK and NK regions i.e., only 37.86% net irrigated area to the total net area irrigated in NK region, it can be understood by the following table.

It may be observed from the above table that the net irrigated area is higher in NK region than the SK region i.e., 57.98% of NK and 42.02% of SK region. Canals are the major source of irrigation in Karnataka; it has covered 36.57% land to total irrigated area, followed by bore wells i.e., 20.40%. Majority of land is irrigated from canals in SK and NK regions. When we compare between SK and NK regions, NK region has highest land irrigated through the canals than

Table-2
Status of Exploitation of Irrigation in NK&SK region

Sl.No	Particulars	Percentage of utilization (TMC)	Percentage of Irrigated area(Ha)	Percentage of Expenditure(Rs/lakh)
I	Major Irrigation			
	1)SK region	58.77	40.80	10.07
	2)NK region	26.92	41.75	55.78
II	Medium Irrigation			
	1)SK region	09.00	08.54	19.27
	2) NK region	05.31	08.91	14.88
III	Total Major & Medium			
	1)SK region	67.77	49.34	29.34
	2)NK region	32.23	50.66	70.66

Source: Computed from Nanjundappa Report on Regional Imbalance of Karnataka, 2002, p.30.

Table-3
Net Area Irrigated in Karnataka (Ha), 2006-07

Source of Irrigation	Karnataka	South Karnataka	North Karnataka	Hyderabad Karnataka
Canals	10,30,438	3,62,497	6,67,941	3,76,864
Tanks	1,91,691	2,11,194	49,702	14,373
Wells	3,72,236	1,02,814	2,69,422	69,141
Bore wells	9,55,216	5,19,462	4,35,754	1,23,539
Lift Irrigation	1,18,698	18,218	1,00,480	34,710
Other Sources	2,78,031	56,856	2,21,175	8,152
Total Net Irrigated Area	29,46,310	12,24,387	17,21,923	6,29,542

Source: Karnataka at a Glance, 2007-08, pp. 40-41.

Table-4
Area Under Important Crops in Karnataka (Hectares)

Name of the regions	Total Cereals & Minor Millets	Total Pulses	Commercial Crops
Karnataka	5078106	2315690	2039093
SK Region	1965470	504984	735960
NK Region	3112636	1810706	1303133
HK Region	1091446	1123663	466192

Source: Karnataka at a Glance, 2007-08, pp. 43-44.

Table-5
Production of Important Crops in Karnataka, 2006-07 (Hectares)

Name of the regions	Cereals & Minor Millets	Pulses	Commercial
Karnataka	8490157	838855	44004602
SK Region	3995549	213358	11932224
NK Region	4494608	625497	32072376
HK Region	2034768	410469	3940366

Source: Karnataka at a Glance, 2007-08, pp. 47-48.

in SK region i.e., 39.32% in NK and 32.76% in SK region to the total net irrigated area, followed by tanks in NK and bore wells in SK region. Majority of land in HK region also irrigated through canals i.e., 62.23% it is highest from the state average and followed by wells i.e., 19% of the land irrigated to the total irrigated area of NK region.

6. AREA UNDER IMPORTANT CROPS IN KARNATAKA

Karnataka is having a variety of soil distribution and receiving normal rainfall, soils are suitable for growing many crops. The following table gives the details of cropping pattern in Karnataka.

The above table shows that, the main feature of the area under crops in Karnataka is predominance of cereals and minor millets over other crops of the total cropped area of 97.04 lakh hectares, cereals and minor millets are grown in an area of 50.78 lakh hectares and also highest grown in NK region i.e., 31.26 lakh hectares to the total area of cereals and minor millets, 19.65 lakh hectares in SK region and 10.91 lakh hectares in HK region. Pulses and commercial crops are cultivated more in NK region (13.03 lakh hectares of pulses and 13.03 lakh hectares of commercial crops). But pulses are cultivated more in HK region (11.23 lakh hectares) compare to SK region i.e., 5.04 lakh hectares.

7. PRODUCTION OF IMPORTANT CROPS IN KARNATAKA

Total production of agricultural produce reflects the combined effects of area and quantity in the state shown in Table-5.

The above table reveals that, majority of cereals and minor millets (Paddy, Ragi, Jowar, Bajra, Maize, Wheat and minor millets) are highest output in NK region i.e., 44.94 lakh tones, similarly, majority of pulses (Gram, Tur and Other pulses) were highest output in NK region i.e., 62.54 lakh tones.

The output of pulses in HK region is higher than the SK region to the total production of pulses in NK region. Commercial (Groundnut and Sugarcane) crops output is also highest in NK region i.e., 320.72 lakh tones. Regarding cotton output is also highest in NK region i.e., 6.56 lakh bales, but in HK region it is less if compare to NK and SK region.

8. REGION-WISE CLASSIFICATION OF AGRICULTURAL LABORERS IN KARNATAKA

The agricultural laborers are the spring of an agrarian economy. Although all over the state, the conditions of agricultural laborers are simply appalling as they are miserably poor, and their level of living is too low than the riches. Most of them illiterates and some political factors also responsible in the rural areas, they are divided to lead a normal social life. The general indication is that, a major proportion of agricultural laborers are drawn from Scheduled Caste, Scheduled Tribe and Backward classes and they are confined by the caste structure in these backward regions. At present 62.09 lakhs people belong to these and their earnings or livelihood is depends on categories the development of irrigation in the state. The following table indicates region wise distribution of agricultural labour force during the year 1991 and 2001 census.

The table reveals that, distribution of agricultural labours in the state varies from region to another region, during 1991 and 2001 census. In the 1991 census, 20.94 lakhs in SK region and 29.04 lakhs of agricultural labours in NK region out of 49.99 lakhs of state total agricultural labours. But 48.88% of the agricultural labours in HK region to the total agricultural labours of NK region. In 2001 census, it is increased to 62.26 lakhs of state account, from this 26.64 lakhs in SK and 35.62 lakhs agricultural labourers in NK region to the total state

agricultural labours. In HK region agricultural labours are increased to 16.73 lakhs from 14.20 lakh labourers compared to 1991 census.

9. PROBLEMS OF IRRIGATION FACILITIES IN KARNATAKA

In India as well as in Karnataka state, 64% of agricultural land depends on rainfall. At present irrigation has vital role in the dry land agriculture, but it is facing lot of problems which are as follows;

- Irrigation projects are not completed within the targeted period.
- Irrigation potential rate is very low.
- Low standard of irrigation projects.
- Negligence of minor irrigation projects.
- Inefficient utilization of Watershed Development Programmes, Ganga Kalyana Yojana and Million Wells Schemes.

Table-6

Distribution of Agricultural Labour Force in Karnataka (1991 & 2001 census)

(Hectares)

Name of the regions	1991	2001
Karnataka	4999959	6226942
SK Region	2094970	2664400
NK Region	2904989	3562542
HK Region	1420171	1673524

Source: Karnataka at a Glance, 2007-08, p.27

- Lack of political will.
- Unscientific agricultural system adopted by neighboring state i.e. the Andhra Pradesh farmers.
- Lack of formation of water users association.
- Lack of knowledge in water harvesting system.
- People participation in irrigation is very low.
- North Karnataka and Hyderabad Karnataka regions are away from rain register instruments and

- Less forest area in North Karnataka and Hyderabad Karnataka region when compared to South Karnataka region.

10. SUGGESTIONS

The following are important suggestions for efficient utilization of irrigation sources and potential in Karnataka state.

- a) Full utilization of the major, medium and minor irrigation schemes and also ground water exploitation, for the development of irrigation sector in the state during the coming eight years.
- b). Water usage in the major, medium and minor irrigation areas are to be encouraged to form such co-operative associations with the responsibilities of collection of the irrigation charges collectively.
- c). The lift irrigation scheme introduced in select districts of NK region is a glaring example. Almost 40% of the irrigation schemes implemented in the districts of Raichur, Gulbarga, Bidar, Bellary and Bijapur are not working satisfactorily. Even those working are providing just about 36% of potential water. A sum of Rs 17.59 crores invested in 9203 hectares for the development of irrigation.
- d). To start the water users association in every Gram Panchayats.
- e). To develop the reserve forest area.
- f). Irrigation Projects should complete within the stipulated period.

11. CONCLUSION

Irrigation through canals, wells and other sources is considered as a catalyst of economic development of a country. Numerous studies have confirmed on the role of irrigation in increasing crop productivity, intensity of cropping in India since the evolution of planning. However, it also helps in reducing instability in crop production, changes the cropping pattern in favour of high valued crops, reduces inequality in income among various section farmers in the society.

Simultaneously, some scholars pointed out that the inequity in sharing gains of development resulting from investment in irrigation and some drew attention to the increase instability of farm output. Irrigation is not certainly considered as blessings on the mankind. Its side effect in the shape of water logging and salinity within the large canal commands have been considered as one of the important negative impact on the farms output. Based on the theoretical framework, the financial, economic, social and environmental aspects of the project are analysed by applying the familiar cost-benefit analysis technique.

Irrigation is one of the most important inputs for enhancing the productivity of agricultural land. By irrigation we can make attempt to balance the different lands in agriculture. Irrigation can generate the both direct and indirect employment, like daily laborers, use of scientific technology can be

applied through the irrigation facilities like tractors, high yielding variety of seeds and fertilizer etc. Good irrigation facilities can help to improve the output of the crop and seasoned crops throughout the year. As a matter of fact, irrigation increases the effective size of agricultural labour, otherwise the supply is in scares and inelastic. It is therefore, known as land augmentic factor. It displays its land augmentic capacity broadly. Hence, well irrigation is a very ancient method of irrigation in India. Tube wells are of recent origin. Tanks are an important and an ancient source of irrigation in India and in Karnataka. Canal irrigation is the most important form of irrigation in India accounting for nearly 31.6 per cent of the net irrigated area. The important benefits of canal irrigation are its cheapness, certainty, easy supply, control over supply etc. India has one of the world's largest canal systems stretching over more than one lakh km and serving more than 20 million hectares.

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