



## **“SOCIO -ECONOMIC ANALYSIS AND CROPPING PATTERN IN THE COMMAND AREA OF NARAYANPUR IRRIGATION PROJECT”**

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### **ABSTRACT:**

Agriculture being the main occupation of the state, Irrigation plays utmost significant part in obtaining increased yields from the land. The development of Irrigation in the state was slow and unsystematic during the pre independence era. However, there were some notable Irrigation works undertaken and completed during the pre-independence, such as Krishnaraja Sagar (which was the only major project completed prior to independence), Vijayanagar canals, Cauvery anicut Channels, Gokak canal, Vanivilasa Sagar, Markonahalli and Anjanapura. Though major projects like Tungabhadra, Bhadra and Ghataprabha stage-I were commenced prior to the plan period, their progress was slow and they got impetus only after their inclusion in the first five year plan. As an agrarian economy Karnataka, irrigation is most important to achieve economic development.

This research analyzes the impact of Narayanpur irrigation project (NRBC) in the command area. A comparative study of the output, employment, income and other variables related to the irrigated and un-irrigated agricultural land within and outside the Narayanpur irrigation Project area has led to positive result. This study found that agricultural productivity increases from 15.30 percent to 92.5 percent in different crops. Likewise irrigation seems to have contributed to increase employment, investment, net income.

**KEYWORDS:** Irrigation Command Area, cropping pattern and impact on Farm Employment,

### **1. BACKGROUND**

Karnataka being an agrarian economy, around 81 percent of its population is employed in agriculture sector. It receives more than 40 percent of its national income from agriculture. Unfortunately, the current growth rate in agricultural production is 2.4 (Government of Karnataka, Ministry of Finance, 2054/55). To raise the living standard of the people, it is evident that the improvement in agriculture is inevitable. To increase the agricultural production, in turn, the use of various inputs such as improved seeds, fertilizers, irrigation etc. are essential.

In Karnataka more than 50 Percent of cultivated land is used only for seasonal agricultural product. These lands remain idle for 6 months. Consequently the population of unemployment is more severe. If we are able to irrigate agricultural land, employment opportunity can be increased; it will also help to solve the problem of unemployment to a greater extent. Agriculture Perspective Plan has stressed the role of agriculture in generating employment opportunities and improving the living standard of people. This plan has also defined irrigation as a strategic input and has prescribed the conjunctive use of water in NRBC region. As the agricultural sector contributes a significant amount to

the national income, the change in national income is a direct reflection of the change in agricultural production. When national income increases the per capita income will also increase. This is an effective indicator of economic growth. Thus, it is essential to analyze the parameter of agricultural growth. In this connection, irrigation is one of the most important inputs to increase the agricultural product particularly in the following two grounds. Firstly, we can increase the agricultural product in the cultivated land with irrigation by enhancing the efficiency of rest auxiliary inputs. And, secondly, we can extensively cultivate the uncultivated agricultural land providing irrigational national facilities.

The reported physical development of irrigation has been a subject of review since the targets of agricultural development envisaged in the feasibility study report were not met. NRBC irrigation project is a large irrigation project and its performance to a greater extent may represent the performances of other larger surface irrigation project. Therefore, this study is based on NRBC Irrigation Project. A review of such project is essential in order to make them more productive. Such review also warns us not to commit similar mistakes in the future. In this backdrop, this paper aims at assessing the impact of irrigation in the command area of BIP. Specifically this paper aims to measure the contribution of irrigation in increasing agricultural productivity and employment in and around the NRBC Project area.

## 2. REVIEW OF LITERATURE

Although irrigation and water resources has been the subject of study for a long time, systematic attempts measuring the effect of the irrigation project on agricultural productivity, employment, and responsiveness of co-operating factors in an integrated manner is scarce. Here some of the available and relevant previous studies have been reviewed in order to be familiar with the works done earlier. In the review, more attention has been given to the objectives, methodology and findings.

Raut (1987) made a case study of *Manusmara* Irrigation project of Sarlahi district. The main objective of the study was to analyze *Manusmara* irrigation project in the light of the contribution made by it to wellbeing of the agricultural peasants. To fulfill the objective, the researcher has used cost benefit analysis method to analyze the data collected through primary and secondary sources. It was found that the cost benefit ratio more than unity. So, it was concluded that the project was financially feasible and it could benefit the farmers residing in the project area.

One more Impact Evaluation Study of Mahakali Irrigation Project was done by Mahakali Irrigation Project (1985). The main objective of this study was to evaluate the contribution of irrigation project in agricultural development, to study the impact of the project and to study the problems associated with full utilization of irrigation. To meet his objective, the primary data was collected through the cross-sectional method. The finding of this study indicated that this irrigation project had increased the productivity of land and increased the farmers' production, investment and employment and also it helped to cultivate the uncultivated land. It also helped to increase the price of land. Thus, this study showed the positive impact of the project in the project area.

Lamsal (1989) made a study on Impact of *Vijayapur* Begnas Irrigation Project in *Pokhara* valley as a case study of *Lekhanath* and *Roki* Millage Panchayat. The main objectives of this study was to find out the impact of irrigation of the cultivated land of that area and to analyze the changes in the production of various crops and price of land after irrigation facility. It used both primary and secondary data to conduct this study. A comparison between the productions, investments and employment of irrigated and un-irrigated land was made. This study found that the project increased the production of the area. It helped to cultivate the uncultivated land increased productions. Analysis on investments and employment of irrigated and un-irrigated land was made. Irrigation facility helped to cultivate the uncultivated land, and to increase the price of the agricultural land. So the impact of this project was positive.

Gelal (1994) made a study on Problem of Water-Resources Management in *Jhukhal* with the main objectives of (a) assessing the present day water management practice; (b) analyzing the available source of water supply and quantity of water in village; (c) presenting the demand scenario of water to

examine the cases of water shortage; (d) performing economic analysis of water resource project; and (e) suggesting economic measures for the better management. This study used Cost Benefit Analysis method. It found that it was necessary to control the leakage and wastage of water, which helped to increase water supply to the growing population. To meet demand for water, it was necessary to search new sources of water supply. Government should provide piped drinking water facility. To regulate the irrigation system of the village, canal must be built using the sources of *Monahare Khola*. Similarly Shrestha (1989) studied the community managed irrigation systems in *Arughat Vishal Nagarpipes* Irrigation Project. The main objectives of this study were to find the benefit of the local economy, find the impact in terms of cropping patterns, input demand and community participation. It used primary data. It found that this project increased land productivity of the area. The study also indicated that to take full advantage of the irrigation, there should be no shortage of improved seeds and fertilizers in the project area.

Irrigation is vital lifeline to stabilize crop production, especially after introduction of High Yielding Variety Seeds, new machineries, fertilizer and chemical open up a new vista in the field of agricultural production paving way to multiple cropping through increased cropping intensity. Technological change in agriculture will provide abundant increase in income, employment and cropping intensity to the peasant farming class in those areas where soil and water resources are favorable to the new technologies.

Taking into consideration the fact that introduction of irrigation facilities would continue to be the main spring of increased output in the economy, an attempt is made in the present study to assess the impact of irrigation the following issues, in a backward agricultural region.

- Socio-economic conditions of the farmers in the study region.
- Cropping pattern, production of the crops, cost of production profit and employment opportunities in the agriculture.
- Landholdings, assets, income, and consumption pattern.

### 3. MAJOR SPECIFIC OBJECTIVES.

To study the pattern and growth of irrigation in NRBC Project.

1. To trace out the **Cropping distribution of area in Raichur district and Net Area Irrigated by Different Sources in Raichur District NRBC .**
2. To understand the various factors and forces that cause an increase in the production and productivity of agriculture in the project area as distinguished from the controlled areas.

**Table 1**  
**CROPPING DISTRIBUTION OF AREA IN RAICHUR DISTRICT DURING THE 2015-16**

Crops	Area in hectares	Percentage to the gross cropped area
Paddy	160,227	22.17
Chilies	3,336	0.48
Cotton	22,259	3.08
Oil seeds	251165	34.76
Wheat	3,155	0.43
Pulses	91,327	12.64
Sugur cane	81	0.01
Fruits and vegetable	5,348	0.74
Jowar	120,018	16.61
Bajra	61,077,	8.45
Maize	1,168	0.16
<b>Total</b>	<b>722518(86.44)</b>	<b>100.00</b>

Source: Govt. of Karnataka, District at a Glance 2015-16.

The cropping pattern in the district reveals that out of 722518 (86.44) hectares gross cropped area, 47.96 percent is under cereals, paddy accounts for 22.17 percent followed by Jowar 16.61 percent, Bajra 8.45 percent, wheat and maize 0.43 and 0.16 percent, respectively. Under pulses 12.64 percent, under oil seeds 34.76 percent and remaining under cash crops such as cotton, sugarcane, chilies and fruits and vegetables. The major plantation and horticulture crops grown in the district are mango, coconut, sapota, pomegranate, onion and mulberry. The table it indicates that major crops grown in the district are paddy, Jowar, Bajra and oil seeds.

**Table 1.1**  
**NET AREA IRRIGATED BY DIFFERENT SOURCES IN RAICHUR DISTRICT NRBC ( SQ. KM.)**

Sl. No.	Taluks	Canals	Tanks	Dug wells	Bore wells	Lift Irrigation	Total
1	Raichur	55.16	2.92	35.18	37.70	6.58	137.54
2	Devadurga	80.07	2.65	43.07	13.00	2.58	141.37
3	Lingasuger	28.44	4.57	140.9	41.99	7.00	222.09
	Total	163.67	10.14	219.15	92.69	16.16	501

Source: Raichur district at a glance 2015 - 16.

From the above table shows .Net Area Irrigated by Different Source in Raichur District .( Sq. Km) Predominance source being canals that is 163.67 Sq Km Dug well 219.15 Sq. Km. Nearly Sixty percent of the geographical area in the district is under irrigation. Total 501sq KM area irrigated in the study area.

#### 4 . METHODOLOGY AND DATA SOURCE

The present study is based on the secondary and primary data.

##### a) Secondary Data

The required data were collected from various sources, like reports published by Directorate of Economics and Statistic, Government of Karnataka, Bangalore, District Statistical Offices, Economic Survey of India, Government of India, Economic Survey of Karnataka, Various Books and Journals.

##### b) Primary Data

The primary data was collected through pre-tested interview schedule from the sample farmers. It is a developmental analysis of the agriculture through cost of cultivation, production, employment, income and profit from irrigation.

##### c) Techniques of Data Collection and the Period of the Study

The survey method was used for the collection of data from the sample farmer's through direct canvass of the interview schedules. Usually the head of the family who is taking decisions in the management of farms and cultivated was interviewed. The data were collected for one complete agricultural year of 2017-18.

##### d) Analytical Procedure

The primary data collected through interview schedules was organized in a tabular form; various statistical methods such as average, percentage were used to analyses the data. Further to find out the development of agriculture through production, profit, cost of production and employment. "t"-test,

For testing of the't' test was employed. The formula is

$$t = \frac{\bar{M}_1 - \bar{M}_2}{\sqrt{\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2} \left[ \frac{1}{N_1} + \frac{1}{N_2} \right]}}$$

Where  $M_1$  = Mean score of I<sup>st</sup> variable.

$M_2$  = Mean score of II<sup>nd</sup> variable.

$S_1$  = Standard deviation of I<sup>st</sup> variable

$S_2$  = Standard deviation of II<sup>nd</sup> variable.

$N_1 + N_2 - 2$  = df (degree of freedom).

From the theoretical 't' table the probability of obtaining such a large derived 't' value is obtained if this provability greater than the specified significance level then the difference between two mean values taken as significant.

$X^2$  test is a basic test for determining whether what is observed differs from what is expected by chance at a particular level of significance

$$X^2 = \sum \frac{(O - E)^2}{E}$$

Where  $O$  = The frequency of observations in any particular category: and

$E$  = The frequency of observations expected under the probability model in any particular category (goodness of fit test).

#### e) Sample Design

A multi-stage sampling method was used to draw a sample, with village as a primary unit and operational holdings as the ultimate unit.

#### Selection of District

Upper Krishna Project consists of four districts, namely, Bagalkot, Bijapur, Gulbarga, and Raichur. The Narayanpur Right Bank Canal project, Lingasagur, Devadurga and Raichur districts one each from these project were selected for the study purpose.

#### Selection of Villages

In Raichur district, three taluks were selected. And from each taluka two villages were selected randomly viz., Raichur district, and from each taluka 2 villages were selected on the basis of random sampling method.

**Table-2**  
**Sample Selection**

District	Taluka	Villages	Households Irrigation	Households Non-Irrigation
Raichur	Raichur	Buddinni and Byalihal	4	4
	Devadurga	Arkera and Ganajali	4	3
	Lingasagur	Hosahalli and Rodalabanda	4	3
<b>Total</b>			<b>12</b>	<b>10</b>

Source: Field Study



## SELECTION OF FARMERS

1. For selecting the sample farmers, the random sampling method has been utilized. In each village 4 respondents were selected from the three talukas and Totally 12 respondents were selected. The present study is limited to only Upper Krishna Project (Narayanpur Right Bank Canal (NRBC). The study covers 12 sample farmers located in three talukas only.

### a) Effect of Irrigation on Total Output

A comparison of total outputs of irrigated land and non-irrigated land indicates that there is more production in irrigated land than in non-irrigated land as shown in Table.

**Table 2.1: Effect of Irrigation on Main crops in Narayanpur Project**

Crops	Total Output (kg)		Change in Total	% Change
	Without Irrigation	With Irrigation		
Paddy	1542.40	2182.40	640.00	41.49
Chilly	1323.00	1625.05	302.05	22.83
Cotton	673.75	887.81	214.06	31.77
Others	248.36	417.22	168.86	67.99
<b>Total</b>	<b>3787.50</b>	<b>5112.48</b>	<b>1324.98</b>	<b>34.98</b>

## 4. IMPACT OF IRRIGATION IN THE COMMAND AREA OF NARAYANPUR IRRIGATION PROJECT

The study shows that, in the region literacy level in the irrigated area is high as compared to the non-irrigated area. In the region the land is distributed in the small holdings. Cast wise distribution is shows that, the back ward cast and SC/ST are more actively participated and cultivated. Through the analysis of the economic impact of the irrigation on agriculture is shows that, due to the irrigation facility the annual income and expenditure of the farmers increased, investment on land purchase, agriculture equipments and purchase of gold and other assets is increased, the farmers shift the cultivation from traditional crops to the commercial crops, wage and employment is also increased as compared to non-irrigated area. In the study area the main problems facing by the farmers are irregular supply of water, lack of adequate marketing facilities and irregular supply of inputs, lack of transportation facility, low quality of inputs. Hence if these problems are solved they will be able to get better returns from irrigation.

## 5 . CONCLUSION

Irrigation is an instrument of economic development. Therefore, irrigation affects the national economy through its impact on agriculture. It enables improvement in agricultural economy through its area, yield and income effects. Irrigation confers on the community a large number of tangible and intangible benefits. The role of irrigation becomes almost important in a country like India, because Indian agriculture depends largely on vagaries of monsoons which are uncertain, irregular and unevenly distributed throughout the year, over area and space. In addition, irrigation assumes crucial importance in view of the country's increasing needs of food production to the ever increasing population. Recognizing this, Massive investments, expansion and improvement of irrigation facilities have occupied a central place in India's Five-Year Plans.

However, in recent years, the investment in irrigation is being questioned in view of under utilization of created potential. Many of the major and medium irrigation projects are losing their sustainability due to the longer gestation period, heavy cost escalation due to delay in construction, increasing overhead cost, inefficiency and ecological problems. However, major irrigation projects play very important role to boost the agricultural production in Indian economy. Hence the present study was taken to analysis the impact of irrigation on agriculture in Upper Krishna Project.

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