

## **CHAPTER - I**

# **DATA BASE AND METHODOLOGY**

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#### INTRODUCTION:

Agricultural development plays vital role in economic development of underdevelopment countries. Agricultural development implies increase in productivity and production of agricultural sector. Productivity of agricultural sector depends on irrigation facilities fertilizers, pesticides, improved seeds, and application of modern techniques of cultivation etc. Supply of water or irrigation facilities assumes greater importance because without sufficient water supply other inputs cannot be fully utilized. Hence in agricultural development irrigation is the most important element.

Different authors have viewed at irrigation differently

According to Prof. Shahane and M.K. Raj, Irrigation is defined as the artificial application of water to soil for the purpose of supplying water which is essential to plant growth. It means by which water is conveyed to dry areas from rivers.

According to O.W. Iseralsen, 'Y.E. Hansen' Irrigation generally defined as the application of water to soil for the purpose of supplying the moisture which is essential for plants growth.

Irrigation may be defined as the process of artificial supply of water collection and planning of water which is the evidently most necessary element in the plant's life. If there is scarcity of water, plant cannot be grown up and we cannot get fruits of plant.

Following points throw light on the necessity of water supply for irrigation in agricultural development. Water is normally supply to the plant naturally through rain. However, total water supply may be insufficient and irregular. Also the rainfall may not be uniform in a particular area over the crop period. No water may be available either at the beginning or at the maturity stage or at the end period of the crop. Causing severe damage to the crop. In this case, "Irrigation alone can save the crop." There is need to collect water during the excess rainfall and provide it to the crop when it is needed.

Plenty of water is necessary for raising commercial and cash crops like sugarcane, banana, grapes etc. Their requirement of water is periodical in the course of their production. Only monsoon water is not enough for them. Thus existence of water reservoirs is must for reaping a beautiful crop. In such cases provided other factors remain favorable, irrigation percolates water in the soil to supply the moisture which is essential for the plant's growth. It saves the crops during short duration droughts. It wastes out or dilutes salts in the soil and redacts the Hazard of soil piping.

Irrigation helps in intensive cultivation of land and it is one of the key elements in boosting and stabilizing agricultural production. Expansion of irrigation leads to expansion of plantations. The stripped area along the canal is always damp. For that trees are planted along the canal boundaries .Such plantations check the erosion. Irrigation is one of the crucial factors in the process of modernizing agriculture. Sustained high rate of agricultural growth requires increasing dose of fertilizers, improved seeds and use of pesticides which is possible if water is available.

Prices of agricultural commodities exercise a dominant influence of general price level. In fact prices of food grains acts as a pacesetter in the behaviors of general prices. The output of agricultural commodities changes from year to year due to seasonal nature of agriculture. Hence, there is price instability.

Introduction of irrigation provides guarantee to agricultural production. It reduces fluctuations in prices of goods. Price stability is important to agricultural development. It provides full confidence that the additional effort and investment would be beneficial to farmers.

Irrigation is very good means to get production from famine. A systematically developed irrigation system collects water during the periods of excess rainfall and stores it. This water stock is life saving during the famine and drought period. Major River valley projects are usually planned to provide hydroelectric power together with irrigation. Irrigation channels can be utilized to generate electricity. In this way irrigation helps the development of agricultural sector.

## **SIGNIFICANCE OF THE STUDY**

Now a day, the availability of water supply is limited for agricultural sector so if available water supply is utilized in better way then the development of agricultural sector is made. Farmers can take marketable crops, in their farm and make profit from their farm. This research also useful to the farmers, stakeholders, Gov .and society of irrigation scheme. Importance of irrigation can be evaluated from the following points.

### **1) Source of Government Income**

To provide irrigation water by canals and tube wells are the source of income to the government. When there is more of agricultural income there can be more of government income as majority of the population is depend on agriculture and they are paying the taxes. It is also the source of government income.

### **2) Commercial Farming**

Development of irrigation potential and its utilization can pave the way for commercialization of agriculture in place of subsistence farming which can play a pivotal role in raising the level of income of the farming community.

### **3) Employment Generation**

Development of irrigation facility can generate employment opportunities by developing the system of multiple cropping throughout the year and also by reclamation of wasteland.

### **4) Economic Development and Planning**

By raising agricultural productivity irrigation system can play an important role in the planned development of our country. Modernized agricultural sector is the basis there for the development of industry trade and transportation system required for all round development of the country further; such increased productivity can also raise the government revenue.

## **REVIEW OF LITERATURE**

Following are some of the studies which we have referred and reviewed for our study .

K. M. Sellamuthu, S. Natarajan. R. Sivasomy & S. Mani [Dec – 2000] has Studied , Quality of irrigation Water on Sugarcane production . They focused

on, determination of the quality of irrigation water of the Sugarcane growing areas of the uttiramerur taluka of Kancheepuram District . They found that the C4 class of water cannot be used for irrigation . They suggested that, Drip irrigation is an important management measure in reducing the development of salinity in Soil due to saline water irrigation .In recent days drip irrigation for sugarcane is also practiced . Further researches this will improve the efficiency of the technique on reducing the soil salinity development , thereby increasing the cane yield and productivity .

S. Suresh. A. Ravi raj and Dr. S. Senthilvel (2000) has studied, Landscape irrigation scheduling. They focused on , The irrigation scheduling in relation to landscape development is totally different from that of fixing command area of water or periodical application as to the crop stands at on , Farm levels. . They suggested that , the sprinkler system is needed to be cycled for proper irrigation .

Man is mortal while nature remains immortal. At least human kind with a sense of consciousness may try to rehabilitate the devastated earth crust by resorting to landscape development and sustaining the greenery through proper scheduling of irrigation these conserving the soil and water resources .

D. D. Pawar. M . B . Dhonde. P . G. Bhoi & S. H. Shinde, (2000) has studied. Economical feasibility of drip irrigation for sugarcane. They focused on , sugarcane is a major commercial crop of Maharashtra . They find out the experiment , Economical feasibility of drip irrigation of sugarcane in canal command area was undertaken on well irrigation in order to study the economical feasibility of drip irrigation system for sugarcane. They suggested that , the Juice quality in terms of brix , pol purity and commercial cane sugar (CCS) was improved when irrigations were applied through Drip as compared to conventional surface method. The juice quality also increased by application of Nitrogenous, Fertilizer in zosplits through drip.

The drip irrigation system has also resulted in net extra income over conventional method. Maximum was also observed in drip irrigation system and as compared to surface method.

Dr. Gouranga Kar (2000) has studied, Role of Remote sensing for integrated sustainable watershed management, He focused on , Watershed as a natural unit of ecosystem planning and development is widely used in most of the countries which require generation. He find out the availability of high resolution satellite data has further opened up new vistas in the area of watershed management and development. The satellite data along with conventional data could effectively utilized for watershed development. He suggested that, estimation of runoff, soil loss due to water and wind erosion. The remotely sensed data in conjunction with ancillary data it certainly helpful for achieving sustainability on watershed basis.

L. S. Madhava Rao (1983) has studied, Management of rural water supply programs. He find out the prescribed service levels for water supply in the rural areas. He suggested that,

- 1] Training facilities for the engineering personnel currently employed.
- 2] Ensuring adequate supply of material and equipment for water supply programmers.
- 3] Involvement of the local community in the project planning, programming and implementation .

K. U. Keshavaiah, V. B. Sureshkumar [1998] has studied Irrigation in Robusta coffee. He focused on water requirement. He suggested that whatever be the method of irrigation there cannot be a compromise on the quantity of water. Otherwise the floral abnormalities are noticed.

In coffee blossom and fruit set are the critical stages for irrigation. Coffee yield are boosted by providing irrigation at these stage. Sprinkler irrigation is the popular method of irrigation among coffee planters. Quantity of water is another important parameter to be considered during irrigation . Quantity of water leads to floral abnormalities.

V. S. Kubsed, C. S. Hunshal, D.P. Vishwant, S. T. Patil and D. S. M. Gowda [1995] has studied dry matter accumulation insectaria as influenced by saline water irrigation. He focused those effects of saline water of verging salinity levels. He find out, dry matter production and its accumulation in set area under different salinity

levels. Its effect was clearly reflected on the grain yield where maximum grain yield was recorded at 6 Ds/m salinity level compared to others.

V.P. Rao [1995] studied on, Correlation and path coefficient analysis in sesame under varying irrigation on regimes. He focused on crop production. He find out applications prevailed during the crop growing season. He suggested that, the studies on correlation and path. Coefficient analysis under different crop environments revealed the strong positive and significant correlation of seeds and capsules. The characters would be the selection indices for, improvement of summer season.

M. Venkata Reddy (1990) studied on, Impact and development of irrigation system. He pointed out that the shortcomings of canal design to ensure protective irrigation. Even so this issue calls from further research to identify the design constraints production differentials in a given command area.

A. Naryanmoorthy (2001) studied irrigation and rural poverty nexus. A state wise analysis is an outcome of a survey conducted with the main objectives of –

- i) To demonstrate the importance of irrigation as an implication policy intervention on other variables which were used by earlier studies for analyzing the incidence of rural poverty?
- ii) To analyze the relationship between the level of rural poverty and irrigation across the states. The study attempted to understand the role of irrigation in the reduction of the level of rural poverty in India taking cross section data of 14 major states at four points of time.

Moorti (1984) Edited in their study on the, Impact of one lift irrigation scheme in, Himachal Pradesh. Wheat played an import role in the cropping pattern accounting for 33.46% and 36.09% of the total cropped area of the irrigated and un irrigated farms respectively. The paddy crop which needs irrigation facilities occupied more area on the irrigated forms about 31% as against only 18% of the total cropped area on non irrigated farms.

S.G. Barve commission (1972) had observed that although the state of Maharashtra ranks third in the country in terms of population and area, the state significantly locks water resources out of the state's total cultivable area of 194 lakh hectares only 3% area is under irrigation. It could be raised to 27% by harnessing the

surface irrigation resources in the state and to 40% by further harnessing the subsurface irrigation resources.

Given this scenario and turning specifically to the co-operative lift irrigation societies (CLISS) in Maharashtra, Vasant Jugale and Yojana Jugale (2000) observed that the number of (LISS) in Maharashtra has risen from merely 119 in 1961 to 4,380 in 1995. During the same period, the collective command area from 4700 ha. to 4.40 lakh ha. In other words 15% of the cultivable land in the state has been brought under irrigation and that when all the irrigation projects planned in the, Krishna valley are commissioned at least 33% of the cultivable land in the state should come under irrigation .

Against this background a careful security of the available literature revealed that although there is a super abundance of the literature at the techno economic aspects of irrigation including feasibility studies and post facto impact studies .The research material which is being presented in the succeeding pages in a chronological order

**OBJECTIVES:**

- 1) To examine the impact of Kundal Co-operative irrigation project on agricultural area, production, productivity and yield of the crops in the command area.
- 2) To study the impact of irrigation on cropping pattern.
- 3) To measure crop wise agricultural income of farmers through changing cropping pattern.
- 4) To examine the nature of improvement in the social life of beneficiaries.
- 5) To suggest appropriate measures to improve the operational efficiency of the project.
- 6) To analyze the working of co-operative irrigation society.

**HYPOTHESIS:**

- 1) There is no association between area under irrigation and the education level of the farmers.
- 2) The average variation of area under irrigation and income level of the farmers is same.



- 3) The income of the farmer is closely associated with irrigation and cropping pattern.

**RESEARCH METHODOLOGY:**

**A) Data Collection**

**i) Primary data**

Primary data has been collected from various sources through structure questionnaire.

- 1) Survey of sample households.
- 2) Special interviews of office bearer and chairman.
- 3) Discussion with leading farmers.
- 4) Field work

**ii) Secondary data**

Secondary data on various relevant variables were collected from the following documents/reports.

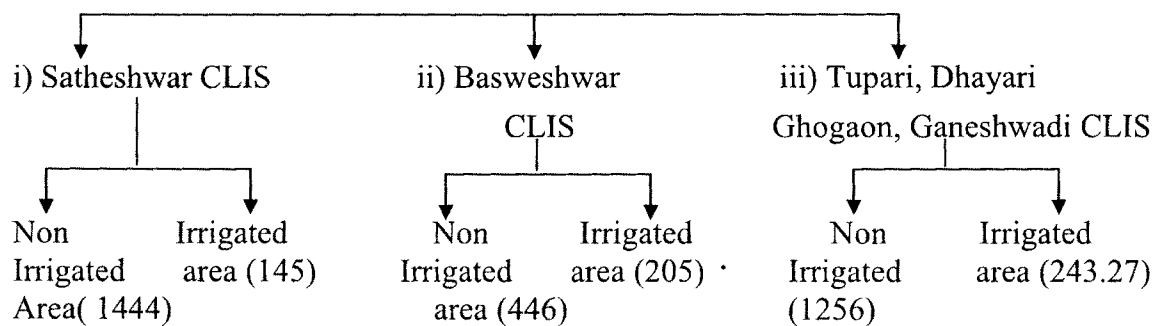
- i) Departmental publication.
- ii) Annual report of the co-operative society.
- iii) Data from Kundal co-operative irrigation office.
- iv) Gazetteers of district.

**B) Data Analysis**

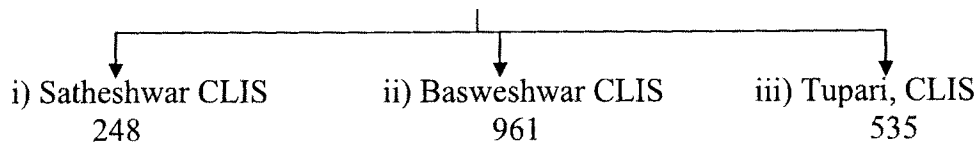
Simple statistical techniques like percentage changes, frequency, distribution and mean are used. Moreover some other tools are used to data analysis.

**C) Sample Design**

**CLASSIFICATION OF IRRIGATION AND NON IRRIGATION AREA UNDER THREE COOPERATIVE IRRIGATION SOCIETY**



**CLASSIFICATION MEMBERS OF WATER MANAGEMENT OF LIFT IRRIGATION**



The researcher has selected three irrigation scheme located at Kundal which are described in chart - I.

**Sampling Technique:**

Samples are selected by using Yamnes Formula. Stratified Random sampling Technique has used for selecting different projects. Proportionate allocation method of sampling has used for selecting the sample size of each strata . The segments will be based on the category of projects.

**Calculation of the sampling size:**

Researcher has determined the sample size by using Yames formula as below.

Formula:

$$n = \frac{N}{1+N(e^2)}$$

- Where, n = Sample size
- N= Population size
- e = Sampling error

Here it is assumed that sample error is 10%

Total population is 1780. Therefore, Sample size is 100. The population used for the study is finite. Researcher had selected the farmers of different project using stratified sampling method. Proportionate allocation of each stratea is calculated with respect to total population by using the formula.

$$N_i = \frac{n \cdot N_i}{N}$$

**Sample size:**

Project Name	Total number of farmer	Sample size (n)
Satyeshwar	248	16
Basweshar	961	54
Tupari	535	30
Total population	1780	100

The Satheshwar co-operative irrigations scheme have 248 total members, from which researcher has selected 16 members .The Basweshwar co-operative irrigations scheme having 961 members. The researcher has selected of that 54 members. The Tupari, Dhayari, Ghogaon, Ganeshwadi Co-operative irrigations scheme have 535 members from which researcher has selected 30 members.