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STATUS IMPROVEMENT OF SOCIO-ECONOMIC LIFE OF THE FARMING COMMUNITY DUE TO MAHANADI RESERVOIR CANAL IRRIGATION SYSTEM IN CHHATTISGARH

Shilpa Beck¹ and Dr. M.A. Khan²

¹Research Scholar.

²Professor, Department of Agricultural Extension, I.G.K.V. Raipur, C.G.

ABSTRACT:

Agriculture makes a pre-eminent contribution in the Indian economy. About seventy per cent of the rural families depend on it. According to the reports of Indian economic survey 2017-2018 more than 50 per cent of the work force in India is involved in agriculture and has a share of 17 to 18 per cent in the total GDP. Many factors depends on agricultural production like soil, climate, genetic diversity, abundance of micro-organisms, water etc, among which water play an important role because it is required from seed germination to

other physiological stages of crop growth.

Water is the most essential component of the environment and holds a unique status in it. One-third of our country's total geographical area is drought-prone because we are dependent upon the monsoons which can be wavering. Water should be provided in drought-prone areas not only for human and cattle consumption but also for irrigation. Water has inimitable characteristics that determine that it can be allocated and use as a resource in agriculture. For irrigation, agricultural use of water is itself contingent on land resources. Water is the most exquisite and essential source of ecosystems and agricultural production. However, the world constitution, water being the most essential natural resource. About 97.39 per cent of total 1,384 million cubic kilometers water of it is present in the oceans, which natures is salty. Out of total (i.e. 36 million km³) 2.61 per cent is fresh water, out of which, 77.23 per cent (27.82 million km³) is present in the form of polar ice caps, glaciers and snow bergs and very little amount of water (0.59% or 8.2 million km³) is present on the earth (i.e atmosphere, rivers, lake, ground) can be utilize by mankind. Whereas, less than 99 per cent of water present on the earth is not suitable for the use of mankind.

KEYWORDS: Agriculture , micro-organisms.

INTRODUCTION

After Independence, Prime Minister Jawaharlal Nehru in one of his speeches deeply focused on India's self-sufficiency in economically and food production self-reliant, advanced the campaign still further. A series of five year plans based on soviet

style resulted in multi-purpose river control projects which included the four-dam i.e. From inspiration by America's Tennessee valley authority, Damodar valley project in West Bengal and Jharkhand, and in Orissa in the eastern India, the Hirakund Project, designed to provide irrigation for over 1.5 million acres of crop land." In Orrisa , the study of the large Hirakund project found that the head-reach

farmer were able to irrigate 100 per cent of their land in the command area, whereas in the middle reach village only 35 per cent the area was irrigated and the tail - ender were able to irrigate no more than 18 per cent of their land. Reservoirs are the structure created to store

surplus water during wet periods, which can be used for irrigating arid lands or for in irrigation during less rainfall period. One of the major advantages of creating reservoirs is that water flows can be managed as per agricultural demand and requirements of the various regions over the year. Reservoirs render indelible services to the mankind in fulfilling irrigation requirements on a larger extent. In developing countries, where larger part of land is arid zone, need reservoirs for meeting their irrigation requirements. There is a severe necessity for construction of more reservoir based projects in spite of various measures developed in conserving water through other advancements in irrigation technology. As per the records of Government of India, Reservoirs can be classified generally as small, medium and large with the area of (<1000 ha), (1000 to 5000 ha) and (> 5000 ha) respectively. In India, number of small reservoirs is approximately 19134 ha which has a total water surface area of 1485557 ha. In the similar manner, 180 medium with 527541 ha and 56 large have an area of 1140268 ha reservoirs in the country. Thus, the country has 3153366 ha covered by 19370 reservoirs. Irrigation, municipal's water supply, industrial water supply, navigation, hydropower, large scale fisheries, tourists development etc. are provided by the major irrigation projects. The projects are having the potential of changing the total agriculture's scenario of the area as enormous benefits can be received by them. Keeping of above fact canal irrigation is the almost cheaper method for irrigation demand in farming community. Canal irrigation brings the influence the civilization, productivity of crops, agricultural based industrial progress too.

OBJECTIVES:

1. To study about socio-economic profile of beneficiary and non beneficiary farmers of Mahanadi reservoir canal irrigation system.
2. To study the cropping pattern, productivity and income of beneficiary and non beneficiary farmers of Mahanadi reservoir canal irrigation system.
3. To find out the problems confronted by the farmers of different water reaches and to obtain their suggestions to overcome the problems confronted by them.

HYPOTHESIS OF THE STUDY

1. There is no significant difference between socio-economic profile of beneficiary and non-beneficiary farmer of Mahanadi reservoir canal irrigation system.
2. There is no significant relationship of cropping pattern, productivity and income between beneficiary and non-beneficiary farmers.

LIMITATIONS OF THE STUDY

1. The boundaries of time and resources were faced by the researcher for the present study.
2. Limited items are incorporated in the study for detailed examine because all the segments cannot be cover in such a very short time.
3. The present investigation is based on the individual's opinion and expressed attitude of the respondents as they perceived hence there is chances of occurrence of biasness which generally occurs in such type of field study.
4. All possible efforts were made to make the best use of standardized tools and techniques of data collection, yet their truthfulness may not guaranteed.
5. Although all possible preventative measure were taken to make the study specific and accrued, as per the objective and trustworthy. As the present study was restricted to Mahanadi reservoir canal irrigation of Chhattisgarh, therefore, the direction of finding might not give real picture of all the Chhattisgarh, which has no resemblance with the present situation of locations.

LOCATION OF THE STUDY AREA

The present study was carried out in Mahanadi reservoir canal irrigation system of Chhattisgarh state during the years 2017-18 and 2018-19. Mahanadi reservoir canal irrigation system comprise of seven canal systems namely, Mahanadi main canal, Mandhar branch canal, Abhanpur lift

canal, Bhatapara branch canal, Baloda branch canal, Lawan branch canal and Mahanadi feeder canal system.

SAMPLE AND SAMPLING PROCEDURE

Selection of canal :- Out of the 7 canal system, 4 were considered for this study namely Mahanadi main canal, Mandhar branch canal, Baloda branch canal and Lawan branch canal, as, it is very difficult to cover entire 7 canal system. For the purpose of study, each canal is divided into three parts, on the basis of their reach, i.e. head, Mid and tail. Accordingly, total 28, 14, 17 and 21 distributaries belonging to Mahanadi main canal, Lawan branch canal, Mandhar branch canal and Baloda branch canal, respectively were taken for sample collection.

Selection of villages: - Three villages belonging to each identified distributary canal had been selected randomly so as to make a total of 24 village as beneficiary village and half (12) of the total beneficiary villages had been selected from same locality as non beneficiary village.

Selection of the respondents:- 20 farm families (beneficiary of canal irrigation) had been selected randomly from each of the selected village. In this way, total 240 beneficiary families (80 from Head reach, 80 from Mid reach and 80 from the tail reach) and 120 non beneficiary farm families has been selected randomly (40 head reach, 40 mid reach and 40 tail reach).

Family size

It is generally referred to the total number of persons in the consumer unit during the survey period. On this basis, family size grouped in to three categories viz. small, medium and large on the basis of Mean.

Family type

Family type indicates whether the family is nuclear or joint. Nuclear family means, parents and their children living as one unit, whereas joint family means, where 2 or more conjugal family and their children living under one roof as one unit.

Material possession

Material possession was conceptualized as the number electronics or mechanical goods, such as mobile, Radio, T.V., bicycle, motor cycle, tractor bullock cart etc. possessed by the respondents.

Source of credit

The availability of credit facility to respondents, purpose and duration, as availability of credit needed to purchase the vital input may influence the adoption behavior of the farmers. Hence, a question was asked to individual respondents, in order to know the source from where they get loan and how easily they can get it.

Animal possession

Animal possession plays a very important role in rural households. During the investigation individual respondents were asked about the total number of possessed animals.

Land holding

Land holding is an important factor to determine the economic status and potentiality of farmers. The respondents were asked about the total cultivated land owned by them at the time of enquiry. The respondents were grouped in to five categories using the criterion method adopted by Indian Agricultural Statistics Research Institute, New Delhi (Anonymous, 2016).

Soil type

Different variety of soil is present in the area, selected for investigation. Characteristics of these soils were taken into consideration and accordingly, soil is characterized as Bhata (*Entisols*), Matasi

(*Inceptisols*), Dorsa (*Alfisols*), Kanhar (*Vertisols*) and Bharri (*Lateritesols*) on the basis of its texture, moisture content and colour etc.

Occupation

The data collected from the individual on the sources of income over a period of time from any activity, such as agriculture, MGNREGA, parental business, agricultural labour etc.

Cropping intensity

Regarding cropping intensity, the data presented in table 4.55 observed that 46.67 per cent beneficiaries and 45 per cent non-beneficiaries had the cropping intensity between 101 to 200 per cent.

Followed by 45.42 per cent beneficiaries and 50.83 per cent non-beneficiaries were having cropping intensity up to 100 per cent respectively. It was also observed that only 7.92 per cent beneficiaries and 4.16 per cent non-beneficiaries respondents had cropping intensity of up to 100 per cent. The average cropping intensity among beneficiary respondents was 117.92 per cent as compared to 102.03 per cent cropping intensity amongst the non- beneficiary farmers.

The test of significant between cropping intensity of beneficiary respondents and non-beneficiary respondents (Z test) was calculated and difference was found significant at 0.01 level of probability which means, the null hypothesis (there is no significant difference of cropping intensity between beneficiary and non- beneficiary farmers of canal irrigation) is rejected.

Distribution of respondents according to cropping intensity

Sl. No.	Cropping intensity	Beneficiaries (n=240)		Non- beneficiaries (n=120)	
		F	%	F	%
1	Upto 100%	109	45.42	61	50.83
2	101 to 200 %	112	46.67	54	45.00
3	More than 200	19	7.92	05	4.16

Average cropping intensity of beneficiaries farmers = 117.92%

Average cropping intensity of non- beneficiaries farmers = 102.03%

Z test, ** (table value = 2.58),
Calculated Value = 2.761**
Significant at 0.01 level of probability

F = Frequency

% = Percentage

Productivity of major crop

The data regarding the productivity of rice grown by the respondents in the study area in kharif season are compiled in table 4.56. The findings stated 13.75 per cent of the beneficiaries and 12.50 per cent of the non-beneficiaries rice growers fetched up to 30 q/ha productivity, followed by 22.08 and 49.17 per cent beneficiaries and non-beneficiaries obtaining 30 to 40 q/ha yield respectively.

While 64.17 per cent beneficiaries and 38.33 per cent of non-beneficiaries obtained productivity of rice above 40 q/ha. The average productivity of rice among beneficiary respondents was 43.20 q/ha as compared to 38.09 q/ha average productivity among the non- beneficiaries farmers.

The test of significant between productivity of rice of beneficiary respondents and non-beneficiary respondents (Z test) was calculated and difference was found significant at 0.01 level of probability which means, the null hypothesis (there is no significant difference of productivity of rice between beneficiary and non- beneficiaries farmers of canal irrigation) is rejected.

Comparison of productivity of rice between beneficiaries and non-beneficiary respondents

	(q/ha)	Beneficiaries (n=240)		Non-beneficiaries (n=120)	
		F	%	F	%
Productivity	Upto 30	33	13.75	15	12.50
	30 to 40	53	22.08	59	49.17
	Above 40	154	64.17	46	38.33
Average Productivity		43.20		38.90	

Z test, (table value = 2.58),
Calculated Value = 3.747**

** Significant at 0.01 level of probability

F = Frequency

% = Percentage

Indirect benefits from canal irrigation

Regarding indirect benefits from irrigation, the data is presented in table 4.62 which indicates that there are many benefits found from irrigation. Among beneficiary respondents, cent per cent from head reach, 92.50 per cent from mid reach and 88.75 per cent from tail reach respondents benefited by, increase in water table, followed by 90, 82.50 and 62.50 per cent from head, mid and tail reach respondents were from increase in income. About 43.75 per cent from head reach, 36.25 per cent from mid reach and 35 per cent from tail reach respondents found increase in crop diversity, 40 per cent of head reach, 25.75 per cent of mid reach and 23.75 per cent of tail reach respondents benefited by way of changing in cropping pattern and only per cent of them got increase in ground water table. In non-beneficiary respondents, 60 per cent found irrigation beneficial for crop diversity, followed by 28.75 per cent of head reach, 21.25 per cent of mid reach and 13.75 per cent of tail reach respondents for increase in cash crop.

Distribution of respondents according to indirect benefits from canal irrigation

Sl. No.	Indirect benefits of canal irrigation	Head reach (n= 80)		Mid reach (n=80)		Tail reach (n=80)	
		F	%	F	%	F	%
1	Increase in area of cash crop	23	28.75	17	21.25	11	13.75
2	Increase in water table	80	100.00	74	92.50	71	88.75
3	Increase in income	72	90.00	66	82.50	50	62.50
4	Varietal diversity	35	43.75	29	36.25	28	35.00
5	Change in cropping pattern	32	40.00	23	28.75	19	23.75

F= Frequency

% = Percentage

*Data based on multiple responses

SUMMARY AND CONCLUSION

The present study was undertaken impact of Mahanadi reservoir canal irrigation system on socio-economic upliftment of farming community in Chhattisgarh. In this chapter, the results were discussed for meaningful summary and conclusion are presented in the following manner.

1. To study about socio-economic profile of beneficiary and non beneficiary farmers of Mahanadi reservoir canal irrigation system.
2. To study the cropping pattern, productivity and income of beneficiary and non beneficiary farmers of Mahanadi reservoir canal irrigation system.

3. To identify the existing irrigation pattern followed by farmers for various crops.
4. To study the adoption of rice production practices by the farmers of different water reaches.
5. To study the impact of Mahanadi reservoir canal irrigation system on socio-economic upliftment of farm families.
6. To find out the problems confronted by the farmers of different water reaches and to obtain their suggestions to overcome the problems confronted by them.

SUGGESTIONS AND RECOMMENDATIONS FOR FUTURE WORKS

1. Suitable cropping pattern - Farmers need to schedule the cropping pattern for the agricultural year well in advance depending on the monsoon and water storage situation in the reservoir.
2. Remove encroachment from canal area- It is necessary to remove the encroachment produced in streams, field channels and channel banks. These intrusions stop the smooth flow of water and cause water to starve the farmers in the tail-end region.
3. Water use efficiency should be encourage- Adoption of technology is very essential to enhance effectiveness in water use. The farmers can irrigation methods such as sprinkler and drip irrigation. Government subsidies to buy these irrigation tools will assist farmers buy them at affordable rates and institutional financing is also accessible to buy these tools.
4. Sustainable farming - Farmers are now passionate about electricity-driven pump sets they negligible regard in keeping the channel system. This ultimate result will be at stake in decrease water table and sustainable farming as occurred in some areas of this region of research.

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- Anupama Adhau (2003)** in research work at Jamwadi Irrigation Project reported on the level of education.
- Bhange (2004)** revealed in his study that, a majority of beneficiaries were illiterate.
- Mohiuddin et al (2007)** concluded on average 86% and 81% sampled farmers were literate in Patiya and Satkania respectively.
- Deshkmukh and Deshpande (2004)** found that majority (43.75) of the respondents belonged to medium size.
- Tayde (2011)** reported that 44.44 and 68.33 per cent of the non-beneficiaries were from medium family size.
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