



PERFORMANCE LEVEL OF GINGER CBR WITH SPECIAL REFERENCE  
TO IRRIGATION TECHNOLOGY : A CASE STUDY OF SATARA AND  
AURANGABAD DISTRICT OF MAHARASHTRA STATE IN INDIA

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**Abstract:** Irrigation is a backbone of agricultural development, particularly in drought prone areas, where it is impossible to crops without irrigation. Irrigation facility is very significant in connection to assured ginger production. Now days for getting more yield most of the experimental ginger growers use the different irrigation methods in ginger cultivation. Even though, to study the performance level of different irrigation methods is very beneficial to ginger growers for calculating the best method for irrigate the ginger crop. Present investigation, aims to analyse the performance level of ginger cost benefit ratio (CBR) with special reference to irrigation technology in Satara and Aurangabad district of Maharashtra. The entire analysis is based on empirical data collected through intensive fieldwork through questionnaires and schedule technique. Of 28 villages from 7 tahsils in Satara district and 12 villages from 6 tahsils in Aurangabad district are selected for present investigation. The stratified random sampling (10%) method has been adopted for the selection of villages. 84 growers from 28 villages in Satara district and 36 growers from 12 villages in Aurangabad district selected for present investigation. Here stratified purposive sampling method used for selection of ginger growers for calculating the performance level of ginger CBR with special reference to irrigation technology. If we can see at performance level of ginger CBR in case of drip irrigation method i.e. 1:2.60 followed by the sprinkler and flood irrigation method i.e. 1:2.30 and 1:1.74 respectively. However, only 53.33 percent area of ginger cultivation is under drip irrigation. So there is a need to promote area under drip irrigation method rather than sprinkler and flood irrigation in ginger cultivation. Therefore per hectare yield will be increased. It results benefit of ginger growers will increase. Hence remaining ginger growers of study region should implement modern irrigation technology i.e. drip irrigation for higher CBR performance level in ginger cultivation.

**Keywords:** Ginger, CBR, Irrigation technology

**Introduction:**

Indian agriculture has been in doldrums for a long time however it is the backbone of Indian economy. Varied agro climatic conditions prevailing in India are suitable to grow almost all condiments and spices. And hence India is known as “The Home of Spices”. Ginger is one of the important spice crop having an area of 4,27,423 hectares with a production of 16,18,627 tons in World. At international level India is a second largest country with 27.24 percent of the total global production of ginger. Ginger commonly called ‘Aale’ is grown in an area of 3,426 hectares with a production of 34,267 metric tons in Maharashtra. More than 49 percent of the area and production is mainly from Satara and Aurangabad district and hence ginger cultivation is the backbone of the particular farmers.

Irrigation facility is very significant in connection to assured ginger production. At the beginning period flood irrigation method

is vastly used in Maharashtra for ginger cultivation. But now days most of the experimental ginger growers use the drip and sprinkler irrigation method for to get the more yield per unit area from ginger cultivation rather than flood irrigation. In short it is clear that the performance level of different irrigation method is very beneficial to the ginger growers to calculate the best method to irrigate the ginger crop. And so, that the performance of different irrigation methods are required to find out best method for higher yield in ginger cultivation.

And hence here is an attempt to try find out the performance level of ginger cultivation CBR with special reference to irrigation technology in Satara and Aurangabad district of Maharashtra State in India.

**Study region**

In India Maharashtra State is selected for present investigation in general as well as Satara and Aurangabad districts of the

State in particular. Maharashtra State is located in central part of India between 15°44' to 20°60' North latitudes and 72°36' to 80°54' East longitudes and drains the Godavari, Bhima and Krishna rivers. Having 3, 07,762 sq. km. area (9.36 percent of India), state is divided in 36 districts and it support 11,23,72,972 population.

Geographically the state divided into two broad categories one is 'Konkan' and other one is 'Maharashtra Plateau'. The daily maximum temperature in hot season is 32°C to 42°C while the daily minimum temperature in cold season is between 12°C to 20°C. The region receives rainfall mainly from south-west monsoons, ranging between 5000 mm. to 200mm. Broadly the year may be divided into three seasons. The study region including black soil, lateritic soil, alluvial soil and brown soil is placed in different pockets.

#### **Objectives**

In view of above present investigation, aims to analyse the performance level of ginger CBR with special reference to irrigation technology used in ginger cultivation in Satara and Aurangabad district of Maharashtra State in India.

#### **Database**

Basically particular investigation is based on primary data. Primary data is collected through intensive field sample survey and observations with the help of questionnaire and schedule technique.

#### **Methodology:**

Researcher select ginger crop for detail investigation because itslucrasive gain than any other spice crops. Then Maharashtra State is selected in general as well as Satara and Aurangabad district of this state in particular on the basis of highest area under ginger cultivation. Both the district shares 49.18 percent area of ginger as

compare to Maharashtra. Whereas, 28 villages from 7 tahsil in Satara district and 12 villages from 6 tahsils in Aurangabad district selected for present investigation. The stratified random sampling (10%) method has been adopted for the selection of villages. 84 growers from 28 villages in Satara district and 36 growers from 12 villages in Aurangabad district selected for present investigation. Here stratified purposive sampling method used for selection of ginger growers for calculating the performance level of ginger CBR with special reference to irrigation technology used in ginger cultivation.

#### **Limitations**

At the time of collection of primary data it has been observed that some of the farmers purposively could not give correct and relevant information. To overcome this difficulty an attempt has been made to achieve the relevant information by consulting the educated and knowledgeable farmers of the neighborhood area.

#### **Performance level of ginger cbr with special reference to irrigation technology:**

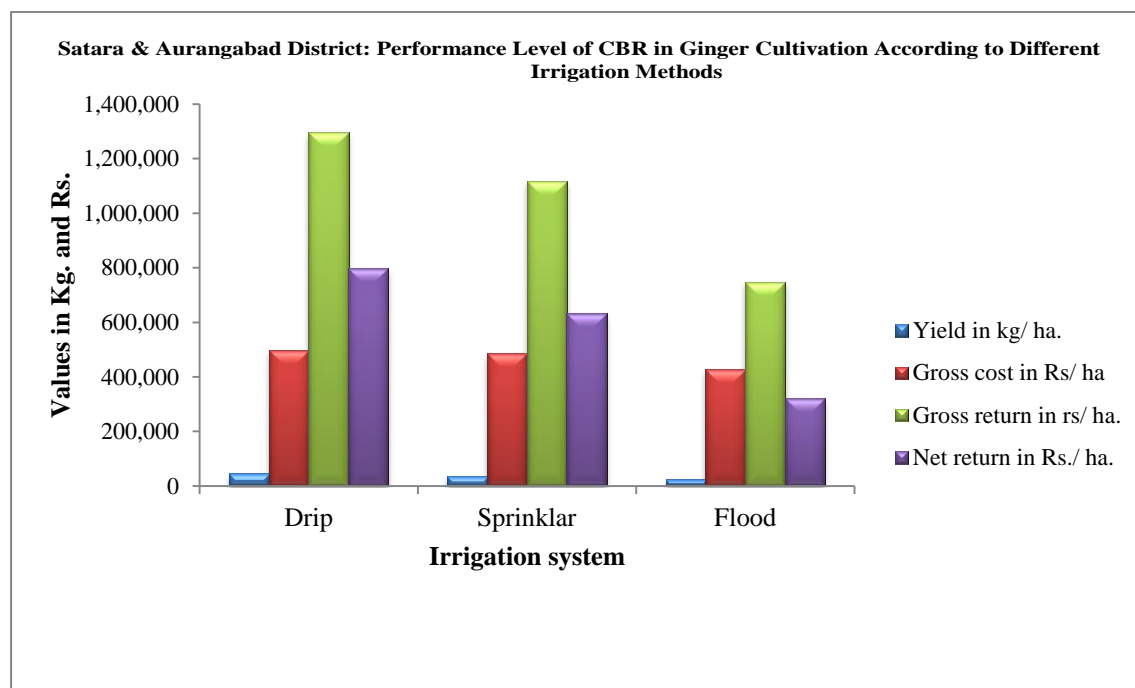
The analysis reveals that the performance level of cost benefit ratio (CBR) changes according to the different irrigation technology used in ginger cultivation. Table 1.1 and fig 1.1 reveals yield in Kg/ha, gross cost in Rs./ha, gross return in Rs./ha, net return in Rs/ha and cost benefit ratio from ginger cultivation by drip, sprinkler and flood irrigation method.

The region as a whole receives on an average per hectare yield of 35,189 kg The highest per hectare yield has been recorded in Aurangabad district (49,276 kg./ha) and Satara district (40,980 kg./ha) by drip irrigation method which is greater than regional average of 35,189 kg./ha.

Table-1.1 Satara& Aurangabad District: Performance Level of CBR in Ginger Cultivation According to Different Irrigation Methods

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Irrigation system/ Method	Sample District	Sample Villages	Total Sample growers in no. & in (%)	Total Area observed in ha.	Total yield in kg.	Yield in kg/ ha.	Gross cost in Rs/ ha	Total Return in Rs./ ha from ginger	Total Return in Rs./ ha. Intercrop	Gross return in Rs/ ha.	Net return in Rs./ ha.	C.B.R.	Rank
Drip	Satara	28	28 (23.33)	24.75	8,30,500	40,980	5,08,268.33	10,18,029	1,28,476.34	11,46,505.34	4,38,237.01	2.25	
	Aurangabad	12	36 (30.00)	29.47	12,53,000	49,276	4,88,212.10	13,28,627	1,17,090.56	14,45,717.56	9,57,505.46	2.96	
	Average					45,128	4,98,240.12	11,73,328	1,22,783.45	12,96,111.45	7,97,871.33	2.60	1
Sprinkler	Satara	28	43 (35.83)	20.34	6,10,000	37,082	4,84,769.22	9,64,132	1,53,783.44	11,17,915.44	6,33,146.22	2.30	
	Aurangabad	12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
	Average					37,082	4,84,769.22	9,64,132	1,53,783.44	11,17,915.44	6,33,146.22	2.30	2
Flood	Satara	28	13 (10.83)	2.49	40,500	23,357	4,27,373.52	6,07,282	1,40,462.33	7,47,744.33	3,20,370.81	1.74	
	Aurangabad	12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
	Average					23,357	4,27,373.52	6,07,282	1,40,462.33	7,47,744.33	3,20,370.81	1.74	3
			120	77.05	27,34,000	35,189	4,70,127.62	9,14,914	1,39,009.74	10,53,923.75	5,83,796.12	2.24	

Source: Compiled by the researcher through intensive fieldwork



About 53.33 percent sample growers in Satara and Aurangabad district used drip irrigation method for ginger cultivation Besides this 37,082 kg./ha. Yield has been

recorded by sprinkler irrigation method in study region which is again greater than regional average. About 35.83 percent sample growers in Satara district used

sprinkler irrigation method in ginger cultivation. However no any farmer of Aurangabad district used sprinkler method in ginger cultivation. Behalf of these 23,357 kg /ha yield has been recorded by flood irrigation method which is lower than the regional average. About 10.83 percent sample growers in Satara district used flood irrigation method in ginger cultivation.

Particular table 5.6 & fig.5.11 also reveals that the region as a whole receives on an average per hectares cost of production is Rs.4,70,127.62. In which highest per hectare cost has been recorded by drip irrigation method of Rs.4,98,240.12 and sprinkler irrigation method by Rs. 4,84,769.2 which is greater than the regional average of Rs.4,70,127.62 followed by the gross cost of flood irrigation method comes Rs.4,27,373.52 which is lower than the regional average. The analysis reveals that the gross return of drip irrigation method is of Rs.12,96,111.45 and sprinkler irrigation method is of Rs. 11,17,915.4 which is greater than that of regional average of Rs.10,53,923.75 followed by the gross return by flood irrigation is Rs.7,47,744.33 which is lower than the regional average

After all observation reveals that net returns from ginger cultivation by drip irrigation method is Rs.7,97,871.33 and sprinkler irrigation method is Rs.6,33,146.22 which is greater than the regional average of Rs.5,83,796.12 per hectares. However per hectare net returns from ginger cultivation by flood irrigation method is Rs. 3,20,370.81 which is lower than the regional average.

Lastly cost benefit ratio per hectares of ginger crop at regional level is 1:2.24 whereas the highest cost benefit ratio has been obtained in case of drip irrigation method i.e.1:2.60 followed by the sprinkler and flood irrigation method i.e. 1:2.30 and 1:1.74 respectively.

The aforesaid analysis reveals that drip irrigation method gives maximum yield, returns and maximum cost than that of sprinkler and flood irrigation method. However in Aurangabad district drip irrigation method gives maximum yield and minimum cost than that of the Satara

district. Generally the farmers in Aurangabad district are using their own ginger seed as seed rhizome. It saves the vast expenditure. Even they are uses their own family members as labors for all the process of planting, earthing up, weeding, harvesting, cleaning, packing etc. Therefore the gross cost is lower in Aurangabad district. In contrast the farmers in Satara district use labors for all the process. And it is resulted in high gross cost in Satara than Aurangabad district. Using own family labor is very helpful for accuracy and good care in all the works in Aurangabad district. So the yield is also higher than Satara district.

Overall the use of drip irrigation prevents the weeding. As well as, it is possible to irrigate water at root zone in ginger rhizome. It prevents the water wastage and the fustigation helps to save the expenditure on fertilizers. Due to that the cost benefit ratio of drip irrigation is higher than sprinkler and flood irrigation method in study region. From the above discussion and table 1.1, it is clear that the CBR varies from modern irrigation technology used in ginger cultivation and also differ from Satara and Aurangabad district of Maharashtra State in India.

#### **Conclusion and Recommendations:**

The analysis reveals that the performance level of cost benefit ratio (CBR) changes according to the different irrigation technology used in ginger cultivation. The net returns from ginger cultivation by drip irrigation method is Rs.7,97,871.33 and sprinkler irrigation method is Rs.6,33,146.22 which is greater than the flood irrigation method i.e. Rs. 3,20,370.81. However CBR of Aurangabad is higher than Satara district due to clear sunshine, high temperature, low rainfall, low humidity and dry climate gives healthy growth of ginger and restrict the attack of pest and diseases. In short CBR of ginger crop obtained in case of drip irrigation method i.e. 1:2.60 followed by the sprinkler and flood irrigation method i.e. 1:2.30 and 1:1.74.

However, only 53.33 percent area of ginger cultivation is under drip irrigation. So there is a need to promote area under drip irrigation method rather than sprinkler and flood irrigation in ginger cultivation.

Therefore per hectare yield will be increased. It result benefit of ginger growers will increase. Hence remaining ginger growers of study region should implement modern irrigation technology i.e. drip irrigation with fustigation system for increasing the CBR of ginger cultivation.

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