

**To Study the Cost-Benefit Analysis of Food Crops in Sangamner  
Tehsil of Ahmednagar District (MS)**

**Dr.Khakare R. D.**

Department of Geography, Jaikranti Arts College, Latur,  
Dist. Latur –413531 (MS) India.

### Abstract

The present research paper study and analyze the Cost-benefit analysis of food crops at the macro level in Sangamner tehsil. This study is based on primary and secondary data collected from farmer's revenue records and district gazetteer offices. Food crop production depended on physical, climate, socio-cultural, economic, technological and organizational factors. The Sangamner tahsil covers 135780 hectares of land and has a population of 487939 in 171 villages as per the 2011 Census. The primary crops under consideration include Jowar, Wheat, and Bajra (both irrigated and unirrigated), each analyzed in terms of various farming operations, labor, and input costs. The cost-benefit analysis for unirrigated Jowar showed a profit of Rs. 6,459 per hectare. For irrigated Jowar, the profit was Rs. 25,690 per hectare. Unirrigated Bajra cultivation resulted in a profit of Rs. 9,316 per hectare, while irrigated Bajra had a profit of Rs. 5,316 per hectare. In the case of irrigated Wheat cultivation, the research found a profit of Rs. 33,980.60 per hectare. The cash flow analysis revealed the percentage of cash outflows and inflows for each type of crop, helping to understand the income distribution and costs involved.

**Keywords:** Food Crops, Cash in flow, Cash outflow, Cost Benefit Analysis

### Introduction

The dominant cropping pattern in the tahsil is discussed in the research paper. At this juncture, it seems that the Cost-Benefit analysis of the various crops being grown in the tahsil can provide more insight into the problems faced by the farmers. The cost-benefit analysis was carried out based on the sample survey information. The research paper is mainly devoted to discussing the problems of agriculture and farmers in the tahsil as understood by the primary survey. The survey provides information on parameters related to agricultural benefits and production costs by the current cropping pattern. This and a similar kind of database are used to understand and analyze the spatial distribution.

In the last few years, in various geographical studies, cost-benefit analysis techniques have been used by various geographers and these techniques are enormously useful for the study of agricultural geography, such as Prest and Turvey (1965), Joshi (1985), Hakke (1990), Saptarshi and Bairagi (1998)

and Saptarshi and Bhagat (2004). The efficient use of available water resources based on technology (Saptarshi 1993, Bhagat 2002, More 2008 and Sonawane 2013), current employment status in rural areas (Jagdale, 2002), assessment of human resource development (Ugale, 2006), a strategy for sustainable development of agriculture (More, 2008), human resource development (Musmade, 2012), cost-effective use of water resources (Sonawane, 2013) and a strategy for groundwater management for sustainable development of agriculture (Chavan, 2014). The present study aims to find out the availability of water resources for the sustainability of agriculture in the Sangamner tahsil. Hence, the cost-benefit analysis of major food crops in the tahsil has been carried out. For this, the primary data was collected from at least 100 farmers cultivating each selected crop in the tahsil based on the questionnaire. The sample points have been selected in such a way that they will be well distributed among the villages of the tahsil in a circle-wise manner. Thus, after analyzing the basic database collected from the primary sources, the average values of the price of

each crop are obtained. Comprehensive information regarding expenditure is given in the table Table No. 1 To Table No. 16.

### Study Area

Sangamner tehsil is located in the western part of Ahmednagar district in the state of Maharashtra. Sangamner is surrounded by Rahata, Rahuri and Kopargaon to the east. Sinner tehsil Nashik District to the North. Akole tehsil to the west. Sangamner tehsil to the south-east, Junner tehsil Pune district to the south. The Tehsil 'Sangamner' is located middle part of the bank of the Pravara river. This lies between 19°34' North 19.57° North to 74°13' East 74.22° East longitude. It has an average elevation of 549 metres (1,801 ft) from mean sea level Sangamner tehsil is located in the western part of Ahmednagar district. The highest peak, as well as the temple of this tehsil, is Baleshwar. Baleshwar is located in Harichandra Range 15 km from Sangamner tehsil headquarters. Physiography, rainfall, soil, temperature, and drainage influence agricultural land use patterns in this tehsil. Rainfall varies between 200 to 225 mms. The underlined basalt on disintegration and decomposition brought various agents that had yielded three kinds of soils viz. Deep black, deep & shallow Alluvial soils in Pravara, Mhalungi and Adhula river basins. These rivers are the main irrigation source of middle tehsil areas. Including five centers of Revenue Circle i.e. Sangamner, Ashwi, Talegaon, Ghargaon and Sakur. The rainfall is mainly due to rain shadow area in terms of the amount of rainfall average receives 416.6 millimeters in the western and middle parts of the tehsil but in the southern part of the tehsil 102 villages are drought-prone areas. Therefore these areas are mostly hilly and unirrigated. The variation in the amount of rainfall & type of soil exerts influence on the cropping pattern of the study region. The major crops namely cereals, cash crops, pulses, oil seeds, fruit crops, vegetables, flower and fodder crops are cultivated in Sangamner tehsil.

### Objective

To study the Cost Benefit Analysis for food crops in Sangamner Tahsil Ahmednagar District of Maharashtra.

**Database and Methodology :** The study is based on secondary data and field observations. Circle-wise

crop data is obtained from village officers' (Talathi) records, APMC Market and Panchayat Samities records in Sangamner tehsil. Topographical maps and survey of India sheets are used for the physiographical study. Landuse data collected from the socio-economical abstract and Ahmednagar gazetteer and district census handbook in Ahmednagar district referred to collect related information.

### Methodology

The 171 villages were divided according to 14 Revenue Circles. Information from more than 100 farmers from selected villages in 14 circles of the tahsil has been collected. Well distributed to 14 villages randomly selected according to crop to collect primary information. Expenditure incurred for various operations like tillage, fertilizer, seed, planting, weeding, harvesting, etc. is considered as final charges. A summary of various operations has prepared to understand the cost per hectare for each major crop in the tahsil.

First of all, the cost of major food crops in the tahsil has been taken into consideration. The first step is to identify the major food crops in the tahsil. The major food crops grown are mainly Jowar, Bajra and Wheat etc. Out of the net sown area in the tahsil, only 25.74% of NSA is under irrigation. The highest irrigated area is 58.32% under Well irrigation, Canal 20.43%, Tube well 3.75%, and River 17.50%.

### Cost Structure

To understand the cost of each crop based on a sample survey in randomly selected 8.18% of villages, A structured questionnaire has been developed to find out the cost of various operations ranging from planting to harvesting and selling in the market.

### Cash Flow Analysis

The total income of the farmer has been analyzed to understand the cash flow after getting the statistics of expenditure on the cultivation of major crops in the study area. This type of cash flow analysis has been done in research over the last few decades (Saptarshi and Kale 1984, More 2008, Sonawane 2013 and Chavan 2014). This technique is very useful to understand the economic system as a whole. In the present study, the following factors have been considered to cover the cost of cash flow.

**Cash in Flow**

1. Wages are given to women worker
2. Wages are given to the male worker
3. Profit margin earned by cultivators.

**Cash-out Flow**

1. Cost of seeds, fertilizers, and pesticides
2. Cost of packing material brought from the urban sector
3. Cost of fuel such as electric bill, diesel or hiring tractor, and technology

Thus, the share of income that remains in the tahsil and the share that goes out of the tahsil is estimated based on expenditure structure. This research has estimated for each village and the tahsil.

**Cost of Unirrigated Jowar (Rabbi) Crop Cultivations:**

**Table No. 1. Cost of Unirrigated Jowar Cultivation (Rabbi)**

S r. N o.	Opera tions	Human Power		Labour Cost			Ot her Co st	Tot al Co st	Per Ce nt (%)
		M an Da ys	Wo men Day s	M ale	Fe male	Tot al			
1	Ploughing	02	00	80	00	80	35	43	15.80
2	Harro wing	02	06	80	180	26	90	35	12.86
3	Sowin g / Seedli ng	02	00	80	00	80	60	14	05.15
4	Cost of Seeds	00	00	00	00	00	20	20	00.74
5	Electri city Charg es	00	00	00	00	00	00	00	00.00
6	Fertili zers/ Pesti cides	00	00	00	00	00	24	24	08.82
7	Weedi ng	00	10	00	300	30	10	40	14.70
8	Irrigati on	00	00	00	00	00	00	00	00.00
9	Harve sting	06	10	24	300	54	10	64	23.52
10	Thresh ing	02	02	80	600	14	16	30	11.21
11	Packin g	02	02	80	600	14	56	19	07.20
	<b>Total</b>	<b>16</b>	<b>30</b>	<b>64</b>	<b>900</b>	<b>15</b>	<b>11</b>	<b>27</b>	<b>100.00</b>

*Source: Field Survey Data (2022-2023).*

As discussed in the Jowar crop is cultivated in the tahsil only during Rabbi Season. Rabbi season Jowar is mainly divided into irrigated and unirrigated varieties. The cost of various operations in the agricultural sector has been calculated for both irrigated Jowar and unirrigated Jowar. Table No. 2 shows the cost-benefit analysis of unirrigated Jowar. The figures in the table show that unirrigated Jowar can get a profit of Rs. 6459/- hectare.

**Table No. 2: Output of Unirrigated Jowar Cultivation (Rabbi)**

Sr. No.	Details	Rupees
1	On-farm Price/Kg. Rs.	Rs.39.00/-
2	Grain Production/Hector Kg.	671 Kg.
3	Grain Production/Hector Rs.	Rs.26169/-
4	Average on-farm price of fodder/Hector Rs.	Rs.7500/-
5	Total Earnings/Hector (Grains + Fodder)	Rs.33669/-
6	Total Cost/Hector	Rs.27210/-
7	Net Profit/Hector (Total Earning - Total Cost)	Rs.6459/-
8	Man Days/Hector	16 Days
9	Women Days/Hector	30 Days
10	Daily wages for male workers	Rs.400/-
11	Daily wages for female workers	Rs.300/-

*Source: Field Survey Data (2022-2023).*

Table No. 2 shows Rabbi unirrigated Jowar cultivation cost Rs.27210/- per hectare. The total result of rainfed Jowar cultivation (including fodder cost) is Rs. 33669/- per hectare. Area observation and statistics show that the net yield of rainfed Jowar is Rs.6459/- per hectare. The employment for rabbi rainfed Jowar cultivation per hect is 16 males and 30 females. The area under Rabbi unirrigated Jowar cultivation in the tahsil in 2022-23 is 3186 hectares. The employment power requirement is 73720 male days and 98766 female days. The Employment power generated from the unirrigated Jowar cultivation is 50976 male workers and 95580 female workers in the tahsil.

**Table No. 3 Cash Flow Analysis of Unirrigated Jowar Cultivation (Rabbi)**

Sr. No.	Cash Flow Analysis	Rupees	Percentage (%)
1	Cash Out-flow	11810	35.08
2	Cash In-flow	15400	45.74
3	Profit	6459	19.18
	<b>Total Income</b>	<b>33669</b>	<b>100.00</b>

*Source: Field Survey Data (2021-2022).*

Rabbi unirrigated Jowar has been found to provide about 19.18 % profit to the farmers (Table No. 3). The cost-benefit analysis technique, called cash-outflows, is useful for understanding the part of cash flow and out-of-rural income, the share of income transmitted in a tahsil. In the case of Jowar, cash inflow is 45.74%. In contrast, Rabbi unirrigated Jowar has a cash outflow of 35.08% only.

**Cost of Irrigated Jowar Cultivation (Rabbi):**

**Table No. 4. Cost of Irrigated Jowar Cultivation (Rabbi)**

S r. No.	Opera tions	Human Power		Labour Cost			O ther Cost	To tal Cost	Per Cent (%)
		M an Day s	Wo men Da ys	M al e	Fe male	To tal			
1	Ploughing	04	00	16	00	16	350	51	12.97
2	Harrowing	02	06	80	180	26	900	35	08.90
3	Sowing/Seedling	02	00	80	00	80	600	14	03.56
4	Cost of Seeds	00	00	00	00	00	200	20	00.51
5	Electricity Charges	00	00	00	00	00	400	40	10.18
6	Fertilizers/Pesticides	00	00	00	00	00	520	52	13.23
7	Weeding	00	12	00	360	36	100	46	11.70
8	Irrigation	06	00	24	00	24	150	39	09.92
9	Harvesting	06	10	24	300	54	100	64	16.28
10	Threshing	02	02	80	600	14	165	30	07.76
11	Packing	02	02	80	600	14	560	19	04.99
	<b>Total</b>	<b>24</b>	<b>32</b>	<b>96</b>	<b>960</b>	<b>19</b>	<b>201</b>	<b>39</b>	<b>100.00</b>

Source: Field Survey Data (2020-2021).

In the above table, the cost of various operations in the field of irrigated Jowar cultivation has been

calculated. Table No. 4 shows the cost-benefit analysis of Jowar based on irrigation facilities.

**Table No. 5: Output of Irrigated Jowar Cultivation (Rabbi)**

Sr. No.	Details	Rupees
1	On-farm Price/Kg. Rs.	Rs.32.00/-
2	Grain Production/Hector Kg.	1250 Kg.
3	Grain Production/Hector Rs.	Rs.40000/-
4	Average on-farm price of fodder/Hector Rs.	Rs.25000/-
5	Total Earnings/Hector (Grains + Fodder)	Rs.65000/-
6	Total Cost/Hector	Rs.39310/-
7	Net Profit/Hector (Total Earning - Total Cost)	Rs.25690/-
8	Man Days/Hector	24 Days
9	Women Days/Hector	32 Days
10	Daily wages for male workers	Rs.400/-
11	Daily wages for female workers	Rs.300/-

Source: Field Survey Data (2022-2023).

The figures in the table show that the average total production cost of Jowar based on irrigation facilities is Rs. 39310/-. The total average cost of labor is Rs. 19200/- while the other total expenditure is Rs. 20110/-. Cost-benefit statistics of irrigated Jowar crops show that most of the cost in various operations is on harvesting and threshing.

Table No. 5 indicates that the cost of irrigated Jowar cultivation is Rs.65000/-per hectore and the net output from the irrigated Jowar cultivation including the cost of fodder is Rs.25000/- per hect. The net benefit from the irrigated Jowar cultivation is Rs.25690/- per hect. The field observation and statistical data show the requirement of employment per hect. irrigated Jowar cultivation is 24 males and 32 females. In the tahsil 2022-23 the area under irrigated Jowar cultivation is 918 hect. The employment power requirement is 22032 male days and 29376 female days.

**Table No. 6: Cash Flow Analysis of Irrigated Jowar Cultivation (Rabbi)**

Sr. No.	Cash Flow Analysis	Rupees	Percentage (%)
1	Cash Out-flow	20110	30.94
2	Cash In-flow	19200	29.54
3	Profit	25690	39.52
	<b>Total Income</b>	<b>65000</b>	<b>100.00</b>

Source: Field Survey Data (2020-2021).

It is observed that the profit earned by the farmer due to the cultivation of irrigated Jowar is about 39.52%. Except for grains, most of the Jowar crop is used as dry fodder in the tahsil. The cash inflow in the case of irrigated Jowar is 29.54%. The cash outflow in irrigated Jowar cultivation is 30.94% (Table No. 6).

**Cost of Unirrigated Bajra Cultivation:**

In the following table, the cost of various operations in the field of unirrigated Bajra cultivation has been calculated. Table No. 7 shows the cost-benefit analysis of Bajra based on non-irrigation facilities. The figures in the table show that the average total production cost of Bajra based on non-irrigation facilities is Rs. 46300/-. The total average cost of labor is Rs. 18400/- while the other total expenditure is Rs. 27900/-. Cost-benefit statistics of unirrigated Bajra crops show that most of the cost in various operations is on harvesting, threshing and ploughing.

**Table No. 7: Cost of Unirrigated Bajra Cultivation**

S r. N o.	Operati ons	Human Power		Labour Cost			Ot her Cost	To tal Cost	Per Ce nt (%)
		M an D ays	Wo me n D ays	M al e	Fe mal e	To tal			
1	Ploughing	02	00	80	00	80	45	53	14.97
2	Harrowing	02	00	80	00	80	35	43	12.15
3	Sowing/Seedling	02	00	80	00	80	90	17	04.80
4	Cost of Seeds	00	00	00	00	00	90	90	02.54
5	Electricity Charges	00	00	00	00	00	00	00	00.00
6	Fertilizers / Pesticides	02	00	80	00	80	45	53	14.97
7	Weeding	00	12	00	360	36	10	46	12.99
8	Irrigation	00	00	00	00	00	00	00	00.00
9	Harvesting	01	12	40	360	40	10	50	14.12
1	Threshing	02	08	80	240	32	35	67	18.93
1	Packing	01	02	40	600	10	60	16	04.52
	<b>Total</b>	12	34	48	102	15	20	35	10
				00	00	00	40	40	0.0
				0	0	0	0	0	0

Source: Field Survey Data (2020-2021).

**Table No. 8: Output of Unirrigated Bajra Cultivation**

Sr. No.	Details	Rupees
1	On-farm Price/Kg. Rs.	Rs.27.00/-
2	Grain Production/Hector Kg.	1408 Kg.
3	Grain Production/Hector Rs.	Rs.38016/-
4	Average on-farm price of fodder/Hector Rs.	Rs.6700/-
5	Total Earnings/Hector (Grains + Fodder)	Rs.44716/-
6	Total Cost/Hector	Rs.35400/-
7	Net Profit/Hector (Total Earning - Total Cost)	Rs.9316/-
8	Man Days/Hector	12 Days
9	Women Days/Hector	34 Days
10	Daily wages for male workers	Rs.400/-
11	Daily wages for female workers	Rs.300/-

Source: Field Survey Data (2022-2023).

Table No. 8 indicates that the cost of unirrigated Bajra cultivation is Rs.35400/-per hect. and the net output from the unirrigated Bajra cultivation including the cost of fodder is Rs.44716/- per hect. The net benefit from the unirrigated Bajra cultivation is Rs.9316/- per hect. The field observation and statistical data show the requirement of employment per hect. unirrigated Bajra cultivation is 12 males and 34 females. In the tahsil during 2022-23, the area under unirrigated Bajra cultivation is 18488 hect. The employment power requirement is 258832 male days and 684056 female days. The Employment power generated from the unirrigated Bajra cultivation is 221856 male workers and 628592 female workers in the tahsil.

**Table No. 9: Cash Flow Analysis of Unirrigated Bajra Cultivation**

Sr. No.	Cash Flow Analysis	Rupees	Percentage (%)
1	Cash Out-flow	20400	45.62
2	Cash In-flow	15000	33.55
3	Profit	9316	20.83
	<b>Total Income</b>	<b>44716</b>	<b>100.00</b>

Source: Field Survey Data (2022-2022).

It is observed that the profit earned by the farmer due to the cultivation of unirrigated Bajra is about 20.83% (Table No. 9). Except for grains, most of the Bajra crop is used as dry fodder in the tahsil.

The cash inflow in the case of unirrigated Bajra is 33.55%. The cash outflow in unirrigated Bajra cultivation is 45.62%.

**Cost of Irrigated Bajra Cultivation:**

**Table No. 10: Cost of Irrigated Bajra Cultivation**

S r. N o.	Operati ons	Human Power		Labour Cost			Ot her Cost	To tal Cost	Per Cent (%)
		M an Days	Wo men Days	M al	Fe mal e	To tal			
1	Ploughing	02	00	80	00	80	45	53	11.45
2	Harrowing	02	00	80	00	80	40	48	10.37
3	Sowing/Seedling	02	00	80	00	80	90	17	03.67
4	Cost of Seeds	00	00	00	00	00	90	90	01.94
5	Electricity Charges	00	00	00	00	00	40	40	08.64
6	Fertilizers / Pesticides	02	00	80	00	80	45	53	11.45
7	Weeding	00	18	00	540	54	10	64	13.82
8	Irrigation	04	00	16	00	16	15	31	06.70
9	Harvesting	01	12	40	360	40	15	55	11.88
10	Threshing	02	08	80	240	32	45	77	16.63
11	Packing	01	02	40	600	10	60	16	03.46
	<b>Total</b>	16	40	64	120	18	27	46	10.00

In the above Table, No. 10 indicates, the cost of various operations in the field of irrigated Bajra cultivation has been calculated. Table No. 10 shows the cost-benefit analysis of Bajra based on irrigation facilities. The figures in the table show that the average total production cost of Bajra based on irrigation facilities is Rs. 46300/-. The total average cost of labor is Rs. 18400/- while the other total expenditure is Rs. 27900/-. Cost-benefit statistics of irrigated Bajra crops show that most of the cost in various operations is on threshing and harvesting.

**Table No. 11: Output of Irrigated Bajra Cultivation**

Sr. No.	Details	Rupees
1	On-farm Price/Kg. Rs.	Rs.27.00/-
2	Grain Production/Hector Kg.	1708 Kg.
3	Grain Production/Hector Rs.	Rs.46116/-
4	Average on-farm price of fodder/Hector Rs.	Rs.5500/-
5	Total Earnings/Hector (Grains + Fodder)	Rs.51616/-
6	Total Cost/Hector	Rs.46300/-
7	Net Profit/Hector (Total Earning - Total Cost)	Rs.5316/-
8	Man Days/Hector	16 Days
9	Women Days/Hector	40 Days
10	Daily wages for male workers	Rs.400/-
11	Daily wages for female workers	Rs.300/-

*Source: Field Survey Data (2022-2023).*

Table No. 11 indicates that the cost of irrigated Bajra cultivation is Rs.46300/-per hect and the net output from the irrigated Bajra cultivation including the cost of fodder is Rs.51616/- per hect. The net benefit from the irrigated Bajra cultivation is Rs.5316/- per hect. The field observation and statistical data show the requirement of employment per hect. irrigated Bajra cultivation is 16 males and 40 females. In the tahsil during 2022-23, the area under irrigated Bajra cultivation is 3513 hect. The employment power requirement is 49182 male days and 129981 female days. The Employment power generated from the unirrigated Bajra cultivation is 56208 male workers and 140520 female workers in the tahsil.

**Table No. 12: Cash Flow Analysis of Irrigated Bajra Cultivation**

Sr. No.	Cash Flow Analysis	Rupees	Percentage (%)
1	Cash Out-flow	27900	54.05
2	Cash In-flow	18400	35.65
3	Profit	5316	10.30
	<b>Total Income</b>	<b>51616</b>	<b>100.00</b>

*Source: Field Survey Data (2020-2021).*

It is observed that the profit earned by the farmer due to the cultivation of irrigated Bajra is about 10.30% (Table No.12). Except for grains, most of the Bajra crop is used as dry fodder in the tahsil. The cash inflow in the case of irrigated Bajra is

35.65%. The cash outflow in irrigated Bajra cultivation is 54.05%.

**Cost of Irrigated Wheat Cultivation:**

**Table No. 13: Cost of Irrigated Wheat Cultivation**

S r. N o.	Operati ons	Human Power		Labour Cost			Ot her Co st	To tal Co st	Per Cent (%)
		M an D ay s	Wo me n Day s	M al e	Fe mal e	To tal			
1	Ploughin g	02	00	80	00	80	45	53	09.26
2	Harrowi ng	02	00	80	00	80	35	43	07.51
3	Sowing/ Seedling	02	00	80	00	80	90	17	02.97
4	Cost of Seeds	00	00	00	00	00	27	27	04.72
5	Electricit y Charges	00	00	00	00	00	40	40	06.99
6	Fertilizer s / Pesticide s	04	00	16	00	16	10	11	20.49
7	Weeding	00	25	00	750	75	10	85	14.85
8	Irrigatio n	08	00	32	00	32	25	57	09.96
9	Harvesti ng	03	12	12	360	48	10	58	10.14
1	Threshin g	02	04	80	120	20	35	55	09.61
1	Packing	01	02	40	600	10	10	20	03.49
	<b>Total</b>	<b>24</b>	<b>43</b>	<b>96</b>	<b>129</b>	<b>22</b>	<b>34</b>	<b>57</b>	<b>10</b>
				<b>00</b>	<b>00</b>	<b>50</b>	<b>72</b>	<b>22</b>	<b>0.0</b>
						<b>0</b>	<b>5</b>	<b>5</b>	<b>0</b>

In the above Table, No. 13 indicates, the cost of various operations in the field of irrigated Wheat cultivation has been calculated. Table No. 13 shows the cost-benefit analysis of Wheat-based irrigation facilities.

**Table No. 14: Output of Irrigated Wheat Cultivation**

Sr. No.	Details	Rupees
1	On-farm Price/Kg. Rs.	Rs.32.00/-
2	Grain Production/Hector Kg.	2459.55 Kg.
3	Grain Production/Hector Rs.	Rs.78705.60/-
4	Average on-farm price of fodder/Hector Rs.	Rs.12500/-
5	Total Earnings/Hector (Grains + Fodder)	Rs.91205.60/-

6	Total Cost/Hector	Rs.57225/-
7	Net Profit/Hector (Total Earning - Total Cost)	Rs.33980.60/-
8	Man Days/Hector	24 Days
9	Women Days/Hector	43 Days
10	Daily wages for male workers	Rs.400/-
11	Daily wages for female workers	Rs.300/-

*Source: Field Survey Data (2022-2023).*

The figures in the table show the average total production cost of Wheat-based irrigation facilities is Rs. 57225/-. The total average cost of labor is Rs. 12900/- while the other total expenditure is Rs. 22500/-. Cost-benefit statistics of irrigated Wheat crops show that most of the cost in various operations is on threshing, harvesting, and wining.

Table No. 14 indicates that the cost of irrigated Wheat cultivation is Rs.57225/-per hect. and the net output from the irrigated Wheat cultivation including the cost of fodder is Rs.91205.60/- per hect. The net benefit from the irrigated Wheat cultivation is Rs.33980.60/- per hect. The field observation and statistical data show the requirement of employment per hect. irrigated Wheat cultivation is 24 males and 43 females. In the tahsil during 2022-23, the area under irrigated Wheat cultivation is 5507 hect. The employment power requirement is 132168 male days and 236801 female days.

**Table No. 15: Cash Flow Analysis of Irrigated Wheat Cultivation**

Sr. No.	Cash Flow Analysis	Rupees	Percentage (%)
1	Cash Out-flow	347225	86.01
2	Cash In-flow	22500	05.57
3	Profit	33980.6	08.42
	<b>Total Income</b>	<b>403705.6</b>	<b>100.00</b>

*Source: Field Survey Data (2022-2023).*

It is observed that the profit earned by the farmer due to the cultivation of irrigated Wheat is about 8.42% (Table No. 15). Except for grains, most of the Wheat crop is used as dry fodder in the tahsil. The cash inflow in the case of irrigated Wheat is 5.57%. The cash outflow in irrigated Wheat cultivation is 86.01%.

Cash Flow Analysis:

Table No. 16: Cash Flow Analysis

S r. N o.	Operations	Cash-Out Flow	%	Cash-In Flow	%	Profit	%	Total Income	%
1	Jowar R.	11810	10.27	15400	17.97	6459	8.00	33669	11.76
2	Jowar Ir.	2010	17.50	19200	22.40	25692	31.81	65000	22.71
3	Bajra R.	20400	17.75	10200	11.90	9316	11.53	44716	15.62
4	Bajra Ir.	27900	24.27	18400	21.47	5316	6.58	51616	18.03
5	Wheat R.	34725	30.21	22500	26.25	33981	42.07	91205.6	31.87
<b>Total</b>		<b>114945</b>	<b>10.00</b>	<b>85700</b>	<b>10.00</b>	<b>80764</b>	<b>10.00</b>	<b>286206.6</b>	<b>10.00</b>

Source: Field Survey Data (2022-2023).

The cash flow analysis technique is very useful for understanding the crop-wise rupee incoming and outgoing in tahsils. The cash flow analysis of food crops in the study area was revealed in Table No. 16. The cash-out flow is higher in the case of crops like Wheat (30.21%), Irrigated Bajra (24.27%), Rabbi Bajra (17.75%), Irrigated Jowar (17.50%) and Rabbi Jowar (10.27%). Also, the cash inflow is higher in the case of crops like Wheat (26.25%), Irrigated Jowar (22.40%), Irrigated Bajra (21.47%), Rabbi Jowar (17.97%) and Rabbi Bajra (11.90%). The profit is higher in the case of crops like Wheat (42.07%), Irrigated Jowar (31.81%), Rabbi Bajra (11.53%), Rabbi Jowar (8.00%) and Irrigated Bajra (6.58%).

Conclusion

The research paper discusses the dominant cropping pattern in Sangamner tehsil, Maharashtra, focusing on cost-benefit analysis and agriculture-related problems. The study aims to understand the sustainability of agriculture by analyzing the cost-benefit of major food crops in the region. Data was collected from over 100 farmers in a sample survey distributed across the villages in the tehsil. The primary crops under consideration are Jowar, Bajra, and Wheat, and the study distinguishes between irrigated and unirrigated variants of these crops.

Unirrigated Jowar (Rabbi Season): The total cost of unirrigated Jowar cultivation is Rs. 27,210 per hectare, while the total earnings per hectare are Rs. 33,669. This results in a net profit of Rs. 6,459 per hectare. Employment requirements include 16 male and 30 female workdays per hectare. The study estimates that in 2022-23, 3,186 hectares were cultivated with unirrigated Jowar, generating employment for 50,976 male and 95,580 female workers in the tehsil. The cash flow analysis shows that cash inflow is 45.74%, cash outflow is 35.08%, and the profit is 19.18%.

Irrigated Jowar (Rabbi Season): For irrigated Jowar, the total cost is Rs. 39,310 per hectare, and total earnings are Rs. 65,000 per hectare, and net profit is Rs. 25,690 per hectare. The employment requirements include 24 male and 32 female workdays per hectare. In 2022-23, 918 hectares were cultivated with irrigated Jowar, creating employment for 22,032 male and 29,376 female workers in the tehsil. The cash flow analysis indicates that cash inflow is 29.54%, cash outflow is 30.94%, and the profit is 39.52%.

Unirrigated Bajra: Unirrigated Bajra cultivation costs Rs. 35,400 per hectare, and the total earnings are Rs. 44,716 per hectare, resulting in a net profit of Rs. 9,316 per hectare. This cultivation requires 12 male and 34 female workdays per hectare. In 2022-23, 18,488 hectares were cultivated with unirrigated Bajra, employing 221,856 male and 628,592 female workers. The cash flow analysis shows that cash inflow is 33.55%, cash outflow is 45.62%, and the profit is 20.83%.

Irrigated Bajra: Irrigated Bajra cultivation costs Rs. 46,300 per hectare, while the total earnings are Rs. 51,616 per hectare, resulting in a net profit of Rs. 5,316 per hectare. This cultivation requires 16 male and 40 female workdays per hectare. In 2022-23, 3,513 hectares were cultivated with irrigated Bajra, employing 49,182 male and 129,981 female workers. The cash flow analysis shows that cash inflow is 35.65%, cash outflow is 54.05%, and the profit is 10.30%.

Irrigated Wheat: Irrigated Wheat cultivation costs Rs. 57,225 per hectare, and the total earnings are Rs. 91,205.60 per hectare, resulting in a net profit of Rs. 33,980.60 per hectare. This cultivation requires 24 male and 43 female workdays per hectare. In



2022-23, 5,507 hectares were cultivated with irrigated Wheat, employing 132,168 male and 236,801 female workers. The cash flow analysis shows that cash inflow is 5.57%, cash outflow is 86.01%, and the profit is 8.42%.

In summary, the research paper provides a detailed cost-benefit analysis of various food crops in Sangamner tehsil, highlighting the profitability and employment generation associated with different crops and irrigation practices.

### References

- 1) Bairagi, S. I. and Saptarshi, P. G. (1998): "Cost Benefit Analysis of Export and Domestic Market System for Grapes: A Case Study of Pimpalgaon Baswant (Nashik)" The Deccan Geographer Society, Pune, Vol.: 37, No.: 2, July-Dec. 1999, Pp: 42-51.
- 2) Banerjee, B. (1969): "The Infrastructure of Indian Agriculture in Essays in Agricultural Geography," B. Banerjee (Ed), Calcutta, Pp: 254-277.
- 3) Chaudhari, K. C. and Musmade, A. H. (2021): "A Geographical Analysis of Occupational Structure in Parner Tahsil of Ahmednagar District (M.S.)." Maharashtra Bhugolshastra Sanshodhan Patrika (MBP), Vol.: 38, No.: 2, Jul.- Dec. 2021, Pp: 47-56.
- 4) Chaudhari, K. C. and Musmade, A. H. (2022): "The Role of Wells to Sustainable Irrigation in Parner Tahsil of Ahmednagar District (MS): A Systematic Analysis." Bengal, Past and Present, Vol.: 118, Issue: (I) January – March 2022, Pp: 90-98.
- 5) Dwivedi, R. S., Sreenivas K, Ramana K. V., Redy, P. R., Ravi Sankar G. (2006): "Sustainable Development of Land and Water Resources Using Geographic Information System and Remote Sensing". J. Indian Soc. Remote Sensing 2006, 34 (4), Pp: 351-368.
- 6) Government of India (2011): District Census Handbook- Ahmednagar.
- 7) Gregory, S. (1989): "The Changing Frequency of Drought in India", Pp: 1871-1985.
- 8) Gupta, S. K. and Gupta, I. C. (1997): "Crop Production in Waterlogged Saline Soils", Scientific Publication, Jodhpur.
- 9) Hanley, N., Shogren J. F., White, B. (1997): "The Economics Sustainable Development" Unpublished Course Work for Training Programme on Environmental Economics, Administrative Staff College of India", Hyderabad, India.
- 10) Herman, Bouwer (1978): "Ground Water Hydrology" McGraw Hill Book Company, Jaipur and New Delhi, Pp: 65-70.
- 11) Hillgard, E. W. (1906): "Soils Formation, Properties, Composition and Relation to Climate and Plants Growth", Illus, New York and London, Pp: 593.
- 12) Husain, Majid (2004): "Systematic Agriculture Geography" Rawat Publications, Jaipur, Pp: 1-20.
- 13) Prest, A. R. and Turvey, R. (1965): "Cost-Benefit Analysis", A Survey, The Economic Journal, 75 (300): Pp: 683-735.