

Benefit Cost Ratios of Organic and Inorganic Wheat Production: A Case Study of District Sheikhupura

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Abstract: Majority of the farmers in Pakistan are involved in inorganic farming practices due to its high productivity and profit margins which showed that they are quantity conscious instead of quality. It was therefore, essential to disclose the reality after investigating and analyzing the benefit cost ratios of organic and inorganic wheat production on per acre basis. To fulfill the objective of the study District Sheikhupura was divided into three strata and from each stratum two villages were randomly selected and from each village five respondents each of both organic and inorganic growers were interviewed to get necessary information and to make the sample of sixty respondents. At the end results were presented in the tabular and graphical form which showed that per acre cost of production in organic wheat system was lesser than inorganic. Furthermore, BCR (benefit cost ratio) of organic wheat was found 1:1.08 which was higher than inorganic having value of 1:1.01.

Key word: Cost analysis • Gross margin • BCR • Wheat crop

INTRODUCTION

Agriculture in Pakistan is considered to be a driving force for growth and development and provides livelihood for more than 64% of the country's population. It contributes approximately one fifth of the gross domestic product and employs nearly 44% of the total work force. Moreover, agriculture is base lining of the nation's economic policies and has been designated by the government as the engine of national economic growth and poverty alleviation. It supplies raw materials to industries and also contributes substantially to Pakistan's export earnings. Thus any improvements in agriculture will not only help country's economic growth to rise at a faster rate but will also benefit a large segment of the country's population [1].

There are two main crop seasons in Pakistan, i.e. Kharif and Rabi coupled with Zaid Kharif and Zaid Rabi. Kharif season commences from April-June and comes to an end in October-December. Similarly Rabi season begins in October-December and ends in April-May. Rice, cotton, maize, mung, mash and sorghum are Kharif crops while wheat, gram, lentil, tobacco, rapeseed and mustard are the Rabi crops. Wheat is the leading food

grain crop of Pakistan and prime staple food of the people. Wheat occupies a central position in formulation of agricultural policies with special emphasize on food security as it contributes 14.4% to the value added in agriculture and 3.1% in gross domestic product (1). According to an estimate per capita availability and per capita consumption of wheat in Pakistan was 126.77 kgs and 122.796 respectively in 2008-09. The per capita consumption of wheat was low for high income group (119.052 kgs) and high for low income group (124.272 kgs). The area, production and yield per hectare of wheat crop for the last five years are tabulated as under [2].

Two type of farming methods are used in Pakistan i.e. organic farming and inorganic farming. Organic farming is considered to be holistic, sustainable and close to natural farming system, which not only sustain the fertility of the soil but also uses least resources to produce high quality of nutritious food [3-5]. The maintenance of soil fertility relies principally on the use of green fodder/legumes, crop rotation as well as the application of composted farm manures (poultry and animals waste). In this type of farming weeds are controlled mechanically, while insect, pests and diseases tend not to be a problem due to the intrinsic bio-diversity in existing system [6].

Different studies [7-11] revealed that comparative profitability of inorganic or organic agricultural production practices varies due to a wide range of production techniques used in different areas and with different crops. The profitability of organic farming usually depends on price premiums.

The gradual increase in the number of quality conscious consumers world wide has encouraged the farmers to bring more land under the organically agricultural products. According to statistical figures available from 141 countries of the world, its share of land and farms continue to grow more swiftly. Results of the global survey on certified organic farming reveals that 32.2 million hectares² of agricultural land are managed organically by more than 1.2 million producers, including smallholders. Moreover to the agricultural land, there are 0.4 million hectares of certified organic aquaculture. The regions with the largest areas of organically managed agricultural land are Oceania, Europe and Latin America. Australia, Argentina and Brazil are the countries with the largest organically managed land areas [12].

As far as the scenario in Pakistan is concerned, organic cultivation is still negligible. Perhaps the question which is faced by the inorganic farmers and those who wish to transfer from conventional to traditional method is that whether organic farming is profitable or not? In this regard the attempt was made to guide the growers, policy makers, researchers, NGO's and government agencies after comparing the cost of production and benefit cost ratio of organic and inorganic wheat crop per acre production from district Sheikhupura of Punjab Province.

MATERIALS AND METHODS

The study is based on primary data collected through face to face interview from organic and inorganic wheat growers of Sheikhupura district of Punjab province. Sheikhupura district was selected as a universe for the present study because of the inclining interest of a few farmers towards cultivation of organic products on their lands. Wheat crop was earmarked for the sake of comparison of organic and inorganic on the basis of cost of production and for cost benefit analysis. Six villages Muhammad Pura, Toola Wali, Cheecho Ki Mallianh, Sahoo Ki Mallianh, Dera Mallah Singh and Dera Chubari Walli were selected by using the stratified random sampling. These villages were divided into three strata. Five respondents of each organic and inorganic wheat growers from aforesaid randomly selected villages were interviewed, making 20 from each stratum and 60 from all.

After completing the data collection from all respondents, statistical techniques averages, percentages and T test were used to finalize part of results and discussion in present study [13]. Adopted the same method to compare the cost of production and benefit cost ratio, of organic and inorganic carrot production.

Cost of Production and Gross Margin:

$$C_p = C_{seed} + C_{ferti/manure} + C_{pp} + C_{labor} + C_{land,prep} + C_{irri} + C_{other}$$

Where

C_p	=	Cost of production
C_{seed}	=	Cost on seed
$C_{ferti/manure}$	=	Cost on fertilizer or manure
C_{pp}	=	Cost on plant protection (organic or inorganic)
C_{labor}	=	Cost on labor
$C_{land,prep}$	=	Cost on land preparation
C_{irri}	=	Cost on irrigation
C_{other}	=	Cost on other inputs

Gross Margin: After deducting total variable cost from gross returns, gross margin was obtained as shown below.

$$\text{Gross Margin} = \text{Gross Return} - \text{total variable cost}$$

Benefit Cost Ratio Analysis: Benefit cost ratio analysis is an important tool to assess economics of farming. It is the ratio of net value of the crop produce after deducting the cost of different inputs after their summation. It indicates the rate of net returns from the use of an input.

$$\text{BCR} = \frac{\text{Value of crop produce} - \text{cost of inputs}}{\text{cost of inputs}}$$

RESULTS AND DISCUSSION

To fulfill the objective of the study in hand the comparison between organic and inorganic wheat crop production was made to calculate the cost of production, profit margin and BCR on the basis of following approaches.

- Cost analysis
- BCR analysis

²One Hectare = 2.47 acres, One Hectare = 10,000 sq. meters or 107,600 sq. feet, One Acre = 4,050 square meters or 43,560 sq. feet

Table 1: Area, Production and yield of rice

Year	Area		Production		Yield	
	(000 Hectare)	% Change	(000 Tons)	% Change	(Kgs/Hec.)	% Change
2005-06	2621	4.0	5547	10.4	2116	6.1
2006-07	2581	-1.5	5438	-2.0	2107	-0.4
2007-08	2515	-2.6	5563	2.3	2212	5.0
2008-09	2963	17.8	6952	25.0	2346	6.1
2009-10(P)	2883	-2.7	6883	-1.0	2387	1.7

P: Provisional(July-March) Source: [6]

Table 2: Per acre cost of production of organic and inorganic wheat crop

Sr. No	Inputs	Organic Wheat Production (Rs.)	Inorganic Wheat Production (Rs.)	t test
1	Cost on seed [a]	764	963	-6.84
2	Cost on fertilizer/ manure [b]	3070	6495	-18.46
3	Cost on land preparations [c]	1705	1537	2.22
4	Cost on pesticides/ organic plant protection [d]	519	807	-5.03
5	Cost on labor [e]	4903	4007	3.80
6	Cost on irrigation [f]	1336	1701	-4.93
7	Cost on other inputs/ (Marketing and Transportation Cost) [g]	975	1139	-1.63
Total cost of production [$C_p = a+b+c+d+e+f+g$]		13274	16650	-8.46

Significant at 95% confidence level

Table 3: Gross margin of organic and inorganic wheat system

Sr. No	Particulars	Organic wheat	Inorganic wheat
1	Income	Rs. 27717	Rs. 33586
2	Total cost	Rs. 13274	Rs. 16650
Gross Margin		Rs. 14442	Rs. 16936

Cost Analysis: After detailed interview from both categories of the wheat growers, results were presented in tabular and graphical forms which showed that average per acre cost of seed on organic farm was computed Rs. 764/- while Rs. 963/- for per acre inorganic farm and average per acre cost for fertilizer was found Rs. 6495/- and Rs 3070/- for purchase of manure/spent for green fodder. Furthermore, average per cost on land preparation was calculated Rs. 1705/- for organic wheat farm while Rs. 1535/- for inorganic farm. During survey organic spraying cost was estimated Rs 519/- instead of Rs. 807/- spent on inorganic farm for pesticides.

In addition, per acre average cost of labor was estimated Rs. 4903/- on organic farm with respect to Rs. 4007/- on inorganic farm which was endorsed by the views of [14] reported that organic farm is more labor intensive than that of inorganic. Similarly, average cost on irrigation charges was derived Rs. 1336/- while Rs. 1701/- for inorganic per acre wheat production. Moreover, marketing and transportation cost was included in other

cost which were obtained as Rs. 975/- for organic farm while 1139/- for inorganic farm due to its high productivity. At the end Rs. 13274/- was calculated as total average cost of production of organic farm against of Rs. 16650/- for inorganic farm.

Gross Margin: After deducting total cost from income of the organic and inorganic wheat growers, values of gross margin were obtained. Table 3 showed that Rs. 14442 was estimated from organic wheat growers while Rs. 16936 was found as gross margin for inorganic wheat system which was higher than organic system due to its high productivity.

Cost Benefit Analysis: After implying the statistical techniques the results were obtained by computing different cost which includes seed, land preparation, fertilizer /farm manures, plant protection /pesticides, labor, irrigation charges, marketing and, transportation cost which showed that average cost of production of organic

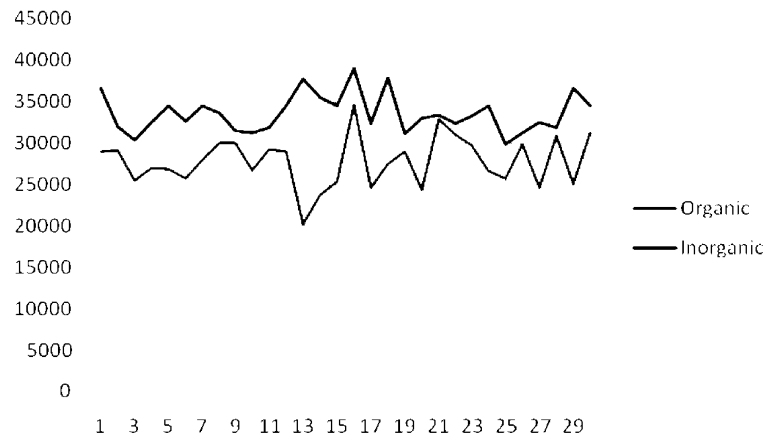


Fig. 1: Income received from organic and inorganic wheat crop (per acre)

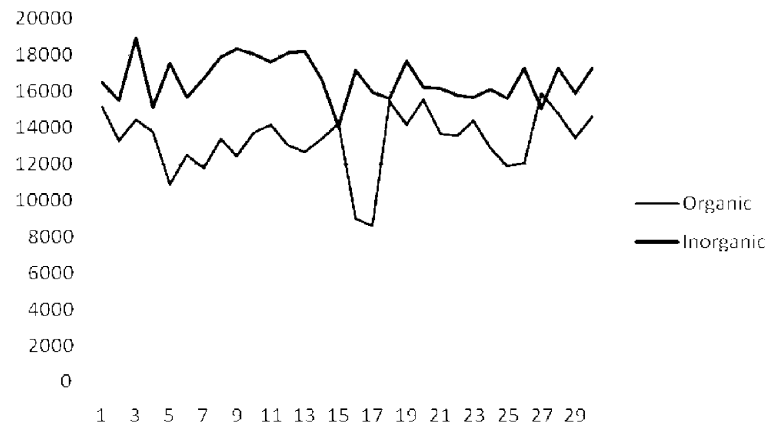


Fig. 2: Total cost for organic and inorganic wheat production (per acre)

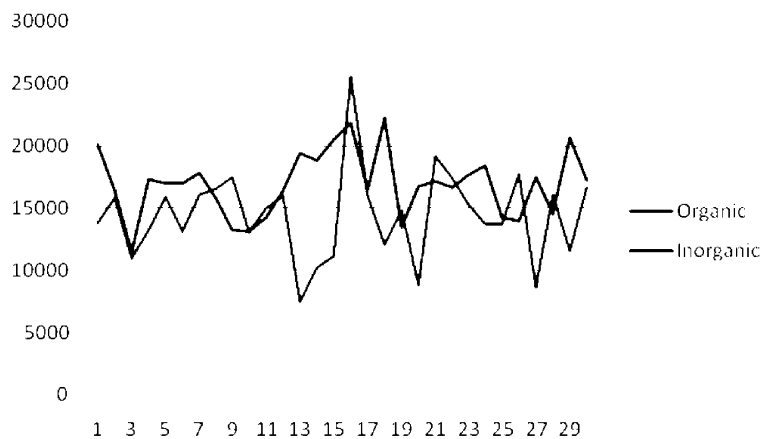


Fig. 3: Profit margin received from organic and inorganic wheat production (per acre)

wheat crop was Rs. 13274/- as compared to Rs. 16650/- of Inorganic Wheat Crop. Similarly, benefit per acre for both farming were computed as Rs.27717/- and Rs.33587/- respectively and net income was estimated Rs. 14443/- from organic and Rs 16939/- from inorganic farming.

Benefit cost ratio of both farming systems were computed by dividing benefit with costs. So that BCR estimated on per acre was 1:1.08 and 1:1.01 respectively for organic and inorganic wheat system as shown in Figure 4. However, in case of average production per acre of organic farm yield was comparatively less than that of

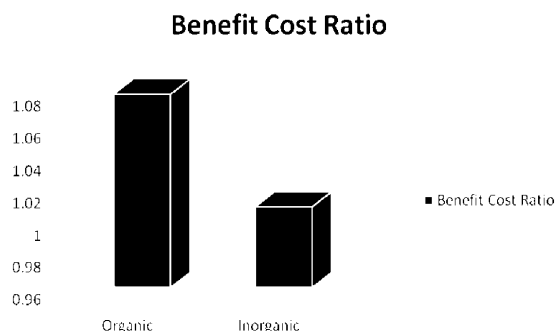


Fig. 4: Benefit cost ratio of organic and inorganic wheat crop (per acre)

the inorganic farm yield. To some extent (13) found similar findings of BCR analysis, i.e. 1:1.52 for organic carrot production systems than that of inorganic carrot production system which was computed as 1:1.44.

CONCLUSION

Organic farming is considered the best option for producing quality and healthy agriculture products at lower costs, but farming community in Pakistan is least interested to adopt this method because of its low productivity, subsistence land holding and unavailability of the market for organic products. The study in hand clearly indicated that net income received from per acre inorganic wheat farm was greater than organic wheat, while benefit cost ratio showed opposite situation in this regard, which was computed 1:1.08 from organic wheat system and 1:1.01 from inorganic wheat cultivation.

Suggestions and Recommendations: The following recommendations are offered and these require immediate attention of government agencies, research institutes, policy makers, NGO's, consumers and farmers.

- There is a dire need to establish a research institute for organic farming at the national level.
- Establishment of a separate market for the sale of organic products.
- The present procedure for the certification of organic products need to be simplified which is quite difficult.
- A media campaign for the awareness of the farmers as well as the consumers to describe the advantages of organic farming is also needed.
- NGO's must play a positive role in this regard to assist the farming communities to adopt the traditional method of cultivation which should be supervised by government agencies.

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