



# An Economic Analysis of Wheat Production in Uttar Pradesh, India

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## ABSTRACT

*Wheat is the major cereal crop of Uttar Pradesh grown in both irrigated and unirrigated conditions. The present study estimated various costs and returns in wheat cultivation under irrigated and unirrigated condition. Appropriate policy implication has been drawn for improving the farm economy of Uttar Pradesh.*

**KEYWORDS:** Economics Analysis, Wheat Crop, Cost of cultivation, Irrigated and Unirrigated condition.

## 1. INTRODUCTION

India has been second largest producer of wheat after China. It covers an area of 27.8 million hectare having a production of 99.87 million tones with a productivity of 31.25 quintal per hectare it contributes about 34 per cent of the total food grain production of the country (Department of Agriculture, Cooperation and Farmers Welfare 2017-18).

Wheat is grown in all the states in India except Southern and North Eastern states. Uttar Pradesh, Haryana, Punjab, Rajasthan are the major wheat producing states and accounts for almost 80% of total production in India. Only 13% area is rain fed. Major Rain fed wheat areas are in Madhya Pradesh, Gujarat, Maharashtra, West Bengal and Karnataka. Central and Peninsular Zone accounts for total 1/3rd of wheat area

in India. All India basis only 1/3 irrigated wheat receives desired irrigations and remaining is limited irrigation only.

Uttar Pradesh is one of the important states in India producing 32% of total wheat production in the country. It is adaptable to different soils, climates and elevation. The wheat production has been increasing from year to year after the Green Revolution in India. The increase in wheat production in India is not the result of just an increase in the area of cultivation, but also due to higher yields per hectare. After the Green Revolution the yield per hectare of wheat in India increased from 14.1 quintal per hectare to 25.80 quintal per hectare on the farm of major wheat growing states.

The adoption of improved wheat production technologies resulted in a "wheat revolution" increasing

production by 200 per cent, yield by 80-90 per cent and per capita availability of wheat from 23.4 Kg to 40 Kg. in recent years, from last two decades. Estimates of the benefits of a new technology should be balanced against possible costs implied by changes in other parts of the farming system. The long-term sustainability of a new practice may also need to be examined when considering costs and benefits. Another important use of the information from level of adoption of crop production technology and its economic studies is to assess the impact of technology on agricultural development and to measure the returns to investments. During the post Green Revolution period, the large-scale adoption of new technology particularly in wheat raised the production of food grain remarkably.

Cost studies are the backbone in the field of research in agricultural economics which is quite evident of the fact that all systematic research in our discipline started with cost studies not only in India but at abroad also. These studies went through various stages and were refined every time with the experience, looking to the nature and limitations of agricultural business. Very systematic studies in India started in the year 1954 when the Directorate of Economics and Statistics, Ministry of Agriculture (GOI) conducted farm management studies in the selected states of India. They were further repeated also and wide experience was obtained through those studies. Again an important milestone in the cost studies was the initiation of comprehensive scheme on Cost of Cultivation of principal crops in 1971 practically in all states to feed data to Agricultural Price Commission (now Commission for Agricultural Costs and Prices) followed by problem oriented farm management studies in certain command area of the country. Cost of Production form an important basis of price fixation of agricultural commodities.

The Central Sector Scheme for Studying the Cost of Cultivation of Principal Crops in India started in the year 1970-71. At present 19 States (Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal) are covered under the scheme. The scheme envisages collection of representative data on

inputs and outputs in physical and monetary terms, compilation and supplying the estimates of cost of cultivation per hectare and cost of production per quintal of the selected crops to CACP every year on a continuing basis.

The research scientists working in the agricultural universities and research institutes have also estimated costs and returns in wheat production. Singh[1] estimated the economics of wheat cultivation in Uttar Pradesh. Moorthy [2] analyzed the costs and returns of various crops. Yadav et. al. [3] calculated the profitability of wheat crop in the Etawah district of Uttar Pradesh. Ahirwar et. al. [4] have studied the cost and income structure of wheat crop in Vindhyan region of Madhya Pradesh. Agam et. al. [5] and Pushpa et. al. [7] analyzed the economics of wheat production. Hamsa et. al. [6] have made an comparative analysis of costs and returns of various crops. The present study has been carried out by Mr. A. K. Tewari [8] for his M.Sc.(Ag,) thesis research.

## 2. RESEARCH METHODOLOGY

### Cost concepts

The cost concepts developed by Commission for Agricultural Costs and Prices (CACP) have been used for calculating cost of cultivation of wheat crop. Cost concepts was used in the study are detailed as below:

- a) **Cost A<sub>1</sub>** = All actual expenses in cash and kind incurred in production by the owner.
  - It includes:
    - (i) Wages of hired human labor
    - (ii) Wages of permanent labor
    - (iii) Wages of contract labor
    - (iv) Imputed value of owned animal labor
    - (v) Animal labor
    - (vi) Charges of hired machinery
    - (vii) Cost of seed
    - (viii) Irrigation charges
    - (ix) Depreciation on implement, buildings and infrastructure
    - (x) Cost of manures, fertilizers & chemicals
    - (xi) Imputed value of owned machinery
    - (xii) Miscellaneous charges
- b) **Cost A<sub>2</sub>** = Cost A<sub>1</sub> + rent paid for leased in land
- c) **Cost B<sub>1</sub>** = Cost A<sub>1</sub> + interest on value of owned capital asset (excluding land)
- d) **Cost B<sub>2</sub>** = Cost B<sub>1</sub>+ rental value of owned land

e) Cost  $C_1$  = Cost  $B_1$  + imputed value of family labor.

f) Cost  $C_2$  = Cost  $B_2$  + imputed value of family labor

g) Cost  $C_3$  = Cost  $C_2$  + 10% of  $C_2$

### Managerial Cost

Is the imputed value of all the efforts under taken by farmer in managing his farm, Crops, live stocks and other resources to get best possible output.

### Average cost and returns per hectare

The cost and returns for wheat in irrigated and un-irrigated condition of Uttar Pradesh were calculated separately. Per hectare average cost and returns was calculated by dividing total cost and returns of all the farmers by total acreage under the crop. Net return was calculated by deducting the total cost per hectare from the total return per hectare which included the value of main as well as by-product.

(i) Average cost (per hectare) = Total cost ÷ Total area

(ha.) under the crop

(ii) Average return (per hectare) = Gross return ÷ Total area (ha.) under the crop

(iii) Net return (per hectare) = Gross return per hectare - Total cost per hectare.

### 3. RESULTS

The cost of cultivation of wheat was estimated in both irrigated and unirrigated conditions and presented in Table 1.. Under irrigation condition, cost  $A_1$  was Rs. 25101.31 whereas it was Rs. 19163.70 in unirrigated condition. It was due to lesser use of various inputs like fertilizer, plant protection chemicals etc. in unirrigated wheat cultivation. The cost  $C_3$  was Rs. 49796.31 under irrigated condition against Rs. 38772.62 in unirrigated condition.

**Table 1: Per hectare cost of cultivation of wheat in irrigated and unirrigated condition**

Particulars	Amount (Rs.)	
	Irrigated	Unirrigated
Cost $A_1$	25101.31	19163.7
Cost $A_2$ ( $A_1$ + Rent Paid for Leased in Land)	25352.47	19382.11
Cost $B_1$ ( $A_2$ + Interest on fixed Capital)	26092.69	19947.17
Cost $B_2$ ( $B_1$ + Imputed Rent)	40868.08	31749.94
Cost $C_1$ ( $B_1$ + Family Labor)	30493.99	23445.07
Cost $C_2$ ( $B_2$ + Family Labor)	45269.37	35247.84
Cost $C_3$ ( $C_2$ + Marginal Cost)	49796.31	38772.62

The net returns over different cost concepts have been determined for both irrigated and unirrigated condition. The estimates of various returns have been mentioned in Table2. The net return over cost  $A_1$  is Rs. 37351.45 in irrigated condition and Rs. 29699.98 in unirrigated condition in wheat production. The values of costs  $A_2$ ,  $B_1$ ,  $C_1$ ,  $C_2$  and  $C_3$  in irrigation condition are about 26 percent higher over the costs in unirrigated condition in wheat production. This is due higher use of various inputs like fertilizer, labor, machine etc. in irrigated farms.

**Table 2: Net returns over different cost concepts in irrigated and unirrigated condition**

Particulars	Amount (Rs.)	
	Irrigated	Unirrigated
Net return over cost $A_1$ ( Total return - Cost $A_1$ )	37351.45	29699.98
Net return over cost $A_2$ ( Total return - Cost $A_2$ )	37100.29	29481.57
Net return over cost $B_1$ ( Total return - Cost $B_1$ )	36360.07	28916.51
Net return over cost $B_2$ ( Total return - Cost $B_2$ )	21584.68	17113.74
Net return over cost $C_1$ ( Total return - Cost $C_1$ )	31958.77	25418.61
Net return over cost $C_2$ ( Total return - Cost $C_2$ )	17183.39	13615.84
Net return over cost $C_3$ ( Total return - Cost $C_3$ )	49796.31	38772.62

The estimates of per hectare returns of wheat in both irrigated and unirrigated condition are presented in Table 3. The value of main product were Rs. 50200.88 in irrigated condition and Rs. 39781.97 in unirrigated condition. The Values of by product, Gross return, cost of cultivation and Net return were higher about 26 percent in irrigated condition over unirrigated condition. The income of the farmers can be increased by improving the irrigated facilities

**Table 3: Per hectare returns of wheat in irrigated and unirrigated condition**

Items	Amount (Rs.)	
	Irrigated	Unirrigated
Main product	50200.88	39781.97
By product	12251.88	9081.70
Gross Return	62452.77	48863.68
Cost of cultivation	49992.62	38986.91
Net return	12460.14	9876.77

#### **4. CONCLUSION**

The economic analysis of wheat production under irrigated and unirrigated condition in Uttar Pradesh has been carried out. The estimates of various costs and returns were higher on irrigated farms in comparison to unirrigated farms. There is need to improve the irrigation facilities for increasing the income of the farmers in Uttar Pradesh.

#### **Conflict of interest statement**

Authors declare that they do not have any conflict of interest.

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