International Journal of Scientific Research and Engineering Development-– Volume 5 Issue 1, Jan-Feb 2022
Available at www.ijsred.com

RESEARCH ARTICLE OPEN ACCESS

Resource Use Efficiency in Wheat Production in Uttar Pradesh

Rakesh Kumar [1], A. K. Tiwari[2], Chandra Sen[3]

[1]Assistant Professor, [2]M.Sc. Ag. Student
Department of Agricultural Economics, Udai Pratap (Autonomous) College Varanasi-220002
[3] Former Professor& Head, Department of Agricultural Economics, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221005, India
Email:chandra_sen@rediffmail.com

Abstract

The present study has been carried out to measure the resource use efficiency in wheat production in Uttar Pradesh. The Cobb Douglas production function has been used for irrigated and unirrigated farms separately. The productivity of human labor, animal labor, machine, fertilizer and irrigation have been estimated.

Keywords: Resource Use Efficiency, Cobb Douglas Production Function, Returns to Scale.

I. Introduction:

The study of resource use efficiency of any crop is required for improving the profitability of the crop. The resource use efficiency of hybrid maize production in Chhindwara district of Madhya Pradesh was estimated [1] and made appropriate recommendations for improving the profitability of maize production. It has been reported [2]about the increase in the production of Sorghum and Pearl Millet in India during Green Revolution period. It has been suggested to stimulate the demand of Sorghum and Millet through policy interventions. The resource use efficiency of Paddy cultivation in Nellore district of Andhra Pradesh has been estimated [3] and made the appropriate recommendation for improving the resource use efficiency.

The resource use efficiency has been estimated [4] for major crops in North Eastern Dry Zone of Karnataka. Suitable recommendations have been made for improving the farm economy in the study area. The resource use efficiency in Wheat cultivation in district Basti was estimated by [5] and suggested for appropriate use of inputs for improving the wheat economy in the Basti district. The present study [6] has been carried out for M.Sc. Ag. Thesis research.

II. Methodology:

Resource use efficiency of various factors in crop production can be determined by various linear and nonlinear production functions. Cobb Douglas production function has been found more suitable for the purpose. The Cobb Douglas production function used in the present study has been described as below:

$$Y = a X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5}$$

Where,

Y= Gross return per hectare in Rs,

A= Constant

X_1= Labor use per hectare in Rs.

X_2= Animal use per hectare in Rs.

X_3=Machine use per hectare in Rs.

X_4= Fertilizer use per hectare in Rs.

X_5= Irrigation use per hectare in Rs.

Where;

b_1, b_2, b_3, b_4, and b_5 are the elasticities of production for inputs X_1, X_2, X_3, X_4 and X_5 respectively. Secondary data have been obtained from Directorate of Economics & Statistics, GOI for the year 2013-14.

III. Results

The Cobb Douglas production function was fitted for irrigated and rain fed wheat production in Uttar Pradesh. The results of the regression analysis have been presented in the following table

Table: Regression coefficients of variables in irrigated and unirrigated in wheat production in Uttar Pradesh.

Item	Intercept	Regression Coefficients				∑ bi	R^2
		Human Labor	Machine Labor	Fertilizer	Irrigation		
Irrigated farms	1.o35	0.283 (7.315)*	0.046 (4.139)*	0.674 (3.8589)*	0.004 (0.225)	1.003	0.875
Unirrigated Farms	1.050	0.181 (4.527)*	0.169 (2.546)*	0.643 (2.295)*	..	0.995	0.892

Note: Figures in parentheses indicate 't' values and values with '*' indicating the level of significance at 1 percent level.

In irrigated and unirrigated condition, the coefficients of elasticity of production (regression coefficient) of human labor turned out to be positive and significant. It means that for every one percent increase in human labor (value term), there will be an increase in the gross return by 0.28 percent in irrigated condition and 0.18 percent increase in unirrigated condition keeping the other variable resources at constant levels.

The coefficient of elasticity of animal labor was found to be negative and insignificant in irrigated condition while it was positive but insignificant in unirrigated condition. Since the elasticity of coefficient was statistically insignificant so it means that no impact of animal labor was visible on the gross return. This may be due to uniform used of animal labor in the farm operations.

The coefficient of elasticity of machine labor was found to be positive and significant in both irrigated and unirrigated condition. It indicated that every one percent increase in machine labor, there will be an increase in the gross return by 0.04 percent in irrigated condition and 0.16 percent increase in unirrigated condition keeping other variable resources at constant levels.

The coefficient of elasticity of fertilizer was found positive and significant in both irrigated and unirrigated conditions. The infers that for one percent increase in the machine labor, there will be an increase in the gross return by 0.67 percent in irrigated condition and 0.64 percent increase in unirrigated condition keeping the other variable resources at constant levels.

The regression coefficient of irrigation was found to be positive and insignificant in irrigated condition. The obvious reason for insignificant coefficient of irrigation resource could be the practice of adherence to uniform rate of application of irrigation in the crop in the state as almost all the farmers apply the same but less number of irrigations.

The sum of the regression coefficients of variables in irrigated condition viz. human labor, animal labor, machine labor, fertilizer and irrigation is more than one. It implies that there is increasing returns to scale. The farm income can be enhanced by additional use of these resources. In case of unirrigated condition, the sum of regression coefficients of variables of human labor, animal labor, machine labor and fertilizer is less than one i.e. 0.99. However, like irrigated condition, the farm income can be increased by additional use of these resources.

IV. **Conclusion**

The present study analyzed the resource use efficiency in wheat production in irrigated and unirrigated condition in Uttar Pradesh. The increasing returns to scale has been noticed under both irrigated and unirrigated wheat production. The farm income can further been hanced by additional use of these resources.

References:

[1] Korde, D. (2013) Resource use efficiency of hybrid maize production in Chhindwara district of Madhya Pradesh, Thesis, M. Sc. (Ag,), Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur.

[2] Nagraj N., Basavaraj, G., Rao, P. P.Bantilan, C. and Haldar, S. (2013) Sorghum and Pearl Millet economy of India. Economic and Political Weekly, 48(52), 74-81.

[3] Reddy, E. L. and Reddy, R. (2013) A study of resource use efficiency of input factors with reference to farm size in paddy cultivation in Nellore district. Journal of Humanities and Social Science, 17(10 48-55.

[4] Rohit, G. V., Olekar, J., Rashmi, K. S. and Swamy, D.P.S. (2018) Resource use efficiency of crops in North-Eastern Dry Zone of Karnataka. International Journal of Agriculture Environment and Biotechnology. 11(2), 365-369.

[5] Singh, N. Singh, P.K. and Kumar S. (2018) Growth rate wheat crop in Azamgarh division of Uttar Pradesh, India. International Journal of Current Microbiology and Applied Sciences, 7(03): 3348-3352.

[6] Tewari, A. K. (2019) An economics analysis of wheat production in Uttar Pradesh, India. M.Sc. Ag. Thesis submitted in the department of Agricultural Economics, Udai Pratap (Autonomous) College, Varanasi-2201002.

