A COMPARATIVE STUDY FOR RESOURCE USE EFFICIENCY OF TRAINED AND UNTRAINED FARM WOMEN

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ABSTRACT

The resource-use efficiency of crop production have been computed using primary data collected from 240 farm women respondents i.e. 120 trained and 120 untrained spread over eight villages of Junagadh district. The multistage, purposive and random sampling techniques were used for the study. The study has revealed that planting material, plant protection chemicals, chemical fertilizers, human labor and irrigation had a positive and significant influence on crop yield. For trained farm women economic efficiency of human-labour, chemical fertilizers, bullock labour and plant chemicals were greater than unity and it indicates that these resources are being used at sub optimum level and there exists the possibility of enhancing the production by increasing their use. The ratios of irrigation and planting material were less than unity, there by indicating over utilization of the said variables. Whereas, for untrained farm women the variables human-labour, chemical fertilizers and plant protection chemicals were observed to be greater than unity ad of bullock-labour, irrigation and planting material were less than unity. The cost invested in underutilized variables should be decreased and the use of underutilized resources should be encouraged. Hence, moving towards achieving the ratios of unity or optimal use which will increase the production for per unit cost spent.

Keywords: training, resource-use efficiency, farm women

INTRODUCTION

An efficient farmer or farm women allocates his land, labour, water and other resources in an optimal manner, so as to maximise his/her income, at least cost, on sustainable basis (Wakili, 2012). However, there are countless studies showing that farmers and farm women often use their resources sub-optimally (Rahman and Lawal, 2003). While some may attain maximum physical yield per unit of land at a high cost, some others achieve maximum profit per unit of inputs used (Chandravadia *et al.,* 2021). All would try to maximise their farm returns by allocating resources in an efficient manner. But as resources (both qualitatively and quantitatively) and managerial efficiency of different farm women vary widely, the net returns per unit of inputs used also vary significantly from farm to farm (Nyagaka *et al.,* 2010). The difference in knowledge level, skill acquired and access to extension services by a farm woman also influence her understanding of efficient economic efficiency of resource use (Karthick *et al.,* 2013). Thus, this understanding can be enhanced by organizing specialized training programme for encouraging optimal use of resources and increasing decision participation of farm women on field (Guleria *et al.,* 2019).

OBJECTIVE

To study for resource use efficiency of trained and untrained farm women

METHODOLOGY

Sampling and Data Collection

The study was conducted under ex-post facto research design. The multistage, purposive and random sampling techniques were used for the study. In the present investigation, the population for study constituted trained farm women (trained at FTC, Junagadh in last two years) and untrained farm women. In first stage, Junagadh district of Gujarat state was purposively selected as it is under the jurisdiction of Farmer Training Centre, Junagadh. In second stage, out of ten talukas of Junagadh district, four talukas were randomly selected for the study. Two villages from each taluka were selected, thus eight villages from selected talukas. The villages and taluka from Junagadh district were selected on the basis of information given by Farmers Training Centre, Junagadh.

At the third stage, 15 trained farm women were selected by random sampling method from each selected village. Thus, total 120 trained farm women were selected as sample for the study. The equal numbers of untrained farm women also were randomly selected from the same villages making total respondent size to be 240 farm women. Interview schedule was prepared to ask the respondents relevant questions regarding the study.

Table 1: Selected taluka, villages and respondents for survey or data collection

Sr. No.	Name of the taluka	Name of the village	No. of trained farm women respondents	No of untrained farm women respondents
I	Junagadh	1. Bandhala	15	15
		2. Goladhar	15	15
II	Manavadar	3. Sanosara	15	15
		4. Pajod	15	15
III	Vanthali	5. Tikar-padardi	15	15
		6. Thanapipli	15	15
IV	Visavadar	7. Shirvaniya	15	15
		8. Sarsai	15	15
		Total	120	120

Analytical Framework

Production Function

The resource-use efficiency of the inputs used by the turmeric-growing farmers was estimated using Cobb-Douglas (CD) production function, as given below:

$$Y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} \ldots\ldots\ldots\ldots (1)$$

where, Y is the yield of crop/crops (kg/ ha); X_1, X_2 and X_3 denote quantities (in kg/ha) of planting material, Plant Protection Chemicals and Chemical Fertilizers, respectively; X_4 is the human laobour days (men days/ crop season) , X_5 is the bullock use (hour/ha), and X_6 is the irrigation (No./crop season).

Resource-use Efficiency

The estimated coefficients of significant independent variables were used to compute the marginal value products (MVP) and the resources-use efficiency (r) was worked out using Equation (2) (Rahman and Lawal, 2003)

$$r = \frac{MVP}{MFC} \ldots\ldots\ldots\ldots (2)$$

Where,

$$MVP(X_i) = \alpha_i \frac{G.M.(Y)}{G.M.(X)} \times P_y$$

Where,

G. M. (Y) = Geometric mean of output

G. M. (X) = Geometric mean of input

= Regression Co- efficient of the ith input

P_y = Price of output.

RESULTS AND DISCUSSION

The estimated resource-use efficiency in crop production is furnished in Table 1. The R^2 value was 0.87 which indicates that 87 per cent of the variations in yield were influenced by the explanatory variables included in the study. It is evident from Table 1 that except bullock labor, all variables included in the study were positive and significant. Hence, increase in the use of inputs such as planting material, plant protection chemicals, chemical fertilizers, human labor and irrigation would increase the crop yield by 0.36 per cent, 0.47 per cent, 0.41 per cent, 0.33 per cent, 0.32 per cent and 0.45 per cent, respectively.

Table 1: Resource-use efficiency in the field of farm women (n=240)

Variables	Regression coefficient	Standard error	Significance
Regression constant	0.58	0.89	NS
Planting material	0.36	0.10	**
Plant Protection Chemicals	0.47	0.11	**
Chemical Fertilizer	0.41	0.08	**
Human-Labor	0.33	0.06	*
Bullock-labour	0.03	0.05	NS
Irrigation	0.45	0.12	**

Note R^2 = 0.87**   F- ratio = 20.24   N = 240

**Significant at 1 per cent level, *Significant at 5 per cent level, NS Non-significant

Trained farm women

The Table 2 depicts that the ratios of Marginal Value Products (MVP) and Marginal Factor Cost (MFC) of human-labour, chemical fertilizers, bullock labour and plant chemicals are greater than unity and it indicates that these resources are being used at suboptimum level and there exists the possibility of enhancing the production by increasing their use. The ratios of irrigation and planting material are less than unity, there by indicating over utilization of the said variables. Hence in trained farm women, the technological input variables chemical fertilizers, bullock labour and plant protection chemicals were underutilized whereas expenditure on irrigation and planting material were over utilized. The ratio was almost one for human labour showing its relative optimum utilization.

Table 2 : Economic efficiency of resource use in the field of trained farm women   (n=240)

Inputs	Description of Inputs	MVP	MFC	Ratio	Optimal Use
X_1	**Planting Material**	0.745	1.000	0.745	Over utilization
X_2	**Plant Protection Chemicals**	6.233	1.000	6.233	Under utilization
X_3	**Chemical Fertilizer**	2.533	1.000	2.533	Under utilization
X_4	**Human-Labor**	1.099	1.000	1.099	Under utilization
X_5	**Bullock-labour**	1.768	1.000	1.768	Under utilization
X_6	**Irrigation**	0.967	1.000	0.967	Over utilization

Untrained Farm Women

In Table 3 the ratios of MVP and MFC of the variables – human-labour, chemical fertilizers and plant protection chemicals are observed to be greater than unity. Hence, untrained farm women respondents are under utilizing the above factors. The ratios of bullock-labour, irrigation and planting material are less than unity. Therefore, one can say that untrained farm women respondents are underutilizing bullock-labour, irrigation and planting material excessively.

Table 3 : Economic efficiency of resource use in the field of untrained farm women   (n=240)

Inputs	Description of Inputs	MVP	MFC	Ratio	Optimal Use
X_1	**Planting Material**	0.250	1.000	0.250	Over utilization
X_2	**Plant Protection Chemicals**	7.801	1.000	7.801	Under utilization
X_3	**Chemical Fertilizer**	4.300	1.000	4.300	Under utilization
X_4	**Human-Labor**	5.325	1.000	5.325	Under utilization
X_5	**Bullock-labour**	0.059	1.000	0.059	Over utilization
X_6	**Irrigation**	0.639	1.000	0.639	Over utilization

It can be observed from Table 2 and 3 that beside the overutilization and underutilization by trained and untrained farm women respondents of same inputs the extent is much lower in trained farm women respondents. There ratios are much closer to one, i.e. optimum utilization, concluding that training was able to create significant improvement in economic efficiency of at farm women's field.
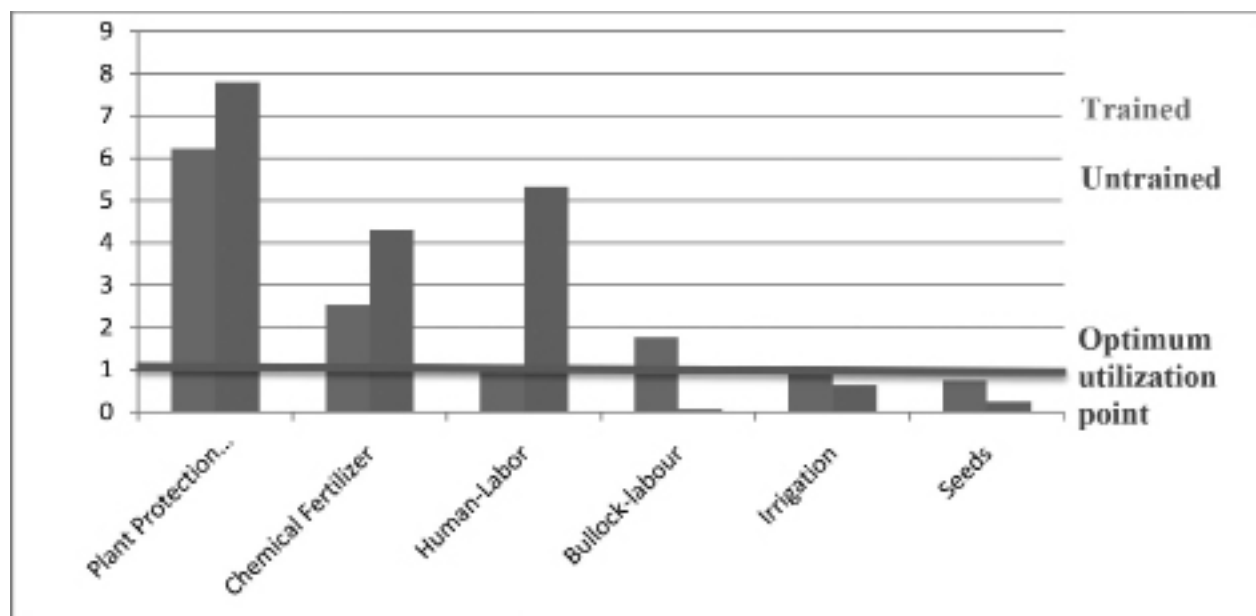
Fig. 1: Utilization pattern of resources by trained and untrained farm women

CONCLUSION

The economic efficiency of resource use was computed using marginal value productivity (MVP) and marginal factor cost (MFC) and is presented in Table 2 and Table 3. In case of trained farm women, the ratios of Marginal Value Products (MVP) and Marginal Factor Cost (MFC) of human-labour, bullock labour, chemical fertilizers and plant chemicals are greater than unity and the ratios of irrigation and planting material are less than unity. Whereas for untrained farm women, the ratios of MVP and MFC of the variables; human-labour, chemical fertilizers and plant protection chemicals are observed to be greater than unity and the ratios of bullock-labour, irrigation and planting material are less than unity. Therefore, one can say that untrained farm women respondents are underutilizing bullock-labour, irrigation and seeds excessively. There is scope for better utilization of resources to make its optimal use. The cost invested in underutilized variables should be decreased and the use of underutilized resources should be encouraged. Hence, moving towards achieving the ratios of unity or optimal use which will increase the production for per unit cost spent. This economic efficiency is influenced by knowledge and skill level of farm women. Therefore, there is the need to train farmers and farm women through conducting specialized training programmes so as to increase their productivity and income levels.

CONFLICT OF INTEREST

The authors of the paper declare no conflict of interest

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