Short Communication

Resource productivity in patchouli

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ABSTRACT

The study on resource productivity in patchouli in Konkan region was conducted with a sample of 31 patchouli growers selected from Thane, Raigad, Ratnagiri and Sindhudurg districts of Konkan region. The sample patchouli growers were classified into three groups; according to their area under patchouli crop as Group-I (Area upto 0.40 ha), Group-II (0.40-0.80 ha) and Group-III (0.80ha and above). To estimate the contribution of various inputs on crop yield, multiple linear production function was fitted for patchouli crop with input- output data. The variation in yield explained by the various inputs used in crop production was 98 per cent. Amongst the six variables considered for regression only three have turned out to be significant. Price function analysis revealed that, 78 per cent variation in the average prices revealed for patchouli leaves have been explained by factors under consideration. The length of harvested stem cuttings (X_1), the completely dry leaves (D_1) and the form of final produce (D_2) have turned out to be significant.

Key words : Resource productivity, Multiple linear production function, Price function.

INTRODUCTION

In India the production of patchouli oil is major requirement of Indian perfumery are met by import of more than 50 tonnes of patchouli oil and 70 tonnes of formulated oil per annum. India has considerable scope to enter the world market. In recent years, patchouli is introduced in Konkan region of Maharashtra state. It thrives well under agro climatic conditions of Konkan region. Due to commercial advantages of patchouli crop it improves the income and employment opportunities for the farmer. In this process, it will conserve our foreign exchange. Further more this crop will enhance scope for establishing small scale industries for extraction of patchouli oil in this region. In this context an attempt had been made in this study to investigate resource productivity in patchouli in Konkan region.

MATERIALS AND METHODS

The Konkan region was selected purposively as cultivation of Patchouli in Konkan region is new one. The sample for the study necessarily involved the selection of cultivators for gathering the relevant data of the study. The

districts selected for the study are Thane, Raigad, Ratnagiri, and Sindhudurg. Adequate Patchouli growers were selected randomly from the study area.

RESULTS AND DISCUSSION

Data collected were analyzed and the results are presented in the tables.

Resource productivity in patchouli:

Tabular analysis had shown the static results i.e. per hectare use of inputs and corresponding output of patchouli on sample growers. In the present study 'Multiple linear production function' has been estimated to show the technical relationship between output of patchouli and use of various inputs. In Multiple Linear Production Function, the relationship between output (Y) of patchouli (kg) and various factors namely area (X_1), irrigation (X_2), labour (X_3), cutting (X_4), manures (X_5), fertilizer (X_6) were considered. Results of the same are presented in Table I.

It is seen from results that, the function indicated a very high value of R^2 i.e. 0.98. It implied that 98 per cent variation in the output (dried leaves of patchouli) was

Table 1 : Production elasticities of independent variables

S.No.	Name of the variable			Regression coefficient
1.	Area	(ha)	(X_1)	7383.00300***
2.	Irrigation	(Rs)	(X_2)	0.17898
3.	Labour	(no.)	(X_3)	24.27417**
4.	Cuttings	(no.)	(X_4)	-0.00796
5.	Manuring	(kg)	(X_5)	-0.29677*
6.	Fertilizers	(kg)	(X_6)	0.96154

R^2 = 0.98
F = 260.35
*** Highly significant (1%)
** Moderately significant (5%)
* Significant (10%)

* Author for corrospondence.

explained by the factors under consideration. Similarly, the F value was 260.35. It was also very high and significant indicating thereby the overall significance of estimated production function.

From amongst six variables considered for regression only three have turned out to be significant. The magnitude of variable area (X_1) was 7383 and highly significant i.e. at 1 per cent level of probability. It indicates that, if area under patchouli increased by one hectare, there would be addition in output to the tune of 7383 Kg of patchouli leaves. In other words, it showed the average productivity of patchouli in Konkan region and other factors remaining constant. Another factor that has be turned out significant was labour (X_3) with magnitude 24.27 implying thereby, on an average there will be addition in output by that level for every additional use of labour. Though the regression coefficient of factor 'manure' has turned out be significant, it was negative and was very negligible in value.

It is concluded from production function analysis that the area and labour were important factors influencing the production of patchouli.

Price function:

It was observed through tabular analysis that the factors namely various levels of dryness of leaves, length of cuttings, type of final produce, etc. have bearing on the prices realized by the producers. In other words, there is some kind of relationship between various characteristics of patchouli leaves and price realized. However, tabular analysis was static analysis. Therefore, in the present study the following 'price function' has been estimated for the data on prices of patchouli leaves (Dependent variable (Y)) and the related explanatory variable namely length of cutting (X_1), dryness (D_1), type of final produce (D_2) and quantity sold by produce (X_2).

$Pt = 17.91 + 0.21X_1^* + 1.24D_1^{**} + 0.85D_2^{***} + 0.009X_2$
Where,
$R^2 = 0.78$
$F = 23.56$
***Highly significant(1%)
** Moderately significant (5%)
* Significant (10%)
Pt = price of patchouli leaves (Rs. per kg.)
X_1 = Length of cutting (cm.)
X_2 = Quantity sold by producer (quintals).
Dummy variable representing
D_1 = Complete dry leaves
D_{01} = Excluded dummy variable
    = After 2 days of harvesting
D_2 = Leaves along with stick.
D_{02} = Excluded dummy variable
    = leaves removed from sticks.

The coefficient of multiple determination the R^2 value has turned out to be 0.78 that is 78 per cent variation in the average prices received for patchouli leaves have been explained by factors under consideration. The overall F value was 23.56 implying thereby overall significance of the fitted regression. As regards the individual coefficient, three factors have turned out to be significant at various levels. The first factor namely length of harvested stem cuttings (X_1) was highly significant with coefficient 0.21 indicating there by for every increase in stem length of harvested stem cutting by 1 cm, producer received additional Rs. 0.21 per kg. The another factor D_1 (Dummy variable) representing the completely dry leaves was moderately significant with value of regression coefficient 1.24. It showed that if the producer sales patchouli leaves in complete dry form, they would get premium of Rs. 1.24 per kg over that of patchouli leaves sold immediately after harvest (2 days after harvest). The third factor namely the form of final produce (D_2) has turn out to be significant at 10 per cent level. The magnitude of coefficient was 0.85 indicating thereby good premium (Rs. 0.85 per kg) for the 'form of produce' only in the form of leaves. In other word 'leaves along with stick' fetch less price compared to that of 'leaves removed from sticks'. The last factor viz., size of lot (quantity sold) has no effect on the price received. The tabular analysis also indicated that there was no definite relationship between the quantity (lot size) sold and price received. In functional analysis also this variable has not turned out to be significant. The value of intercept term 17.91 and also includes effect of excluded dummy variable. Therefore, it was observed to be difficult to interpret the same.

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