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The Determination of Socio-Economic Effects of Pomegranate Production in Sistan Region

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Abstract

Pomegranate is one of the most important economic products in the agricultural sector in Sistan region. This region due to dry weather, very low rainfall and frequent droughts and lack of resources for agriculture faces many problems. Hence, one way to increase agricultural production is to increase efficiency, So that it can help the economy of the region. In this study, the effectiveness of pomegranate gardens in Sistan region is considered as one of the main product. I used SFA method for data analysis. The data has been collected in Zabol, Zahak and Hirmand from 150 farmers in 2016-2017 year. The results show the technical efficiency of Zabol, Hirmand and Zahak cities are respectively 60, 55 and 67 percent. Also for the city of Zabol, age, experience, household size, number and size of garden plots for city of Zahak, experience, size of household and garden, for city of Hirmand, experience are significant impact on technical efficiency. Finally, with regard to the percentage of responding farmers, will provide suggestions for improving them.

Keywords: Socio-Economic Effects, Efficiency, Stochastic Frontier, Manufacturing, Pomegranates, Sistan.
JEL Classification: Q10, N5.

1. Introduction

In developing and developed countries, due to resource constraints in food production and food needs of growing human populations, agricultural operators can measure efficiency, the gap between the best producer and other producers in similar constancy technology set (Sardar Shahraki, 2017; Sardar Shahraki and Karim, 2018; Sardar Shahraki et al., 2018). Determining efficiency of farmers can be used in analysis of agricultural policies (Je et al., 2018; Sardar Shahraki et

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al., 2018). Understanding the possibilities and constraints of agricultural sector in Iran, can be help to increasing production and revenue with using factors correctly of maximization production with fixed inputs (Shahnavazi, 2017; Shahraki et al., 2012). Farmers are looking to minimize the variance of income and profits (Dahmardeh and Sardar Shahraki, 2015; Karim and Sardar Shahraki, 2019).Thus, improving the efficiency and resource allocation is necessary (Sardar Shahraki et al., 2018). Applied model in this study is stochastic frontier production and elasticity production inputs. Among the garden products, Pomegranates with 254 thousand hectares are including the 9.8% of horticulture in Iran. Total of no-fertilized and fertilized is 254164 hectares, also water produced of Pomegranates is 1112547 tons and rain fed production of pomegranates is 120131 tons. Yield of water Pomegranate is equal to 2547 kg per hectare and rain fed yield is 1987.3 kg per hectare. Sistan and Baluchistan province with 953.2 hectares irrigated non-fertilized cultivation, 950 irrigated fertilized cultivation and 1254.2 tons of fertilized cultivation has yield equal to 112.2 kg per hectare. Much of this amount is grown in Sistan. It is the most economical garden product in this region (Agricultural report, garden production, 2017; Sardar Shahraki et al., 2016).

Therefore, the potential of pomegranate production is important in this region. Existing methods for increasing the production of pomegranates is not useful, for instance increasing production of basic resources and developing new technologies. But we can increase the amount income and production with current level of resources and technology. In this article the efficiency of pomegranate growers was studied to increasing production. The analysis current situation is necessary of optimization of this activities, we answer to this question: Do units of pomegranate garden have a good technical efficiency in Sistan region? Do pomegranate grower, have a logical and economical behaviour in taking if inputs? What are effective factors (social-economical characteristics) on technical efficiently?

2. Research Objectives

a. Determining the technical efficiency of horticultural units of pomegranate production in Sistan region.

b. Determining the effective factors on technical efficiency of

horticultural production units of pomegranate in Sistan region.

3. Literature Review

A review of the research literature shows that the issue of efficiency in agriculture has attracted many researchers. For example: Battese and Broca (1997), wheat farmers in four districts of Pakistan with the technical efficiency analysis of random boundary. Apply studies and observations of the effectiveness of agricultural research. Both methods of analysis of stochastic frontier and data envelopment analysis have been done. Karagiannis and Alexander (2005) lack of technical efficiency and scale tobacco farming using parametric random boundary techniques. Croppenstedt (2005), wheat farmers in Egypt in technical efficiency using stochastic frontier analysis. Speelman et al. (2008) by using data envelopment analysis, the irrigation water use efficiency of South African farms and the factors affecting it were analysed. The results showed that the average water efficiency in fixed and variable returns was 43% and 67%, respectively. Pakravan et al. (2010) the efficiency of rapeseed growers in Sari city has been investigated. This research showed that by implementing programs to increase farmers' allocation efficiency, such as conducting extension classes and training in order to properly use inputs, production can be increased and costs reduced. Mehrabi and Pakravan (2010) calculate the types of efficiency and returns to the scale of sunflower producers in Khoy. The results showed that the average technical, allocation, economic, and sunflower farmers' efficiency in the region were 66, 54.7, 35.9 and 75.9%, respectively. The economic inefficiency in this region is primarily due to the inefficiency of the allocation and secondly because of the difference in the quality of inputs such as water and land. Babaie et al. (2014) the calculation of water efficiency in major agricultural products in Zabol city was investigated using data envelopment analysis approach. The results showed that the average of field efficiency in fixed and variable yields was 77% and 98%, respectively. Moulaie and Sani (2015) evaluated the environmental performance of the agricultural sector. The results show that the efficiency values with regard to bad products (pollutants) are less than the efficiency without considering it. Other studies are as follows: Fadzim et al. (2017); Bellarby et al.

(2018); Robin et al. (2018); Temoso et al. (2018).

A review of the research background shows that the topic of efficiency has been of interest to many researchers. The present study investigated the effectiveness of pomegranate growers Sistan region with an emphasis on socio-economic characteristics considered.

4. Methodology

In this lecture, technical efficiency have been studied with (SFA)[1] parametric method to achieve the objectives, the extraction, the difference regression model were estimated. Then stochastic frontier production is estimated. So lack efficiency random is estimated to linear form, that both of these models using maximum likelihood. The mean values of logarithmic factors of production and inputs of each strain were placed and were used amount of Pomegranate growers reasonable in inputs described. Finally, a stochastic frontier production model for agricultural fields is considered as follows (Tan et al., 2010; Khan et al., 2010):

$$Y_{it} = f\left(X_{it}, \alpha\right) exp\left(\varepsilon_{it}\right) \quad (1)$$

In this model Y_{it} is the garden product i for time t, the vector ($k\times1$) of production inputs and other explanatory variables α is one vector ($1\times k$) of the unknown parameters to be estimated, N number of observations and t is the number of periods. ε_{it} compound sentence of error is defined as follows:

$$\varepsilon_i = g\left(X_i;\ \beta\right)V_i - h\left(X_i;\delta\right)U_i \quad (2)$$

$g\left(X_i;\ \beta\right)V$ is a function of risk and, $h\left(X_i;\delta\right)U_i$ is the indicator of inefficiency function. β and δ are vector parameters. Model when the function $f\left(X_{it}, \alpha\right)$ was determined, E_j of the Cobb-Douglas or Translog and Transndntal, assumptions with regard to the distribution for V_{it} (normal) and U_{it} (usually semi-normal), can be estimated using

1. Stochastic Frontier Analysis

maximum likelihood. V_{it} is the part independent and symmetric that produces random changes, caused by factors outside the control of farmers, such as weather, operating machinery, pests and diseases in the random error is normally distributed with zero, mean and variance, and the lack of efficiency in production, which is representative of issues such as skill, effort, or lack of effort, farmers and, other technical limitations.

U_{it} is indicated partial non-negative random variable units on the frontier production function. *f* them is equal to zero but the units are under the frontier production curve, therefore U_{it} represents the surplus of frontier production to actual production in a certain level of inputs. Finally the technical efficiency is obtained the flowing equation (Aigner et al, 1977):

$$EF_{it} = exp\left(-U_{it}\right) \tag{3}$$

The index of farm production is exactly on the frontier production function. Therefore quite useful in terms of technical efficiency is equal to one. Otherwise, number is calculated between 0 and 1. That the gardens work, produce relatively inefficiently frontier model can be used to test the various hypotheses (Villano et al., 2005; Khan et al., 2010). They compounded the error the composite error given in (4), paid the following form (Villano et al., 2005):

$$\varepsilon_i = g\left(X_i;\beta\right)\left[V_i - U_i\right] \tag{4}$$

Assuming the equality $g\left(X_i;\beta\right)V_i = h\left(X_i;\delta\right)U_i$ can be written as:

$$Y_i = f\left(X_i;\ \alpha\right) + g\left(X_i;\beta\right)\left[V_i - U_i\right] \tag{5}$$

5. Data

Questionnaire was used to collect information and needed data to evaluate the efficiency of pomegranate gardens was collected from year statistical community 2016- 2017. To achieve better results, the

information was collected in third city (Zabol, Hirmand and Zahak), and then homogenization and the objectives is looking for the area study. A typical method of making the cluster is the one-stage cluster of pomegranate farmers in the city of Zabol, Hirmand and Zahak. To this end, 150 farmers were selected, among it the 88 samples are from the city of Zabol and 32 samples are and 30 samples from Zahak and Hirmand, and through interviews with them the questionnaire was completed. The maximum level of production that each firm is defined as the purely technical efficient and technical efficiency of other firms depends on how far away from it. In traditional production functions is often assumed that all firms and farms to operate efficiently, and any error in this regression of production function to the measurement errors and other invisible variables, but this is excluded from the frontier functions and firm performance is accepted in a concept.

6. Results and Discussion

Estimation results of production functions and select the best functional one of the important issues that are considered in estimating the efficiency as a function of mathematical relationship is used between the variables in most studies between specific functional form, using econometric statistics, the best model fit is determined initially. In the present study, three types of Cobb Douglas function, Transndntal (transcendent) and Translog (transcendental logarithmic) as well as possess the classical features was estimated by the *Eviews*$_8$ software estimated coefficients for these functions is necessary become a simple linear form can be found with the logarithm of these functions (Debertin, 1998).

Table (1) shown the test results of the model assumptions and estimates of technical efficiency factors for each city of Zabol, Hirmand and Zahak.

Table 1: Results of Maximum Likelihood Ratio Test Functions in the Frontier

Area of Sistan

The Null Hypothesis	The Critical Values	DF	Likelihood Ratio(λ)	Decision
$\gamma = \delta_0 = \Delta_1 = ... = \Delta_9 = 0$	23.43	12	84.6	Refusal
$\gamma = 0$	35.13	3	93.54	Refusal
$\delta_0 = \Delta_1 = ... = \Delta_9 = 0$	20.67	9	31.08	Refusal
$\gamma = \delta_0 = \Delta_1 = ... = \Delta_9 = 0$	23.04	12	40.98	Refusal
$\gamma = 0$	35.13	3	23.68	Refusal
$\delta_0 = \Delta_1 = ... = \Delta_9 = 0$	20.67	9	41.92	Refusal
$\gamma = \delta_0 = \Delta_1 = ... = \Delta_9 = 0$	23.43	12	41.66	Refusal
$\gamma = 0$	35.13	3	22.92	Refusal
$\delta_0 = \Delta_1 = ... = \Delta_9 = 0$	20.67	9	30.54	Refusal

Source: Research Finding, The critical values has been extracted from the table of Kadeh and Palm (1986)

First and second hypothesis implies that the inefficiency affects models to estimate the technical efficiency and there is no random. In other hand the garden units were placed on the efficient frontier and models to estimate the technical efficiency of the *ML* method is more appropriate than the *OLS* the results of the null hypothesis was rejected in each city and there are inefficiency effects. *ML* methods for estimating models to estimate the efficiency of farming is better. The third hypothesis suggests that the inefficiency effects model variables such as farmer's age, education, experience, size of household, attending promotional activities of pomegranate grown, the gardens, the trees, the number of units in garden plots on technical efficiency levels were not affected in this study. Note that each of these variables was tested separately can impact on the critical values and levels of technical efficiency. The results in table shown maximum likelihood estimator of the null hypothesis was rejected in each city and the variables considered on the level of technical efficiency effects are subjects.

10. Estimation Results of the Frontier Production Function and

Technical Inefficiency Factors

Now, after estimating the model specified and selection Translog function for the Zabol city and Transndntal for Hirmand and Zahak cities as appropriate production functions, with *Frontier*$_{4.1}$ software to estimate the frontier production function using random and technical inefficiency model using maximum likelihood (ML), let frontier production of pomegranate is estimated by the given the input that was introduced in the previous section, following relations:

$$LnY_i = \beta_0 + \beta_1 Ln(X_1) + \beta_2 Ln(X_2) + \ldots + \beta_6 Ln(x_6) + \beta_7 X_1 + \beta_8 X_2 \ldots + \beta_{12} X_6 \quad (6)$$

$$LnY_i = \beta_0 + \beta_1 Lnx_1 + \ldots + \beta_6 Lnx_6 + \beta_{11}(Lnx_1)^2 + \ldots + \beta_{66}(Lnx_6)^2 + 1/2\beta_{12} Lnx_1 Lnx_2 + \ldots + 1/2\beta_{56} Lnx_5 Lnx_6 \quad (7)$$

i Number of farms, LnY_i production of pomegranates per hectare garden in the i, X_i inputs used in the production of pomegranates, including land (X_1) per hectare, hire labor (X_2) per day-person, the working family (X_3) per day- person, the frequency of irrigation (X_4), animal manure (X_5) per kg and fertilizer (X_6) per kg part sector is random inefficiency, including composite error (V_i-U_i). Inefficiency model using is characterized by equation (5): Z_j is the economical-social factors, that may effect on the efficiency of farmers in this study the factors affecting on the efficiency are age (Z_1), education (Z_2), experience (Z_3), household size (Z_4), and the activity of pomegranate grown (Z_5), if the job is done only to pomegranates and zero otherwise number entered is 1. The number of plots (Z_6), distance from trees (Z_7), participated in the extension classes (Z_8), and if not participating zero otherwise the size of garden (Z_9) enters one.

Table 2: Estimate the Results of the Stochastic Frontier Model and Technical

Inefficiency Pomegranate

Hirmand City			Zahak City			Zabol City		
Variable	**Coefficient**	**T Statistic**	**Variable**	**Coefficient**	**T Statistic**	**Variable**	**Coefficient**	**T Statistic**
C	19.75***	13.24	C	11.34***	9.84	C	87.72***	55.64
Lnx_1	2.66**	2.52	Lnx_1	1.83***	13.5	Lnx_1	7.91***	12.66
Lnx_2	-2.09*	1.91	Lnx_2	-0.74***	-2.69	Lnx_2	0.33	-0.42
Lnx_3	0.11	0.62	Lnx_3	0.09	1.05	Lnx_3	-14.1***	-10.8
Lnx_4	-0.44	-0.56	Lnx_4	-0.4	-1.1	Lnx_4	5.41***	4.99
Lnx_5	-0.34	-1.89	Lnx_5	-0.57***	-2.59	Lnx_5	-8.21***	-9.99
Lnx_6	0.45	1.61	Lnx_6	0.28**	2.41	Lnx_6	30	0.31
X_1	-1.15	-1.6	X_1	-2***	-10.28	$1/2\ (Lnx_1)^2$	5.03	0.28
X_2	0.008	1.36	X_2	0.007	1.07	$1/2\ (Lnx_2)^2$	5.01	-0.33
X_3	0.0007	0.37	X_3	0.0006	0.92	$1/2\ (Lnx_3)^2$	4.18**	1.93
X_4	0.07	1.19	X_4	.05**	2.33	$1/2\ (Lnx_4)^2$	2.29***	5.74
X_5	0.00002	1.57	X_5	0.00002***	2.6	$1/2\ (Lnx_5)^2$	3.35***	5.88
X_6	-0.0005	-0.03	X_6	0.0003	0.35	$1/2\ (Lnx_6)^2$	-2.09***	-3.44
						$Lnx_1 \times Lnx_2$	-0.05	-0.53
						$Lnx_1 \times Lnx_3$	-2.23***	-5.81
						$Lnx_1 \times Lnx_4$	.31**	2.13
						$Lnx_1 \times Lnx_5$	-2.54***	-4.4
						$Lnx_1 \times Lnx_6$	2.18	1.62
						$Lnx_2 \times Lnx_3$	-2.07	-0.98
						$Lnx_2 \times Lnx_4$	12.11	1.22
						$Lnx_2 \times Lnx_5$	-1.002	-0.04
						$Lnx_2 \times Lnx_6$	4.1*	1.79
						$Lnx_3 \times Lnx_4$	1.13	0.64
						$Lnx_3 \times Lnx_5$	0.51***	8.11
						$Lnx_3 \times Lnx_6$	2.18	1.22
						$Lnx_4 \times Lnx_5$	-5.25***	-10.6
						$Lnx_4 \times Lnx_6$	2.34***	3.37
						$Lnx_5 \times Lnx_6$	-1.16**	-2.24

Source: Research Finding, *, **, *** Show respectively Significant of the 10, 5 and 1 percent.

Table 3: Model of Technical Inefficiency Effects

Hirmand City			Zahak City			Zabol City		
t	**Coefficient**	**Variable**	**t**	**Coefficient**	**Variable**	**t**	**Coefficient**	**Variable**
1.80	0.49	C	2.08	0.35	C	-1.29	-0.09	C
-0.25	0.10	Z_1	0.23	0.00	Z_1	2.45	-1.01***	Z_1
-0.51	-1.09	Z_2	-0.24	-0.03	Z_2	2.76	-1.04	Z_2
1.52	-1.004*	Z_3	2.20	-0.001**	Z_3	-2.90	1.001-***	Z_3
-1.41	-0.18	Z_4	-1.67	-0.05***	Z_4	-4.82	-1.6***	Z_4
1.21	1.16	Z_5	2.65	0.1*	Z_5	-5.19	-1.01	Z_5
-0.22	-1.13	Z_6	1.23	0.01	Z_6	-1.74	-0.13***	Z_6
0.14	2.12	Z_7	0.26	0.01	Z_7	1.72	0.03	Z_7
-0.14	-1.23	Z_8	0.37	0.05	Z_8	-1.56	-0.01	Z_8
2.14	0.0005**	Z_9	1.21	0.00	Z_9	2.91	0.0001***	Z_9
4.14	0.02***	σ^2	3.09	0.02***	σ^2	6.64	0.02***	σ^2
141.00	0.99***	γ	687	0.99***	γ	365	0.99***	γ
Loglike	21.23			54.23			111	
LR test	25.65			22.98			21.59	
R^2	0.75			0.67			0.80	

Source: Research Finding, *, **, *** Show respectively Significant of the 10, 5 and 1 percent.

Grower three city of Zabol, Hirmand and Zahak, has been paid maximum likelihood method (*ML*).

They has been determined With varying cultivation symbol X_1, hire labor convention symbol X_2, a symbol of family labour X_3, the frequency of irrigation with symbols X_4, the symbol of animal manure, X_5, fertilizer symbol X_6,. Also, variables that determine the technical efficiency is characterized by the following symbols: age (Z_{1i}), education (Z_{2i}), experience (Z_{3i}), household size (Z_{4i}), the activity of Pomegranate grown (Z_{5i}), number of plots (Z_{6i}), the trees (Z_{7i}), attending the promotion (Z_{8i}), garden size (Z_{9i}). Results Table 2 shows that the coefficients of the variables of family labour and animal manure have been negative in city of Zabol.

In the city of Zahak variable coefficients of hire labour and *X* in the Hirmand task force looking to rent and animal manure have been negative, and have a negative impact on pomegranate production. Thus, by adjusting the amount of inputs, to improve technical efficiency and increased production of pomegranates, there is no increase in the use of inputs. In general, the coefficients being significant for the Zabol city, according to the stochastic frontier model, the factors, frequency of irrigation and cultivation in city of Hirmand and Zahak has increased the most effective and positive impact on pomegranate production. Also according to incidental Translog in the city of Zabol and Transndntal in the city of Zahak and Hirmand (models estimate the technical efficiency) effects of variables is visible on technical efficiency of pomegranate grower.

The results show that the value of γ close to one in each city (0.99) with very small probability of error close to zero (0.01) indicate these results shown that changes of waste have a lot of inefficiency effects *U*, and the random error, i.e., *V* is very small, The value of γ represents the convergence of the stochastic frontier model, the final frontier model (*V=0*) in the samples is investigated. This is an interest result of in agriculture because the role of random errors in the production function in agriculture sectors is very low and natural resources that are faced with many uncertainties. The value of γ can be somewhat unexpected. It shows variables included in the production could significantly control and reduce random errors of natural factors that estimate the parameters σ^2, and γ are significantly different from zero and this is illustrated significantly affect the efficiency of production and efficiency changes in pomegranate gardens of the each city. The results indicate that variables of the farmer's age, household size, number and size of garden plots with pomegranate production, have significant relationship with inefficiency in the city of Zabol. While in city of Zahak the size of household and non- Pomegranate grown Zahak variables and, variable of pomegranate garden is found sized in Hirmand garden significant relationship inefficiency: Table (3) to examine these factors are addressed farmer age (Z_1): effect coefficient of age is negative and significant on the inefficiency in the city of Zabol. While there is the lack inefficiency of Hirmand and Zahak any significant effect. Therefore, this factor shows that age and Technical

inefficiency Pomegranate Growers in city of Zabol have an inverse relationship.

In other words, technical efficiency of Pomegranate grower has increased when age increase, in city of Zabol. In fact, older farmers may have more experience in producing. Thus they are efficient. Experience (Z_3): The relationship between these factors and inefficiency is significant in each city. The negative coefficients on this variable indicates with increasing experience, reduce inefficiency and increased efficiency. As the age variable was explained by increasing age, experience, and squinty increase the technical efficiency has increased: Table (2) to examine these factors are addressed Farmer age (Z_1): effect coefficient of age is negative and significant on the inefficiency in the city of Zabol, while there is the lack inefficiency of Hirmand and Zahak any significant effect. Therefore, this factor shows that age and Technical inefficiency Pomegranate growers in city of Zabol have an inverse relationship. In other words, technical efficiency of Pomegranate growner has increased when age increase, in city of Zabol.

In fact, older farmers may have more experience in producing, and thus they are efficient. Experience (Z_3): The relationship between these factors and inefficiency is significant in each city, the negative coefficient on this variable indicates with increasing experience, reduce inefficiency and increased efficiency as the age variable was explained by increasing age, experience, and consequently increase the technical efficiency has increased Household size (Z_4): The relationship between these factors and the efficiency is significance only for the city of Zabol and Zahak. The negative coefficient indicates that technical efficiency increases with higher household size this inverse relationship is between family size and inefficiency. It has been interpreted in the elasticity. This variable is significant for the city Helmand Business activities other than Pomegranates (Z_5): a positive coefficient of this variable is significant only in the city Zahak that Shows who do have jobs other than Pomegranates have been less of technical efficiency this direct relationship between this variable and cannot prove efficacy. This is confirmed in this Only those who are working at jobs Pomegranates, spent more time on this work and, have more technical efficienciancy The negative coefficient

on this variable indicate that technical efficiency increases with increasing number The number of plots (Z_6): The relationship between these factors and the efficiency is only significant for the city of Zabol Therefore, fewer units of inputs are used and managed in units smaller than it is applied. Garden size (Z_9): *t* statistics show that only the city of Zabol and Helmand, the variable is significant. Positive coefficient on this variable indicates, that inefficiency increases when size garden and higher technical efficiency is reduced.

The lower size of garden means that the operations can be done better. The variables education (Z_2), the distance of trees (Z_7), general promoting S (Z_8) can be expressed. The *t* statistic associated with each of them, there is no significant effect on technical efficiency of the city. Review results elasticity of production inputs as amount parameters of the Translog function and Transndntal be interpreted as not directly. The inputs elasticity used to interpret the quantities of inputs used Elasticity of Inputs production that a percentage change in consumption what the percentage of production will change, while

Table 4: Frequency Distribution of Pomegranate Growers in the Various Levels of Technical Efficiency

Level of Technical Efficiency	Hirmand City		Zahak City		Zabol City	
	Percent	Number	Percent	Number	Percent	Number
50-60	4.76	3.00	75.8	5.00	2.08	3.00
60-70	21.43	10.00	23.75	20.00	13.88	20.00
70-80	21.43	10.00	27.5	23.00	22.91	33.00
80-90	23.8	11.00	21.25	18.00	15.91	23.00
90-95	7.15	4.00	11.25	10.00	20.16	29.00
Greater Than 95	21.43	10.00	7.5	7.00	25	36.00
Average	0.60		0.55		0.67	
Standard Deviation	0.24		0.22		0.21	
Minimum	0.41		0.33		0.40	
Maximum	0.99		0.98		0.99	

Source: Research Findings

using the elasticity production inputs can be found to product stage per each. Input elasticity of production at each point of the curve shows returns to scale in the production, just in the second area, is logical and economical production. Table 4 shows the technical efficiency of pomegranates at different levels.

11. Conclusions and Suggestions

Pomegranate is one of the most important products in Sistan region. This agricultural product plays an important role in the region's economy. Therefore, in this study, the pomegranates' efficiency has been considered. To achieve this goal, a random boundary model was used. A questionnaire was used to collect information in three Zabol, Zahak and Hirmand cities. The results of this study, the following suggestions are offered to improve the efficiency of pomegranate growers.

- Results showed that the experienced gardener who has a positive effect on technical efficiency, therefore be trained to transfer their experiences to new farmers through extension classes.
- Between variables, education and advocacy attending technical and relationship with economic efficiency, there was no significant, so should be the level of quality and quantity of classroom science to promote agriculture and farmers, adequate and proper supervision.
- Reviews of the results revealed gardeners are not optimally treated in use of hire labour inputs, so it should conduct extension services to farmers on the efficient use of inputs and employing experienced and trained workforce to increase their production.
- Government support for manufacturers, to monitor prices and banking facilities, providing can be improved market access requirements for production and supply of Pomegranates
- The basic strategies for success manufacturers and their revenue and their strategies for success is essential, cooperative Union of Pomegranates in the region to improve the timely supply market, and credit insurance products.
- Planning and conversion industries related to the excess supply

of Pomegranates and creating added value at the time of product purchase creating and strengthening infrastructure facilities required such as roads, transport, storage.

- Study Factors affecting efficiency Field studies showed the factors studied except other factors also affect the types of efficiency.
- Unfortunately, the possibility that they were entering or getting the correct answer, the farmer was not. The factors are Personal interests of individual farmers, the opportunity cost for other tasks or extent of his access to funds, it is recommended Interviews with people with high-efficiency Promoters and positive in their approach to consider using new technologies and approaches to water and weather conditions in the crop.

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