



# COMMERCIAL PRODUCTION OF *ALOE VERA*: RESOURCE USE EFFICIENCY ANALYSIS

T. Ponnarasi, K. Sitadevi and C. Prabakar

Depart. of Agricultural Economics, Faculty of Agriculture, Annamalai University,  
Annamalainagar-608002 (TN), India.

## Abstract

*Aloe vera* is one of the important medicinal crops in the world. This crop is mainly cultivated in dry regions of Africa, Asia, Europe, America and India. The extract of *Aloe vera* is widely used in food, cosmetic, health care, skin care and medical industry.

In India *Aloe* is largely used in cosmetic applications such as skin moisture, skin cream, and hair tonic. The marketing of *Aloe* is exclusive unorganized, closed and under valued further, the middleman and traders have exploited the farmers. There is inadequate secondary information viz., extent of *Aloe* cultivation, area, production, productivity and marketing particulars. This scenario of unfortunate supply and little information about market actually makes the problem more difficult to policy maker / researches. Hence the study was attempted with the objectives to study the input and output relationship in

*Aloe* production, and the problems encountered in *Aloe* cultivation. Ninety farmers from Udumalpet taluk in Coimbatore district, was selected for the study and divided into three groups viz., group I (<1 ha), group II (1 to <2 ha) and group III (>2 ha). Data were collected through, personnel interview methods by contacting individual selected

*Aloe* grower with the help of a pre-tested questionnaire. The average farm size of group I, group II and group III farmers were 0.78, 1.18 and 2.59 ha, respectively. The results of the estimated production functions showed that the co-efficient of multiple determination

$R^2$  0.967 in group I, 0.902 in group II and 0.892 group III, farmers. The major problems faced by farmers in marketing of *Aloe* were exploitation by middleman, absence of processing unit at the nearest place, absence of storage and transport facilities, lack of assured price and lack of market information in the order. The farmers preferred contract agency because of the easiness in selling and since there was no need for transport of the produce.

**Key words :** *Aloe vera*, Productivity, Resources, Labour.

## Introduction

India is endowed with medicinal plants wealth of over 9,500 species. The annual exports of these plants were Rs. 1,200 million. The potential for earning foreign exchange by India from export of medicinal plant is estimated to be over US \$ 2000 million per annum. The value and importance of medicinal plants are increasing in India day by day and presently, the herbal drug industry turn over exceeded more than Rs. 2,000 crores and over one and half million practitioners of the Indian medicinal system in the oral and codified streams use herbal plants in prevention, primitive and curative applications of various

\*Author for correspondence : E-mail : ebenezarjoshua@gmail.com

deceases. It has been estimated that there are more than 7,800 manufacturing units of medicinal drugs in India.

The global herbal market is growing at the rate of seven per cent per annum. The trade in medicinal plants in the world for plant derived drugs account for Rs. 2,00,000 crores whereas, in India it is estimated to be to the tune of Rs. 550 crores per annum. Total turn over of ayurvedic and herbal products is around Rs. 2300 crores per annum.

India is known for its plant resources from time immemorial and is one of the world's 12 biodiversity centers sheltering over 45,000 different plants species.

About 95 per cent of medicinal plants used by the

industries are collected from wild habitat. About 800 species are used in production by the industries out of which only about 40 plants species are used in modern drug industries and only about 25 species are under commercial cultivation. In India *Aloe* is largely used in cosmetic applications such as skin moistures, skin cream and hair tonic. 21<sup>st</sup> century consumers are more aware of healthy organic products and the demand for health oriented products are increasing day by day.

## Materials and Methods

Coimbatore district was purposively selected, because this district had favourable climate, irrigation water availability, soil type more conducive for *Aloe* cultivation. Among the nine taluks in Coimbatore district, *Aloe* cultivation was found higher in Udumalpet taluk. Five villages in Udumalpet taluk viz., Kumaralingam, Pappenpatti, Pottayampalayam, Sampuratiputtu and Madathukulam were selected taluk. Ninety *Aloe* farmers from these village were selected for the study and divided into three groups 1 (< 1 ha), group II (> 1 to < 2 ha) and group III (> 2 ha). Data were collected through, personal interview methods by contacting the selected *Aloe* grower with the help of a pre-tested questionnaire. The purpose of the study was explained to the farmers in order to solicit their co-operation and to recall information. Detailed information on cropping pattern, cost of cultivation of *Aloe* and specific problems in cultivation of *Aloe* were gathered by personal interview method. The secondary information like climate, soil types, irrigation, land use pattern, infrastructure facilities were collected from the records maintained by the Assistant Director of Statistics at Udumalpet.

### Production function

Cobb-Douglas type of production function was fitted to study the perform resource use efficiency in *Aloe* production.

$$Y = b_0 X_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} u_i$$

Where,

Y = Physical output of *Aloe* (kg/ha)

X<sub>1</sub> = Land (ha)

X<sub>2</sub> = *Aloe* suckers (kg/ha)

X<sub>3</sub> = Manures (kg/ha)

X<sub>4</sub> = Human labour input measured in man-day of eight hours.

β<sub>0</sub> = Constant term

u<sub>i</sub> = Error term

This production function was estimated in its log –

linear form by Ordinary Least Square (OLS) technique.

### Garrett's Ranking Technique

Garrett's ranking technique was used to study the problems in the *Aloe vera* cultivation. The problems in production of *Aloe* faced by cultivators were collected and the respondents were asked to rank their priority of problems and ranks given by respondents were converted into the percent position by using the following formula

$$\text{Percent position} = \frac{100 (R_{ij} - 0.50)}{N_j}$$

Where

R<sub>ij</sub> = Rank given for the i<sup>th</sup> factor by j<sup>th</sup> individual

N<sub>j</sub> = Number of factors ranked by j<sup>th</sup> individual

Then the per cent position for each rank was converted into score by using Garrett's table. The scores by individual to total number of respondents to were added. The mean scores of all problems were arranged in descending order and ranks were given.

## Results and Discussion

The results of the estimated production function are presented in Table 1.

The results of the estimated production functions showed that the co-efficient of multiple determinations (R<sup>2</sup>) were 0.9671 in group I, 0.9028 in group II and 0.8952 in group III cultivars.

In the group I, among the four independent variables included in this production function analysis, the co-efficient of two variables are positively significant, the variable land (X<sub>1</sub>) and (X<sub>4</sub>). The variable land had one per cent level of significant, keeping all other variables constant at their mean levels would increase the production of *Aloe vera* by 0.4567 per cent and labour had five per cent level of significant, keeping all other variables constant at their mean levels, would increase the production of *Aloe vera* by 0.3846 per cent.

In the group II, among the four independent variables included in this production function analysis, the co-efficient of three variables are positively significant. The land had one per cent level of significant, keeping all other variables constant at their mean levels, would increase the production of *Aloe vera* by 0.2165 per cent and labour had five per cent level of significant, keeping all other variables constant at their levels, would increase the production of *Aloe vera* by 0.3316 per cent.

In the group III, among the four independent variables included in this production function analysis, the

**Table 1:** Production Function Estimates.

Sl. No.	Particulars	Group I	Group II	Group III
1	Constant	4.4896	4.073	3.7485
2	Land	0.4567***(0.1364)	0.3165***(0.1293)	0.1924(0.0183)
3	Suckers	0.0958(0.1857)	0.1222(0.1991)	0.2180**(0.0703)
4	Manures	0.0807(0.1212)	0.2165(0.2046)	0.1684(0.0826)
5	Labour	0.3846**(0.1831)	0.3316**(0.1169)	0.1742*(0.0962)
6	R <sup>2</sup>	0.9671	0.9028	0.8952
7	F	73.9532	68.6108	61.9468
8	b <sub>i</sub>	0.9598	0.9883	1.053

(Figures in parenthesis indicates the percentage t-ratio)

\*\*\* P<sub>≤</sub>0.01 (two tailed test); \*\* P<sub>≤</sub> 0.05 (two tailed test); \* P<sub>≤</sub>0.10 (two tailed test)

**Table 2:** Cultivation constraints faced by *Aloe* farmers.

Sl. No.	Constraints	Group I		Group II		Group III	
		Mean score	Rank	Mean score	Rank	Mean score	Rank
1	Lack of knowledge about cultivation	37.83	IV	31.27	V	31.63	VI
2	Lack of technical guidance	46.78	III	67.83	I	33.63	IV
3	Poor quality and timely unavailability of suckers	27.32	VII	27.54	VI	52.96	II
4	High cost of suckers	61.43	I	61.55	II	25.83	VII
5	Non availability of required quantity of organic manures	30.43	VI	21.42	VII	62.55	II
6	Poor drainage facility	34.78	V	43.63	IV	38.62	V
7	Absence of high yielding suckers	58.25	II	55.52	II	75.83	I

co-efficient of two variables are positively significant. The sucker had five per cent level of significant, keeping all other variables constant at their mean levels, would increase the production of *Aloe vera* by 0.2180 per cent. The labour had ten per cent level of significant, keeping all other variables constant at their mean levels, would increase the production of *Aloe vera* by 0.1742 per cent.

### Cultivation constraints

It could be seen from the above table 2 that in group I, high cost of suckers ranked as first problem in their cultivation constraints, followed by, absence of high yielding suckers, lack of technical guidance and lack of knowledge about cultivations respectively.

In group II, lack of technical guidance, higher cost of sucker, absence of high yielding suckers and poor drainage facility and lack of knowledge about cultivation were the most important problems ranked by the farmers.

In group III absence of high yielding sucker was very important problem with a mean score of 75.83 followed by non availability of required quantity of organic land, poor quality and unavailability of sucker, respectively.

The results of the study revealed that production of *Aloe* has enhanced the profitability of the selected respondents. Production efficiency revealed that the variables like area under *Aloe*, labour and manures were found to influence the yield of *Aloe* significantly among the difference size groups of farmers.

### References

- Anonymous (2003). Economic impact of IPRS in medical crop – A case study of *Coleus forskohlii*. *Indian Institute of Horticulture -Highlights*, **26(1)**: 4.
- Canter, P.H., H. Thomas and E. Ernst (2005). Bringing medical plant into cultivation: Opportunities and challenges for biotechnology. *Horticultural Science Abstract*, **75(10)**: 1454.
- Chinnappan (1998). Resource use, farm size and return to sale in a backward agriculture. *Indian Journal of Agricultural Economics*, **30(1)**: 32.
- Natesh (2001). The changing scenario of herbal drugs. *Phytomorphology Golden Jubilee Issue*, 75-95.
- Rajagopal, N., R. Sivakumaresan and R. Kumar (2016). Price spread and marketing efficiency of betel leaves in Cuddalore district of Tamil Nadu. *International Journal of Tropical Agriculture*, **28(1-2)**: 28-31.