



E-ISSN: 2278-4136

P-ISSN: 2349-8234

www.phytojournal.com

JPP 2020; Sp 9(3): 100-103

Received: 01-04-2020

Accepted: 02-05-2020

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Economics of davanam production under contract farming

KS Shashank Yadav, K Shivaramu, Gaddigangappa and MA Murthy

Abstract

The research study was conducted during 2019-20 in Chikkaballapur district of Karnataka, India. In total 80 Davanam farmers under contract farming constituted the sample size of the study. The data were collected by employing personal interview method using pre-tested interview schedule. Ex-post-facto research design was used for the study. Mean, Standard Deviation, Frequency, Percentage Grouping, t-test correlation co-efficient and regression co-efficient statistical tools were used for analyzing the data. The results revealed that the total cost incurred for Davanam production was Rs. 87,158 per hectare, out of which Rs. 64,515 was variable cost and fixed cost was Rs. 22,643. The total quantity of Davanam yield obtained per hectare was 23.78 tons. The price per ton of Davanam was Rs. 10,000. The average gross return realized per hectare was Rs. 2,37,800. Net returns over variable cost from a hectare was Rs. 1,73,285 and net returns over total cost was Rs.1,50,642. The cost of production per kg incurred was Rs.3.67, net return over variable cost per kg was Rs.7.29 and net return over total cost per kg was Rs.6.33. The return per rupee of expenditure was Rs.2.73. The farmers were happy with the higher returns realized from Davanam compared to other crops. The contract farming had positive and significant impact on the social variables-organizational participation and extension contact and economic variables-annual income, savings and material possession. The variables mass media exposure, management orientation, organizational participation, extension participation and economic motivation of Davanam contract farming farmers were highly significant with annual income. The R^2 value specified that all 14 independent variables had contributed to the tune of 0.6870 per cent of variation in personal characteristics of Davanam contract farming farmers to annual income.

Keywords: Davanam, contract farming, economics, production, impact, socio-economic status

1. Introduction

The globalization of Indian agriculture in recent years resulted in the need for the production of export-oriented quality products having comparative advantage. To fulfil the commitment of the World Trade Organization (WTO), the recent dismantling of the system of quantitative restrictions (QRs) on imports by the Union Government has provoked new challenge to the Indian farmers to compete in the world market. With the WTO's demand for trade liberalization and subsidy cut to farmers the Indian farmers are facing threats to their survival from every quarter. In this context contract farming could be one of the best solution which may decrease the polarization of rich and poor and thus encourage Indian farmers to compete with the very large, rich and highly indirect subsidized western farmers. Contract farming can indeed to be a vehicle for the modernization of agriculture in India. It can be a means to bring about a market focus to Indian farming. Also, the contract farming system forms the most heartening part of the vision of the National Policy on agriculture. Contract farming enables a processor to procure the necessary raw material in right quantity, quality and in time at least cost.

Davanam (*Artemisia pallens*) is well known for its aroma and is generally known as scent crop. It is a native of South India. India holds key position in production of Davanam oil and acquired considerable reputation in international trade. Annual production is about 2 tons/ annum and mostly grows in Kashmir valley, Simla, Nainital hills, Karnataka, Tamil Nadu, Uttar Pradesh and Andhra Pradesh. Davanam cultivation under contract farming is highly profitable, even small farmers can practice it. Risk involved due to fluctuation in market price is minimized through contract farming. Farmer is assured of better returns compared to other field crops as the companies offer remunerative prices. With this background the present study is undertaken with the following specific objectives.

1. To Estimate the Economics of Davanam production under contract farming.
2. To Study the Impact Contract Farming on Socio-Economic Status of Davanam Farmers.
3. To know the Relationship between Personal Characteristics of Davanam contract farming farmers and Annual income.
4. To know the Contribution of Personal Characteristics of Davanam contract farming farmers to Annual income.

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2. Methodology

The research study was conducted in Chikkaballapur district of Karnataka, India. Based on the highest production two taluks viz., Gauribidanur and Chikkaballapur were purposively selected. From each selected taluk 40 Davanam contract farming farmers were randomly selected. Thus, the total sample size for the research study was 80 respondents. The data were collected by employing personal interview method using pre-tested interview schedule. Ex-post-facto research design was used for the study. The data were scored as per the set standards and tabulated. Keeping in view the objectives of the study and amenability, the data were subjected to different statistical tests. These tests includes mean, standard deviation, frequency percentage grouping. T-test correlation coefficient and regression analysis.

3. Results and Discussion

3.1 Economics of Davanam Production under Contract Farming

It was observed from the Table-1 that the total cost of Davanam production per hectare was Rs. 87,158. The average total variable cost incurred in Davanam production was Rs. 64,515. Among the various cost items, maximum cost (Rs. 14,099) was found on fertilizers in Davanam production and second most cost incurred was on farm yard manure (Rs.13,770) followed by cost on plant protection chemicals (Rs.13,521). The cost on land preparation incurred was Rs. 10,078. Among the fixed cost of Rs. 22,643, land rent was Rs. 14,697, land revenue was Rs.54, depreciation on farm machinery and equipment's was Rs.5,466 and followed by interest rate on fixed capital at 12% was Rs.2426. Further, the total cost incurred to produce Davanam was Rs. 87,158 and in which variable cost was higher (Rs. 64,515) than the fixed cost (Rs.22,643). Therefore, there is a need to improve the

efficiency of labours by imparting training and also offering some incentives to the labours in order to reduce the cost on labours. The cost on fertilizers and farmyard manure accounts for 31.98 per cent of total variable cost of production. The application of recommended dose of fertilizers and timely application of farmyard manure to the crop may reduce the cost incurred on nutrient management. The total cost incurred in Davanam production was Rs. 87,158 per hectare, out of which Rs. 64,515 was variable cost and fixed cost was Rs. 22,643. The total quantity of Davanam yield obtained per hectare was 23.78 tons. The price per ton of Davanam was Rs. 10,000. The average gross return realized per hectare was Rs. 2,37,800. The Net returns over variable cost from a hectare was Rs. 1,73,285 and net returns over total cost was Rs.1,50,642. The cost of production per kg incurred was Rs.3.67, net return over variable cost per kg was Rs.7.29 and net return over total cost per kg was Rs.6.33. The return per rupee of expenditure was Rs.2.73.

The returns from Davanam production was found to be profitable and it is beneficial to the farmers in relation to the total cost incurred by them. The gross return was found to be higher than the cost incurred. The gross return was found to be Rs. 2,37,800 per hectare. The net return over variable cost was worked out to be Rs. 1,73,285. The net returns over total cost was worked out to be Rs. 1,50,642. The farmers realized net returns of Rs. 10,000/ton. The return was worked out for every rupee of expenditure and it was found that farmers obtained Rs.2.73 which was higher than the expenditure. Further, if the farmers apply recommended quantity of FYM and fertilizers more returns may be obtained through increased yield. This would lead to further increase in the net returns and average returns on per rupee of expenditure. The findings of present study are in conformity with the findings of Pramod Kumar (2018).

Table 1: Economics of Davanam Production under Contract Farming/Hectare

Sl. No	Items	Amount (Rs.)	Percent
I.	Cost		
A.	Variable cost		
1	Land preparation	10078	11.56
2	Farmyard manure	13770	15.80
3	Sowing/planting	2433	2.79
4	Fertilizers	14099	16.18
5	Irrigation management	2453	2.81
6	Weeding	3940	4.52
7	Plant protection chemical	13521	15.51
8	Interest on working capital @ 7%	4221	4.84
	Cost A	64515	74.02
B.	Fixed cost		
1	Land Rent	14697	16.86
2	Land Revenue	54	0.06
3	Depreciation on farm machinery and equipment's	5466	6.27
4	Interest on fixed capital @ 12%	2426	2.78
	Cost B	22643	25.98
	Cost A + Cost B	87158	100.00
II.	Returns		
1	Yield Davanam herb (Tons)		23.78
2	Price realized for Davanam herb (Rs./tons)		10000
3	Gross returns (Rs.)		237800
4	Net returns over variable cost (Rs.)		173285
5	Net returns over total cost (Rs.)		150642
6	Cost of production (Rs./Kg)		3.67
7	Net returns over variable cost (Rs./Kg)		7.29
8	Net returns over total cost (Rs./Kg)		6.33
9	Returns per rupee of expenditure (Rs.)		2.73

(n=80)

3.2 Incremental BC ratio of Davanam over other competing crops

The data in Table-2 indicates the benefit cost ratio of various competing crops grown before Davanam cultivated under contract farming. Among various crops, the Davanam showed the highest B:C ratio of 2.73 followed by field bean with B:C ratio of 2.67, Carrot with B:C ratio of 2.61, maize with B:C ratio of 2.50 and Tomato (2.32). As per the results the farmers realised higher returns from Davanam when compared to all other crops.

The incremental BC ratio, which provides clearer picture of additional benefits if Davanam is cultivated in place of other

competing crops in the study area. Among the different crops, the incremental BC ratio was found to be the highest in case of tomato (5.06), followed by maize (2.96), carrot (2.94) and field bean (2.77) and all were positive, thus Davanam cultivation found to be more profitable compared to other crops. In other words, for every rupee spent on growing Davanam instead of maize, it would give an incremental benefit of Rs.2.96. Similarly growing of Davanam in place of tomato fetches Rs.5.07, if carrot is replaced it would give Rs.2.94 and if Davanam cultivated instead of field bean it would result in incremental BC ratio of Rs.2.77.

Table 2: Incremental BC Ratio of Davanam Over Other Competing Crops (Rs./ha)

Sl. No.	Crop	Cost	Gross returns	Net returns	B:C ratio
1	Maize	44460	111150	66690	2.50
2	Tomato	74471	172900	98430	2.32
3	Carrot	56810	148200	91390	2.61
4	Field bean	37050	98800	61750	2.67
	Davanam	87158	237800	150642	2.73
		Incremental cost	Incremental benefits	Incremental net returns	IBCR
1	Maize	42830	126650	83820	2.96
2	Tomato	12820	64900	52081	5.06
3	Carrot	30480	89600	59120	2.94
4	Field bean	50240	139000	88760	2.77

(n= 80), **Note:** IBCR- Incremental BC ratio of Davan over other competing crops

3.3 Impact of Contract Farming on Socio-Economic Status of Davanam Farmers.

The results presented in Table-3 on impact of contract farming on socio-economic status of Davanam farmers indicates that various indicators of characters like organizational participation (9.28), extension contact (6.46), mass media exposure (1.88), and extension participation (1.72) had shown positive change due to contract farming in Davanam. If we look at the overall improvement of socio-economic status of farmers it showed that mean difference is increased due to contract farming. It is very important to

know that there was a good economic impact with respect to increase in annual income (Rs. 2,37,800) and annual savings (Rs.79,925). The possession of material inputs was also showed increasing trend like farm implements (Rs. 18,182), household materials (Rs. 40,206) but decrease in draft power (Rs.3650). Further, social and economic impacts of all the indicators were found to be significant at one per cent level, whereas extension participation and mass media exposure were non-significant. These findings are in confirmation with Sahana (2013) [7].

Table 3: Impact of Contract Farming on Socio-Economic Status of Davanam Farmers.

Sl. No.	Variable	Mean score		Mean difference due to contract farming	Paired t-value
		Before contract farming	After contract farming		
I.	Social Variable				
a.	Extension Contact	5.10	11.56	6.46	8.07**
b.	Extension participation	12.75	14.47	1.72	0.68NS
c.	Mass media exposure	5.25	7.13	1.88	0.71NS
d.	Organizational participation	12.75	22.03	9.28	8.48**
II.	Economic Variable				
a.	Annual income (Rs.)	165453	403253	237800	515**
b.	Savings (Rs.)	16700	96625	79925	3.71**
c.	Material possession				
	i. Draft Power (Rs.)	10625	6975	-3650	4.46**
	ii. Farm implements(Rs.)	9275	27457	18182	3.59**
	iii. Household materials	5723.75	45930	40206.25	5.49**

(n=80), **=significant at 1 percent level, NS=Non-significant

3.4 Relationship between Personal Characteristics of Davanam Contract Farming Farmers and Annual Income

The correlation test was carried out to know the relationship between personal characteristics of Davanam contract farming farmers and annual income. The variables-mass media exposure, management orientation, organizational participation, extension participation and economic motivation were highly significant at one per cent level. Further, annual income, achievement motivation and level of aspiration were significant at 5 per cent level. Whereas, age,

education, land holding, family type, family size and extension contact were non-significant with annual income. The extent of exposure to Mass media exposure, management orientation, organization participation, extension participation and economic motivation might have helped the farmers to gain additional income through contract farming by actively participating in mass media and local organizations. The findings of the study gets the support of findings of Shilpa (2018).

Table 4: Relationship between Personal Characteristics of Davanam Contract Farming Farmers and Annual Income.

Sl. No.	Characteristic	Correlation Coefficient (r)
1	Age	0.068NS
2	Education	0.123NS
3	Land holding	0.142 NS
4	Annual income	0.257*
5	Family Type	0.112NS
6	Family Size	0.134 NS
7	Extension Contact	0.151NS
8	Extension Participation	0.326**
9	Mass media Exposure	0.398**
10	Achievement motivation	0.256*
11	Economic Motivation	0.318**
12	Organizational Participation	0.349**
13	Management Orientation	0.351**
14	Level of Aspiration	0.240*

(n= 80), NS: Non-Significant; *: Significant at 5 per cent level; **: Significant at 1per cent level.

3.5 Contribution of Personal Characteristics of Davanam Contract Farming Farmers to Annual Income.

The contribution of independent variables to the annual income of the Davanam contract farming was presented in Table-5. The variables viz., family type, annual income, economic motivation, management orientation and mass media exposure have significantly contributed to the annual income of Davnam contract farming farmers. The R^2 value specified that all 14 independent variables had contributed to the tune of 0.6870 per cent of variation in personal characteristics of Davanam contract farming farmers to annual income. The family type, annual income, management orientation, economic motivation and mass media exposure have contributed highly towards annual Income. The results implies that physical and social environment around farmers is important for any consequential changes observed among the individual by involving in mass media through better management. These findings are in line with the findings of Sahana (2013)^[7]

Table 5: Contribution of Personal Characteristics of Davanam Contract Farming Farmers to Annual Income.

Sl. No	Characteristic	Regression Coefficient(b)	Standard Error of Regression coefficient	't' value
1	Age	0.0573	0.1712	0.33 NS
2	Education	0.0452	0.2386	0.18 NS
3	Land holding	0.0580	0.1223	0.47NS
4	Annual income	0.9084	0.2254	4.03**
5	Family Type	0.7912	0.1490	5.31**
6	Family Size	0.2585	0.2856	0.91 NS
7	Extension Contact	0.3058	0.1463	2.09*
8	Extension Participation	0.1224	0.2383	0.51 NS
9	Mass media Exposure	0.4749	0.1690	2.81**
10	Achievement motivation	0.3186	0.1455	2.19*
11	Economic Motivation	0.7031	0.2232	3.15**
12	Organizational Participation	0.1791	0.1705	1.05 NS
13	Management Orientation	-1.0861	0.2821	3.85**
14	Level of Aspiration	0.1224	0.2383	0.51 NS

(n=80), NS: Non-Significant; *: Significant at 5 per cent level; **: Significant at 1per cent level.

$R^2 = 0.6870$

Conclusion

The cost of production of Davanam clearly indicates that it is a capital intensive activity. Hence, there is a need for extending credit facility to the contract farmers by companies to meet the critical input costs and other related expenditure. The Davanam production is a highly risky activity in spite of taking all operations in time. Even a slight variation in climatic conditions such as unexpected rains (cyclones) results in loss of crop or destroys crop quality which may lead to rejection of herb by the contracting firm, in such a situation to protect the farmers, the scheme of crop insurance may be introduced to cover climatic risks. The results also revealed that the contract farming had positive and significant impact on socio-economic status of Davanam farmers. The benefit cost ratio of various competing crops grown the Davanam showed highest B:C ratio of 2.73. This implies that the contract farming is beneficial to both farmers and firms if the price is fixed on scientific lines with regular payment and advance facility. This makes the way for adoption of recommended package of practices by the farmers to make it remunerative.

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