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Research Article

MULBERRY NURSERY ENTERPRISE IN KARNATAKA AND ANDHRA PRADESH – AN ECONOMIC STUDY

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Abstract: Mulberry nursery as a business is a profitable and viable venture. The present study was conducted in Karnataka and Andhra Pradesh (AP) during 2016-17 to evaluate the socio-economic status of mulberry nursery business. A total of 40 mulberry nursery units were selected for the study and simple statistical tools like averages and percentages were used to compare, contrast and interpret results appropriately. The data revealed that the entrepreneurs had an experience of 8 years (Karnataka) and 10 years (AP) in nursery management. Majority of the entrepreneurs in Karnataka (70 percent) and AP (80 percent) were performing nursery business as a subsidiary activity. The venture has vast potential of generating employment of about 730 Man Days (MD) and 694 MD per acre/annum in Karnataka and AP respectively. Total costs involved in nursery management per acre/annum in Karnataka was Rs. 3.35 lakhs and Rs. 3.42 lakhs in AP. The activity is a good source of income to the rural youth with returns per rupee of cost of production as Rs. 2.02 and Rs. 1.94 for Karnataka and AP nursery enterprises respectively. High demand for labour during uprooting of saplings was the main constraint reported followed by improper demand for saplings and lack of adequate fund. Interventions are required to establish linkages for regular demand and enabling availability of new varieties for nursery production. base.

Keywords: Costs, Returns, Input use

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Introduction

India is the second largest silk producing country in the world and the demand for silk is increasing over the years. To achieve the set target of 8500 MT annual bivoltine raw silk production in the country by 2020, expansion of area under mulberry cultivation is also equally important besides improving average cocoon yield. Mulberry propagation by nurseries has proven well to obtain healthy garden by the supply of saplings to the growers. Mulberry saplings are to be raised for about four to six months in nursery to establish mulberry bush garden and for a period of eight months to make as a tree plantation. Saplings in nursery can be raised two times a year depending on the water availability in ideal monsoon periods. Healthy saplings enable quick establishment of the garden and also to obtain quality leaves [3]. Any newly evolved mulberry variety has to be systematically multiplied to ensure adequate availability of saplings for its rapid spread in farmers field [1]. The multiplied mulberry seed material in the research centres is distributed to the farmers to raise the kisan nursery for sale to the interested farmers. Many nurseries are established in various parts of Southern India and are playing very important role in expansion of area under mulberry cultivation. Nursery management has gained the status of a commercial venture with its low gestation period and investment. Majority of the nursery growers carry the activity as per their convenience along with the other sericultural activities like late age silkworm rearing, chawki rearing, *etc*. Few entrepreneurs have made it as a year-round activity with established supply chain across the Southern states. Though mulberry saplings contribute 12 to 18 percent of the total cost of establishing mulberry garden, very few economic studies were conducted on mulberry nursery business. Hence, an attempt was made to know the socio-economic conditions of the nursery entrepreneurs, to reveal the economic (income and employment) potential of the enterprise and identify the constraints in the activity. The in-depth information about the mulberry nursery business would help the researchers as well as policy makers for the improvement of the business and also to encourage new entrepreneurs in taking up sericulture.

Materials and Methods

The present study was taken up in Karnataka and Andhra Pradesh (A.P.) where many mulberry nurseries were established and large number of saplings were being supplied across the Southern states. Random sampling method was followed and Chitradurga (Karnataka) and Anantapur (A.P) districts were purposively selected, with the availability of more number of nurseries. In Chitradurga district, two clusters *i.e*., Challakere and Hiriyur were selected and under each cluster two villages were selected. Five nursery entrepreneurs in each village were selected and data was collected from 20 entrepreneurs in the district. Similarly, in Anantapur district, Hindupur and Madakasira clusters were selected and data was collected from 5 entrepreneurs in each village and two villages in each cluster. An interview schedule against set objectives for measuring the variables of the study was first prepared and pre-tested with nursery entrepreneurs in the non-sample area. The data was collected from 20 mulberry nursery units in each state through personal interview method during the year 2016-17. Simple statistical tools like averages and percentages were used to compare, contrast and interpret results appropriately. Though many farmers were practising mulberry nursery, majority are for the domestic purpose and not as a commercial activity. Hence, entrepreneurs undertaking mulberry nursery business on a minimum scale of 0.50 acre and with an experience of three years were selected for the study. Land use cost was calculated on the basis of rental value of land per year. Relative profitability of mulberry nursery business was examined on the basis of gross margin and net return analysis. Gross returns were calculated by multiplying number of saplings with market price of the sapling. Total variable cost refers to all variable costs including the imputed value of family supplied inputs. Gross margin was calculated by deducting the total variable cost from the

gross returns. Net returns were calculated by deducting total cost from the gross returns. The problems faced in mulberry nursery business were ranked by assigning weighted scores to each individual problem to know the severity. The ratings adopted were as follows: 1= not important, 2= less important, 3= important and 4= very important. Mean rank for each of the constraints were estimated and the constraint with highest mean rank was identified as the most important constraint affecting the nursery business in the study area.

Weighted Score = $\sum S_i$

where, S_i indicates the score given by the respondent for the i^{th} problem, and i = 1, 2, 3.....n (M A Haque *et al*, 2007)

Table-1 *Socio-economic profile of the respondents in the study area*

SN	Particular	Karnataka	AP
1	Family labour (No.)	3.1	2.8
	Adult male	1.6 (51.61)	1.6 (57.14)
	Adult female	1.5 (48.39)	1.2 (42.86)
2	Education level (%)		
	Primary	4 (20.00)	12 (60.00)
	Secondary	8 (40.00)	4 (20.00)
	Above Secondary	8 (40.00)	4 (20.00)
3	Occupation (%)		
	Mulberry nursery (sole)	4 (20.00)	2 (10.00)
	Mulberry nursery and commercial silkworm rearing	14(70.00)	16(80.00)
	Mulberry nursery and commercial chawki rearing	2(10.00)	2(10.00)
4	Experience (no. of years)		
	Mulberry nursery	8	10
	Silkworm rearing	20	16
5	Ownership of nursery land (%)		
	Own	16 (80.00)	13 (65.00)
	Lease	4 (20.00)	7 (35.00)
6	Area under mulberry nursery (acres)	1.35	1.63

**Figures in parenthesis indicate percentage to the total*

Table-3 *Cost and return structure of mulberry nursery enterprise*

SN	Particulars	Karnataka	AP
1	Fixed cost (Rs.) per acre per year	67375	63729
2	Variable cost (Rs.) per acre per year	268394	278779
3	Cost of production (Rs.) per acre per year	335769	342508
4	Average selling price per sapling (Rs.)	3.07	3.38
5	No. of batches per year	2	2
6	No. of cuttings/batch	139000	122000
7	Recovery off saplings (%)	79	81
8	No. of saplings recovered/batch	110300	98250
9	Gross return (Rs.) per acre per year	677242	664170
10	Net revenue (Rs.) per acre per year	341473	321662
11	Gross margin (Rs.)	408848	385391
12	Returns over variable cost (Rs.)	408848	385391
13	Returns over cost of production (Rs.)	341473	321662
14	Returns per rupee of variable cost (Rs.)	2.52	2.38
15	Returns per rupee of cost of production (Rs.)	2.02	1.94
16	Cost of production per sapling (Rs.)	1.52	1.74
17	Break-Even Unit (BEU)	44512	36191
18	Break-Even Sales (BES)	136650	122324
19	Break-Even Price (BEP) (Rs.)	1.90	2.09

Table-4 *Constraints faced by the entrepreneurs in mulberry nursery enterprise*

SN	Constraints	Rank value	
		Karnataka	AP
1	Inadequate supply of new varieties	6	6
2	Lack of technical know-how	5	5
3	Low price of sapling/seedling and Uneven sale	9	8
4	High wages /timely availability of labour	8	9
5	Damage of sapling/seedling	3	3
6	Infestation of insects and diseases	2	1
7	Lack of irrigation facilities	4	7
8	Lack of credit facilities/ adequate fund	7	4
9	New competition	1	2

Results and Discussion

Socio-economic status of mulberry nursery entrepreneurs

The socio-economic characteristics of the mulberry nursery entrepreneurs in Karnataka revealed that the average family size was six. On an average, 60 percent of the respondents had secondary level of education and about 90 percent of the respondents were carrying nursery business along with other sericulture activities like commercial silkworm rearing [Table-1]. Fifty five-percent of the nursery practitioners had an experience of above five years in mulberry nursery business. Average land holding was 3.35 acres and area allotted under mulberry nursery was 1.35 acres. Majority (90 percent) of the respondents have mentioned that their principal occupation was commercial silkworm rearing and commercial chawki rearing, whereas mulberry nursery business was a subsidiary occupation. In AP, 65 percent of nursery entrepreneurs are running on their own lands and due to the high cost of land in the study area entrepreneurs also prefer leasing of lands to outright purchase. More than half of the nursery entrepreneurs established their enterprise on land area that was less than one hectare and above 0.5 acre. On an average 40 percent of the respondents had secondary level of education. Mulberry nursery enterprise was taken up along with silkworm rearing (80 percent) and commercial chawki rearing (10 percent) by the respondents. Among the entrepreneurs in both the states, V1 variety saplings are being produced (95 percent) and supplied to the farmers. The size of operation was based on the profit gained in the previous years by the entrepreneurs, demand in the previous season and availability of resources like land, water and cuttings also.

Input-use pattern

Input use pattern of different mulberry nurseries in Karnataka revealed that the number of mandays required for mulberry nursery establishment was estimated to be 730 MD/acre/year and constitutes around 45 percent of the total costs involved [Table-2]. Labour requirement is very high for preparation of cuttings and planting (232 MD), weeding (176 MD) and uprooting of saplings (224 MD). Nursery entrepreneurs were applying 12 MT of farmyard manure/ acre/ year and chemical fertilisers (Urea, DAP, MOP) to promote the growth of saplings. Majority (80 percent) were applying Poshan, a multi-nutrient formulation once in every crop (1 lit/acre). Only 20 percent of the entrepreneurs were growing saplings in polyethene bags and others are raising saplings directly in the field. Imputed value of family labour was found to be Rs. 21784 (18 percent of the total labour force employed). In AP, 694 MD were used for mulberry nursery establishment per acre per year and family labour contributed 22 percent (Rs. 28572) of the total labour engaged. Planting material constitutes 8.76 percent of total cost followed by farmyard manure cost (4.90 percent). Nursery entrepreneurs were applying 14 MT of farmyard manure/acre/year and chemical fertilisers (Urea) to promote the growth of saplings. Weeding was taken up 2 times per crop depending on the intensity of weeds. Mulberry nursery garden was being irrigated once in a week other than the rainy days. Uprooting of saplings was done based on the demand after 120 days of planting and it takes around fifty percent of the total labour force consumed in the nursery management. In both the states, only 10 percent of the entrepreneurs were using cutting making machine and cuttings were prepared manually by hiring labour. Spray of pesticide in the nursery was totally restricted and practised only as per the requirement with the notice of disease incidence. All the entrepreneurs possess farm implements like sickles, secateurs and sprayer which was used for silkworm rearing also. Rental value of land per acre per year ranged from Rs. 25000 to Rs. 30000 in both the states. Around 90 percent of the entrepreneurs were purchasing cuttings from other farmers and they consider thickness of the stem, age of the garden, inter-nodal distance, appearance of stem, viability and moisture content while selecting the seed material. The estimated total cost per acre per year of mulberry nursery business in Karnataka was Rs. 3.35 lakhs and the major share of cost incurred was for the labour usage (50 percent) followed by purchase of planting material (8.93 %) and manure (5.36 percent). The variable cost of mulberry nursery business includes machine labour, human labour, cuttings, farmyard manure, chemical fertilizer, irrigation and interest on operating/working capital. Fixed cost considered were rental value of land use and depreciation of tools & equipment. The total cost of mulberry nursery business in AP was estimated to Rs. 3.42 lakhs per acre/year. Expenditure incurred on labour usage was Rs.1.74 lakhs (50 percent) as the enterprise was highly labour demanding for planting of cuttings and uprooting of saplings.

Table-2 *Input use pattern of mulberry nursery entrepreneurs in the study area*

	Particulars	Unit	Karnataka			AP		
			Quantity	Value (Rs.)	Percent Share	Quantity	Value (Rs.)	Percent Share
I	Variable cost/working capital							
1	Land preparation	Machine hour	6	6000	1.79	4	3180	0.93
		Bullock labour	2.5	2438	0.73	6	6900	2.01
2	Farm Yard manure	MT	12	18000	5.36	14	16800	4.90
3	Manure application	Mandays	10	3000	0.89	14	4900	1.43
4	Preparation of nursery bed	Mandays	10	4000	1.19	16	6080	1.78
5	Planting material	MT	6	30000	8.93	6	30000	8.76
6	Preparation and planting of cuttings	Mandays	232	69600	20.73	204	58140	16.97
7	Fungicide (Bavistin)	Kg.	2	2000	0.60	2	2000	0.58
8		Mandays	2	500	0.15	2	560	0.16
9	Irrigation	Mandays	60	15000	4.47	50	12000	3.50
10	Weeding (2 times)	Mandays	176	35200	10.48	194	38800	11.33
11	Chemical fertilizer			2200	0.66		850	0.25
12	Fertiliser application	Mandays	16	4800	1.43	4	1200	0.35
13	*Poshan*	lit	2	800	0.24	-	-	-
14	Uprooting of saplings	Mandays	224	33600	10.01	210	52500	15.33
15	Bore well maintenance			10000	2.98	12000		3.50
16	Miscellaneous (insecticides, spray, etc)			2500	0.74	3000		0.88
17	Interest on working capital (@ 12%)			28757	8.56	29869		8.72
Total variable cost				268394	79.93	278779		81.39
II	Fixed Cost							
1	Depreciation of equipments			250	0.07	250		0.07
2	Rental value of land			29500	8.79	24400		7.12
3	Land revenue			50	0.01	50		0.01
4	Managerial cost @ 10% of working capital			26839	7.99	27877		8.14
5	Risk premium @ 5% of 80% of working capital			10736	3.20	11151		3.26
Total fixed cost				67375	20.07	63729		18.61
Total cost/acre/year				335769	100.00	342508		100.00

Costs and return structure

All the entrepreneurs were raising 2 batches of mulberry nursery per year and the survival rate was found to be 75 to 81 percent. Average selling price (Rs.3.07 in Karnataka and Rs. 3.38 in AP) of the mulberry sapling was determined by the demand in the area, variety, time of sale, production cost and age of the saplings. Entrepreneurs were offering discount to the regular farmers and transportation costs were borne by the purchasing farmers. Gross returns per acre per year received from the sale of saplings was found to be Rs. 6.77 lakhs in Karnataka and Rs. 6.64 lakhs in AP [Table-3]. The returns per rupee of cost of production was Rs. 2.02 and Rs. 1.94 in Karnataka and AP respectively, indicating that the mulberry nursery business was a highly profitable venture. Direct marketing of saplings by the nursery entrepreneurs to the farmers was noticed with its main advantage of the opportunity to reduce marketing costs and to add value by increasing the profit margin. In Karnataka, cost of production per sapling was Rs. 1.52 with a Break-Even Price (BEP) of Rs. 1.90 per sapling and returns over total cost of production per acre per year was Rs. 3.41 lakhs/acre/annum. As the entrepreneurs were carrying nursery business, along with other sericulture activities like commercial late age silkworm rearing and commercial chawki rearing, the net returns received from nursery business was the subsidiary income. In AP, the total cost of production was found to be Rs. 3.42 lakhs/acre/year and returns over cost of production was Rs.3.21 lakhs/annum. BEP was worked out to be Rs. 2.09 per sapling with cost of production of Rs. 1.74 per sapling. Larinde and Ruth Santus (2014) also found that the plant nursery enterprise (horticulture crops) was a viable venture that one can engage in with a BCR of 2.79.

Constraints

The respondents were asked their opinion regarding the problems of mulberry nursery business and the problems noted were ranked according to the importance of problems as per their opinion [Table-4]. The study revealed that the timely availability of labour and high wages for uprooting of saplings followed by lack of proper market channel and unpredicted demand for saplings resulting in fluctuation of selling price of sapling were the most important problems faced by all the nursery entrepreneurs. Lack of adequate fund, timely sale of saplings, inadequate supply of new varieties and lack of technical know-how, inadequate irrigation and credit facilities were the crucial problems faced in the study area. The entrepreneurs have mentioned the technical interventions required like developing new machinery for uprooting of saplings, supply of cutting making machine on subsidy basis, providing training and literature regarding new mulberry varieties developed. As success of the enterprise depends on establishing linkages through proper market channel, provisions are to be made for institutional support to nurseries, registering entrepreneurs, regulating price of sapling *etc.* which enable the entrepreneurs to fetch remunerative price and also to attract new entrepreneurs. The entrepreneurs are supplying saplings to the far distant places and the saplings are healthy and viable with regular demand of selling all the saplings raised without any wastage except few instances. Lack of credit facilities/ adequate fund was restricting the entrepreneurs in extending the business and support from nationalised banks using proper business models will extend great support. Nursery entrepreneurs were considering the available improved mulberry variety and analysed the demand and gap in supply for ensuring timely availability of saplings during the rainy season. Advertisement and publicity is not systematic and major source of spreading information was through farmers in the village.

Conclusion

The findings of the study revealed that the mulberry nursery business was a profitable business in the study areas. Nursery as a business generated high employment opportunity and additional income to the rural entrepreneurs. Extending technical support and adequate fund facility will encourage farmers to extend the business and also to attract new entrepreneurs. Extended financial support from government to nursery entrepreneurs, mulberry growers and optimum mulberry cocoon prices will encourage farmers to plant mulberry in new areas which in turn increases the demand for mulberry nurseries.

Application of research: The in-depth information about the mulberry nursery business would help the researchers as well as policy makers for the improvement of the business and also encourage new entrepreneurs in taking up sericulture.

Research Category: Sericultural Economics

Abbreviations: MT- Metric Tonns, Kg – Kilogram, Lit - Litres

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