

Constraints in Adoption of Arecanut Based Farming Systems

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Introduction

INDIA leads the world in arecanut production followed by Sri Lanka and Bangladesh. The area under arecanut in the country is about 2,68,700 ha and the annual production is around 3,33,900 tonnes of nuts. Arecanut plantations in India are largely located in fertile valleys in the coastal and ghat regions of Kerala and Karnataka and alluvial deltas of Assam and West Bengal. Kerala, Karnataka, Assam and West Bengal are the major arecanut producing States in the country accounting for more than 90 per cent of area and production.

Arecanut crop has a gestation period of about 7 years and has a long economic life span of about 45 years. The entire economic life span of arecanut can be sub classified into five phases *viz.*, pre-bearing (1 to 3-4 years), initial bearing (5 to 15 years), gradual increase in yield (15 to 25 years), stabilised yield (26 to 45 years) and yield reduction (> 45 years). The flow of costs and returns in arecanut spreads over a number of years with varying degree of magnitude. The expenditure during the pre-bearing phase constitutes the investment cost while the full benefits take quite sometime to accrue regularly. Unlike in case of annual crops like rice, in case of arecanut farming, the fixed assets like land once committed cannot be taken back for more than four decades.

Arecanut farming in northern Kerala and parts of coastal Karnataka is predominated with small and marginal farmers. Under this situation, in order to reduce the degree of production and price risks of arecanut farmers, adoption of Arecanut Based Farming Systems (ABFS), as a productive land use system is widely recommended in the recent past. But, the research efforts on these aspects are being made since fifties. In 1951, Bavappa¹ reported that crops like banana, tapioca, black pepper, colocasia, yams, pineapple, jack and coconut were suitable for cultivation as inter/mixed crop in arecanut gardens. Abraham² (1956) indicated that spices like ginger, turmeric, and cardamom were also suitable for cultivation in arecanut gardens. According to Abraham² (1956), Naidu³ (1959), Khader and Antony⁴ (1968), Bhat⁵ (1974), Nagaraj⁶ (1974) small holding size, long pre-bearing age of arecanut, low income during early bearing phase, production and price risks and seasonality of income from arecanut were the major reasons for adoption of different ABFS models.

In order to reduce the production and price risks, though farm diversification and intensification are considered to be a favourable solution to increase the gross farm income, it is essential to assess the constraints in their adoption in a scientific manner to enable us to suggest strategies to promote the technology through appropriate constraint management measures. In this background, the present study highlights the constraints faced by the farmers for adoption of arecanut based farming systems.

Methodology

The study is based on the primary data collected from 400 arecanut gardens located in 16 Panchayats of four blocks in Kasaragod district of Northern Kerala. Random-cum-cluster sampling technique was adopted. The field study was carried out during 1997-98 based on 1996-97 market prices of input-output. The constraint analysis was performed based on scoring techniques for different size of holdings. The constraints were ranked as Very important, Important, Less important and Not important and they were respectively given scores of 3, 2, 1 and 0. Later on the scoring index was worked out as the ratio between sum of the actual score to sum of the maximum possible score for a constraints. Based on the scoring index, constraints were ranked.

Results and Discussions

Scores offered by the different groups of farmers on various constraints are presented in Table 1. It could be inferred from the table that the availability of land was a major constraint in case of marginal farms, whereas the same scored 6th rank in the case of small and medium farms and 14th rank in the case of large farms. About 85 per cent of the total sample respondents were either small or marginal farmers. The average land holding size of these arecanut gardens was less than one hectare. Arecanut being a perennial crop, requires constant removal and replacement when the older plants become economically non-viable. The research institute suggests that those gardens, which are in existence for more than 45 years, should adopt the replanting method of replacement. In this method, the older and economically non-viable arecanut plants were cut and removed in the entire garden/parts of the garden and in the same place replanted with new arecanut plants with high yielding varieties. However, from the field survey, it was observed that the arecanut farmers

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were retaining their older arecanut plants even upto 55 years and they were not adopting the method of replanting. Instead, they were following the system of under planting in which new arecanut plants were planted in the interspaces of existing arecanut plants of 35 years, thereby reducing the possibility of taking up ABFS in a systematic way. Hence, the farmers were not undertaking systematic cultivation of the component crops *viz.*, coconut, pepper and banana. However, in case of medium and large holdings most of the ABFS models were being practised comparatively in a more systematic manner since the pressure on land in these farms was comparatively less.

Increase in labour cost is another important constraint faced by the arecanut farmers in the study area and the total requirement of labour is directly in proportion to the degree of farm intensification and diversification. Most of the arecanut farmers were depending more on hired labour and at present, the same has become a scarce and costly input in the study area. It could be observed from Table 2 that as compared to 1987-88, the labour wages during 1999-2000 had increased by 300 per cent. From the field survey it was further observed that during the same period, the increase in labour wages in case of specific operations like spraying and harvesting for arecanut had gone up by more than 700 per cent. Under this situation one would expect higher contribution from family labour for various agricultural operations. In contrast, the average family labour contribution for various ABFS models was below 50 per cent even in case of marginal farms. This could be due to higher level of rural literacy and supplement income from non-farm sources.

In a region with higher rate of rural literacy, the share of family labour for farm operations is low since the people of this State including those in rural areas prefer mostly non-farm employment. Hence, the demand for hired labour often exceeds the supply thereby increasing labour cost. Moreover perennial tree crops like arecanut and coconut need specialized labourers for operations like spraying plant protection, harvesting of nuts, etc. From the field survey it could be inferred that the cost of these skilled labourers was more than 200 per cent higher than that of the normal cost of hired labour. Cost of labour had scored 4th rank in the case of marginal farms and 2nd rank in the case of small, medium and large farms.

As stated earlier, labour has not only become costly but also as a scarce input in the study area. Non-availability of hired and skilled labourers especially during their peak demand period is another major problem faced by arecanut farmers of the study area. This constraint was identified as the 5th major problem by marginal problems and as 3rd major problem in case of small, medium and large farms.

Organic manure is a major input used in arecanut based farming systems and its requirement is directly

proportional to the total area. It was inferred that inclusion of dairy as a component in ABFS could meet about 50-75 per cent of the total organic manure requirements for ABFS, which would considerably reduce the total cost of cultivation (Sairam *et al.*, 2000). From the field survey it was observed that medium and large farms with less dairy animals, have to spend a huge amount on this input. Non-availability of organic manures ranked 7th in case of marginal farms, 5th in case of small and medium farms and 6th in case of large farms.

Knowledge on different arecanut based farming systems was identified as one among the constraints for adoption of different ABFS models. Since most of the sample farmers had contact with the officials of the Agricultural Department, this constraint was ranked 12th and 10th, respectively in case of marginal and small farms and 9th rank in case of medium and large farms.

The degree of farm intensification in arecanut gardens is directly related to the existing irrigation facilities. From the field survey, it was observed that most of the arecanut gardens did not possess adequate irrigation facilities. This constraint got 6th rank in case of marginal farms and 4th rank in case of small, medium and large farms. The ranking was comparatively lower in case of marginal farms since the water requirement was relatively low and in case of medium and large farms water saving equipments like sprinkler and drip irrigation systems were common. Further the studies conducted by CWRDM (Source: Reports of the Centre for Water Resources Development and Management, Kozhikode) indicates that Kasaragod district is earmarked as grey with regard to ground water exploitation and hence no financial aid is approved for developing the ground water resources. This policy would discourage farm intensification in arecanut gardens.

Institutional credit in the form of short, medium and long-term loans are essential for farm intensification in arecanut gardens. From the discussions during survey it was evident that more than 50 per cent of the sample farmers could not get adequate institutional credit. However, this constraint had scored 10th rank in case of marginal and large farms, 12th in case of small farms and 11th in case of medium farms.

Existence of adequate marketing facilities for the crops to be raised in ABFS models is an important aspect to be considered before choosing the choice of inter/mixed crop. In general farmers prefer to choose those with higher degree of price stabilization. However, the sample farmers did not feel this as a major constraint and the rank was 14th in case of marginal and medium farms, 13th in case of small farms and 10th in case of large farms. It could be observed that the comparative ranking was lower in case of large farms with higher degree of farm intensification.

The trend in wholesale prices of arecanut was considerably high during the eighties indicating that relative profitability of arecanut cultivation had increased over years. Hence, the farmers prefer to divert their farm resources to arecanut and this had a negative impact in case of farm intensification. This was not identified as a major constraint in marginal farms however in medium and large farms the respective rank for this constraint was 6th and 5th. This indicated that better prices of arecanut would induce diversion of farm resources towards the same.

The amount of working capital available has positive correlation with farm intensification. As expected, marginal farmers observed this as a major constraint and its relative importance decreased with the increase in size of holdings. The respective ranking for this constraint was 2nd, 7th, 9th and 12th in case of marginal, small, medium and large farms.

Based on the earlier experience farmers were asked to rank about the performance of the intercrop. Most of the farmers felt that in general the performance of the intercrops was not a serious constraint and the respective ranking was 10th in the case of small farms and 8th in case of marginal, medium and large farms.

Since most of the farm families undertake farm and non-farm operations, the time allocated to farm activities was yet another factor which would influence the degree of farm intensification. In general this would not be a major constraint in the case of marginal and small farms and the respective ranking was 9th and 8th, however it is interesting to note that the ranking was only 7th in case of medium and large farms.

It could be further inferred that incidence of diseases in arecanut was identified as the most important constraint faced by most of the farmers. Among the diseases "Mahali" (fruit rot disease) is most common during monsoon season throughout the West Coast of India. This disease requires timely spraying of plant protection chemicals by skilled labourers. The disease in advanced stages could reduce the net returns even upto 90 per cent.

Incidence of diseases in inter/mixed crops was uniformly ranked as the last (15th) irrespective of the size of land holdings.

Recommendations

The constraint analysis in the systematic adoption of arecanut based farming system indicated that size of land holding, inadequate capital availability, labour scarcity and labour cost were the major constraints which affected the adoption of different ABFS models. In case of small, medium and large farms, it was observed that incidence of diseases like 'Mahali', higher labour cost and non-

availability of labourers were the major constraints faced by the farmers in their ABFS models.

To overcome these constraints, transfer of technology need to be strengthened taken to popularize covering of fruit bunches of arecanut with polythene cover during monsoon season and the technical feasibility and economic viability of this technology needs to be assessed at many locations. Wherever possible, the involvement of family labour need to be encouraged and the system of resource recycling needs to be more effective in different Arecanut Based Farming System Models.

Future research efforts and policy measures for small and marginal farmers should focus on development of various ABFS models suitable for small size holdings. These schemes should be supplemented with adequate institutional finance from banks and the Directorate of Arecanut, Spices and Aromatic plants. In order to benefit the medium and large farms future research efforts and policy measures needs to give more emphasis on mechanization and labour saving devices.

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TABLE 1—CONSTRAINTS FACED BY THE ARECANUT FARMERS FOR SYSTEMATIC ADOPTION OF ARECANUT BASED FARMING SYSTEMS

Sl. No.	Particulars	Marginal			Small			Medium			Large	
		I	II	III	I	II	III	I	II	III	I	II
1.	Non-availability of land	320	83.99	01	404	63.52	06	44	31.21	12	06	14.2
2.	Inadequate availability of organic manures	281	73.75	07	441	69.34	05	64	45.39	05	21	50.0
3.	Lack of knowledge on ABFS	138	36.22	12	228	35.85	10	48	34.04	09	15	35.7
4.	High Labour cost	297	77.95	04	537	84.43	02	126	89.36	02	38	90.4
5.	Non-availability of Labourers	296	77.69	05	532	83.65	03	125	88.65	03	35	83.5
6.	Lack of Irrigation Facilities	289	75.85	06	481	75.63	04	89	63.12	04	30	71.4
7.	Lack of Credit Facilities	141	37.01	10	217	34.12	12	46	32.62	11	14	33.8
8.	Lack of Marketing Facilities	141	37.01	10	206	32.39	14	44	31.21	12	12	28.5
9.	Price risk of intercrops	125	32.81	14	212	33.33	13	44	31.21	12	14	33.8
10.	Better prices for arecanut	132	34.65	13	244	38.36	09	62	43.97	06	23	54.7
11.	Lack of Capital	307	80.58	02	406	63.84	07	48	34.04	09	13	30.2
12.	Poor performance of intercrops	157	41.21	08	228	35.85	10	49	34.75	08	17	40.4
13.	Lack of managers for the farm	148	38.85	09	252	39.62	08	50	35.46	07	20	47.6
14.	Incidence of diseases for arecanut	307	80.58	02	556	87.42	01	135	95.74	01	41	97.6
15.	Incidence of diseases inter/mixed crop	45	11.81	15	67	10.53	15	07	04.96	15	03	7.1

I-Score; II-Scoring Index, III-Rank.

TABLE 2—THE INDEX NUMBERS FOR AVERAGE LABOUR WAGES IN NORTHERN KERALA (BASE YEAR : 1987-88)

Sl. No.	Years	Index Numbers
1.	1987-88	100.00
2.	1988-89	116.67
3.	1889-90	116.67
4.	1990-91	150.00
5.	1991-92	150.00
6.	1992-93	180.00
7.	1993-94	200.00
8.	1994-95	250.00
9.	1995-96	266.67
10.	1996-97	283.33
11.	1997-98	292.12
12.	1998-99	298.25
13.	1999-00	299.75

Source : Relevant issues of Agricultural Situation in India, Directorate of Economics and Statistics, New Delhi