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Labour availability in coconut cultivation and impact on technology adoption as perceived by coconut farmers

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Abstract

Labour is an important resource for sustainable farming. Coconut, a perennial tree crop, requires skilled and unskilled labour components for adoption of scientific management practices. The study indicated that both hired and family labour were utilised in seedling planting and management, whereas family labour was prominently utilised in case of chemical fertiliser application and basin management with green manure. Hired labour was critical in basin opening, organic manure application, plant protection and harvesting. Most of the technologies adopted were irregular in nature which was indicated due to escalating input costs and declining output price. Majority of the respondents (76.32%) adopted keramithra for de-husking coconuts. Farmers who adopted mechanisation in land preparation opined 60-75 per cent reduction in expenditure compared to manual labour. Seventy eight per cent of respondents recorded scarcity in labour availability. The responses of the farming community towards the high wage rate and scarcity were discontinuation of milch animals in coconut homesteads, reduction in number of regular harvests, untimely harvests of coconut, reduction in intercropping, irregularity in basin opening and cultural practices, low level of organic manure application *etc*. Mechanization in coconut cultivation among small/marginal holders is meagre and needs impetus from supporting agencies. The constraints and suggestions of the farmers were also documented.

Keywords: Coconut, labour availability, mechanisation, root (wilt) disease, technology adoption

Introduction

Coconut assumes importance as a traditional base crop of the agro forestry systems followed by the small and marginal farmers throughout the coconut growing countries, as well as an economically important commercial tree crop. Coconut is cultivated in 1.9 million hectares with an annual production of 14,744 million nuts in India. The coconut farmers has been facing several problems in the root (wilt) disease affected area, of which the major perceived one is the declining profitability from the crop. The cost of inputs, manures, fertilisers and labour increases the cost of production paradoxically with the low price of the coconut. Pathiraja *et al*. (2010) in their study in Sri Lanka, indicated that 29 per cent of the cost of production was labour cost. Similarly Kalathiya *et al.* (2007) in their study reported that 50 per cent of the input wise cost of cultivation comprises of the cost of manures, fertilisers and labour.

Farming is essentially considered as labour intensive process. Mubyarto (1991) stated that coconut farm enterprises constitutes an economic activity carried out by utilising agricultural resources *i.e*. land, labour, capital and technology. Hence, it is evident that technology adoption depends on socio economic and technology attributes. Scientific management of this tree crop requires skilled and unskilled labourers. A study conducted in Alappuzha district also indicated labour scarcity, high wage rate and timely availability as major constraints in technology adoption. (Anithakumari *et al*., 2012). Hence, this study was taken up with the following objectives of assessing farmers perception on labour availability for coconut cultivation and extend of mechanization, analysing the labour scenario in

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technology adoption status and to bring out the constraints and suggestions in overcoming labour shortages

Materials and methods

The study was conducted during 2012 in Edava panchayath of Thiruvananthapuram district and Krishnapuram panchayath of Alappuzha district. Primary qualitative and quantitative data were collected from 70 respondents selected through random sampling method using pre tested interview schedule, direct observations and field visits. The pattern of technology utilisation, possession of tools/ implements/machineries, socio-economic variables like land holding size, number of coconut palms, extent of intercrops cultivated, irrigation, livestock components, status of labour availability in terms of very scarce, scarce, adequate and plenty, working hours, wage rate, diversity of farm labour, age of farm labourers and knowledge of the farm labourers in agricultural activities were tabulated using simple frequencies, scores and percentages. The Pearsons correlation method used for analysing the relationship of the labour availability status as perceived by the coconut farmers and the socio economic variables.

Results and discussion

Technology utilisation profile

The technology utilisation and the associated factors were furnished in tables 1 and 2. The average area of the respondents under coconut cultivation was 0.27 ha with an average 35 bearing and 15 non-bearing palms. All the farmers practice intercropping and approximately one third of them had poultry or livestock components.

Table 1. Details of Coconut cultivation among the respondents (n=70)

Sl. No.	Particulars	Categories	Percentage
1	Land holding size	0.1 ha and below	21.05
		0.11 ha-0.20 ha	28.95
		0.21 ha and above	47.37
2	Number of bearing coconut palms	Up to 10 palms	18.40
		11-25 palms	20.53
		25 to 50 palms	24.20
		Above 50 palms	36.81
3	Number of non-bearing palms	Nil	15.78
		Up to 10 palms	26.31
		11-30 palms	26.31
		Above 30 palms	31.60
4	Intercrops cultivation	Up to 2 intercrops	15.79
		3-5 intercrops	31.58
		More than 5 intercrops	52.63
5	Animal husbandry components	Poultry birds alone	24.32
		Livestock alone (cow or goat)	29.73
		Poultry and livestock	08.11
6	Involvement of farmers in farming	Fully	22.22
		Partially	77.78
		No involvement	02.18

Table 1 indicated that around half of the respondents had coconut cultivation in holding size of 0.2 ha and above. Existence of bearing and non-bearing palms in the same plot may be considered while implementing plant protection against pests and disease in the root (wilt) disease affected area. The wide variation in the land holding size and the number of palms also had bearing in the efficiency of labour utilisation. Two third of the farmers were involved partially in farming indicating the need or prevalence of non-farm income sources. Intercropping was fairly practiced by most of the coconut farmers which helps meeting family requirement as well as small additional income. Only

Table 2. Nature and utilisation of labour sources for adoption of coconut technologies (n=70)

Sl. No.	Technology areas	Pattern of adoption			Labour source	
		Regular	Irregular	Discontinued	Hired	Family
1	Planting of seedlings	65.79	34.21	0	71.84	50.20*
2	Seedling management	60.53	39.47	0	39.47	73.68*
3	Basin opening	73.68	26.32	0	85.32	14.68
4	Chemical fertiliser application	24.32	75.68	2.63	36.20	63.80
5	Basin management with green manure	29.10	70.90	0	45.63	54.37
6	Organic manure application	65.79	34.21	3.20	73.63	23.68
7	Plant protection	2.63	97.37	13.27	100.00	0.00
8	Harvesting	31.58	68.42	0	97.40	2.60

*along with hired labourers family labour participation

one fourth of the respondents practiced animal husbandry. The sustainability of small holding agro forestry system with coconut as base crop largely depended on the animal husbandry components for additional income and as organic manure source. Group or cooperative initiatives in this were expected to provide dividends in future. Furthermore, the study indicated that animal husbandry components were maintained and sustained through family labour, especially the women farmers.

The adoption of technologies was considered positive if the farmer adopted at least one of the technologies recommended as package. Farmers opined that labour problems, escalating cost of inputs, decline in livestock components and low price of coconut forced the irregularity in adoption. Table 2 indicated that family labour utilisation was considerable in seedling planting and management and in chemical fertiliser application and basin management with green manuring. The highest regular adoption was recorded in case of basin opening (73.68%) which was a traditional and proven practice among the coconut cultivators. Regularity of management practices assumes high level of importance for coconut due to its perennial nature and physiological characteristics. Hence, the irregularity in adoption contributes to lower productivity and health reduction of palms. The scarcity and high wages of skilled climbers for harvesting also contributed to decline in profitability according to the farmers' responses. Hence, the data strongly indicated the need for motivational innovative efforts for converting coconut climbing a professional venture through mechanisation and evolvement of technological options suiting the resource base of coconut farmers for regular adoption. Small scale drudgery reduction tools or equipments may have to be promoted so that aged farmers also could involve. Only 4.26 per cent of the sample farmers sorted to tender nut harvesting. The adoption of plant protection measures was critical in root (wilt) disease affected areas which was totally dependent on climbers. Labour availability is scarce in this region with demand for high wage rate, preventing farmers from adopting plant protection measures. This could be bridged through community adoption of bio control or other suitable technologies through appropriate technology delivery strategies. Kalathiya *et al.* (2007) also reported very low adoption of plant protection in coconut among marginal land holders due to high cost.

The possession of implements with coconut farmers are furnished in Table 3. Majority of the respondents (76.32%) adopted 'keramithra' for de-husking coconuts, which was perceived as women friendly, low cost and safe. The coconut clusters or coconut producers' societies could be equipped with necessary machineries/implements as common facility centres along with provision for skill up-gradation and safety handling. The available tools/ equipments like ladders, tillers, sprayers *etc.* may be taught to utilise for coconut cultivation practices.

Table 3. Possession of tools /implements/machinery with coconut farmers (n=70)

Sl. No.	Tools/implements/machineries	Percentage
1.	Power tiller	2.63
2.	Sprayers	12.82
3.	Ladder	65.79
4.	Spade/mammatty	100.00
5.	Keramithra	76.32
6	Axe	26.74
7.	Traditional coconut husking tool	05.26
8.	Chopper/ knife for farm purpose	68.42

Table 4 showed that majority of the farmers (78.37%) perceived labour availability as scarce, whereas 16.22 per cent as adequate and 5.41 per cent as plenty. Availability of coconut climbers was reported as very scarce for timely and regular harvesting, even though they are available in the locality as reported by Pathiraja *et al.* (2010) in their study from Sri Lanka. This was also an indication of the localised availability of farm labourers since most of them were reluctant to be mobile due to high demand. Decline in the traditional manual labour supplying communities due to higher social status and opportunities also demands for change in work culture for sustainability of farming.

Only 2.6 per cent of the farm labourers were below 35 years old, clearly showing the apathy of young generation for manual labour despite high wages. Nampoothiri (1997) and Pathiraja *et al.* (2010) supported this observation in their studies on farm labour.

Table 4. Labour characteristics perceived by farmers in coconut cultivation (n=70)

Sl. No.	Characteristics	Range	Per cent
1	Labour scarcity	Scarce	78.37
		Adequate	16.22
		Plenty	05.41
2	Working hours per day	8 hours/day	11.43
		7 hours/day	13.89
		6 hours/day	22.32
		5 hours/day	22.32
		4-4.5 hours/day	30.04
3	Age of farm labourers	50 and above years	68.75
		40-49 years	28.65
		Less than 40 years	02.60
4	Perception of coconut farmers on the knowledge of farm labourers in farm works	Very good	37.14
		Good	42.86
		Average	17.14
		Poor	2.86
5	Wage rate for farm works	Rs. 465 for men per day	
		Rs. 250-300 for women	
6	Coconut climbing	Rs. 20-30 per tree	

The wage rate was increasing every year according the respondent farmers and they pointed out that the labour output was only 50-60 per cent compared to earlier period. Women workers were rare due to the decline or lack of paddy cultivation for which they were skilled. Hence, the gender perspective in coconut labour scenario showed elimination or lack of women labourers, which needs to be revived through appropriate mechanisation and policy support, for enhancing cropping/farming systems aiding food security. As indicated by Nampoothiri (1997) the contradiction of declining agricultural productivity and rising farm wages cannot last long. All the farm labourers engaged by coconut farmers in the study areas were on daily paid basis and none were engaged as contract or permanent basis which indicated the non-commercial nature of labour utilisation by the small and marginal land holders. Only if they could change the demand of labour on group/community basis for labour requirement in a wider area basis and for providing employment continuously and as partners in coconut farming, labour supply meets livelihood status for farm labourers.

Land holding structures, livelihood options of farmers, cropping pattern etc influences working hours, wage rate and output, *etc*. as indicated in the Table 4. The crux of the problem lies in the non-commercialised subsistence nature of coconut based farming system leading to difference in productivity, cost of production, adoption of technologies *etc*. which at the same time the cost of produce depends on the open market.

The Pearsons correlation index showed significant and negative correlation of labour availability only with the level of involvement of farmers in coconut cultivation. This was also an indication of the changing mind set of farmers in taking up the dual role of managing resources and the doer of farming activities. But as indicated by Nampoothiri (1997) in his study on rural labour aspects, as the wage rate was perceived as high by the cultivators, they resort to various strategies to reduce use of hired labourers such as use of weedicides, shifting to less intensive cultivation, low level of management, shifting to other profitable crops *etc*. This change in mind set could be channelized for farm development through mechanisation involving groups of farmers. The low level of investment affected the productivity of coconut compared to the neighbouring states as stated by Issac (1999).

Table 5. Correlation of various factors in technology utilisation with perceived labour availability (n=70)

Sl. No.	Factors correlated with labour availability scores	Pearsons correlation coefficient
1	Land holding size	0.0654
2	Number of palms	0.0397
3	Adoption of intercropping	0.2491
4	Involvement in coconut farming	-0.4019 **
5	Adoption of animal husbandry components	-0.1053
6	Working hours of labourers	0.0272
7	Age of farm labourers	-0.10079
8	Knowledge of farm labourers	0.2601

***Significant at 0.01 level*

Mechanisation versus manual labour - perceptions of farmers

The status of mechanisation among farmers showed that less than 10 per cent of the sample farmers only adopted drip and sprinkler irrigation methods. The farmers indicated that they need training programmes and after installation technical support in maintaining the systems especially drip irrigation. Tillers/tractors were used mainly for ploughing the land and practicing farmers convinced 60-75 per cent reduction in the cost compared to

manual labour. They also faced some problems like difficulty in ploughing undulated small holdings and levelling of coconut basins while ploughing. Small scale mechanisation was being adopted by women groups engaged in coconut processing and they also require small scale machineries at affordable cost for adoption. Regarding coconut climbing machines, the farmers opined need for mechanised climbing devices with manual involvement only from the ground.

Suggestions and constraints perceived by farmers

The major responses in farming activities due to scarcity of hired labourers recorded by the respondent farmers were increase in pests and diseases of coconut (88.30%), reduction in yield (92.20%), reduction in number of harvest (79.87%), less intensive use of land, discontinuance of livestock (65.43%) and low level of investment due to increasing cost of cultivation and corresponding decrease in price of coconuts.

The reasons emanated for the labour scarcity from among the farmers were social taboos associated with status, more drudgery compared to other works, low wages compared to workers in service sectors, change in role and importance of farming as livelihood option, reduced role and partnership of farm labourers and farmers in farming initiated with decline in paddy cultivation, fragmentation of holdings lead to shift in regular employment opportunities for labourers, cultivators reduce investment due to declining profitability, thus reducing labour and land management resulting in a vicious circle of non-subsistent farming without resource efficiency.

The major suggestion by more than 90 per cent of the farmers were utilisation of MNREGS programme for meeting labour requirement of coconut cultivation in time and quantum along with technical facilitation by changing policy decisions. Another suggestion was to document the labour availability by farming communities and evolve partnership with labourers in providing services on demand and sharing profits. Capacity building of existing labour force and motivating younger generations in appropriate mechanisation facilitated by technical experts and social organisations, considering gender perspectives also. Extension strategies and policies should include farm labourers in the umbrella of clients and government and institutional interventions needs to be planned and implemented considering labourers as important stakeholders in farm development. Research considerations essentially may include labour as critical resource for evolving technologies appropriate for adoption with scale neutrality.

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