

TECHNOLOGY FRAMEWORK FOR COFFEE EXTENSION MANAGEMENT

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Coffee occupies a place of pride among plantation crops grown in India. Cultivation of this stimulating beverage crop is mainly confined to the Southern states of Karnataka, Kerala, Tamilnadu and Andhra Pradesh. Coffee is cultivated in an area of 3.05 lakh ha., by 1.4 lakh growers producing an average of 2 lakh tonnes annually. Coffee industry has a gross turnover of Rs.2000 crores, besides providing daily employment to 4 lakh people. This agro-forestry enterprise is second to none in its contribution to preservation of precious forest, rural development by providing employment to large number of growers, labours, traders and curers earning substantial foreign exchange to national exchequer.

Multifaceted problems faced by Coffee Industry in India are reflected in its low productivity at national level i.e., 860 kgs/ha. compared to potential yield of 1500 kgs/ha. Thus, there is a big gap between the potential and actual yield.

Twenty first century belongs to quality coffee. Quality assumes more importance considering the fact that 60 percent of the coffee produced in India is exported. Hence, maintaining the quality standards of domestic and international consumers is must for the survival of Coffee Industry.

At present, India's contribution to world coffee production is 2.5 – 3.5 percent which is insignificant to make impact in international market to play dominant role.

The ratio between the coffee growers to extension workers is very wide in India i.e., 450:1. The ratio further widens if only the gross root level extension workers are considered excluding the extension supervisors and administrators. The extension work is made more difficult due to large number of small growers in case of Kerala and tribal growers in the states of Andhra Pradesh and North Eastern states. Further Liaisoning with demographically scattered and geographically isolated coffee growers on heavy rainfall area complicated the extension further.

Thus, it is challenging task to coffee extension management not only to increase the yield and profit of farmers but also to produce quality coffee to meet domestic

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and international consumer demand.

It is practically impossible to teach everything on coffee to all the coffee growers. However, it is necessary to teach few things on coffee to few coffee growers. The technology framework decides what has to be taught to the farmers. The present paper is an attempt in this direction. The objectives of the study were,

1. To find out the knowledge and adoption level of coffee growers regarding recommended cultivation practices.
2. To examine the gaps in knowledge and adoption behaviour of coffee growers and in research system.
3. To identify the problems faced by coffee growers.

Methodology

The study was conducted in twenty randomly selected villages i.e., ten each in Chikamagalur district of Karnataka and Wynad district of Kerala during 1997-98. From each of the 20 selected villages, 10 coffee growers were selected using random sampling method. Thus, the total sample constituted 200 coffee growers from 20 villages.

A Knowledge Index and adoption scale was developed by using the standard procedures. The scale was tested for its reliability, validity and found sound. The scale consisted of 30 technologies consisted 99 recommended practices having total score of 100. The Knowledge Index and adoption scales were used to measure the knowledge and adoption levels of coffee growers in recommended practices respectively. Data were collected through personal interview method. The collected data were scored, tabulated and analyzed keeping in view of the objectives of the study. Other tools used for the study were

$$\begin{array}{lcl} \text{1. Adoption Gap Index} & = & \frac{\text{Maximum score with respect to the} \\ & & \text{technology recommended by Coffee} \\ & & \text{Board-Actual score obtained by Coffee} \\ & & \text{grower with respect to the technology}}{\text{Maximum score with respect to the} \\ & & \text{technology recommended by Coffee} \\ & & \text{Board.}} \times 100 \end{array}$$

		Maximum score with respect to the knowledge on technology recommended by Coffee Board – Actual scores obtained by Coffee growers with respect to the technology	
2. Knowledge Gap Index	=	-----	X 100
		Maximum score with respect to the knowledge on technology recommended by Coffee Board.	
		No. of problems perceived by coffee growers w.r.t. the technology – No. of problems for which the solution does exist.	
2. Research Gap Index in a particular technology	=	-----	X 100
		No. of problems perceived by coffee growers w.r.t the technology.	

Results

Knowledge of Coffee Growers

Table-I indicates that average knowledge level of the coffee grower was 59.51 percent. Almost equal number of coffee growers fell in low (31.5 percent), medium (35.5 percent) and high (33 percent) knowledge categories. Further analysis of the data revealed that poor knowledge in respect of vegetative propagation, soil conservation measures, drought management practices, nematode management and care and maintenance of machinery resulted in 31.5 percent growers possessing low knowledge.

Adoption level of Coffee growers

It is noticed from Table-II that average adoption level of the coffee grower was 51.7 percent. It is also found that only 27.5 percent of coffee growers belonged to high adoption category whereas 43 percent and 29.5 percent of the growers fell under medium and low adoption categories, respectively. Further analysis of data revealed that poor adoption in respect of seed coffee preparation, vegetative propagation, soil conservation practices, irrigation management practices, drought management practices, integrated weed management practices, soil testing, fertilizer application, plant protection practices, care and maintenance of machinery and labour management practices resulted in 29.5 percent of the growers coming under low adoption categories.

Knowledge gap and Adoption gap of Coffee growers

Table-III reveals that knowledge gap was more than 50 percent in 8 out of 30 relevant technologies. They are vegetative propagation, soil conservation measures, drought management practices, soil testing, Integrated Nutrient Management Practices, nematode management, integrated pest management, integrated disease management, care and maintenance of machinery, record maintenance and labour management.

Research Gap in Coffee

Table - IV, indicates that very high research gap was found in the area of farm management practices (81.81 percent), more than one third gap in soil, water and weed management practices (37.5 percent), around one fourth research gap in nursery practices (22.22 percent), planting and after care practices (28.8 percent), plant protection practices (23.57 percent), harvesting and post-harvesting practices (25 percent), and low research gap was found in nutrient management practices (16.67). Overall, around 1/3rd (32.91 percent) of research gap was found in coffee.

Problems of Coffee Growers

It is evident from Table - V, that more than two-third of the growers perceived delayed and insufficient blossom and backing showers (67 percent) as most important problem. Other important problems are costly labour (30 percent), non-availability of labour (29 percent) and high market fluctuation (16 percent).

Discussion

- a. Average knowledge level of coffee growers was 59.55 percent and adoption level was 51.7 percent. Knowledge gap and adoption gap was more than 50 percent in eight and thirteen technologies respectively. The coffee research is being carried out from past 100 years and about 920 research papers are published. Coffee Board is exclusively working for this single crop. In spite of the availability of technologies, the knowledge and adoption level of farmers is low and gap is found. Hence, the areas where knowledge and adoption is low and knowledge gap and adoption gap is high which are discussed in results chapter may get priority in extension activities. Good liaison with other line departments and newspapers, Radio, TV and Agro-magazines is essential to attain this objective.

- b. Research priority may be given to areas where research gaps are wide. The research priority should reflect in the form of allocation of more budget, allotment of more scientific personnel and creating of more infrastructure. It is necessary to establish Farm Management department in Coffee Board.
- c. In determining the coffee yield, time and quantity of blossom and backing showers play important role. Even though coffee-growing tracts receive heavy rainfall throughout the year, suffer from want of adequate blossom and backing showers in right time. Therefore, it is necessary to educate the growers in harvesting the rainwater when it is plenty and recycle when it is needed. Thus, watershed should find importance in extension activities. Establishing demonstrations, organizing field visits of growers to watershed area and helping the growers financially with incentives will pay results in this direction. Introduction of crop insurance scheme in coffee has to be considered since coffee involves high investment and crop is exposed to the vagaries of nature.
- d. Labour is another important problem faced by majority of the growers. Different facet of this problem is costly labourer, non-availability of labour, high cost of transporting labour from far off places to working place, unskilled labour, harassment by labour unions and lack of technology transfer to labourers. Therefore, it is necessary to educate growers regarding proper supervision for managing the existing, limited labour efficiently and imparting skills to labourers to increase their efficiency. Thus, it is not only training owners, but training labourers is also important. Hence, extension programmes targeting labourers is also necessary. Mechanization in coffee cultivation will reduce the dependency on labour. Hence, it is necessary to start Agricultural Engineering Department in Coffee Research Stations. The labour should be educated to bring home the point that the survival of coffee estates is the survival of labourers.
- e. Fluctuating market is the off shot of liberalized trade, i.e., introduction of 100 percent free sale quota. Even though all coffee growers were initially benefited from the FSQ, later on, only traders, middleman and big growers took the advantage leaving the small growers to the mercy of uncertain market. Now, traders and middleman are organized and controlling the markets by dictating their own price. Hence, it is necessary to organize the growers into small co-operatives to take care of their marketing of produce. This will remove them from the clutches of big growers and

traders who otherwise exploit them. Coffee Board can play the role of reliable market information provider to the growers by establishing “updated market news service through recorded voice at telephone” at each liaison office. Then, traders and middlemen can not cheat the growers. Fluctuating market can also be stabilized by providing support price.

- f. Coffee growers and extension workers ratio in Coffee Board is wide i.e., 450:1. As such, it is difficult for extension workers to cover each and every grower and educate them in each and every aspect of coffee cultivation. It is further complicated by the demographically scattered and geographically isolated growers, vigorous monsoon, bad approach roads, bad electricity and telecom facility and inadequate funds and vehicles for the mobility of the extension worker. Making use of the findings of this study, it is possible to select needy growers and also possible to concentrate on few practices where the growers are weak in terms of adoption and knowledge. By use of group contact methods and mass media like TV, Radio and newspapers, periodicals, it is possible to reduce the burden on the extension workers.
- g. Extension goals, so far, are being stated in terms of number of growers contacted, meetings, dissemination of information, supply of seed material and other inputs including loans and subsidies. But, these are merely means, but not the ends in extension “*changing a person is more important than changing a practice*” may be the direction in which the extension should work.

Conclusion

In sum, the findings of the present study provides a technology framework for effective, coffee extension management considering the knowledge and adoption level of coffee growers, their knowledge, adoption gaps and research gaps. Technology framework is very useful in developing extension strategy under resources scare condition.

TABLE - I : Overall knowledge of coffee growers

(n=200)

Category	Coffee growers	
	No	%
Low (Below 51.7 scores)	63	31.5
Medium (51.7 to 67.44 scores)	71	35.5
High (Above 67.44 scores)	66	33.0
Total	200	100.0

Mean = 59.57

SD = 15.74

TABLE – II : Overall Adoption of recommended cultivation practices by coffee growers

(n=200)

Category	Coffee growers	
	No	Percentage
Low (Below 44.22 score)	59	29.5
Medium (44.22 to 59.18 score)	86	43.0
High (Above 59.18 score)	55	27.5
Total	200	100.0

Mean = 51.7

SD = 14.96

TABLE - III : Extent of knowledge gap and adoption gap among coffee growers

(n=200)

Sl. No.	Practices	Knowledge Gap in %	Adoption Gap in %
1.	Choice of varieties	4.00	1.50
2.	Seed coffee preparation	22.50	20.25
3.	Vegetative propagation	83.60	95.80
4.	Selection of suitable area	3.78	11.44
5.	Soil conservation methods	71.33	80.33
6.	Spacing	2.00	3.50
7.	Pitting	1.00	4.00
8.	Planting, staking, mulching & hutting	7.25	1.25
9.	Training, pruning and rejuvenation	22.57	21.14
10.	Choice of shade trees	40.00	36.00
11.	Shade regulation	32.00	9.50
12.	Cover digging	5.25	5.50
13.	Irrigation management practices	2.87	92.75
14.	Drought management practices	79.80	99.30
15.	Cradle pits	5.00	20.66
16.	Integrated weed management practices	50.00	54.90
17.	Soil testing	61.03	65.00
18.	Lime application	28.25	44.75
19.	Fertilizer application	37.00	31.33
20.	Integrated nutrient management practices	56.00	66.63
21.	Nematode management	90.50	96.00
22.	Integrated pest management	43.66	57.66
23.	Integrated disease management	50.50	53.00
24.	Harvesting	2.25	1.75
25.	Processing methods	8.25	14.88
26.	Weightage specification	35.00	33.00
27.	Care and maintenance of machinery	66.71	70.57
28.	Record maintenance	31.00	58.00
29.	Labour management	47.00	87.00
30.	Mixed farming	12.00	39.00

TABLE – IV: Overall research gap in coffee

Sl. No.	Areas	No.of problems identified by coffee growers	No.of problems for which, to solve technology not available or needs modifications	Research gap (%)
1	Nursery practices	18	4	22.22
2	Planting and aftercare practices	21	5	23.81
3	Soil, water and weed management	8	3	37.50
4	Nutrient management practices	6	1	16.67
5	Plant protection practices post-harvesting practices	7	2	28.57
6	Harvesting and practices	8	2	25.00
7	Farm Management	11	9	81.81
Overall		79	26	32.91

TABLE - V : Ten most important problems of coffee growers**(n=200)**

Sl. No.	Problems	Coffee growers	
		No	%

1.	Delayed and insufficient blossom and backing showers	134	67
2.	Labour is costly	60	30
3.	Non-availability of labour	58	29
4.	High market fluctuation	32	16
5.	Depends on business, coffee gets secondary importance	32	16
6.	Destruction of pepper due to wilt	28	14
7.	Lack of market information through reliable agency	24	12
8.	Middleman exploiting farmers	22	11
9.	Lack of timely visit of extension worker	22	11
10.	Lack of support price	18	9
