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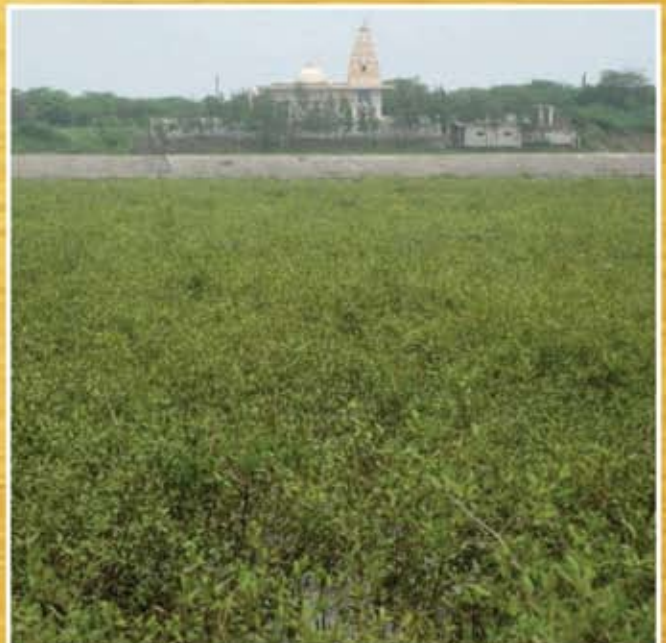


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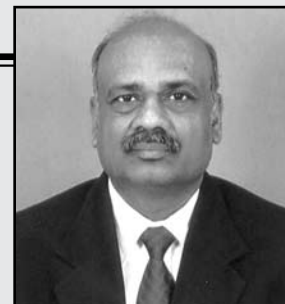
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EDITORIAL

Amongst other factors, agricultural production in the country is largely dependent on farmers. Due to inadequate financial resources and absence of timely credit facilities at reasonable rates, many farmers, even though otherwise willing, are unable to go in for improved seeds and manures or to introduce better methods or techniques. In this issue, we have endeavoured to enlighten our readers in all financial aspects of agriculture.

The new agricultural technology is capital intensive; it depends largely on external sources for financial support. We have presented the Impact of External Finance on farm returns to analyse the impact of credit on farm incomes and employment of different farms. We have also provided a study on innovative payment options in agricultural marketing. The article attempts to link the e-tendering method with online mode of payment that would help the farmers in receiving full and prompt payment for their produce. The e-tendering system caters to the need of all the stakeholders of the APMC system.

The article on microfinance in North East highlights the need to study socio economic indicators because they influence government policy initiatives and innovations. In this edition, you will discover how Contract farming is increasingly being presented as a solution for the problems of Indian agriculture by major international donor agencies, multinational companies and even the government.

A research on Paddy Cultivation and MGNREGA analyses the impact of NREGS on the labour market with special reference to wage rate, and productivity in the rice fields of Kasaragod district of Kerala.

For cultivating better varieties, we have highlighted the numerous benefits of wild mushrooms. There is also a study on the characteristics of mandarin growers and their training needs. It is interesting to note that mandarin occupies nearly 50 percent of the total citrus area.

Please do leave your suggestions and comments at fa.afcl@gmail.com.

A.K. Garg
Editor-in-Chief

I N S



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Impact of External Finance on Farm Returns and Employment in Kadapa District, Andhra Pradesh

By Rajeswari. S and Neelakanta Sastry *

The new agricultural technology is capital intensive; it depends largely on external sources for financial support. With the introduction of improved technology, it needs a sizable dose of financial inputs. The improved technology results in the use of non-farm inputs such as, chemical fertilizers, pesticides and high yield varieties of seeds. This involves more cash inputs, which cannot be fully met from owned funds of the farmer. It can be observed that the farmer invariably depends more on external finance.

Financial constraints may be the main cause for non-adoption of improved technology, which ultimately leads to reduction in net farm returns.

Objectives of the Study

The present study was therefore planned to analyse the impact of credit on farm incomes and employment of different farms.

Methodology

Kadapa district was selected purposively for the present study, as it is one of the agriculturally advanced districts of Andhra Pradesh. From the district, Obulavaripalli mandal was selected as a representative of the district. All the villages in the selected mandal based on the gross cropped area were arranged in descending order and the first four villages were selected for a detailed study. From each village, ten each from small and large farmers were selected at random. Thus, the total number of farmers selected for the purpose of present study was 80. The data on technical coefficients, factor and product prices were obtained by means of questionnaire specially designed for the purpose. The data relates to 2004-05.

A one-year (two seasons) linear programming technique was employed



to develop optimum farm plans and also to estimate net farm returns with existing and new technology under different capital environments.

In linear programming analysis, a linear function of a number of variables is to be maximised subject to a number of constraints in the form of linear equalities and inequalities. In mathematical form, one-year (two seasons) linear programming model can be expressed in the following way.

$$\text{Maximise } Z = \sum_{j=1}^n C_j X_j$$

$j = 1$ to n activities

Subject to following constraints:

1. $\sum_{j=1}^n C_j X_j \quad a_{ij} X_j > b_i \quad (i = 1, \dots, K)$
2. $\sum_{j=1}^n C_j X_j \quad a_{ij} X_j < b_i \quad (i = K+1, \dots, m)$
3. $\sum_{j=1}^n C_j X_j \quad a_{ij} X_j = b_i \quad (i = m+1, \dots, v)$
4. $X_j, b_i > 0$ (non negativity constraint)

where, $Z =$ is the objective function to be maximized in the year.

$C_j =$ is the value or price of j th activity during kharif and rabi seasons of the year.

$X_j =$ is the unit of j th production activity during kharif and rabi seasons of the year.

$a_{ij} =$ amount of i th resource required by j th activity

$b_i =$ quantity of i th resource

Objective Function

The objective function for the model in this study was to maximise the annual net farm returns from crop enterprises subject to the resource constraints specified in the model. In this model, the value of objective function (the optimum solution) which was to be maximised included the sum of the year's net cash flow. The final cash flow into the objective function was the result of changes arising from production, marketing, borrowing and debt management during the year. In interpreting the results of the model, the value of the objective function was adjusted by subtracting owned funds. With the help of the above linear programming analysis, the following four optimum plans were developed for both small and large farms.

Model 1: In this model, cash availability of the farmers was restricted to owned funds. This model was designed to assess whether the farmers have enough funds of their own to meet the cash expenses for the optimum plan under the existing technology.

Model 2: It is similar to model 1 but for the complete relaxation of the loan amount available to farmers. This model was developed to determine the maximum amount of short-term loan required and also to examine the effect of credit on net farm returns.

Model 3: This model is similar to model 1 except that the recommended technology was incorporated in place of existing technology. Model 3 results indicate the income increasing possibilities by a switch over to the recommended technology

even at the existing level of funds.

Model 4: It is similar to model 3 but for the complete relaxation of borrowing. This model would help to examine the effect of borrowing on new technology and consequential effect on net farm returns. The results of this model would indicate the credit requirements for adoption of recommended technology. In short, this model was designed to assess the effect of modern technology in conjunction with adequate capital on net farm returns.

Results and Discussion

The term "relaxed capital" (unrestricted capital) was defined as the provision of as much credit as needed by the farmers. Accepting this definition, the credit needs and their effect on net farm returns were assessed by comparing the optimum plans worked out with limited and unlimited capital availability.

The impact of credit on net farm returns of small and large farmers is presented in Table 1.

A comparison of results of models 1 and 2 indicates the impact of credit under existing technology, when the farmers were allowed to borrow required short term credit. The net farm returns indicated by models S1 and L1 were Rs.45,434 and Rs.1,34,573.50 for small and large farms respectively when the cash availability was restricted to owned funds. When the farmers were allowed to borrow required credit to supplement owned funds, the net farm returns increased to Rs.50,459 and Rs.1,50,480 on small and large farms respectively. The increase of Rs.5,025 (11.06%) on small farms and Rs.15,906.50 (11.82%) on large farms could be attributed to the external financial facilities and the consequential changes in the crop mix.

The impact of credit under recommended technology can be assessed by comparing the net farm returns between the models developed at recommended technology with owned funds (Model 3) and recommended technology with relaxed borrowing (Model 4). The net farm returns of small and large farmers when they adopt recommended technology with their owned funds were Rs.46,361 and Rs.1,67,611.60 respectively. On the other hand, if they were allowed to borrow required credit to adopt recommended technology, the small and large farmers could further increase their net farm returns to Rs.64,815 and Rs.1,92,515.70 respectively. This represented an increase of Rs.18,454 (39.81%) and Rs.24,904.10 (14.86%) over model S3 and model L3 respectively. This increase in the net farm returns could be attributed to the impact of credit under recommended technology.

A comparison of labour use between S1 and S2 and L1 and

Table 1: Impact of Credit on Net Farm Returns of Small and Large Farms (in Rupees)

Category / Model	Existing Technology			Improved Technology		
	Model-1	Model-2	Change over Model-1	Model-3	Model-4	Change over Model 3
Small farmers	45,434.00	50,459.00	5,025.00 (11.06)	46,361.00	64,815.00	18,454.00 (39.81)
Large farmers	1,34,573.50	1,50,480.00	15,906.50 (11.82)	1,67,611.60	1,92,515.70	24,904.10 (14.86)

Note: Figures in parentheses indicate percentages

Table 2: Impact of Credit on Employment of Small and Large Farms

Category / Model	Existing Technology				Recommended Technology			
	Model-1	Model-2	Change Over Model-1		Model-3	Model-4	Change Over Model-3	
			Absolute	Per cent			Absolute	Per cent
1. Small Farmers								
Mandays	46.80	55.78	8.98	19.19	43.33	62.80	19.47	44.93
Womandays	171.33	190.33	19.00	11.09	137.82	234.38	96.56	70.06
Bullockdays	14.29	17.72	3.43	24.00	5.95	5.80	-0.15	-2.52
Tractor hours	4.76	5.69	0.93	19.54	8.34	15.54	7.20	86.33
2. Large Farmers								
Mandays	141.80	160.83	19.03	13.42	164.26	179.29	15.03	9.15
Womandays	508.87	562.30	53.43	10.49	549.38	658.60	109.22	19.88
Bullockdays	26.61	33.28	6.67	25.06	17.99	23.72	5.73	31.85
Tractor hours	36.75	42.15	5.40	14.69	39.96	51.09	11.13	27.85

Table 3: Borrowing, Repayment and Cash Transfers of Small and Large Farmers under Different Optimum Models (in Rupees)

Items	Small Farmers				Large Farmers			
	S1	S2	S3	S4	L1	L2	L3	L4
Borrowing in kharif	-	1,847.73	-	4,836.78	-	11,349.68	-	23,998.92
Repayment in rabi at the end	-	1,958.59	-	5,126.99	-	12,030.66	-	25,438.85
Cash transfer kharif to rabi	-	-	-	-	-	-	-	-
Z	4,432.62	9,457.45	-	6,386.99	6,733.13	20,521.39	-	27,278.75

L2 indicates the impact of credit on employment under existing technology on small and large farms respectively (Table 2).

The results showed that the process of optimization of resources increased labour use on both the categories of farms. In model S2 labour employment increased to the extent of 8.98 mandays, 19.00 womandays, 3.43 bullockdays and 0.93 hours of tractor use over model S1 on small farms. In model L2 employment increased by 19.03 mandays, 53.43 womandays, 6.67 bullockdays and 5.40 hours of tractor service over model L1 on large farms.

The impact of credit on employment under recommended technology can be known by comparing labour use between models S3 and S4 and L3 and L4 for small and large farms respectively. The absolute increase of men, women labour and tractor use was 19.47 mandays, 96.56 womandays and 7.2 hours in S4 over S3, while the same on large farms was 15.03 mandays, 109.22 womandays, 5.73 bullockdays and 11.13 hours of tractor use.

Credit Requirement

Model S2 results suggested that the small farmers required credit to the extent

of Rs.1,847.73 for the optimization of resources at the currently practiced technology. Model L2 suggested to borrow Rs.11,349.68 in kharif for reorganization of resources under existing technology on large farms. The optimum models S4 and L4 indicated borrowing of Rs.4,836.78 and Rs.23,998.92 for small and large farmers to optimize with recommended technology. (Table 3)

From the above analysis, it is evident that the additional amount of capital was borrowed in the process of optimization and adoption of recommended technology. Capital borrowed varied directly with the size of the farm. The results of optimum model suggested repayment of kharif loan in rabi season along with appropriate interest amount. It was mainly because of generation of sufficient income from the sale of kharif crops.

Shadow Prices: Shadow prices refer to marginal value products of resources. They indicate the quantum of change in the net farm returns due to a unit change of that particular resource *ceteris paribus*.

The shadow prices of kharif cash in models S1 and L1 and S3 and L3 indicates that every rupee of additional operational expenses would create additional return

of Rs.5.17 and Rs.3.30 under existing technology and Rs.15.58 and Rs.4.33 under recommended technology respectively. The relaxation of capital (models S4, L2 and L4) brought down the shadow prices at kharif cash to Rs.1.06. The shadow prices of cash in rabi season in all the optimum models except S3 and L3 were Rs.1.00. Table 4.

Conclusions

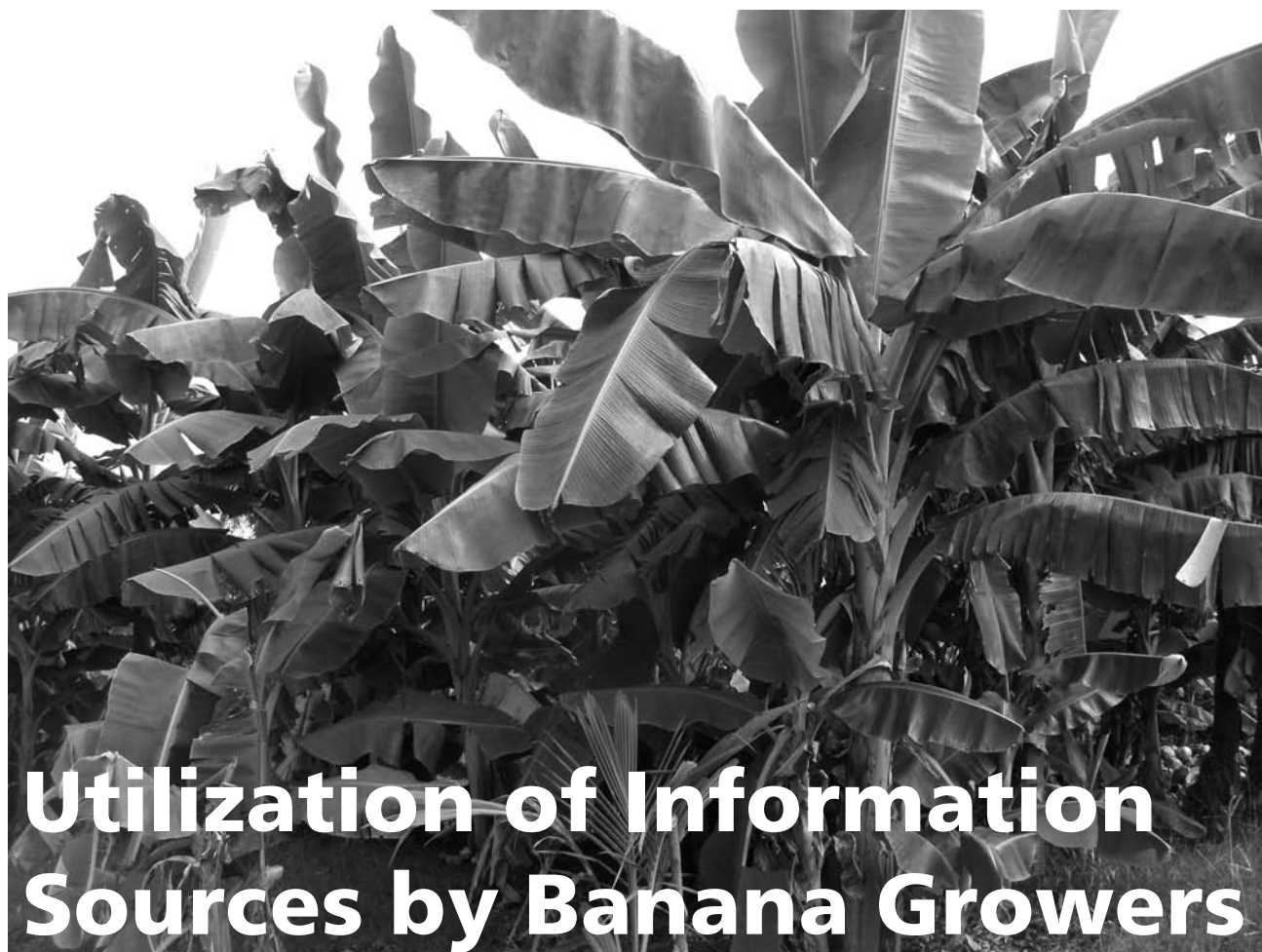
From the preceding discussion, it may be inferred that:

1. Credit played an important role in increasing income under recommended technology.
2. There is greater potentiality of increasing net farm returns through borrowing adequate capital on small farms under recommended technology as compared to large farms.
3. The labour employment was maximum in the optimum models developed at recommended technology with relaxed borrowing.
4. The possibilities of enhancing labour use was more on large farms compared to small farms.
5. The shadow prices of kharif cash under restricted capital was higher on small farms compared to large farms. This supports the policy of state, which has provided preference in lending to small farmers.

Table 4: Shadow Prices of Selected Resources on Small and Large Farms under Different Optimum Models (in Rupees)

S. No.	Resource	Small farmers				Large farmers			
		S1	S2	S3	S4	L1	L2	L3	L4
Cash									
1.	Kharif	5.17	5.17	15.58	1.06	3.30	1.06	4.33	1.06
2.	Rabi	1.00	1.00	2.81	1.00	1.00	1.00	1.42	1.00

SOURCE: Rajeswari S is the Ph.D scholar in S.V. Agricultural College, Tirupati. Neelakanta Sastry is the professor in the department of Agricultural economics, S.V. Agricultural College, Tirupati.



Utilization of Information Sources by Banana Growers

By Suchita V. Gupta* & Dr. P.B. Kale**

Agriculture provides the important basic needs namely food, which is supplied through cereals, pulses, oilseeds, vegetables and fruits. Fruits play a unique role in developing countries like India in economic and social spheres. It increases farmers' income and nutritional status of the people. Fruits play a significant role in the human diet. Banana is the fourth most important food crop in terms of gross value preceded by paddy, wheat and milk products in India. It also forms an important crop for substances farmers as security for food and income. Owing to its multifaceted use and economic returns it is called 'Kalptaru'. Banana is also a rich source of energy. In India, it has importance for economic purposes and also in religious rituals. India is the largest producer of banana as it occupies second rank in respect of per hectare yield. At present, Tamilnadu, Maharashtra, Andhra Pradesh and Gujarat states are the leading producers of banana in India.

In Maharashtra, particularly the region of Jalgaon, Nanded, Vasai and some parts of Vidarbha, have covered most of the area under banana crop. It covers about 2695 ha. in Vidarbha and the districts namely Buldhana, Amravati, Akola and Yavatmal have some recognizable areas under banana

cultivation. In Amravati District, the prominent banana growing tahasils are Anjangaon Surji and Achalpur. The Anjangaon Surji Panchayat Samiti covered 425 ha area and produced 8123.46 tonnes during the year 2008-2009. There is still great potential for bringing more area under banana crop.

One of the most important reasons for low production of banana in these tahasils is inadequate information.

Profile of the Banana Growers

A study on personal, socio-economic and psychological characteristics was done with reference to age, education, land holding, area under banana, annual income, experience in banana cultivation, information sources availability, socio-economic status, social participation, economic motivation, cosmopolitaness and innovativeness. The results pertaining to the characteristics are presented hereunder:

Age: Age is an important factor, which determines the role of farmers in utilization of information sources. The distribution of the respondents according to age was ascertained and is presented in Table 1.

Table 1: Distribution of Respondents According To Age.

No.	Age (years)	Respondents (n= 150)	
		Number	Percentage
1	Young	39	26.00
2	Middle	74	49.33
3	Old	37	24.67

The age-wise distribution of the respondents in Table 1 shows that about fifty percent of the respondents (49.33%) were included in the middle age group of 36 to 50 years. The respondents to the extent of (26.00%) appeared in young age category that is up to 35 years; followed by (24.67%) respondents in the old age group of more than 50 years. It can be concluded from the above finding that banana growers were mostly middle age farmers. The old age respondents generally did not take risk in growing banana, as that of middle and young age group of respondents. This may be due to the limitations of advancement in age.

Education: Education has been considered as one of the most important variables with the help of which social change can be achieved. The education of the respondents was studied and the result is presented in Table 2.

Table 2: Distribution of Respondents According to Education.

No.	Education	Respondents (n=150)	
		Number	Percentage
1	Illiterate	00	00.00
2	Primary school	08	05.33
3	Middle school	16	10.67
4	High school	24	16.00
5	Junior College	35	23.33
	College	67	44.67

It could be inferred from Table 6 that about fifty percent (44.67%) of the respondents were educated up to college level, followed by 23.33 percent of the respondents who could reach up to junior college level of education. Further, it was

India is the largest producer of banana as it occupies second rank in respect of per hectare yield. At present, Tamilnadu, Maharashtra, Andhra Pradesh and Gujarat states are the leading producers of banana in India

found that 16 percent of the respondent were educated up to high school, and 10.67 percent respondents were educated up to primary school level. However, none of the respondent was illiterate.

Land Holding: Land holding was assumed as an important variable that influence utility perception behaviour of the respondents. The result obtained is presented in Table 3.

Table3: Distribution of the Respondents According to Land Holding.

No.	Land holding (ha)	Respondents (n=150)	
		Number	Percentage
1	Marginal	23	15.33
2	Small	24	16.00
3	Semi-medium	75	50.00
4	Medium	13	08.67
5	Large	15	10.00

It is evident from Table 7 that half of the respondents (50%) belonged to category of semi-medium land holding ranging from 2.01 to 4.00 ha. It was followed by 16 percent of the respondents belonging to category of small land holding possessing land up to 1.01 to 2.00 ha and 15.33 percent of the respondents possessed land up to 1.00 ha and belonging to marginal land holding category. A major percentage of respondents (10.00%) belong to large category i.e. above 10.00 ha and (8.67%) belong to medium land holding category i.e. 4.01 to 10.00 ha

Annual Income: Annual income provides for availability of capital for farming. Result obtained is presented in Table 4

Table 4: Distribution of Respondents According to Annual Income.

No.	Annual Income (Rs.)	Respondents (n=150)	
		Number	Percentage
1	Up to 1,00,000	08	5.33
2	1,00,000 to 2,00,000	25	16.66
3	2,00,000 to 3,00,000	49	32.67
4	3,00,000 to 4,00,000	34	22.67
5	Above 4,00,000	34	22.66

From the distribution of the respondents according to their annual income in Table 4, it could be revealed that about one third of respondents (32.67%) had annual income between Rs. 2,00,001 to Rs 3,00,000. The percentages of the respondents having annual income in between Rs. 1,00,001 to Rs. 2,00,000 were found to be 16.67 percent and very few (5.33%) of the respondents were having an annual income up to Rs 1,00,000.

Experience in Banana Cultivation: Experience was the important factor in influencing the respondent in term of utilization of sources. The results obtained is presented in Table 5



Table 5: Distribution of Respondents According to Experience in Banana Cultivation

No.	Experience	Respondents (n=150)	
		Number	Percentage
1	Up to 4 years	42	28.00
2	5 to 8 years	71	47.33
3	Above 8 years	37	24.67

From Table 5 it is apparent that about 50 percent of the respondents (47.33%) had an experience of 5 to 8 years in banana cultivation. It is followed by 28.00 percent having experience up to 4 years and 24.67 percent respondents had an experience of above 8 years in banana cultivation.

Information Sources Availability: Information sources availability is important factor, which determines the information sources utilization by the respondents. The distribution of the respondents according to information sources availability has been depicted in Table 6.

Table 6: Distribution of Respondents According to Information Sources Availability

No.	Info Sources Availability	Respondents (n=150)	
		Number	Percentage
1.	Low	35	23.33
2.	Medium	90	60.00
3.	High	25	16.67

From Table 6 it is revealed that, more than 50 of the respondents (60%) had medium information sources available. It is followed by 23.33 percent having low information sources availability and 16.67 percent were in high category of information sources availability.

Socio-Economic Status: Socio-economic status was the important factor in influencing the utility perception of the respondents. The results obtained according to distribution of respondents have been presented in Table 7.

Table 7: Distribution of Respondents According to Socio-Economic Status

No.	Socio-Economic Status	Respondents (n=150)	
		Number	Percentage
1.	Very low	00	00.00
2.	Low	00	00.00
3.	Medium	16	10.67
4.	High	36	24.00
5.	Very high	98	65.33

It is apparent from Table 7 that 65.33 percent of the respondent belonged to high level of socio-economic status in the village community. This was followed by 24 percent and 10.67 percent of the respondents respectively who have occupied high and medium position in the socio-economic status in their village respectively. None of the respondents were found in low and very low category of socio-economic status.

Social Participation: The distribution of the respondents according to their social participation is shown in Table 8.

Table 8: Distribution of Respondents According to Level of Social Participation

No.	Social Participation	Respondents (n=150)	
		Number	Percentage
1.	Low	81	54.00
2.	Medium	46	30.67
3.	High	23	15.33

It is apparent from Table 8 that more than 50 percent of the respondents (54.00%) belonged to low category of social participation this was followed by 30.67 percent of the respondents.

Economic Motivation: The distribution of the respondents according to their economic motivation is shown in Table 9.

Table 9: Distribution of Respondents According to Level of Economic Motivation

No.	Economic Motivation	Respondents (n=150)	
		Number	Percentage
1.	Low	22	14.67
2.	Medium	114	76.00
3.	High	14	9.33

The distribution of the respondents according to their level of economic motivation in the Table no 9 shows that majority of the respondents (76%) had medium level of economic motivation. Only 9.33 percent of the respondents had high

level of economic motivation.

Cosmopolitaness: The distribution of the respondents according to their cosmopolitaness is shown in Table 10.

Table 10: Distribution of Respondents According to Level of Cosmopolitaness

No.	Cosmopolitaness	Respondents (n=150)	
		Number	Percentage
1.	Low	16	10.66
2.	Medium	112	74.67
3.	High	22	14.67

The distribution of the respondents revealed that most of the respondents (74.67%) had belonged to medium level of cosmopolitaness. This was followed by 14.67 percent of the respondents who had high level of cosmopolitaness and very few of the respondents (10.66%) had low level of cosmopolitaness.

Innovativeness: The distribution of the respondents according to their innovativeness is shown in Table 11.

Table 11: Distribution of Respondents According to Level of Innovativeness

No.	Innovativeness	Respondents (n=150)	
		Number	Percentage
1.	Low	25	16.67
2.	Medium	92	61.33
3.	High	33	22.00

It is apparent from the distribution in Table 11 that most of the respondents (61.33%) were included in the medium category of innovativeness. It was followed by 22.00 percent of the respondents having high innovativeness category. Very few of the respondents (16.67%) were included in the category of low innovativeness.

Information Sources Utilization by Banana Growers: The frequency of information sources utilization by banana growers was ascertained and the findings are given in Table 12.

Table 12: Distribution of Respondents According to Frequency of Information Sources Utilization

No.	Information sources utilization	Respondents (n=150)		
		Always	Sometimes	Never
A) Personal Contact				
1.	Neighbours	80 (53.33)	56 (37.33)	14 (9.33)
2.	Friends	64 (42.66)	78 (52.00)	08 (5.33)
3.	Relatives	10 (6.66)	119 (79.33)	21 (14.00)
4.	Progressive farmers	76 (50.66)	56 (37.33)	18 (12.00)

5.	Gram panchayat members	13 (8.66)	76 (50.66)	61 (40.66)
6.	Local leaders	00 (00.00)	19 (12.66)	131 (87.33)
B) Personal Cosmopolite				
1.	Gramsevak	92 (61.33)	19 (12.66)	39 (26.00)
2.	Agricultural assistants	107 (71.33)	21 (14.00)	22 (14.66)
3.	Agricultural supervisors	21 (14.00)	106 (70.66)	23 (15.33)
4.	Agricultural officers	00 (00.00)	62 (41.33)	88 (58.66)
5.	Agri. Extension officers	15 (10.00)	52 (34.66)	83 (55.33)
6.	Agri. University/ KVK scientist	16 (10.66)	108 (72.00)	26 (17.33)
7.	Horticulture officers	20 (13.33)	26 (17.33)	104 (69.33)
8.	Group discussions	27 (18.00)	28 (18.66)	95 (63.33)
9.	Trainings	14 (9.33)	51 (34.00)	85 (56.66)
10.	Demonstration	12 (8.00)	82 (54.66)	56 (37.33)
11.	Tours	12 (8.00)	67 (44.66)	71 (47.33)
12.	Exhibitions	66 (44.00)	62 (41.33)	22 (14.66)
C) Mass-Media				
1.	Radio	95 (63.33)	55 (36.66)	00 (00.00)
2.	Television	88 (58.66)	44 (29.33)	18 (12.00)
3.	News paper	23 (15.33)	127 (84.66)	00 (00.00)
4.	Agri. Literature	21 (14.00)	98 (65.33)	31 (20.66)
5.	Internet	00 (00.00)	00 (00.00)	150 (100.00)
D) Trade Organization				
1.	Agri. Produce market committee	17 (11.33)	68 (45.33)	65 (43.33)
2.	Seed fertilizer dealer	110 (73.33)	40 (26.66)	00 (00.00)
3.	Co-operatives	16 (10.66)	61 (40.66)	73 (48.66)



Table 13: Distribution of Respondents According to Level of Information Sources Utilization

No.	Information sources utilization level	Respondents (n=150)	
		Number	Percentage
1.	Low	20	13.33
2.	Medium	108	72.00
3.	High	22	14.67

Conclusions

The salient findings of the present study are summarized below:

- Nearly half (49.33%) of the respondents belonged to middle age group of 36 to 50 years, followed by 26 percent in young age group of up to 35 years.
- Most of the respondents (44.67%) were found to be educated up to college level. While 23.33 percent of the respondents were observed educated up to Junior College level.
- The maximum percentage of the respondents (50.00%) belonged to semi-medium land holding category. It was followed by 16 percent who were possessing land 1.01 to 2 ha and happened to be small land holders.
- The majority of the banana growers (73.33%) had 0.61 to 3.50 ha area under banana cultivation, followed by 16.67 percent respondents who had area up to 0.60 ha under banana cultivation.
- About one third of respondent (32.67%) had annual income between Rs. 20,0001 to 3,00,000. it was followed by 22.67 percent respondents who were found to have annual income between Rs. 3,00,001 to 4,00,000.
- Nearly half of the respondents (47.33%) had experience of 5 to 8 years in banana cultivation, followed by 28.00 percent having experience up to four years.

- More than fifty percent of the respondents (60.00%) had medium information sources availability, followed by 23.33 percent having low information sources availability.
- More than half of the respondents (65.33%) had belonged to a very high level of socio economic status in the village community.
- Over half of the respondents (54.00%) had belonged to low category of social participation. This was followed by 30.67 percent of the respondents who had medium level of participation.
- Over three fourth of the respondents (76.00%) had medium level of economic motivation, followed by 14.67 percent of the respondents who had low level of economic motivation.
- Majority of the respondents (74.67%) belonged to medium level of cosmopolitanism. This was followed by 14.67 percent of the respondents who had high level of cosmopolitanism.
- Over half of the respondents (61.33%) were included in the medium category of innovativeness, followed by 22 percent who were included in the high category of innovativeness.

Problems Faced by the Respondents in Information Sources Utilization

The major of problems faced by the respondents were lack of plant doctoral problems advisory service at field (81.33%), lack of awareness about latest technologies (73.33%), inadequate credit/facilities (64.66%), complexity of messages and difficulties in their interpretation (60.00%), irregular field visits by concerned authority (58.66%), lack of participation in different extension activities (56.66%), and location of research stations far away from reach (54.66%).

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Hunting Wild Mushroom for Human Welfare

By Vivek Kumar Pandey and Y.S. Paul

Wild mushrooms are fruit bodies of higher fungi. The term 'mushroom' is used as 'a macrofungus with a distinctive fruiting body, which can be hypogeous or epigeous, large enough to be seen with the naked eye and to be picked by hand'. Wild mushrooms have been collected and consumed by people for thousands of years. The archaeological record reveals edible species associated with people living 13,000 years ago in Chile but it is in China where the eating of wild fungi is first reliably noted, several hundred years before the birth of Christ. In ancient Vedas the effect of poisonous fungi were dealt with in an epigram written by Euripides in about 450 B.C. Edible fungi were collected from forests in ancient Greek and Roman times and highly valued, though more by high-ranking people than by peasants. Caesar's mushroom (*Amanita caesarea*) is a reminder of an ancient tradition that still exists in many parts of world.

Habitat and Distribution

Wild mushrooms are widely distributed in nature. They occur in climates ranging from tropics to tundra. They have a wide habitat range. They grow in damp places having lignocellulolytic material of coniferous and deciduous forests, on

wood, desert sands, lake dunes, gardens, open fields, marshy places, on the heaps of stored straw, farmyard manure etc. From a taxonomic point of view, mainly basidiomycetes (the spore droppers) but also some species of ascomycetes (the spore shooters), belong to mushrooms. The number of mushroom species on the planet earth is estimated to be 140,000, suggesting that only 10 percent are known. Assuming that the proportion of useful mushrooms among the undiscovered and unexamined mushrooms will be only 5 percent, this implies 7,000 yet undiscovered species of possible benefit to mankind. The higher Basidiomycetes include about 10,000 species from 550 genera and 80 families in the Basidiomycetes class with macroscopic fruiting bodies. However, fewer than 25 species are widely accepted as food and only a few have attained the level of an item of commerce. Various mushrooms are toxic and may cause poisoning if eaten. Most of the toxic mushrooms belong to the basidiomycotina, with many in genus *Amanita* (Hymenomycetes, Amanitaceae), *Inocybe*, (Cortinariceae), *Panaeolus* (Coprinaceae) and *Russulaceae*. Presently, more than 190 species of toxic mushrooms belonging to 58 genera and 26 families are known from Asia; of

As mushrooms are widely distributed all over the world, some of them have been used in traditional medicine as anti-inflammatory, analgesics, hemostatic, diuretic, nourishment, antitumour agents

these, 179 species are basidiomycotina belonging to 50 genera and 20 families. More than 40 species are highly toxic, and about 20 other species have slight toxicity and symptoms can be treated if eaten.

Biological Properties of Wild Mushrooms

Wild mushrooms contain several bioactive compounds, which can make a contribution to the general health of man and plant. As mushrooms are widely distributed all over the world, some of them have been used in traditional medicine as anti-inflammatory, analgesics, hemostatic, diuretic, nourishment,



Amanita caesarea



Ganoderma lucidum



Lactarius deterrimus

antibiotic and antitumour agents. Some of the important biological properties with human welfare are discussed below.

Immunological Properties of Wild Mushrooms: Approximately 700 species of higher Basidiomycetes have been found to possess significant pharmacological activities. The macrofungi can be divided into four groups: (1) edible flesh, e.g. Agaricus; (2) medicinal, e.g. Ganoderma; (3) poisonous, e.g. Amanita; and (4) miscellaneous, where the properties are less well defined. Most of the medicinal extracts from mushrooms are different forms of polysaccharides and all of them are strengtheners of the immune system with little or no side effects. For example, a sizofiran, antitumour polysaccharide extracted from the culture broth of Schizophyllum commune is an effective immunotherapeutic agent for cervical carcinoma because it stimulates a rapid recovery of the immunological status impaired by radiotherapy. Lentinus edodes is another immunological strengtheners.

Table 1: Typical Medicinal Mushrooms and their Products

MUSHROOM	PRODUCT
Corolius versicolor	PSK, PSP
Lentinus edodes	lentinan, KS-2, LEM, LAP
Schizophyllum commune	Schizophyllan
Ganoderma lucidium	Reishi
Grifola frondosa	Maitake
Tremella versicolor	Tremella extract
Cordyceps sinensis	Cordyceps extract



Cordyceps sinensis

Some mushrooms are used for the treatment of gastric ulcer, duodenal ulcer and chronic gastritis. A good example is Hericium erinacius. Some mushrooms such as Tremella fulciformis are used for curing leukaemia, coughing, phlegm and asthma (of patients suffering from chronic bronchitis). Mushrooms like T. fulciformis also possess antitumour, hypoglycaemic and cytosine stimulating activities. Antinoceptive components have been isolated from Ganoderma lucidium. This fungus (G. lucidium) has been used in curing neurasthenia, chronic bronchitis and coronary heart disease. Lanostanes triterpenes is another compound from mushroom extracts that have been found to be of medicinal value. The compound has been isolated from G. lucidium and it has cytotoxic, antineoplastic and hypotensive activities. The fungus is widely used in Asian medicine to

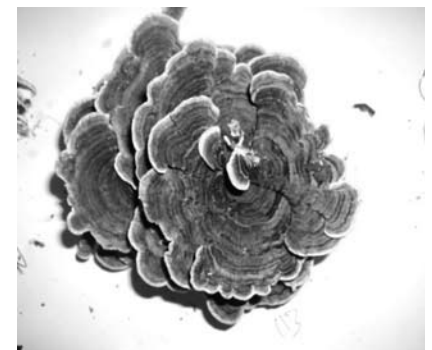
treat all types of diseases. Another collagenase inhibitor considered as candidate for medicine for the treatment of rheumatism, metastasis or periodontal disease has been isolated from Daedalea dickinsii. Oyster mushrooms (Pleurotus ostreatus) decrease serum and liver cholesterol and increases cholesterol 7-hydroxylase activities and faecal excretion of neutral sterols and bile acids in hypercholesterolomic rats. Antibiotic metabolites named oudemasin A and D, illudin S and pterulone B from Collybia nivalis, Omphalotus olearius, a Flavolaschia and a Pterula sp. A strain of Cyathus striatus has been found to produce striatins A, B, C during mycelial growth and these crystalline antibiotics were highly active against Fungi imperfecti and a variety of Gram-positive bacteria, as well as some Gram negative bacteria. Lactarii vellutinus produces an extremely labile compound, identified as stearyl-vellutinal when injured. This biologically inactive precursor which has been shown to be responsible for the dark blue colour that develops when the mushroom is treated with sulphovanillin is rapidly converted to a strongly antibiotic and pungent sesquiterpenoids dialdehydes such as isovelleral. Various bioactive compounds isolated from culture extracts of higher fungi showed other biological properties such as antiprotozoal, anthelmintic, phytotoxic and brine shrimp lethality activities. Also, investigated leishmanicidal and trypanocidal activity of the extracts and secondary metabolites of some Basidiomycetes. A naturally occurring purine nucleoside found in some mushrooms showed high degree of activity against mycobacterium. Aqueous extracts of spent mushroom substrate are used in foliar disease control.



Coprinus comatus



Clitocybe sp



Polyporus versicolor



Lepista nuda



Boletus badius



Cantharellus sp



Cantharellus cibarius



Agaricus sp



Pleurotus ostreatus

Wild Mushrooms as a Source of Extracellular Hydrolytic Enzymes:

Wild mushrooms produce various extracellular hydrolytic enzymes which include Esterase (lipase, Carboxyl esterase), Proteases, Amylase, Phytase etc. These enzymes have significant role in biotechnological importance such as Phytase (in monogastric animal feeds, ELISA, nonisotopic probing, agriculture sector, bioremediation), Amylases (anti-inflammatory reactions, starch digestion, cosmetics brewing industry, laundry, wood pulp bleaching, pharmaceuticals, dairy, antibacterial, cleaners, leather and fur, food and feed, chemicals, protein processing, alcohol fermentation), Proteases (Detergents, cheese making, bating leather, modifying food ingredients, Meat tenderizes, flavour development, blood clotting, inflammatory diseases), Esterases (Fats and oleochemicals, textile, food processing, cosmetics, detergent, diagnostics, dairy, tea processing medical, biosensors, leather industry, sewage treatment, pulp and paper, oil degradation, biodiesel production). An acid phosphatase has been characterized

from commercial basidiomycete *Agaricus bisporus*. Basidiomycetes *Herichium erinaceum* and *Ganoderma lucidum* have been reported for production of amylases in solid state fermentation. Optimized media for lipase production has been developed for *Antrodia cinnamomea*. Recently a novel thermostable lipase from basidiomycete *Bjerkandera adusta* R59 was characterized.

Wild Mushrooms as Potential Source of Myconutraceuticals:

Myconutraceuticals are nutraceutical substances derived from fungi. The word nutraceutical can simply be defined as food or part of food that possess health benefits including prevention and treatment of disease. In essence nutraceuticals possess functional properties in addition to supplying nutrients. Thus, mushroom is often called as a 'superfood'. What makes a food 'super?' According to media standards in the United States (U.S.), a 'superfood' is a food that helps with top health issues, including the fight against cancer, weight management and immunity. Mushrooms are one of the very few foods that provide a natural source of

vitamin D. A recent paper suggested that adequate vitamin D protects women from breast cancer, it also lowers the risk of multiple sclerosis, gum disease, tooth loss, bowel cancer, prostate cancer, rheumatoid arthritis, osteoarthritis, type 2 diabetes and even infectious disease like tuberculosis. Vitamin D, along with calcium, is important for bone mineral density, muscle growth and function. Mushrooms are a good source of minerals. They provide more than 10 percent RDI/100g of potassium, phosphorus, zinc, selenium and copper. A 100g serving of mushrooms provides 29 percent of the RDI (Recommended Daily Intake) for vitamin B2(riboflavin) and 27 percent of the RDI for vitamin B3 (niacin). Mushrooms are naturally low in sodium and high in the amino acid glutamate (a natural flavour enhancer), which makes them a potentially useful flavour addition to low sodium ingredients, foods, meals and diets.

Antibiotic Properties of Wild Mushrooms:

Presently various microorganism develop resistance towards many antibiotics due to indiscriminate use of antibiotics such as penicillin-

resistant *Streptococcus pneumoniae*, vancomycin-resistant *Enterococci*, methicillin-resistant *Staphylococcus aureus*, and multi-resistant *Salmonellae* and *Mycobacterium tuberculosis*. With the recent emergence of the resistant *E. coli* linked NDM-1 'superbug' there is an urgent need to combat pathogens. Antimicrobial resistance in both medicine and agriculture is now a glaring reality. It represents a significant challenge of global dimensions to human and veterinary medicine with the prospect of therapeutic failure for life saving treatments. In such a situation wild mushrooms serve as future for identifying new antibiotics with different mode of action. The first investigations on the potential of wild mushrooms as sources of antibiotics were performed by Anchel, Hervey, Wilkins in 1941 when they examined extracts of fruiting bodies and mycelia culture from over 2000 species. They succeeded in the isolation and identification of pleuromutilin, a diterpene that is especially useful for the treatment of mycoplasma infections in animals and served for the development of the first commercial antibiotic of basidiomycete origin. Since then, a number of anti

microbial compound have been isolated from wild mushrooms. They include illudin, collybial, melleolide B, 5-methoxy-p-toluquinone, linoleic acid, pleurotin, crinipellinA, drosophilinA and frustulosin all of which are antibacterial compound. Currently, more than 50 unsaturated antibiotic substance known from one or more species of *Aleurodiscus*, *Clitocybe*, *Cortinellus*, *Coprinus*, *Marasmius*, *Merulies*, *Polyporus*, *Poria*, *Pasthyrella* and *Tricholoma*. Thus wild mushrooms appear to be a good source for new antimicrobial compounds.

Wild mushroom as a source of antioxidants: The antioxidants in the human diet are of great interest as possible protective agents' to help human body reduce oxidative damage. Mushrooms have become attractive as a source of antioxidant. Some mushrooms species such as *Boletus badisus*, *Lepista nuda*, *Polyporus squamosus*, *Russula delica* or *Verpa conica* have been shown to possess higher chelating effects than synthetic antioxidants, like butylated hydroxytoluene (BHT), butylated hydroxyanisole (BHA), and F-tocopherol. *Polyporus squamosus* and *Agaricus*

bisporus showed higher chelating ability than BHA and F-tocopherol. The reducing power of *Agaricus bisporus*, *Boletus badisus*, *Lepista nuda*, *Pleurotus ostreatus*, and *Polyporus squamosus* was also shown to be higher than BHA, BHT and F-tocopherol. *Lentinus edodes*, *Volvariella volvacea* and *Agrocybe aegerita* extracts demonstrated antioxidant activity against lipid peroxidation of rat brain homogenate. *V. volvacea* was found to have comparable antioxidant activity to caffeic acid against the oxidation of human low density lipoprotein (LDL). *Lentinus edodes* demonstrated higher capacity to inhibit hemolysis of erythrocytes than natural products isolated from Chinese herbs: luteolin-7-glucuronide-6'-methyl ester, rutin, 4'-demethyldeoxydophyllotoxin, erianin and tanshinone I. Among higher fungi, some species clearly demonstrate higher antioxidant properties when compared to others. Among such mushroom species is included the tree oyster mushroom, *Pleurotus ostreatus* which possesses basic antioxidant compounds such as ascorbic acid, tocopherol, G-carotene as well as a high content in phenolic compounds. *Agaricus bisporus*, *Agaricus arvensis*,



Hydnum repandum



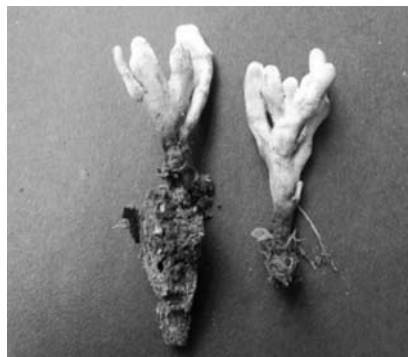
Lepiota procera



Auricularia auricular-judea



Fistulina Lepatica



Xylaria sp



Russula sp



Leccinum scabrum



Lycoperdon perlatum



Strobilurus tenacellus



Amanita pantherina



Amanita rubescense



Amanita sp

Boletus edulis, *Cantharellus cibarius*, *Lactarius piperatus*, *Hygrocybe sp.* and *Pleurotus sp.* are some wild mushrooms species that contain high content of vitamin C. L-ascorbic acid is the main biologically active form of vitamin C and is a potential antioxidant. It has the capacity to eliminate several different reactive oxygen species, keeps the membrane bound antioxidant F-tocopherol in the reduced state and acts as a co-factor maintaining the activity of a number of enzymes, by keeping metal ions in the reduced state.

Anti Plant Pathogenic Properties of Wild Mushrooms: Wild mushrooms are widely distributed in nature. They have different mechanism for survival and proliferation, including physical attack of other fungi and production of biologically active metabolite, such as antibiotic compounds. These fungi therefore have the potential for varieties of bio-control applications. Wild mushroom such as *Lactarius*, *Russula*, *Amanita*, *Lenzites*, *Lentinus*, *Trametes*, *Gonoderma*, *Stereum*, *Collybia*, *Hypholoma*, *Hydnum*, *Lepiota*, *Fistulina*, *Coriolus*, *Xylaria flammulina*, *Boletinus*, *Leccinum*, *Lycoperdon*, *Clitocybe*, *Auricularia*, *Tricholoma* were

found effective against various plant pathogen which include, *Rhizoctonia solani*, *Fusarium oxysporum*, *Sclerotinia sclerotiorum*, *Alternaria alternata*, *Alternaria brassicae*, *Colletotrichum capsici*, *Phoma medicaginis*, *Sclerotium rolfsii* and *Ralstonia solanacearum*. The two new polypropionates designated as xylarinic acid A (4,6,8- trimethyl – 2,4-decadienoic acid) and B (2,4,6 trimethyl – 2 octenoic acid) from fruiting bodies of *Xylaria polymorpha* have antimicrobial activity. Both compounds displayed significant antifungal activity against the plant pathogenic fungi *Pythium ultimum*, *Magnaporthe grisea*, *Aspergillus niger*, *Alternaria panax* and *Fusarium oxysporum*. Newly discovered strobilurins A, has originally been obtained from *Strobilurus tenacellus*, a wild mushroom growing in temperate forest. Their synthesis was initiated by BASF and Zenca to prepare analogous of strobilurin. Another strobilurin analogue metaminostrobin was developed in Japan in 1998 for use against rice diseases.

Wild Mushrooms can be Used for Controlling Insects

Culture extracts from *Amanita pantherina*

and *Amanita kwangsiensis* produce high mortality in flies; phallotoxin and amanita toxin from *Russula emetic* and *Amanita verna* can efficiently kill red spider; ibotenic acid from *Amanita verrucosivolvula* is a lethal chemical toxic preparation against flies, but is not harmful to humans. Sesquiterpene enol from *Lactarius vellereus*, and *L. rufus* have an anti-feeding effect against some insects. These examples show that it is possible to control harmful insects by using toxin from poisonous mushrooms.

Thus wild mushrooms are the gift of the Gods to the forest. They have tremendous potential to utilize human welfare. They can be used as antibiotics, pharmaceutical, antioxidants of myconutraceuticals and biofungicide production.

Source: Vivek Kumar Pandey, Ph.D Scholar, Department of Plant Pathology; Y.S. Paul, Head Department of Plant Pathology CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur-176062 (H.P)



Correlates of Training Needs of Mandarin Growers

By Suranse*, P. K., P. O. Ingle and U. G. Thakare

In India, mandarin occupies nearly 50 percent of the total citrus area. The leading producers of mandarin are Maharashtra, Andhra Pradesh, Assam, Karnataka, Madhya Pradesh, Punjab, Tamilnadu, Tripura, Haryana, Rajasthan, Meghalaya and West Bengal.

In Maharashtra, Vidarbha has the glorious natural gift for cultivation of mandarin. Mandarin of this region is known as 'Nagpur Santra'. It is famous throughout India due to its exceptional quality. In Vidarbha, mandarin is grown over 1,46,040 ha. in Nagpur, Amravati, Wardha, Yavatmal and Akola districts. Mandarin cultivation in Achalpur Panchayat Samiti is on 10,545 ha of land.

The findings of the study will help to identify and understand the characteristics of mandarin growers and their training needs.

Methodology

In all, 60 growers in eleven villages of Achalpur Panchayat Samiti were selected with the help of proportionate random sampling method to ascertain training needs of growers about improved technology for mandarin cultivation. The exploratory design of social research was implied.

Results and Discussion –

Socio-personal characteristics and training needs

Age and training needs: Age was found to be negatively and highly significant with training needs of the growers. Thus, there is a decrease in training needs as age increases. Mandarin has been grown from a large time, therefore increased age leads to increase in experience. This finding is in agreement with the findings of Tambde et al. (2007) and is not in

line with the previous findings of Beena Panicker and Chaudhari (2000), Thakre (2003), Nikhade and Patki (2006).

Education and training needs: Education was found to be positively and highly significant with training needs. The finding is in conformity with the findings of Urade et al. (1992), Gaurav et al. (1995), Tupat (2001), Dakhore et al. (2002), and Nitnaware (2004). The findings are not in line with those of Nikhade and Patki (2006) and Tambde (2007).

Experience in mandarin cultivation and training needs: Experience of mandarin growers established high significance and positive relationship with their training needs. This finding is in agreement with Kumbhare (1996). The findings are not in line with the previous finding of Subramanyam (1988), Edupuganti (1993) and Nitnaware (2004).

Annual income and training needs: The relationship between annual income of mandarin growers and their training need was positive and highly significant. Growers with better economic standing have the capacity to invest more material for profit maximization. Also they have more risk bearing capacity, and desire to earn more and learn more. The study findings are well supported by Dakhore et al. (2002), Nitnaware (2004), Praveena Kadu (2004), Tambade (2007) and are not in agreement with Raut et al. (1995), Thakre (2003), Nikhade and Patki (2006).

Land holding and training needs: Positive and highly significant correlation was observed between land holding and training needs. Bigger land holdings should acquire and implement more modern and improved production techniques. The hypothesis that mandarin growers large land holding will have more training needs is thus accepted. Study finding is supported by Beena Panicker and Chaudhari (2000) and Dakhare (2002), Tambde et al. (2007) and the findings are not in line with Raut

et al. (1995), Thakre (2003), Nitnaware (2004) and Shelar et al. (2007).

Involvement in agri programme and training needs: Involvement in agricultural programme of mandarin growers establishes a positive and significant relationship with training needs. Agricultural programmes provide exposure, guidance and knowledge. The results are not in line with Laxmikantha Rao et al. (1986).

Social participation and training needs: Social participation was found to be highly and positively significant with training needs. Social participation provides exposure and exchange of ideas; it encourages eagerness, grower interest and motivation which increases the need for training. The results are well supported by Laxmikantha Rao et al. (1986), Nimbalkar et al. (1991), Rai and Rai (1991), and Gajre et al. (1991).

Socio-economic status and training needs: Socio-economic status could not establish any association with training needs. The hypothesis that growers with higher socio-economic status have

more training and need of improved technology in mandarin cultivation is thus rejected. The finding is supported by Prevenna Kadu (2004) and is not in agreement with Beena Penicker and Chaudhari (2000), Nitnaware (2004) and Shelar et al. (2007).

Situational characteristics and training needs

Area under mandarin and training needs: Area under mandarin was observed to be highly and positively significant with training needs. The growers with more areas under mandarin may have expanded more and concentrated on mandarin. Therefore, in order to have more income they need more knowledge by means of training.

Size of garden and training needs: There was positive and highly significant correlation between size of garden and training needs of growers. Size of garden indicates number of trees. A higher number of trees will occupy more area which ultimately needs more expenditure, more cognigence and concentration for yielding more. It could be achieved by



Table 1: Correlation of Characteristics of Mandarin Growers with their Training Needs about Improved Cultivation Technology

No.	Variable	'r' value
		Training needs
I.	Socio-Personal Variables	
	1) Age	-0.3073 **
	2) Education	0.4873 **
	3) Experience in mandarin cultivation	0.3309 **
	4) Annual income	0.5576 **
	5) Land holding	0.2842 **
	6) Involvement in agricultural programme	0.2046 *
	7) Social participation	0.3007 **
	8) Socio-economic status	-0.716 NS
II.	Situational Variables	
	9) Area under mandarin	0.3673 **
	10) Size of garden	0.3330 **
III.	Psychological variables	
	11) Economic motivation	0.4158 **
	12) Scientific orientation	0.184749 **
IV.	Communication Variables	
	13) Extension contact	-0.22452 **

* Significance at 5 percent level of probability

** Significance at 1 percent level of probability

NS Non significant

Table 2: Multiple Linear Regression of Selected Independent Variables with Training Needs

No.	Variable	Regression coefficient 'b'	S.E. of 'b'	't' value of 'b'
1	Age	0.17978	0.1213	1.4819
2	Education	0.6654	0.3873	1.7178
3	Experience in mandarin cultivation	0.02906	0.0832	0.03618
4	Annual income	1.91702	1.0672	1.7961
5	Land holding	0.06508	0.1617	0.40248
6	Involvement in agri. programme	2.1452	1.6533	1.2975
7	Social participation	2.6762	0.8996	2.974 **
8	Socio-economic status	0.065	0.06875	0.09557
9	Area under mandarin	0.5721	0.4515	1.267
10	Size of garden	0.14009	0.3564	0.3929
11	Economic motivation	2.0734	1.8907	1.890
12	Scientific orientation	0.1188	0.0744	1.5973
13	Extension contact	-0.6893	0.2382	-2.8936 **

$R^2 = 0.43632$; F value = 9.71126

** Significant at 1 percent level

The growers with more scientific orientation have natural affinity towards modern, improved and advanced technology. Their attitude encourages them for more scientific and technical knowledge that could be satisfied by training

practicing improved techniques attained through training. Matheyazhagan and Sing (1986) reported the same findings earlier.

Psychological characteristics with training needs

Economic motivation and training needs: Economic motivation was found to be positively and highly significant with training need. The growers with higher economic motivation desire new knowledge, new techniques and tools as they are motivated towards profit maximization in farming which leads to training demands. The finding is in line with Laxmikantharao et al. (1986), Sahare (1994) and Beena Panicker.

Scientific orientation and training needs: The relationship between scientific orientation and training needs was found to be positive and highly significant. The growers with more scientific orientation have natural affinity towards modern, improved and advanced technology. Their attitude encourages them for more scientific and technical knowledge that could be satisfied by training. The hypothesis that higher scientific orientation creates more training needs is thus accepted. The findings are in line with Thakre (2002) and Bhosale (2003).

Communication characteristics and training needs

Extension contact and training needs: Extension contacts were observed to be highly significant with training needs.

There is a decrease in training needs if contact with extension personnel increases.

Multiple Linear Regression of Training Needs with Selected Independent Variables

The multiple linear regression of training needs with selected 13 variables in the study is presented in Table 2, where it can be seen that, out of 13 independent variables, only 2 variables viz., social participation and extension contact contributed significantly towards the variation in training needs inclined by the growers about improved mandarin cultivation technology. The extent of variation was 43.63 percent as the coefficient of determination R^2 is 0.43632. Extension contact shows negative relation with training needs. The unexplained variation to the extent of 56.37 percent may be attributed to the variable not included in the study. Thus, training needs of growers was influenced more prominently by social participation and extension contact of mandarin growers.

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Innovative Payment Options in Agricultural Marketing – Harnessing Financial Inclusion Drive and Information Technology for the Betterment of Farmers

By Mahesh M. Junagond, G. M. Hiremath, Siddayya,*
Netrayini K. R. and Vinod R. Naik**

There are several challenges involved in marketing of agricultural produce. There is limited access to the market information, the literacy level among the farmers is low, and multiple channels of distribution take away from the pockets of both farmers and consumers. Farmers in turn, at the end of the transaction do not get correct payment for their produce; there are illegal deductions, unauthorized commission charges, delayed payments, payments made in long term installments which in some cases run up to next season, and deduction in the weight of the produce while making payments to farmers. This article attempts to link e-tendering method with online mode of payment that would help the farmers in receiving full and prompt payment for their produce.

The e-tendering system caters to the need of all the stakeholders of the APMC system. The farmers, who bring the agricultural produce, are particular that they get the best prices for their produce through tendering/auctioning in transparent ways. Linking of the E-tendering system to financial inclusion scheme will offer a solution to the long standing problem of the payment delivery system in agricultural marketing.

E-tendering Method

The e-tendering system caters to the need of all the stakeholders of the regulated markets. The farmers who bring the agricultural produce, are particular that they get the best prices for their produce through tendering/auctioning in a transparent way. The traders on the other side want to ensure that they get the quality produce for the price quoted by them. Similarly, the Commission agents are interested to ensure that the transactions taking place in their shop are smooth and more clients are using their



services. APMC/Govt wants to ensure that the tendering/auctioning process takes place smoothly in the market and maximum number of farmers gets the benefits of its service. In the process, they generate more revenue and use it for the betterment of their customers.

This system has the following functionalities to carry out the regulated market activities:

- **In-Gate Entry** –The agricultural commodities entering the market are recorded into the system using this option and system generates the unique LOT Number for each entry. This LOT Number is used for displaying in the market to be quoted by the traders.
- **Quoting** –The traders, after verifying the quality of the commodity, will quote their prices for each of the LOT on the system using this option.
- **Tender Declaration** – Using this option, the officer will click the button to process all the quotes and declare the tender awardees.
- **Weight and Bill entry** – Once the

tender is declared, the weight of the commodity is measured for each of the LOT and sale bill is prepared by the Commission agents to the traders. These details will be entered into the system to raise the demand for market fee against the sale.

- **Receipt** – This option is used to enter the cheque/cash/DD received from the traders/CAs into the system and generate the receipt.
- **Reconciliation** – Once the bank gives the realization statement of the instruments, the details can be recorded into the system. Now, system posts these receipts into the trader/CA ledger.
- **Permit** – The traders can enter the permit details and generate the permit from this system whenever they are moving the purchased commodities from the market.
- **Out-Gate Entry** – Using this option, the outgoing commodity details can be entered into the system.
- **User Administration** – This module helps the authorized officer of the

APMC to create/freeze the user login accounts for the staff of APMC, traders and CAs.

- **MIS Reports** – The officers/officials can generate number of reports and registers using this module. This system automatically prepares the Tender declaration slip, DCB statement, bank statement, etc.

The system-generated reports can be used to settle the sale proceeds directly with farmers as well as commission agents account by online payment mode. As mentioned earlier, the majority of the Indian farmers (small and marginal) do not have bank accounts. The main reason for financial exclusion is the lack of a regular or substantial income. In most cases, people with low income do not qualify for a loan. The proximity of the financial service is another fact. The loss is not only the transportation cost but also the loss of daily wages for a low income individual. Most of the excluded consumers are not aware of the bank's products, which are beneficial for them. Getting money for their financial requirements from a local money lender is easier than getting a loan from the bank. Most of the banks need collateral for their loans. It is very difficult for a low income individual to find collateral. Moreover, banks give more importance to meeting their financial targets and hence, they focus on larger accounts.

It is not profitable for banks to provide small loans.

Financial Inclusion (FI)

Financial inclusion is the delivery of financial services at affordable costs to sections of disadvantaged and low income segments of society. In India, the basic concept of financial inclusion is having a 'saving or current' account with any bank. In reality it includes loans, insurance services and much more.

Thirty-four (34) percent of Indian individuals have access to, or receive banking services. At present out of the 6,00,000 habitations in the country, only about 30,000 have a commercial bank branch. In order to increase this number the Reserve Bank of India and the Government of India took innovative steps. One of the reasons for opening new branches of Regional Rural Banks was to make sure that the banking service is accessible to the poor. With the directive from RBI, these banks are now offering "No Frill" Accounts to low income groups. These accounts either have a low minimum or nil balance with some restriction in transactions. The individual bank has the authority to decide whether the account should have zero or minimum balance. With the combined effort of financial institutions, six million new 'No Frill' accounts were opened in the period between March 2006-2007. Banks are now considering

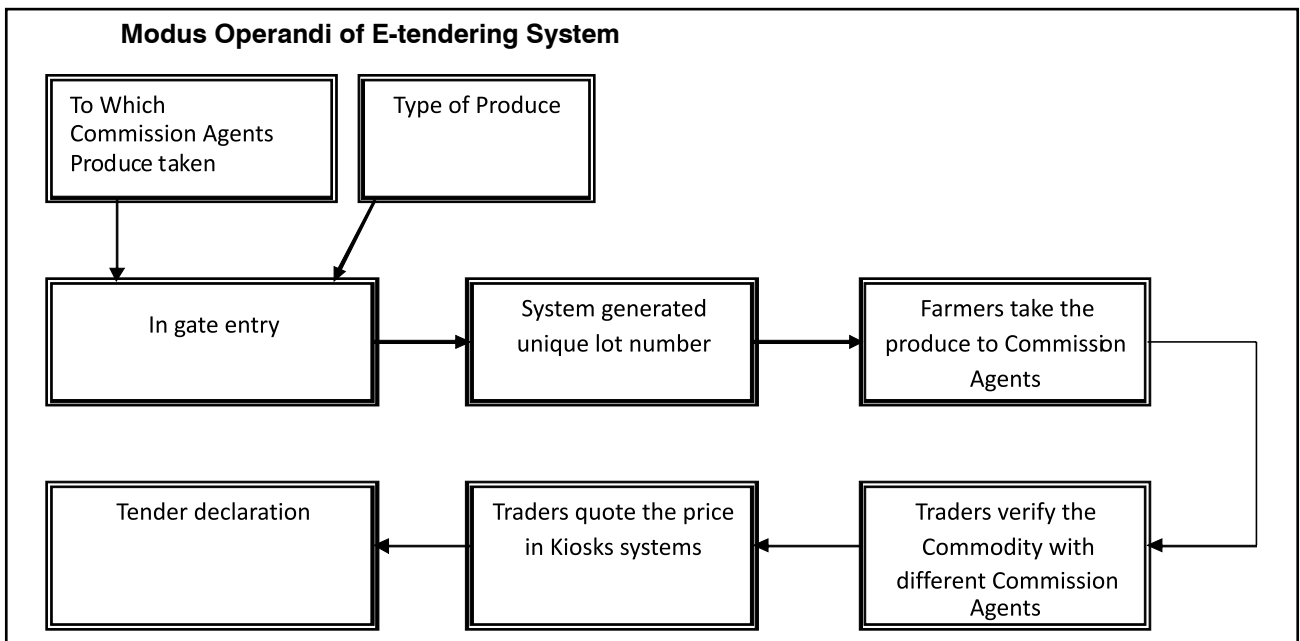
FI as a business opportunity in an overall environment that facilitates growth.

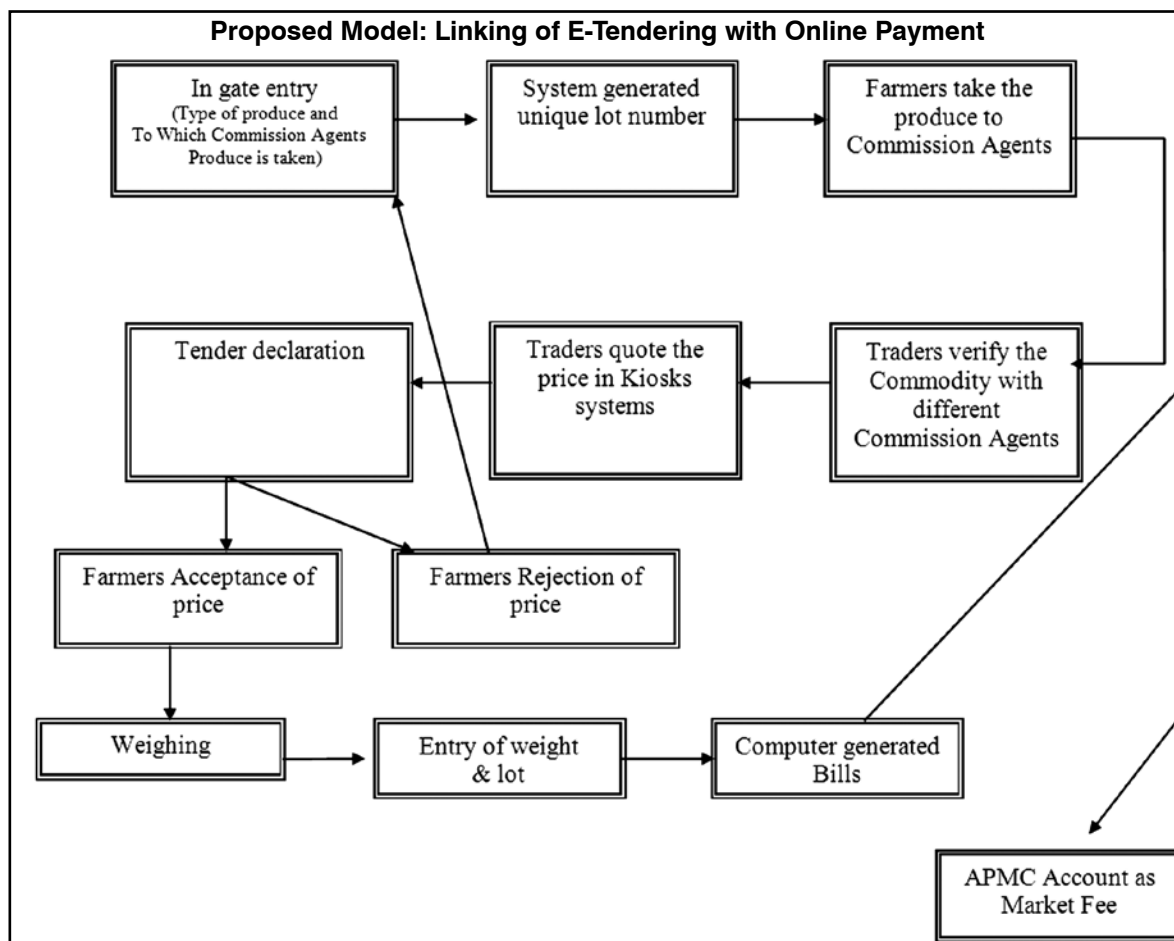
Financial inclusion mainly focuses on the poor who do not have formal financial institutional support and getting them out of the clutches of local money lenders. Financial inclusion is a great step to alleviate poverty in India. Financial service providers should learn more about the consumers and new business models to reach them.

Linking of E-tendering System Online Mode of Payment - An Innovative Option

To overcome the problems of delayed payments, illegal deductions (soot) and unauthorized commission charges from producers, there is a need to bring new innovations to the present agricultural marketing payment system. Linking of an E-tendering system to financial inclusion scheme will offer a solution to the long standing problem of payment delivery system in agricultural marketing.

To link the E-tendering system to financial inclusion, a particular lead bank or any financial institutions like viable Commercial Banks of private or public sector, which provides advanced technological services would be entrusted to carry out all the operations. This Bank would maintain account details of all the stakeholders' viz., traders, commission agents, farmers and other





market functionaries. The farmers who do not have bank accounts should be brought under the ambit of financial inclusion through 'No Frill' accounts.

At present, the E-tendering operation ends with the declaration of tender. Under the proposed linkage system all the further transactions viz., weighing, sale bills based on the LOT number and price quoted for the respective LOT number have to be generated electronically along with the amount payable to farmers and commission agents by the trader. This electronically generated information at regulated market has to be passed on to the entrusted bank for further process. The bank will then process the information received from the regulated market, credit the amount to commission agent's account and farmers account from traders account based on the volume of transaction. The amount is to be transferred to farmers' bank account with an SMS alert to the farmer's mobile, which would help them in knowing their payment receipt status.

In this regard, each trader has to maintain a certain amount of minimum deposit which would be based on the previous season transaction. The minimum deposit maintained by the traders has to be utilized in case of default payments. The bank should have a freehand in operating all the stakeholders' accounts. There should be a system of ceasing traders' accounts at E-tendering level itself if the trader does not maintain minimum deposit amount.

Benefits of the Proposed Model

- The entire process will be computerized and thereby, ensure transparency;
- From the farmers' point of view, it will overcome the problems of delayed payments, unauthorized commission and illegal deductions;
- Farmers will be in touch with financial institutions, thereby increasing access to financial services;
- All the transactions by the traders and commission agents are accounted; and,

- The transparency in the transactions will bring competitiveness among market functionaries.

Conclusion

The immediate and prompt payment to the farmers would help them in planning their crops and expenditure. The transparency in the transactions will create a competitive environment among traders and also bring extra exchequer to the Government. It will also fulfill the aspirations of the Government in implementing financial inclusion through financial institutions. The proposed model will work on a sustainable basis with the cooperation and collaboration of financial institutions, State Marketing Board and Regulated markets.

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CIPHET set to Commercialise Stabilisation of Rice Bran by Ohmic Heating



Fig. 1 Ohmic heating system enclosed in wooden frame (left) and mounted on a stand (right)

Achieving a new landmark in research, Central Institute of Post Harvest Engineering and Technology (CIPHET), has developed an ohmic heater for stabilization of rice bran oil. The technology, which helps in scaling up the production of rice bran oil and increasing its shelf life, is first of its kind in the country.

CIPHET Director Dr R.K. Gupta transferred this technology to V. Gowathaman of Chennai, the entrepreneur who had requested the institute for development of the technology.

Notably, with increasing health awareness, use of rice bran oil is on the rise due to the presence of many naturally occurring antioxidants. Rice bran oil has a very high smoke (burn) point, making it perfect for deep frying, pan or stir frying and is a premium choice for the replacement of hydrogenated oil

containing trans fat now being used in deep fryers. Rice bran oil creates fewer polymers than other oils implying better flavour and easier clean-up.

Senior Scientists Dr. Devinder Dhingra and Dr. Sangeeta Chopra, who have developed an ohmic heater for rice bran, said that ohmic heating was the most advanced technology available anywhere in the world.

“Through, ohmic heat we would be able to preserve many important ingredients and also its shelf would get improved manifolds,” Dr. Devinder Dhingra said, adding that this method of heating is also good for large scale production.

V. Gowthaman, who procured the technology, said that the oil processed through ohmic heating was far superior to conventional methods. He said, “I will start commercial scale production by

Through, ohmic heat we would be able to preserve many important ingredients and also its shelf would get improved manifolds,” Dr. Devinder Dhingra said, adding that this method of heating is also good for large scale production

using CIPHET technology in Chennai”.

Rice bran is the outer layer of the rice kernel and a by-product of the rice milling process. Several studies have reported that rice bran is an excellent source of nutrients and bioactive compounds including proteins, vitamins, dietary fibres, tocopherols, tocotrienols and a-oryzanol.

Rice bran is also a satisfactory source of fat with a range between 12 and 20 percent. Edible grade oil is produced by refining of the crude bran oil of low FFA content (about 5%). De-oiled rice bran is used as feed for poultry and livestock. Crude bran oil of high FFA content is used for the manufacture of soap and fatty acids.

Rice bran can be classified into three groups: (1) full fatted raw bran (raw bran) obtained from milling of raw paddy; (2) full fatted parboiled bran (parboiled bran) obtained from milling of parboiled paddy; and, (3) defatted/de-oiled bran obtained after extraction of oil from either raw or parboiled bran.

Raw bran is a light-coloured oily, unstable meal of various particle sizes. The most important and crucial property of rice bran is the instability of its oil caused by an oil-splitting enzyme, lipase, inherently present in it. The enzyme, lipase acts as a catalyst. The fat and enzyme are spatially distributed in aleurone and testa layers respectively in intact rice grain. So as long as the bran surface is uninjured

As soon as the bran surface is ruptured and separated from the brown rice in milling operations, the lipase comes in contact with the oil-bearing layers and they are intimately mixed with each other causing a very rapid rate of hydrolysis of fats into free fatty acids

and protected by the husk, the enzyme remains dormant and the enzymatic activity is not perceptible.

As soon as the bran surface is ruptured and separated from the brown rice in milling operations, the lipase comes in contact with the oil-bearing layers and they are intimately mixed with each other causing a very rapid rate of hydrolysis of fats into free fatty acids. As the reaction is hydrolytic type of rancidification, it is apparent that the rate of hydrolysis will be further enhanced with the increase of moisture in bran.

The free fatty acids can then be more readily oxidised than the natural oils by the oxidative agents resulting in oxidative rancidity with the production of unpleasant odours and flavours. Immediately after milling, the FFA content of bran is normally below 3 percent. After milling, the rate of increase of FFA in bran may be as high as 1 percent per hour under favourable conditions. Alkali refining of crude oil for edible grade oil is considered uneconomical if its FFA content goes beyond 10 percent level.

Thus, stabilisation of rice bran is considered important to inactivate the enzymes. Stabilisation of bran extends the storage period of bran without any appreciable change in FFA content. Various stabilisation methods, applied to protect rice bran oil degradation, have been reported such as steaming, extrusion and microwave heating. Stabilisation of rice bran by ohmic heating has been successfully tried at CIPHET.

The complete system was enclosed in a wooden frame and mounted on an MS stand. The unit is shown in Fig. 1. The volume of the system to fill rice bran was 0.02 m³ and 10 kg hydrated rice bran could be easily filled in the system for each batch. The electrical field strength of 15 V/cm was applied. The current flow increased with increase in temperature of the rice bran. Heating continued till steam started emanating. It took around 20 minutes to heat bran from 20 degrees centigrade to 100 degrees centigrade. At this point, electrical current was switched off. The heated rice bran was taken out from the system and dried in a tray drier.

The treated bran was then stored and the percentage of FFA was calculated as oleic acid and expressed as percentage of the total lipids. The variation in percentage of FFA is presented in Fig. 2.

The percentage of FFA in treated (ohmically heated) bran was observed to be 4.77 percent after 75 days of storage whereas it was 41.84 percent in case of raw bran. Ohmic heating effectively checked the development of FFA in rice bran.

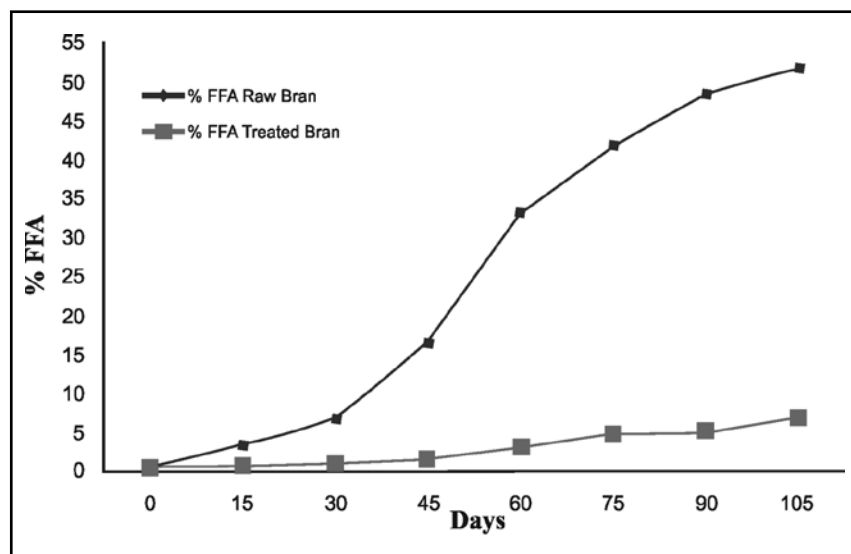


Fig. 2 FFA (%) of treated and raw rice bran with storage

SOURCE: Research conducted by CIPHET



Radiation Processing Technology for Food Safety

By Mr. C.R. Biswal & Mr. V.S Raju *

The Radiation processing of food is a universally accepted technology and used in scientific and commercial applications in agriculture, animal husbandry, medical sciences, pharmaceuticals etc. One of the most important applications is in the post-harvest handling and management of food. This process improves food conservation, food hygiene and paves the way for higher food exports. It eliminates quarantine barriers at the port of importation. It enhances the shelf life of food products and facilitates in packaging, storage, transport and distribution of food for the end consumer usage. Radiation processing is useful in the preservation of food items since it destroys organisms that cause spoilage, thus extending shelf life.

The safety and nutritional adequacy of irradiated foods for human consumption is well established. India is one of the few countries that have the expertise in the deployment of radiation technology. Food safety is an important topic worldwide. Irradiation is a proven and effective post-harvest method to reduce losses, to

eliminate food-borne pathogens in foods and to enable the control of insects and pests, including pests of quarantine, in agricultural commodities. The technology helps developing countries in their efforts to improve food safety and quality, and to facilitate trade in food items. Irradiation is a direct, simple and efficient one-time process. Good numbers of countries are using this process in food processing industries and institutional catering. In 1986, the Government of India set up a National Monitoring Agency to oversee commercial application of radiation processing of food. In 1991 the Atomic Energy Act was amended and Atomic Energy (Control of Irradiation of Food) Rules were framed. In 1994, the Government of India amended the Prevention of Food Adulteration Act (1954) Rules and approved irradiation of onions, potatoes and spices for the domestic market. Additional items were approved in 1998 and 2001. In 2004, the Ministry of Agriculture amended its quarantine regulation to include irradiation as a quarantine treatment. Then Bhabha Atomic Research Centre

(BARC) also approached the Ministry of Health for providing generic or class-wise approval for radiation processing for agricultural and food commodities. Preservation of food by ionizing radiations involves controlled application of energy of ionizing radiation such as gamma rays, X-rays and accelerated electrons on agricultural commodities, foods and food ingredients for improving their storage life, hygiene and safety.

As far as Food Processing and Horticulture Sectors are concerned, Ministry of Food Processing Industries, National Horticulture Mission and National Horticulture Board are providing financial assistance for setting up and modernizing the processing units and creation of infrastructure and development of human resources in addition to other promotional measures to encourage the growth of the Food sector. They are also providing financial assistance to the private sector and Government Agencies for setting up cold chain infrastructure including refrigerated transport vehicles and different kinds of cold storages under various schemes.

It may be mentioned here that the State Government is providing storage support under the Central Sector Schemes of Development and Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization being implemented by the Directorate of Marketing and Inspection. The Government of Andhra Pradesh is also providing Incentives and Concessions to the Food Processing Industries.

Food Processing is declared as a Small Industry and is eligible for relief from minimum electricity charges during off season when the unit is not functioning. Twenty-five percent cost of external infrastructure for power, water, approach roads and other infrastructures limited is rupees two crores. Reimbursement on State Goods and Services Tax for Mega Food Parks during the construction period for a period of two years is limited to a maximum of rupees two crores. Reimbursement power costs stand at the rate of Rs.1.00 per unit (upper ceiling) on the proposed revised rates (2010-11) for 5 years. In case, there is a decrease in power tariff, the reimbursement will be reduced proportionately. All eligible industries/enterprises under Food Processing will also be eligible for other benefits as per the Industrial Investment Promotion Policy 2010-15.

Investors must take advantage of the liberal incentives being provided by the Government and invest in food processing units. Today the Food Processing Industry is a 'sunrise industry' and has immense



scope for growth, and therefore, this industry offers a unique opportunity for investment.

Food preservation is a need to have supply of food throughout the year, particularly during crop failure/natural disaster and to supply food across a large area where it is not produced. Food is the most precious commodity to human life on earth. Life is not sustained without adequate food. Therefore, food security and preservation are more important.

Rapid urbanization, depletion in the quantum of arable land, uncertain agro-climatic conditions, primitive practices of harvesting and storage of food grains, and long distances between harvesting and

consumption centres have only added to the necessity for better preservation and effective utilization. About 20-40 percent of India's agricultural produce is lost due to spoilage by pests, insects and microbes. Microbial contaminants cause human illness and produce toxins, which also render food unsafe for consumption. Therefore, Radiation Technology is essential to preserve agricultural commodities and food products.

India is the world's second largest food producing country and has the potential to be the world's number one. After achieving self-reliance in agriculture production through the 'green revolution' we are not only in a position to feed our own people, but also in a position to export agricultural produce. In this connection, Radiation Technology has played a significant role in increasing shelf life. Food preservation by radiation involves application of nuclear energy to agricultural commodities, for improving their storage life, hygiene, and for overcoming quarantine barriers to international trade. It facilitates packing, storage, transport and distribution of food. Thus, radiation processing can be supplementary and sustain agriculture, horticultural and food products.



** Mr. C.R. Biswal, IAS is Principal Secretary to Government, Industries & Commerce Dept, Government of Andhra Pradesh and Mr. V.S Raju is President, Federation of Andhra Pradesh Chambers of Commerce and Industry (FAPCCI).*

Contract Farming in India *Issues and Challenges*

Dr. Rais Ahmad and Mohammad Awais *



Contract farming is increasingly being presented as a solution for the problems of Indian agriculture by major international donor agencies, multinational companies and even the government. It is argued that private sector participation will be promoted through contract farming and land leasing arrangements will allow accelerated technology transfer, capital inflow and assured markets for crop production, especially of oilseeds, cotton and horticultural crops.

What is Contract Farming?

Contract farming is an agreement between farmers and processors and/or marketing firms for the scientific production and supply of a specified agricultural product at a frequently and mutually pre-determined price. In return, the contracted farmers are offered high price against their farm produce. Contract farming is characterized by its enormous diversity not only with regard to the products contracted but also in relation to many different ways in which it can be carried out. The contract would

include a commitment from the farmers to supply the specified agricultural commodity in specified quantity and quality levels within the given time frame. The main objective is to increase crop production, improve quality farm produce and minimize cultivation cost. The farmer is therefore compelled to provide the produce in specific quantity and quality determined by the processor. Contract farming usually involves the following main elements: pre-agreed price, quality, quantity or acreage (minimum/maximum) and time. From a developmental interventionist point of view, it is a situation in which the relationship between agribusiness firms and farmers takes the form of an expert endowing the apprentice with resources, knowledge and skills.

Models of Contract Farming

Firms or contractors have devised various models for contract farming. The contracts could be of three types:

- (i) Procurement contract, under which only sale and purchase conditions are

Contract farming is characterized by its enormous diversity not only with regard to the products contracted but also in relation to many different ways in which it can be carried out

specified, and the contractor does not provide any input.

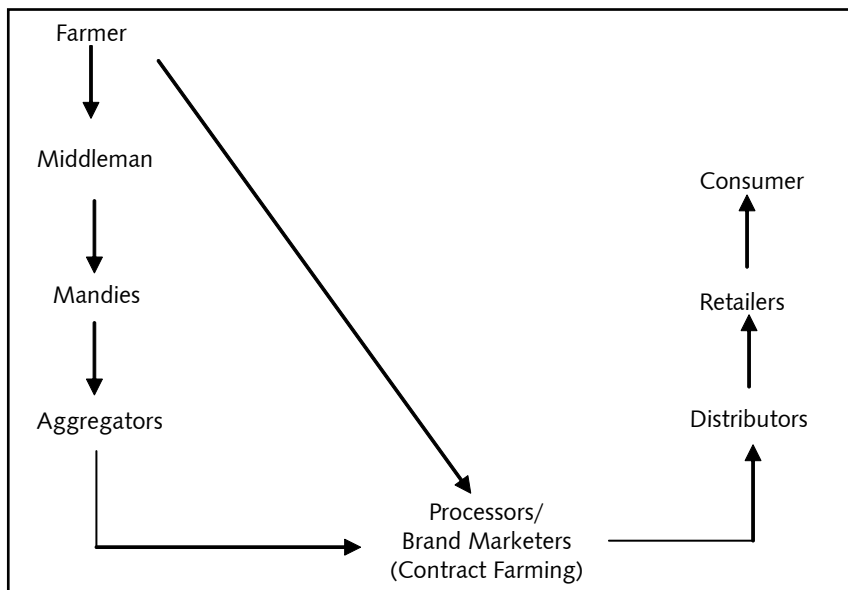
- (ii) Partial contract, wherein only some inputs are supplied by the contracting firm and produce is bought at pre-agreed prices. In India, this type of contract is followed by Pepsi Co., which sells only saplings to farmer and buys the produce at predetermined price but does not offer any other inputs.
- (iii) Total contract, under which the contracting firm supplies and manages all the inputs on the farm and the farmer is just a supplier of land and labour.

Rallis India, a Tata Group company is working together with Credit provider ICICI Bank, HUL and Food World to solve all problems of a farmer under one head.

Contracting Firms

Contract farming is most commonly practiced by food processing companies. Contract farming had solved the problem of supply of raw material of the desired quality and quantity from reliable source near to the processing plants.

Companies gain access to crop production on land that would otherwise



be unavailable, with the additional advantage of not having to buy or lease it. Contract farming facilitates more and more companies to develop backward linkage with farmers.

Companies and Crops under Contract Farming

Company	Crops
Cadbury	Cocoa
Pepsi Co	Potato, tomato, chilly, groundnut, corn, Basmati rice
Hindustan Unilever	Basmati rice, tomato, chicory, tea, milk
ITC	Tobacco, wood trees, oilseeds
Cargil	Seeds
KRBL	Basmati rice
Ballarpur Industries	Eucalyptus, poplar trees
Chambal Agritech	Potato seeds
JK Papers	Eucalyptus, poplar trees
Wimco	Eucalyptus, poplar trees
Green Agro Pack	Gherkins
Global Green	Gherkins
Intergarden India	Gherkins
Kempscity Agro Exports	Gherkins

Sterling Agro	Gherkins
United Breweries	Barley
Nijjer Agro	Tomato
Tarai Foods	Vegetables
M Todd	Mint
Namdhari Seeds	Seeds
Field fresh foods	Vegetables and fruits

Source: Shah (2007) and Agriculture Today, July 2007.

Potential Benefits of Contract Farming

Contract farming is becoming popular among rural masses in India. It is increasingly being practiced in the state of Punjab, Maharashtra, Gujarat, Andhra Pradesh and Karnataka. For different reasons though, both farmers and farm product processors/distributors are going for various kind of contracts for farming. Considering the present socio-economic status of Indian farmers, contract farming seems to be an ideal option because this system would have certain advantages over the present crop production and marketing systems, such as:

- Profit in produce sale is possible by capitalizing the scientific research in post-harvest technologies.
- Indian agriculture per se is becoming commercial due to global demand for a variety of food products.

- Any crop can be cultivated on a large area to obtain produce of uniform quality by adopting appropriate technology. Crop production is also possible on small land holdings through cooperative/corporate farming to enhance productivity and avoid admixture or inferior quality produces.
- Technology transfer becomes easier due to large scale adoption.
- Risk involved due to fluctuation in market price is minimized. This point is relevant to the present strategy of farm economics as the minimum support price is generally declared at the end of crop season and it often remains ambiguous.
- Commercial and nationalized banks are coming forward to finance contract farming through soft loans and are revising prime lending rates.
- Farmers benefit from improved technology, better quality of seeds and other facilities which would result in higher productivity and reduction in the cost of cultivation. Additional income from intercrops is certain due to crop diversification. Consolidation of small and marginal lands can make farming economically viable, resulting in higher (more than 30 percent) net returns than traditional/conventional farming systems. At macro-economic level, this arrangement helps in accumulating foreign exchange as contracting firm generally promotes export oriented crops and cash crops.
- Contract farming reduces the transaction cost.
- The private sector gets requisite quality of produce regularly at predetermined prices. The industry is able to procure the produce of desired quality at a much cheaper rate.
- Contract farming offers access to crop production from land that would not otherwise be available to a company, with the additional advantage that it does not have to purchase it. Scarce resources of the company can then be put to better use.
- Contract farming allows companies

to plan their long term return on investments.

- Processed items such as fruits and vegetables for export, demand high quality standards. Open market purchases are fraught with uncertainties in quality, quantity and price. Contract farming, thus helps to ensure all the three parameters.
- Contract farming ensures availability of uniform produce for better price realization.
- To get quality produce, industry is under obligation to provide extension services to the farmers. For mutual prosperity, the companies also provide latest technology under farm inputs to the farmers.
- Contract farming with small farmers, particularly when the farmer is not a tenant of the sponsor, is much more politically acceptable.

Suggestions

The following steps are required to overcome the problems of contract farming:

- In India, the distribution of farm holdings is dominated by small and marginal farmers. Therefore, without improving their income and living standard we cannot think of sustainable growth in agriculture sector. In order to reduce income disparity among the rural masses companies should also promote small farmers. This is in fact one of the major issues among firms.
- A code of conduct for contract farming will have to be developed for major groups of farm commodities such as vegetables, fruits, flowers, medicinal plants, tuber crops, pulses, oilseeds, sugarcane, cereals and cotton. A farmer should not be alienated from his/her land under any circumstance. At the state level, a monitoring committee comprising farmers and appropriate officials may be set up to ensure the spread of a non-exploitative pattern of contract farming.
- Any production contract between the firm and the farmer must be in written form.



- Contracts must be in local language. The language used must be simple and should be easily understandable by the farmer. There should not be ambiguity in any clause in the contract.
- Steps should also be taken to improve the bargaining power of the farmers. One of the suggested models for small and marginal farmers is cooperative farming wherein farmers with small land holdings come together, pool their land, negotiate with the firm and engage in large scale production.
- Delegate contract farmers to be stakeholders of the company (like Board members of corporate, shareholder etc.).
- Company should build long term relationship with farmers and practice only those agricultural activities which are conducive for the sustained growth of agriculture. This would also rationalize the cost structure of the company in the long run.
- Creating awareness about the benefits of contract farming among farmers. Educating farmers about sustainable agricultural practices. Conducting workshops and crop specific studies would help in improving the situation of both farmers and firms. Opening up of information centre for farmers would also help them to get more information about the latest technological advancement. Plant protection and fertilizer

recommendations of contract firms should be authorized by public research institutions.

Conclusion

The cutthroat competition in the era of globalization spells doom for the Indian farmer. Almost 75 percent of Indian farmers subsist on small and marginal land holdings, spreading up to two hectares. With fragmented land holdings, non-existent farm credit, lack of infrastructure, inadequate extension services and long drawn process for marketing the produce, it would be unfair to expect Indian farmers to compete globally on their own as far as quality productivity and cost are concerned. While contract farming is not a panacea to solve all related problems of agricultural production and marketing systems, the participation of the corporate sector in contract farming might provide the care for all such problems that ail this sector. Contract farming, unlike corporate farming, brings farmers into the mainstream of economy. The farmers are emotionally attached to their land and farming is their sole source of livelihood. Considering the advantages and disadvantages of contract farming, it needs to be encouraged with utmost caution and appropriate policy measures.

** Dr. Rais Ahmad, Former Professor in Management Studies, JMI, Ex-Chairman, Associate Professor, Dept. of Agricultural Economics & Business Management, Aligarh Muslim University, Aligarh, U.P.*

Paddy Cultivation and MGNREGA: A Study of Kerala

By Alungal D. Manikandan



Consider the scenario where there is a labour market with forces like demand and supply of labour and wage rate is determined by the interaction of these forces. Sometimes wage income of the rural households may not be sufficient to meet their basic requirements because of low wage rate, increase in the price level of essential commodities, higher economic dependency, the lack of sufficient days of employment etc., which in turn exacerbates the incidence and intensity of deprivation among rural households. For instance, 32.43 lakh persons are poor due to which they are unable to meet the 'target income' of Rs.20645.76 per year for family of four or Rs.25807.20 for family of five in Kerala (Mukherjee and Sinha 2011).

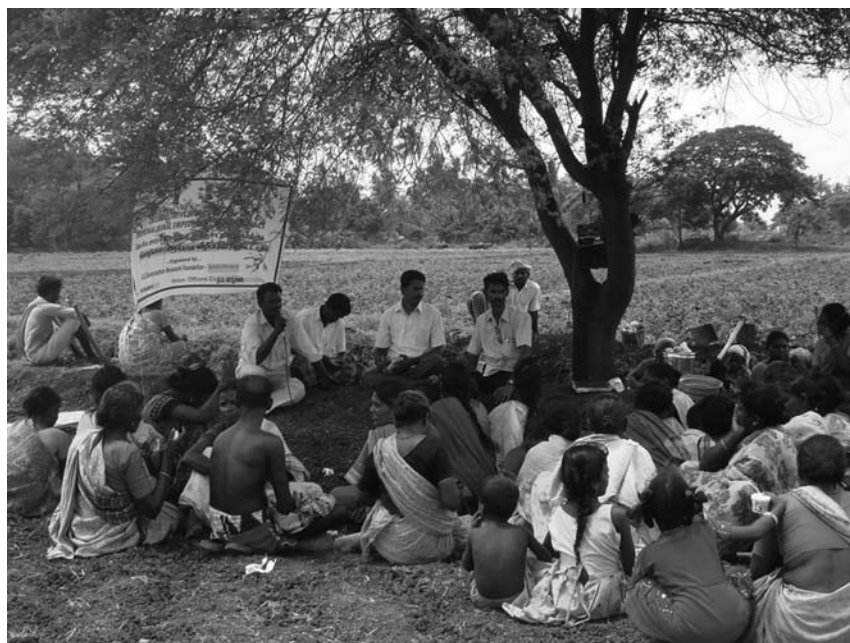
The condition has not improved ever

since the implementation of a number of anti-poverty programmes by both the national and sub-national level governments. Under such circumstances, policy makers, economists and even politicians have decided to combat poverty at the grass root level. The commencement of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is a great step in this direction. This scheme basically makes a direct intervention into the rural labour market by providing 100 days of employment to every household who are willing to do unskilled manual work at a statutory wage rate in a financial year. At present, MGNREGA has covered all rural areas of the country. This paper analyses the impact of NREGS on the labour market with special reference to wage rate and productivity in the rice fields of Kasaragod district of Kerala.

Impact of NREGA on Wage Rate

Let us begin with a question: How do we justify the intervention of MGNREGA where there is a labour market with high levels of shortage of labourers and wage rate? This question is more relevant particularly in states like Kerala. The shortage of labourer, including unskilled and skilled men and women workers in the agricultural sector is already a serious problem. As a result, the wage rate has shot up and it is likely to go up higher. For instance, the average agricultural wage increased to Rs.247.1 in 2002-03 from Rs.39.41 in 1991-92 (Jha 2007). This situation has further exacerbated since the inception of MGNREGA in the state. Nair et al (2009) have shown certain externality effects of NREGA in the agricultural sector in three Gram Panchayats of Kasaragod district. One of the major findings of their study is

that frequent replanting and harvesting in rice fields are delayed by shortage of labour. The NREGS works were observed to exacerbate these agricultural labour shortages in all three Panchayats. This has had the added effect of pushing up wages in the agricultural sector, moving slowly towards the NREGA wage rate. It would have an undesirable impact on agricultural sector in Kasaragod district like decline in rice production. For instance, the average production of rice was 12844 tonnes between 2004-05 and 2006-07 while it was 10422 tonnes between 2007-08 and 2009-10 (Government of Kerala 2011). It shows that production of paddy has gone down since the implementation of MGNREGA in the district. However, wage rates for workers, especially women workers in agricultural sector have gone up from Rs.80 to Rs.110 for a full day's work although it is low compared to NREGA wage rate. It indicates that the wage rate of NREGA is still much attractive for workers and thus, stimulates the flow of workers, including workers from the agricultural sector to NREGA in the district. It is clear from the number of household issued job cards. For instance, the number of households issued job cards shot up to 1.21 lakh in 2010-11 from 0.78 lakh in 2007-08. Therefore, person-days generated to households under NREGA have increased



to 20 lakh in 2009-10 from 3.15 lakh in 2007-08 (Table-1). It shows a steady increase in person-days generated under the NREGA in the district, although it was low compared to many other districts in Kerala. Apart from increase in wage income, it is expected to increase productivity in the agricultural sector. In the following section we will look at the impact of NREGA on rice productivity in the district.

Impact of NREGA on Paddy Productivity

The MGNREGA has numerous objectives in which increase in agricultural productivity is one. This is because low fertility and productivity of the agricultural land is one of the root causes of poverty in rural areas. By envisaging a situation like this, NREGA focuses on large productivity increase in the agricultural land, especially the small and marginal land. It is very important in states like Kerala because 95 percent of paddy land is small and marginal. Therefore, NREGA must improve productivity of rice fields. Otherwise, it would have an adverse impact on rice fields due to increase in the shortage of labour and wage rate. Hence, paddy cultivation will become more unviable. Here, one important question is that: Whether MGNREGS ensures food security of poor paddy farmers in Kasaragod or not? The answer of this question is depending on changes in productivity and labour supply in the agricultural sector in response to MGNREGA. Sinha and Mukherjee (2011) have rightly argued that: "If the NREGA leads to a relatively small productivity increase compared to a relatively large drop in labour supply the overall paddy production will go down, whereas if there is relatively large productivity increase and relatively little change in labour supply in response to NREGA there would be positive output

Table-1: Persondays Generated under MGNREGS in Kerala

District	2006-07	2007-08	2008-09	2009-10	2010-11
Palakkad	11.55	26.73	37.4	46.18	45.93
Wayanad	8.93	28.01	26.73	31.86	19.73
Idukki		2.86	16.54	45.55	57.47
Kasaragod		3.15	13.71	17.54	20.02
Alappuzha			4.70	24.74	51.48
Ernakulam			6.05	13.21	31.94
Kannur			5.29	12.07	18.31
Kollam			5.12	17.18	29.71
Kottayam			1.73	9.28	20.41
Kozhikode			6.15	21.63	37.12
Malappuram			7.45	23.10	33.33
Pathanamthitta			3.44	13.4	17.54
Thrissur			9.06	22.43	40.20
Trivandrum			10.36	41.54	57.13
Kerala	20.48	60.75	153.73	339.71	480.32

Source: Ministry of Rural Development (MoRD), Government of India, August, 2011

effect." Therefore, the NREGA must ensure productivity increase, which stimulates food security of both farmers and workers under NREGA in the district. However, paddy productivity has come down in Kasaragod district ever since the commencement of NREGA, which raises concerns over the viability of rice cultivation and the quality of assets created under NREGA in Kasaragod district. For instance, rice productivity has declined to 2107 Kg per hectare in 2009-10 from 2123 Kg per hectare in 2007-08. It shows that paddy productivity was stagnant around 2100 Kg per hectare ever since the commencement of the NREGA. During this period, rice productivity in Kerala has increased up to 2557 Kg per hectare in 2009-10 from 2308 Kg per hectare.

Unlike Kerala, rice productivity in Kasaragod has come down and contributed to a decline in the area under paddy and production. In order to avoid such cases, NREGA undertakes more work, which is related to water conservation, harvesting, irrigation and land development in the small and marginal paddy land, which in turn improves rice productivity. As a result, agriculture becomes more viable. The improvement of agricultural productivity through NREGA must get higher priority and steps in this direction need to be taken immediately. Otherwise, rice fields would disappear because the area under paddy is just 4400 hectare only in Kasaragod district in 2009-10.



Table-2: District-wise Paddy Productivity in Kerala

(Kg/Ha)

District	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Palakkad	2343	2341	2473	2463	2497	2648
Alappuzha	2441	2494	2903	1868	3053	2930
Thrissur	2406	2348	2381	2431	2575	2510
Kottayam	2491	2490	2573	2592	2936	2547
Wayanad	2578	2468	2596	2585	2657	2552
Ernakulam	1936	1926	2010	1977	1998	1949
Malappuram	2182	2108	2192	2290	2113	2251
Kannur	1878	1885	1965	1951	1783	1942
Kasaragod	2221	2286	2281	2123	2213	2107
Kollam	2307	2225	2289	2258	2149	2301
Pathanamthitta	2485	2284	2714	2314	2760	2583
Trivandrum	2378	2345	2618	2505	2429	2573
Idukki	2458	2558	2609	2721	2598	2636
Kozhikode	1455	1343	1418	1341	1390	1313
Kerala	2301	2285	2435	2308	2520	2557

Source: Various issues of Economic Review, Government of Kerala (2005, 2008, 2011)

Conclusion

This research has analysed the impact of MGNREGA on labour market with reference to wage rate of unskilled workers and productivity in rice fields of Kasaragod district. Results of the study show that wage rates for labourers, especially women unskilled labourers in rice fields have gone up. However, rice productivity stagnated to 2100 Kg per hectare ever since the inception of NREGA. It would have an undesirable

impact on paddy farmers in Kasaragod district. For instance, paddy cultivation will become unviable. In view of this, we would like to give some policy suggestions to improve rice productivity. Among them most important are the following:

- The public and private partnership under NREGA in terms of sharing of wages and works needs to be done;
- NREGA worker households should work in rice fields at least for 10 days;
- Works in the small and marginal rice land owned by BPL households should be treated as NREGA works; and,
- Works related to the improvement of rice productivity must get the first priority compared to other works under NREGA in Kasaragod. To sum it up, we need to frame a new NREGA guideline, which includes concerns of both poor farmers and poor NREGA worker households that ensures optimum benefits of NREGA.

SOURCE: A.D. Manikandan, Research Associate, Centre for Wage Employment and Poverty Alleviation (CWEPA), National Institute of Rural Development (NIRD), S.K. Dey Block, S-29, Rajendranagar, Hyderabad-30.

Microfinance in North Eastern Region of India - **What is the future?**

By Sheikh Mohammad Feroze *

The Microfinancing System of India

The term 'microfinance' is often confused with the term micro credit and used interchangeably. Microfinance is a broad term that includes deposits, loans, payment services and micro insurances.

Broadly two modules can be identified in the microfinance systems functioning in India. The first considers microfinance as down marketing of credit to the informal sector or those clients who are not considered as creditworthy for loans by the formal financial system of the country. The second module is a community based participatory approach which emphasizes on forming small groups for solving common problems and mainly covers the marginalized people of the society. These groups are known by various names, viz., Self Help Groups (SHGs), Joint Liability Groups (JLGs), Common Interest Groups (CIGs), Solidarity Groups, etc. Microfinance services can be broadly categorized as (i) SHG Model; (ii) Grameen Model; (iii) Co-operative Model; and (iv) For-profit Model. Amongst these, the SHG Model is the most popular model in India.

Regional Distribution of SHGs

Table 1. Regional spread of SHG bank linkage over the years

Regions	No of SHGs (in %)	
	2001	2007
Northern	3.42	6.22
North-Eastern	0.18	3.14
Eastern	8.43	17.98
Central	10.94	11.38
Western	5.89	9.25
Southern	71.14	52.04
Total (No)	263825	2924973

Source: RBI, 2007

During 2006-07, NABARD intensified the implementation of the programme



in the 13 identified priority states, viz., Uttar Pradesh, Orissa, West Bengal, Madhya Pradesh, Maharashtra, Gujarat, Rajasthan, Chhattisgarh, Jharkhand, Bihar, Assam, Himachal Pradesh and Uttarakhand. A paradigm shift can be observed during this period as the cumulative share of non-southern regions rose from 29 percent on 31st March 2001 to 48 percent on 31st March 2007 (Table 1) (RBI, 2007). Still, 52.04 percent of total credit linked SHGs are

based in Southern India mainly in Andhra Pradesh, Tamil Nadu and Karnataka as on 31st March, 2007.

Microfinance in North Eastern Region

Socio-economic Indicators:

It is imperative to study the socio-economic indicators of a region because they influence the growth of innovations and government policy initiations. The

Table 2. Socio-economic indicators in NER

NE States	Per Capita NSDP (Rs) (Current Prices)		BPL population (%) (uniform reform period)	Rural population as % of state's population	Road length (km) per 100 sq km
	2002-2003	2006-2007			
Arunachal Pradesh	17124	25717	17.6	79.25	19.70
Assam	14421	20194	19.7	87.10	293.65
Manipur	13250	18630	17.3	73.42	73.91
Meghalaya	18208	26387	18.5	87.08	43.87
Mizoram	20896	25682	12.6	50.37	29.21
Nagaland	19413	20892	19.0	82.77	134.53
Sikkim	19428	29819	20.1	88.93	26.40
Tripura	19059	27816	18.9	82.94	302.60
NER	17725	24392	17.96	78.15	127.87

NER lacks behind in nearly all parameters of socio-economic development in comparison to other parts of the country due to its difficult geo-physical terrain, administrative ineffectiveness and social disturbances.

A large section of the population lives below poverty line (Table 2). Per capita income is very low in these NE states in comparison to other Indian states. About 80 percent of the population in different NE states, except Mizoram and Manipur, live in rural areas and the population is sparsely distributed, other than in the valleys and Assam. The poor infrastructure of the region is also reflected by the limited rail network which is mainly concentrated in Assam. Except Tripura, Assam and Nagaland, the average road length per 100 square km in the region is much lower compared to the national average of 128.87 km of road per 100 sq km (Gol, 2010). The average road length per 100 sq km is as low as 19.70 km in Arunachal Pradesh.

Performance of banking sector in NER

Table. 3 Distribution of commercial bank branches (2009)

Regions	Number of branches	Average population (in'000) per branch
Northern	13,800	11
North-Eastern	2,133	21
Eastern	13,406	19
Central	16,027	19
Western	12,440	14
Southern	22,563	11
ALL INDIA	80,369	15
NE States		
Arunachal Pradesh	76	16
Assam	1,382	22
Manipur	80	33
Meghalaya	201	13
Mizoram	93	11
Nagaland	86	26
Tripura	215	17

Source: RBI, 2009



A glance of the performance by formal financial agencies will help to understand the scope and prospect of microfinance in NER. The number of bank branches in the region is insufficient as one branch in the region serves up to 21,000 people whereas Indian average is 15,000 people per branch (Table 3).

Table 4. Credit-deposit ratio (in %) of commercial banks (2008)

Regions	Credit: Deposit	(Investment + Credit + RIDF): Deposit
Northern	68.5	75.1
North-Eastern	35.8	60.1
Eastern	48.9	66.7
Central	44.8	63.6
Western	85.2	79.3
Southern	88.4	103.8
All India	72.6	80.2
NE States		
Arunachal Pradesh	24.8	74.2
Assam	38.3	59.4
Manipur	38.7	67.6
Meghalaya	27.6	52.7
Mizoram	58.7	90.0
Nagaland	30.7	70.5
Tripura	29.8	47.0

Source: RBI, 2009

Within the NER, the pressure on banks is highest in Manipur and least in Mizoram. The credit deposit ratio is worst in Arunachal Pradesh and best in Mizoram within the NER.

Performance of Primary Agricultural Cooperative Societies (PACs) is also not satisfactory in the region. The working capital is miniscule and the number of dormant and defunct societies is very high in the region (Table 5). Within NER states the maximum numbers of PACs were formed in Nagaland but a large number of them have been declared dormant and defunct. Assam has the second highest number of PACs, but the working capital is only Rs. 111 crore.

The analysis of microfinance programme in India reveals that only five percent of the total SHGs are concentrated in NER and saving per SHG is also found to be minimum in the region (Table 6). Within the NER, the maximum number of SHGs was formed in Assam but saving performance is not satisfactory in the state. Per SHG saving is highest in Tripura, followed by Sikkim and Mizoram.

The average magnitude of loan was maximum in Nagaland followed by Sikkim and Tripura.

Loan withstanding per SHG in NER was only higher than the Eastern region (Table 8)

State-Specific Special Projects

NABARD sanctioned Rs. 39.15 lakh for implementing the project 'Micro Finance

Table 5. Performance of PACS (2008)

Regions	No. of PACS	No. of Villages	Members (in '000)	Working capital (in crore Rs)	Dormant Societies	Defunct Societies
Northern	12,768	93,414	11,177	19,891	669	245
North - Eastern	3,511	37,599	3,791	810	680	390
Eastern	18,385	203,891	38,213	10,277	1,561	1,188
Central	16,123	198,233	13,118	7,859	444	177
Western	29,351	65,367	13,429	18,068	678	272
Southern	14,804	80,083	51,800	31,200	646	197
TOTAL	94,942	6,78,587	1,31,529	88,106	4,678	2,469
NE States						
Arunachal Pradesh	31	3,649	18	16	-	-
Assam	766	24,590	3,034	111	-	-
Manipur	186	-	128	459	-	-
Meghalaya	184	5,780	186	18	5	10
Mizoram	175	710	120	2	19	-
Nagaland	1,719	969	14	112	655	379
Sikkim	180	861	29	2	-	-
Tripura	270	1,040	262	90	1	1

Source: RBI, 2009

Performance of SHGs in NE Region

Table 6. Saving performance (in Rs '000) as on 31st March 2009

Regions	SHGs	Savings	Savings/SHG
Northern	310998	2270392	7.30
North-Eastern	240093	1021016	4.25
Eastern	1233635	15968804	12.94
Central	712915	3867920	5.43
Western	796262	6642840	8.34
Southern	2827244	25685210	9.08
GRAND TOTAL	6121147	55456182	9.06
NE States			
Assam	180996	629692	3.48
Meghalaya	9625	32769	3.40
Nagaland	6057	15765	2.60
Tripura	22811	285882	12.53
Arunachal Pradesh	5148	9363	1.82
Mizoram	4230	18463	4.36
Manipur	9474	19178	2.02
Sikkim	1752	9905	5.65

Source: NABARD, 2009



Vision 2011' in Arunachal Pradesh during 2008-09. Further, an amount of Rs 33.66 lakh was sanctioned to the Essom Foundation Trust for setting up a Resource Centre at Itanagar to provide operational inputs, capacity building support and marketing linkages among the groups. Tripura Government initiated a project on SHGs in December, 2008 which aims to credit link the 11,500 existing SHGs. A huge amount of Rs. 5 lakhs was sanctioned to Department of Posts, Shillong in Meghalaya for lending to 50 SHGs in East Khasi Hills.

Challenges

The micro-finance movement started late in the region and the SHG movement varies across the states of the NER. The movement is relatively better in Meghalaya and Tripura whereas in some states such as Arunachal Pradesh, it is yet to take off. Though the ground was favourable, still the movement failed to flourish in the region due to several reasons which have roots in the peculiarity of the region. The sparse population is one of the major hindrances in forming groups which require 10-20 members. As the banks are thinly spread and mainly located in urban clusters in



the valleys it is difficult for the SHGs far-flung to link with banks. The lack of roads and transportation facilities add to the woe, and increases the cost of promoting SHGs. Motivating the tribal poor to form groups is a big challenge. Moreover, it is very difficult to bring ten people to an agreement for investing in a common micro-enterprise as group members. The principle and motto of cooperation evaporates leading to meager incomes from individual micro-enterprises.

Concluding Remarks

Financial intervention such as microfinance has the potential to play an important role in the development of the region through financial and social inclusion. Meaningful modification of the existing module of SHGs prescribed by NABARD is needed to make the microfinance movement successful. Focus should be on the micro-activities through which the majority of the people earn their livelihood. Involvement of NGOs may bring positive influence on the microfinance movement.

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Table 7. Loans (in Rs '000) distributed during 2008-09

Regions	SHGs	Bank Loan	Loan/SHG
Northern	42688	3024324	70.85
North-Eastern	35506	2464179	69.40
Eastern	236789	12376664	52.27
Central	101060	7814081	77.32
Western	125173	5839285	46.65
Southern	1068370	91016607	85.19
NE States			
Assam	26448	1569620	59.35
Manipur	903	48623	53.85
Meghalaya	1003	50943	50.79
Sikkim	982	125267	127.56
Tripura	4766	542837	113.90
Nagaland	94	20051	213.31
Arunachal Pradesh	391	22965	58.73
Mizoram	919	83873	91.27
Total	35506	2464179	69.40

Source: NABARD, 2009

Table 8. Outstanding loan (in Rs '000) against SHGs as on March 2009

Regions	SHGs	Loan Outstanding	Outstanding Loan/SHG
Northern	166511	6789197	40.77
North-Eastern	117812	4693053	39.84
Eastern	933489	30230032	32.39
Central	332116	20453313	61.58
Western	393499	15511474	39.42
Southern	2280911	149121356	65.38
Grand total	4224338	226798425	53.69
NE States			
Assam	88878	3285542	36.97
Manipur	3410	70817	20.77
Meghalaya	3115	113932	36.58
Sikkim	3975	393560	99.01
Tripura	10401	370562	35.63
Nagaland	883	89112	100.92
Arunachal Pradesh	4872	230256	47.26
Mizoram	2278	139272	61.14
Total	117812	4693053	39.84

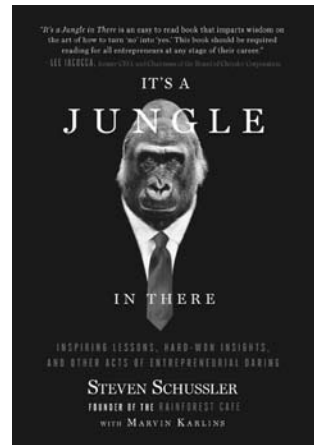
Source: NABARD, 2009

It's a Jungle in There: Inspiring Lessons, Hard-Won Insights, and Other Acts of Entrepreneurial Daring

By Steven Schussler

As a burgeoning businessman in the 1980s, Steven Schussler stopped at nothing to make his dream of a tropical-themed restaurant come true, even turning his home into a rainforest-complete with indoor waterfall, life-size replica of an elephant and 40 tropical birds-in order to have a prototype to show potential investors. Drawing from his own life and business triumphs, Schussler offers would-be entrepreneurs a new way of utilizing creativity to achieve their dreams.

Schussler distils his principles for entrepreneurs on a budget, and also reveals the ways in which his lessons – from self-branding to developing strategic partnerships to giving recognition where recognition is due – can work in larger corporations. Just like his famous themed restaurants, Schussler's insights provide entertainment, education, and ample food for thought for all business people aspiring to their next level of success.



Branding India: An Incredible Story

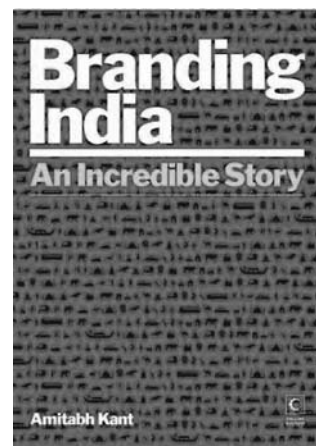
By Amitabh Kant

The book is a case history of the remarkable transformation in Indian tourism in the last seven years. In 2001-2002, after the destruction of the World Trade Centre, the war on Afghanistan and the attack on Indian Parliament, tourism was down in the dumps in India. It was at the peak of this crisis that the 'Incredible India' campaign to position India as a tourist destination was launched.

This is the story of how that campaign

triggered the take-off of Indian tourism, and how support sectors like aviation, hotels and infrastructure grew in tandem so that in 2008 India got 5.38 million visitors compared to the 2.54 million in 2001.

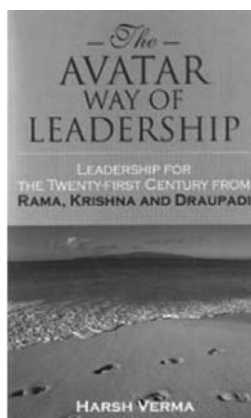
The author, Amitabh Kant, played a key role in this phenomenon as joint secretary in the Union Ministry of Tourism. He writes a scholarly book that is full of personal insights into a remarkable growth story.



The Avatar Way of Leadership: Leadership for the Twenty-First Century From Rama, Krishna and Draupadi

By Harsh Verma

The Avatar Way of Leadership builds an Indian model of leadership by using insights of Jungian psychology, the tales of the Avatars of Hindu mythology and real examples of leaders in contemporary life. It develops a unique perspective of leadership as a process comprised of three successive stages: developing character; building relationships; and devising good strategies. Character attracts people. Relationships turn attraction into loyalty. Good strategies in turn lead to victory, and help sustain attraction and loyalty.



Three Avatars have been chosen for this model: Rama, Krishna and Draupadi who represent different leadership archetypes. Each archetype of leadership is explained with references to real Indian leaders like the former President of India A.P.J. Abdul Kalam; J.R.D. Tata; Atal Bihari Vajpayee; Buddhadeb Bhattacharjee; Ratan Tata; Dhirubhai Ambani, Narayan Murthy; Azim Premji, and several others who have shown the same kind of leadership pattern in their lives. Find out who possesses leadership traits of which Avatar and you will know the way to become the same kind of leader yourself.



AGRI NEWS

Madhya Pradesh Poised to Emerge as Economic Force

Bhopal: Global business information provider Dun and Bradstreet has said that Madhya Pradesh is poised to emerge as a major economic force in the country due to sustained efforts being made by the state. According to Dun Bradstreet 'India 2020', Madhya Pradesh will be contributing significantly to economic growth of India, an official release recently said.

In 2007, at the Global Investors' Summit at Indore, leading industrialist Anil Ambani also said that Madhya Pradesh with immense natural wealth, central geographical location and a committed government, should be prepared to play a leading role in economic growth of the country. "Both predictions are proving to be true, given the fact that Madhya Pradesh has been registering impressive economic growth over the last six-seven years," it said.

The growth rate of the state (GSDP)

which was only three percent in 2004-05 is estimated to have shot up to nine percent in 2010-11 as per the assessment made using the available data.

In the preceding year 2009-10, the State posted a remarkable 9.55 percent growth despite 35 percent deficient rainfall. Besides, in 2009-10 the agriculture growth rate was 7.2 percent while the national average agriculture growth rate was negligible. The industrial growth rate of the state during the period was 10.1 percent.

As per an the all India survey for poverty assessment, the per capital consumption in rural Madhya Pradesh is higher than five major States Bihar, Chhattisgarh, Orissa, Uttar Pradesh and Jharkhand, the release said. In urban Madhya Pradesh, the per capita consumption is higher than six States. These include Rajasthan in addition to the above mentioned five States, it said.

Bill Seeks to Amend Agriculture Council Act

A Bill seeking to amend the Tamil Nadu State Agriculture Council Act 2009 (Tamil Nadu Act 19 of 2009) was recently introduced in the Assembly. Agriculture Minister K.A. Sengottaiyan, who introduced the Bill, said that an amendment was necessary because the existing Act prevented "the activities of sharing or advising the farmers by the people who have traditional knowledge and by the non-governmental organisations."

He pointed out that in Tamil Nadu, while "those who qualify in agriculture

or horticulture do not practise the same or take up farming activities, as in the case of those who qualify in medicine and law," traditional farmers, who possessed the knowledge of natural farming or their representatives, could not become the members of the Council because they did not possess agricultural qualification. "Ultimately, the Act will prevent the natural way of farming, the independence of farming community and the education of agriculture will rest in the hands of private entrepreneurs," he said.

Push Agriculture, Manufacturing Growth for 9.5% Expansion in 12th Five Year Plan

New Delhi: India can achieve 9.5 percent average economic growth in the 12th Five Year Plan, provided steps are taken to push agriculture growth to 4.2 percent and manufacturing to 11.5 percent. According to the growth scenarios given in the draft Approach Paper to the 12th Plan (2012-17), it is possible to achieve high economic growth on the back of robust performance in the other sectors of the economy.

These projections were provided in the document that has recently been approved by the Full Planning Commission headed by the Prime Minister Manmohan Singh. The Full Commission, however, has settled for 9 percent economic growth, although Singh indicated that it is possible to raise the growth target to 9.2 percent in the 12th Plan.

However, in order to achieve 9.5 percent, the government will have to raise the farm sector growth target to 4.2 percent from an estimated 3.3 percent in the 11th Plan (2007-12). Although the Commission had earlier set a target of 4 percent growth in the 10th Plan (2002-07), the country could achieve 2.3 percent. Similarly, the panel would have to raise the growth target of manufacturing to 11.5 in the 12th Plan from an estimated 8.3 percent in the current Plan.

The other important areas include electricity, gas and water supply where the Commission suggests that 9 percent growth is required to achieve 9.5 percent economic growth in next Plan. Electricity, gas and water supply combined together are expected to register a growth rate of 6.4 percent in the current Plan which is lower than 6.8 percent achieved in the 10th Plan.



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- Consultancy for World Bank Assisted Process Monitoring of Andhra Pradesh Rural Poverty Reduction Project – Phase-II (Zone-II) – Society for the Elimination of Rural Poverty, Government of Andhra Pradesh – 2007-08
- Implementation of DFID funded Western Orissa Rural Livelihood Project (WORLP) – Watershed Development Mission, Govt. Of Orissa – 2005-2010
- Comprehensive Watershed Development Project in Karnataka - Watershed Development Department (WDD)- Government of Karnataka – 2006-07
- Madhya Pradesh Tribal Development Project - The International Fund for Agriculture Development (IFAD), Rome – 1997

Grass Roots level Livelihood Implementation

AFC has undertaken large scale Agricultural Extension Programme in 820 Blocks covering all 71 districts of Uttar Pradesh.

The mission of the implementation project is to increase the farm productivity, profitability and sustainability of farming systems, efficient use of natural resources and agricultural inputs etc., by customised farmers' trainings at village cluster level and to provide online information on weather parameters, demand and use of agricultural inputs and market intelligence.

Organic Farming

This project involves the adoption and certification of Organic Farming in 22000 hectares.

Watershed Development

AFC is implementing Livelihood Development Programme based on Watershed Development with funding by DFID, and NABARD.

Panchayati Raj Institutions

AFC has set up an independent division for providing support services in terms of grass roots level planning, training of various stakeholders in UP, Bihar and Jharkhand. AFC has prepared Perspective District Plans in 25 districts of Uttar Pradesh under Backward Region Grant Fund (BRGF). AFC has also conducted TNA and prepared Training Manual for PRIs in Jharkhand.

The PRI division will also provide the following services:

- Organise training programmes for the senior & middle level executives of the NGOs.
- Capacity building of the ERs and various stakeholders.
- Conduct research studies, develop learning material for each level on local self governance, organise seminars and workshops, promote exchange of academic expertise on various aspects related to local planning & DPCs, disseminate specialised information and provide expert advice to all concerned.
- Take up advocacy role to strengthen democratic process, particularly grassroots level democracy through decentralised institutions.
- Lay special emphasis on involving the poor, marginalised and weaker sections of the society in the democratic governance.



