International Journal of Forestry and Crop Improvement
Volume 7 | Issue 2 | Dec., 2016 | 150-156 | ■Visit us : *www.researchjournal.co.in*
e ISSN-2230-9411

RESEARCH ARTICLE

DOI: 10.15740/HAS/IJFCI/7.2/150-156

Adoption of bamboo cultivation practices and its relationship with the socio-economic characteristics of bamboo growers of Arunachal Pradesh

P. HANDIQUE, P. RETHY AND B.K. DUTTA

ABSTRACT : The present study was conducted in Papum pare district of Arunachal Pradesh and selected 160 bamboo growers covering four circle based on elevation. The mean value of adoption score (41.54) is highest in Balijan followed by Kimin (40.26) and lowest in Sagalee circle (35.39). So, the farmers of Balijan circle are much more advanced in adopting the scientific bamboo cultivation practices as compared to other circles. A positive correlation is found in all socio-economic characteristics except age. The co-efficient of multiple determinations explain that all the six variables in overall sample, jointly contributes 53.65 per cent variation in overall adoption score.

KEY WORDS : Adoption, Scientific, Bamboo, Relationship

HOW TO CITE THIS ARTICLE : Handique, P., Rethy, P. and Dutta, B.K. (2016). Adoption of bamboo cultivation practices and its relationship with the socio-economic characteristics of bamboo growers of Arunachal Pradesh. *Internat. J. Forestry & Crop Improv.*, **7** (2) : 150-156, **DOI: 10.15740/HAS/IJFCI/7.2/150-156.**

ARTICLE CHRONICAL : Received : *15.06.2016;* Revised : *05.11.2016;* Accepted : *19.11.2016*

INTRODUCTION

The Extent of adoption in the present study refers to the level of adoption of scientific bamboo cultivation practices by the bamboo growers of Papum pare district of Arunachal Pradesh. It should be worth mentioning that the demand of traditionally important bamboo species has been increasing much more than the available species. To meet the daily requirement of bamboo, only a few farm families have taken initiative for cultivation and management of these species. Though the present bamboo cultivation technique is based on experience rather than on scientific basis, it should be mentioned that some of the indigenous techniques followed by them are scientific, which are knowingly or unknowingly modified by themselves through trial and error method. Therefore, it is most important to know as to what extent the bamboo growers are following scientific cultivation techniques. This information will be valuable for modification of traditional cultivation techniques in future. GOI has also launched National Bamboo Mission to promote, develop and disseminate modern scientific

MEMBERS OF RESEARCH FORUM

Address of the Correspondence : **P. HANDIQUE,** Krishi Vigyan Kendra (A.A.U.), Garumuria, LAKHIMPUR (ASSAM) INDIA Email: prodip_h@rediffmail.com

Address of the Coopted Authors : P. RETHY, Department of Forestry, North Eastern Regional Institute of Science and Technology, NIRJULI (ARUNACHAL PRADESH) INDIA

B.K. DUTTA, Department of Ecology and Environmental Sciences, Assam University, SILCHAR (ASSAM) INDIA

technologies as well as to generate employment opportunities among the rural people. Considering the above points, the following objectives were selected for the study in Arunachal Pradesh.

– To study the extent of adoption of scientific bamboo cultivation practices followed by the bamboo growers of Papum pare district of Arunachal Pradesh

– To study the relationship between the extent of adoption and personal characteristics of bamboo growers.

EXPERIMENTAL METHODS

The present study was conducted in Papumpare district, the heart of the state, Arunachal Pradesh, characterized by hilly ridges, mountains and valleys and covered with green lush vegetation throughout the year. The Nyishis, the indigenous inhabitants, are agrarian in nature and practice shifting as well as settled cultivation using their indigenous technology. Purposive cum random sampling technique was followed for selection of circles, villages and respondents from the district.

Out of the four study sites of the district, Sagalee (825m to 910m asl) and Toru (395m to 538m asl) civil circles are totally hilly and most of the people practice jhum cultivation for crop production. The other two, Kimin and Balijan circles are located in the border area between Arunachal Pradesh and Assam. Most of the people of Balijan, practice the wet rice cultivation and raise maize, millet, pulses, vegetables etc., as the topography of location is almost plain.

Selection of dependent and independent variables and their measurement :

Based on the objectives, the independent variables age, educational level, size of operational land holding, social participation, annual family income and socio economic status of the bamboo growers were selected. The selected dependant variable "Extent of adoption of scientific bamboo cultivation practices of the respondents" was determined for five main aspects namely, propagation, land preparation, planting and fertilizer application, management of bamboo groves, harvesting and disease and pest control. The extent of adoption was calculated as per scale developed by Rogers (1957) and classified into 3 categories (Dasgupta, 1989).

Statistical measures used in the study were arithmetic mean, percentage, standard deviation, co-efficient of variation, Pearson's co-efficient of correlation, t-test and multiple linear regressions analysis.

EXPERIMENTAL RESULTS AND ANALYSIS

The results obtained from the present investigation as well as relevant discussion have been summarized under the following heads :

Extent of adoption of selected scientific cultivation practices:

Bambusa tulda and *B. pallida* are the two major cultivated bamboo species which forms a very important land use among the Nyishi people of Papumpare district. The traditional knowledge system for cultivation of bamboo species has evolved in response to their environment and many elements of their ethnic science, technology and management system, which has significant utility in the design and products of sustainable development process. In the same way the scientific bamboo cultivation techniques are developed considering traditional cultivation practices, soil and climatic condition in the respective areas, altitude, slope of the land, culture and economic condition of the people, yield and productivity of bamboo and its utilization. So, there are some common practices in both traditional and scientific cultivation methods which are followed by the farmers for getting better productivity. Besides, the farmers are also motivated to follow some scientific bamboo cultivation practices by gathering knowledge from different sources like magazines, related trainings, TV, radio, news paper, neighbors, extension personel and observing scientifically managed bamboo gardens within or outside the state.

Table 1 reveals that propagation of bamboo is generally done by 100 per cent bamboo growers through rhizome or offset as the bamboo seeds are difficult to gather and also very costly. Availability of bamboo seed also limited as bamboo flowered once in life time *i.e.,* 50 – 70 years. March- May is the most suitable planting time for cultivation in mid to low altitude areas and is considered as an important factor for successful bamboo plantation programme (Pandey and Tripathi, 2006 and Taj *et al.,* 2007). On an average, 45 per cent of Nyishi bamboo growers from the study circles multiplied bamboo through planting disease free healthy 1 to 2 years old offset or rhizome with 3-4 node cuttings at the length of

1 m from rhizome. These are collected from the outer ring of bamboo groves and planted during the month of March to May in sunny plots. These practices help in establishment of planting materials in soil, initiation of sprouting, proper growth and development of culms. Bamboo growers prefer the pre-monsoon season as it is very effective season for initiation and establishment of roots and shoots. They even covered the cut portion of bamboo culms by using cow dung /mud/ Banana leaves. The practice prevents drying of planting material at the time of root initiation.

The recommended scientific land preparation like cleaning of field one month ahead of planting is done by 30.63 per cent of bamboo growers in the study sites (Table 2). A few percent of the farmers (10-30%) in the study sites follow scientific land preparation technique *i.e.*, cleaning time, size of pit for planting and prior preparation of pit for planting in the selected plot. Overall scientific method of land preparation is adopted mostly in Kimin followed by Balijan and lowest adoption is in Toru circle. It is also recorded that young men are not allowed to plant bamboo saplings because of the fear that if the bamboo grows very vigorously, the potency of the person will be transferred to the bamboo groves leaving him impotent (Sarkar and Sundryal, 2002).

Proper sun shine, row direction (North-South) and spacing for bamboo plantation are very essential for harnessing the solar energy through photosynthesis in bamboo leaves. Table 3 reveals that highest percentage (57.50%) of bamboo growers from Sagalee followed recommended line spacing (5-7m) followed by Balijan (42.86%) that may help in proper growth and development of bamboo groves. On the other hand, North-south direction for bamboo plantation is practiced by 55.00 per cent of the farmers in Kimin followed by Toru (52.63%). Majority of the bamboo growers (65 - 80%) in all the

Table 1 : Extent of adoption on scientific propagation on bamboo cultivation practices

Bamboo cultivation practices		Frequency (%), n=40				Overall (n=160)
		Sagalee	Toru	Kimin	Balijan	
		Propagation				
Propagation materials	Offset/ Rhizome planting*	40 (100.00)	40 (100.00)	40 (100.00)	40 (100.00)	160 (100.00)
Selection of mother plant	Healthy, disease free propagating materials*	17 (42.50)	14 (35.00)	19 (47.50)	23 (57.50)	73 (45.63)
Age of mother plant	1-2 years*	23 (57.50)	21 (52.5)	23 (57.50)	27 (67.50)	94 (58.75)
Planting materials selected from	Outer ring of groves*	24 (60.00)	19 (47.50)	26 (65.00)	33 (82.50)	102 (63.75)
Length of planting material	Upto 1m (3- 4 nodes) *	16 (40.00)	14 (35.00)	17 (42.50)	27 (67.50)	74 (46.25)
	Above 1 m ($\geq$ 5 nodes)	24 (60.00)	26 (65.00)	23 (57.50)	13 (32.50)	86 (53.75)
Cut mark covered with	Cow dung /mud/ Banana leaves*	25 (62.50)	27 (67.50)	27 (67.50)	23(57.50)	102 (63.75)
	Cow dung /mud/ plant leaves + cavity filled up with water*	6 (15.00)	2 (5.00)	4 (10.00)	8 (20.00)	20 (12.50)

Star marks (*) indicates the recommended scientific bamboo cultivation practices and values in parenthesis indicate percentage of extent of adoption

Table 2 : Extent of adoption of scientific methods of site selection and preparation

Bamboo cultivation practices		Frequency (%), n=40				Overall (n=160)
		Sagalee	Toru	Kimin	Balijan	
		Land preparation				
Land selected for plantation	Sunny*	16 (40.00)	15 (37.50)	26 (65.00)	29 (72.50)	86 (53.75)
Cleaning of field before planting	Done*	13 (32.50)	7 (17.5)	18 (45.00)	11 (27.50)	49 (30.63)
Cleaning time	Jan – Feb*	9 (22.50)	4(10.00)	10 (25.00)	5 (12.50)	28 (17.50)
	March – April	9 (22.50)	9 (22.50)	25 (62.50)	20 (50.00)	63 (39.38)
	May – Jun	22 (13.75)	27 (67.50)	5 (12.50)	15 (37.50)	69 (43.13)
Size of pit for planting offset/ rhizome	30x30x30cm	19 (47.50)	22 (55.00)	21 (52.5)	17 (42.50)	79 (49.38)
	45x45x45cm	12 (30.00)	11 (27.50)	13 (32.50)	13 (32.50)	49 (30.63)
	60x60x60cm*	9 (22.50)	7 (17.5)	6 (15.00)	10 (25.00)	32 (20.00)
Preparation of pit	Prior to plantation*	6 (15.00)	5 (12.50)	7 (17.50)	9 (22.50)	27 (16.88)
	During plantation	34 (85.00)	35 (87.50)	33(82.50)	31 (77.50)	133 (83.13)

Star marks (*) indicates the scientific bamboo cultivation practices and values in parenthesis indicate percentage of extent of adoption

study sites buried 1-2 nodes of planting material into the soil. Only a small percentage of farmers (<35%) of the study circles are using irrigation and Farm Yard Manure (FYM) after planting for quick establishment of saplings in soil. Bamboo requires sufficient moisture for the luxuriant growth and scarcity of moisture adversely affect the growth particularly during winter months. Considering the above points, farmers of Balijan circle are found to

Table 3 : Extent of adoption on planting and fertilizer application

Bamboo cultivation practices		Frequency (%), n=40				Overall (n=160)
		Sagalee	Toru	Kimin	Balijan	
Spacing between plants in line	<5m	3 (7.50)	4 (10.00)	1 (2.50)	5 (12.50)	13 (8.13)
	5m – 7m*	23 (57.50)	12 (30.00)	15 (37.50)	17 (42.50)	67 (41.88)
	>7m	14 (35.00)	24 (60.00)	24 (60.00)	18 (45.00)	80 (50.00)
Time of planting	March – May*	19 (47.50)	15 (37.50)	32 (80.00)	24 (60.00)	90 (56.25)
	June - July	21(52.5)	25 (62.5)	8(20.00)	16 (40.00)	70 (43.75)
No. of nodes buried during planting	1-2*	27 (67.50)	31 (77.50)	28 (70.00)	31 (77.50)	117 (73.13)
Row direction	East – West	11 (27.50)	8 (20.00)	15 (37.50)	13 (32.500)	47 (29.38)
	North – South*	17 (42.50)	21 (52.5)	22 (55.00)	18 (45.00)	78 (48.75)
	Others	12 (30.00)	11 (27.50)	3 (7.50)	9 (22.50)	35 (21.88)
Irrigation after planting	At least once in a week*	2 (5.00)	4 (10.00)	3 (7.50)	5 (12.50)	14 (8.75)
	Sporadic	10 (25.00)	9 (22.50)	8 (20.00)	11 (27.50)	38 (23.75)
Manu ring during planting	Soil with farm yard manure*	11 (27.50)	6 (15.00)	9 (22.50)	12 (30.00)	38 (23.75)
Chemical fertilizer use		0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)

Star marks (*) indicates the scientific bamboo cultivation practices

Table 4 : Extent of adoption on management of bamboo groves

Bamboo cultivation practices		Frequency (%), n=40				Overall (n=160)
		Sagalee	Toru	Kimin	Balijan	
Earthing up around clump	Yes*	16 (40.00)	11 (27.50)	13 (32.50)	17 (42.50)	57 (35.63)
Earthing up no	1	14 (35.00)	8 (20.00)	8 (20.00)	13 (32.50)	43 (26.88)
	2*	2 (5.00)	3 (7.50)	5 (12.50)	4 (10.00)	14 (8.75)
Earthing up time	Jan – Feb	2 (5.00)	2 (5.00)	2 (5.00)	3 (7.50)	9 (5.63)
	Mar- April*	9 (22.50)	9 (22.50)	10 (25.00)	12 (30.00)	40 (25.00)
	May - June	5 (12.50)	0	1 (2.50)	2 (5.00)	8 (5.00)
	Oct – Nov*	2 (5.00)	3 ((7.50)	5 (12.50)	4 (10.00)	14 (8.75)
Weeding	Yes*	17 (42.50)	12 (30.00)	18 (45.00)	21 (52.50)	68 (42.50)
Weeding number /year	One time	16 (40.00)	10 (25.00)	14 (35.00)	16 (40.00)	56 (35.00)
	Two times*	1 (2.50)	2 (5.00)	4 (10.00)	5 (12.50)	12 (7.50)
Time of weeding	Feb – March	2 (5.00)	-	3 (7.50)	3 (7.50)	8 (5.00)
	April – May*	3 (7.50)	3 (7.50)	2 (5.00)	4 (10.00)	12 (7.50)
	Jun – July	12 (30.00)	9 (22.50)	13 (32.50)	14 (35.00)	48 (30.00)
	Aug- Sept*	1 (2.50)	2 (5.00)	4 (10.00)	5 (12.50)	12 (7.50)
Pruning of branches	Yes*	19 (47.50)	16 (40.00)	23 (57.50)	25 (62.50)	83 (51.88)
Time of pruning	Oct – Nov	6 (15.00)	5 (12.50)	4 (10.00)	3 (7.50)	18 (11.25)
	Dec – Jan*	9 (22.50)	9 (22.50)	12 (30.00)	17 (42.50)	47 (29.38)
	Feb – March	4 (10.00)	2 (5.00)	7 (17.50)	5 (12.50)	18 (11.25)
Clump cleaning	Yes*	13 (32.50)	15 (37.50)	19 (47.50)	23 (57.50)	70 (43.75)
Time of clump cleaning	Dec – Jan	1 (2.50)	3 (7.50)	4 (10.00)	6 (15.00)	14 (8.75)
	Feb – March*	9 (22.50)	10 (25.00)	12 (30.00)	14 (35.00)	45 (28.13)
	April – May	3 (7.50)	2 (5.00)	3 (7.50)	3(7.50)	11 (6.88)
Mulching	Yes*	15 (37.50)	17 (42.50)	19 (47.50)	21 (52.5)	72 (45.00)
Mulching materials used	Bamboo leaves*	11 (27.50)	11 (27.50)	12 (30.00)	13 (32.50)	47 (29.38)
	Other plant leaves*	4 (10.00)	6 (15.00)	7 (17.50)	8 (20.00)	25 (15.63)

NB: Star marks (*) indicates the scientific bamboo cultivation practices and values in parenthesis indicate percentage of extent of adoption

be much more conscious for irrigating and manuring the saplings for their quick establishment in the pit as compared to other circles. Simultaneously, majority of the bamboo growers from Kimin follow scientific planting methods and fertilizer application followed by Balijan and Toru circle.

Scientific management of bamboo groves is very much essential to obtain high productivity and to minimize clump congestion as well as for proper growth of the culms. Proper management on bamboo groves also provides good quality culms at the time of harvesting. Farmers of Balijan circle are much more conscious in adopting the different scientific management practices of bamboo groves like earthing up, weeding, pruning, clump cleaning and using bamboo or other plant leaves as mulching materials, followed by Kimin (Table 4).

Table 5 reveals that majority of the farmers from Balijan circle follow the scientifically recommended selective harvesting at 1-2 nodes above whereas recommended practice of harvesting in the month of Dec.–March and proper disease pest management practices in bamboo groves for getting healthy culm is followed by the farmers of Kimin circle. If the clumps are scientifically managed, harvesting should be done annually on the basis of a culm selection system (Kumar and Seethalakshmi, 2006) which is practiced in the present study sites also.

It also reveals (Table 6) that mean value of adoption score (41.54) is highest in Balijan followed by Kimin (40.26). The lowest mean value (35.39) is observed in Sagalee circle of Papumpare district. Hence, it can be concluded that the farmers of Balijan circle are much more advanced in adopting the scientific bamboo cultivation practices, followed by Kimin circle. The Balijan and Kimin circles are situated at the boarder of Assam. Therefore, farmers of these areas are much more exposed to the Assamese society. Hence they are better improved as compared to other circles. They are also well connected with road and transport for selling of bamboo to the Hindustan Paper Mill situated at Nagaon, Assam. Hence, the knowledge of the farmers on bamboo cultivation and its management in these two locations are more advanced as compared to other locations.

Relationship between socio - economic characteristics of bamboo growers and extent of adoption :

In the present study, a positive correlation is found in all socio-economic characteristics except age in overall data (Table 7). On the other hand, a negative correlation between age and extent of recommended bamboo cultivation practices is found. It implies that young farmers

Table 5 : Extent of adoption on harvesting and disease and pest control

Bamboo cultivation practices		Frequency (%), n=40				Overall (n=160)
		Sagalee	Toru	Kimin	Balijan	
Harvesting and disease pest control						
Harvesting months	Dec. – March*	23 (57.50)	16 (40.00)	25 (62.50)	20 (50.00)	84 (52.50)
Harvesting system	Felling of all old culm (NSH)	19 (47.50)	23 (57.50)	13 (32.50)	9 (22.50)	64 (40.00)
	Keeping few old and 1-2 years old culm / selected harvested (SH) *	21 (52.50)	17 (42.50)	27 (67.7)	31 (77.50)	96 (60.00)
Harvested at nodes	1-2 nodes*	18 (45.00)	21 (52.5)	23 (57.50)	26 (65.00)	88 (55.00)
Disease pest control	Yes*	13 (32.50)	8 (20.00)	16 (40.00)	14 (35.00)	51(31.88)

Star marks (*) indicates the scientific bamboo cultivation practices and values in parenthesis indicate percentage of extent of adoption

Table 6 : Distribution of respondents based on the extent of adoption score of scientific bamboo cultivation techniques

Category	Frequency (%), n=40				Total (n=160)
	Sagalee	Toru	Kimin	Balijan	
Low (<19.85)	7 (17.50)	11 (27.50)	7 (17.50)	2 (5.00)	27 (16.88)
Medium (19.85 to 54.88)	26 (65.00)	26 (65.00)	23 (57.50)	29 (72.50)	104 (65.00)
High (>54.88)	7 (17.50)	3 (7.50)	10 (25.00)	9 (22.50)	29 (18.13)
Mean	35.39	31.32	40.26	42.50	37.37
S.D.±	17.20	15.11	18.93	17.05	17.51
CV (%)	48.60	48.24	47.02	40.12	46.86

NB: Values in parenthesis indicate percentage of respondents

are more conscious to adopt scientific bamboo cultivation practices as compared to older farmers. The young farmers are much more knowledgeable than the older generation. They are the literate as compared to older ones. Now-a-days, the younger people receives education from formal education system as well as from informal education from different sources and they practice these scientific technology in their field to get higher income. On the other hand, a positive correlation is found between the extent of adoption of scientific cultivation practices and educational level, size of operational land holding, social participation, annual family income and socio economic status of the respondents. It indicates that with the increase in educational level, size of operational land holding, social participation, annual family income and socio-economic status of the respondents to the extent of adoption also increase.

Larger in size of operational land holding motivates the farmers to expand the bamboo cultivation area along with the use of scientific cultivation practices. Hence, the big farmers are always ready to try and use new technology developed by the respective organization. The big farmers are also high risk taker in adoption of the new technology. Annual family income is also an important factor for adopting a new technology. The extent of adoption increase with the increase in annual family income.

The position of the farmers in the society allow him to follow some principles which teaches him how to think, not what to think and to do and what he is suppose to do. Therefore, with the increase in the level of socio-economic status the extent of adoption also increases which in turn increase the yield and income of the family.

Contributory effects of the selected independent variables on the extent of adoption :

Table 8 reveals that educational level is the good predictor found to be significant at 0.05 and 0.01 level of probability for contributing the variation to the extent of adoption of the recommended bamboo cultivation practices in Sagalee and Balijan circle, respectively. Education brings about the desirable changes in knowledge (things known), attitude (things felt) and skills (things done). It changes thinking power, analytical power as a result it helps to develop a positive attitude to take up a new technology. Informal education is the life long process by which every person acquires and accumulates knowledge, skills, attitude and insight from daily experiences and exposure to the environment at home, at work etc which is also associated with the position of

Table 7 : Relationship between farmer's characteristics and extent of adoption of scientific cultivation methods

Independent variables	Sagalee (n=40)		Toru (n=40)		Kimin (n=40)		Balijan (n=40)		Overall (n=160)	
	r value	t value	r value	t value	r value	t value	r value	t value	r value	t value
Age	-0.418	2.844**	-0.515	3.707**	-0.258	1.647	-0.215	1.361	-0.387	5.276**
Educational level	0.707	6.173**	0.628	4.974**	0.397	2.671*	0.609	4.739**	0.610	9.695**
Size of land holding	0.138	0.861	0.274	1.761	0.285	1.835	0.296	1.912	0.235	3.047**
Social participation	0.662	5.452**	0.531	3.867**	0.630	5.006**	0.415	2.817**	0.561	8.524**
Annual income	0.638	5.120**	0.680	5.728**	0.625	4.945**	0.712	6.264**	0.667	11.260**
Socio-economic status	0.288	1.856	0.535	3.906**	0.615	4.819**	0.588	4.483**	0.520	7.663**

* and ** indicate significance of values at P=0.05 and 0.01, respectively

Table 8 : Relative contribution of selected independent variables towards extent of adoption of scientific cultivation methods

Independent variables	Sagalee (n=40)		Toru (n=40)		Kimin (n=40)		Balijan (n=40)		Overall (n=160)	
	r value	t value	r value	t value	r value	t value	r value	t value	r value	t value
Age	-0.030	0.212	-0.076	0.481	-	-	-	-	-0.005	0.068
Educational level	0.481	2.494*	0.285	1.699	-0.287	1.536	0.427	3.232**	0.289	3.434**
Size of land holding	-	-	-	-	-	-	-	-	0.070	1.172
Social participation	0.374	2.000	0.108	0.485	0.428	1.748	0.268	1.806	0.037	0.436
Annual income	0.050	0.223	0.437	2.453*	0.453	3.048**	0.599	5.438**	0.398	5.455**
Socio-economic status	-	-	0.218	1.172	0.176	0.571	0.194	1.139	0.136	1.726
	R^2= 0.520		R^2= 0.576		R^2= 0.549		R^2= 0.691		R^2= 0.554	
	F =11.566		F= 9.235		F =10.631		F =19.550		F = 31.676	

* and ** indicate significance of values at P=0.05 and 0.01, respectively

a man in the society.

On the other hand, annual family income is found to be good predictor, significant at 0.01 or 0.05 level of probability at all the study sites except Sagalee. The other independent variables are found to be non-significant. The multiple determinations (R^2) of the selected independent variables jointly contribute 52.00 per cent, 50.16 per cent, 49.69 per cent and 66.37 per cent variation in the extent of adoption of scientific bamboo cultivation practices in Sagalee, Toru, Kimin and Balijan, respectively.

In the overall sample, two most important socio economic characteristics, *viz.*, educational level and annual family income of bamboo growers are found to be significan can be termed as good predictors for contributing the variation in the extent of adoption of scientific bamboo cultivation practices. The Co-efficient of multiple determination (R^2) reveals that six independent variables selected for the study are highly efficient for predicting the extent of adoption of scientific bamboo cultivation technology by the farmers. The co-efficient of multiple determinations explain that all the six variables in overall sample, jointly contributes 53.65 per cent variation in overall adoption score. The result also reveals that for different location of farmers, different variables are important in predicting their extent of adoption of scientific bamboo cultivation technique.

REFERENCES

Dasgupta, S. (1989) Diffusion of Agricultural Innovations in Village India. New Delhi, Wiley Eastern Ltd.

Kumar, M. and Seethalakshmi (2006). Bamboo cultivation and management for degraded ecosystems. In: *Bamboo species of North East India: Adoption of sustainable cultivation technique for socio economic development of rural people.* Proceedings of Regional workshop, 15-16 Dec, NERIST, Nirjuli, Arunachal Pradesh, pp 26-37.

Pandey, B.K. and Tripathi Y.C. (2006) Methods of scientific propagation and scientific cultivation of bamboo. In: In: *Bamboo species of North East India: Adoption of sustainable cultivation technique for socio economic development of rural people.* Proceedings of Regional workshop, 15-16 Dec, NERIST, Nirjuli, Arunachal Pradesh, pp 38-74.

Rogers, E.M. (1957). A conceptual variable analysis of technical change, Ph. D. Thesis, Amer. Lowa St. University, R.I.

Sarkar, J. and Sundriyal, R.C. (2002). Indigenous uses, management and conservation of Bamboo Resource in Arunachal Pradesh, North East India. *Bamboo J.*, **19** : 24-39.

Taj, R.K., Sinha, G. N. Murtem, G. and Bhuyan, L.R. (2007). Field Mannual on Bamboo Cultivation and Management", *A information Bulletin* No 25, SFRI Itanagar, Arunachal Pradesh.