



Attitude of Farmers Towards Sustainable Agro-Forestry Cultivation in Haryana

KEYWORDS

Agro-forestry, Adoption, Attitude, correlation and regression.

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ABSTRACT *The Agro-forestry systems in India include trees on farms, community forestry and a variety of local forest management and ethno forestry practices. In this era of global warming, fast degradation of land productivity and other environmental hazards, Agro-forestry is indeed a stake for natural resources and socioeconomic sustainability. The present study indicated that there were 54.2% of respondents found had most favorable attitude towards Agro-forestry. It was found that respondents have their own criteria for testing species suitable for improving soil fertility, availability of fodder, and fuel wood requirements. The study further indicated that a significant majority of the respondents had not adopted the recommended Agro-forestry practices. Therefore, it would be worthwhile for the government functionaries to organize training, demonstration and take up appropriate educational programs so that the respondents may be loaded with required information and skills to adopt the new methods and practices of agro-forestry time to time.*

Farmers' viewed farm forestry as economically beneficial and environment friendly. Tree planting was being perceived as increasing income, providing wood for fuel and furniture, controlling pollution, and providing shade for human and animals. Meanwhile, farmers viewed the hindrance in agriculture operations and the harboring of insects pests and diseases as negative impacts of tree planting; however, they were outweighed by their perceptions of positive impacts. Tree growing decisions of the farmers were influenced by the opinions of the family, owners/tenants, fellow-farmers. The study showed that the decision to grow trees on farmlands is associated with farmers' perceptions of the opinions and suggestions of salient referents and the motivation to comply with their approval and disapproval coupled with attitudes and perceptions. Farmers also feel social pressure while making the decision to grow trees on their farms and therefore, an important factor influencing farmers towards growing trees on farm. However, the type and composition and extent of agro-forestry vary from place to place because of varied topography, biophysical attributes and socio-economic. Agro-forestry has been demonstrated to offer a wide range of benefits to farmers including the positive effect on their livelihoods through increasing crop yield and increased food security and income as well as improving farmers' ability to deal with the effects of climate change through improved rain use efficiency and yield stability under rain-fed agriculture.

Many high yielding clones of certain Agro-forestry species have been evolved which need to be demonstrated in the field so that tree growers increase productivity. Most tree growers only plant, tend and harvest once in a lifetime, therefore often lack forest management and marketing expertise. The national goal is to bring at least one-third of country geographical area under forest cover by year 2012. Being an agricultural state, our vision is to bring forest and tree cover over at least 10 per-cent of the state geographical area.

The present study would provide a deep insight into the

attitude of respondents in adoption of Agro-forestry practice by explaining its various dimensions. It may be immensely useful for the researchers, extension workers, planners, policy makers, etc for developing an action plan to guide, encourage and motivate the respondents to adopt Agro-forestry practice.

Materials and methods

The present study was conducted in randomly selected, Yamunanagar and Kaithal districts of Haryana. A total number of eight villages were selected, randomly. Then from each village, fifteen respondents were selected, randomly. Hence, a total number of one hundred twenty respondents were interviewed. The data were collected personally by the researcher through a well-structured interview schedule containing items pertaining the objective of the study. Qualitative data were quantified, appropriately tabulated and analyzed, and standardized statistical techniques as percentage, weighted mean scores, correlation and regression were implied to draw meaningful inferences.

Results and discussion

Profile of respondents

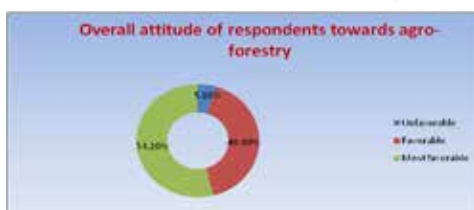
It is revealed that majority of the respondents were from middle to young age group, were educated up to middle school or below it and most of respondents had low level of social participation. About two third of the respondents had more than five acres of land holding and most of the respondents had medium to high level of extension contact and mass media exposure. It was found main source of irrigation used by the respondents in the study area was tube-well. Majority of the respondents had medium to low level of risk orientation, economic motivation and scientific orientation.

Table 1. Profile of the respondents. (n=120)

S/No.	Independent variable(s)	Categories	Percentage
1.	Age	Young	31.00
		Middle	52.34
		Old	16.66
2.	Education	Illiterate	07.50
		Primary	21.70
		Middle	40.80
		Metric	16.70
		Senior secondary	07.50
		Graduate	03.30
3.	Social participation	Low	56
		Medium	38.2
		High	5.8
		Up to 1 acre	05.80
4.	Land holding	More than 1 to 5 acres	29.20
		More than 5 to 10 acres	35.80
		More than 10 to 15 acres	22.50
		More than 15 acres	06.70
		Low	20.00
5.	Extension contact	Medium	73.30
		High	06.70
		Low	09.20
6.	Mass media exposure	Medium	85.00
		High	05.80
		No irrigation	00.00
7.	Irrigation facility	Tube-well	82.50
		Canal	13.30
		Both	04.20
		Low	28.30
8.	Risk orientation	Medium	59.20
		High	12.50
		Low	36.70
9.	Economic motivation	Medium	52.50
		High	10.80
		Low	31.70
10.	Scientific orientation	Medium	55.80
		High	12.50

The study of these variables is necessary since the variable, as age would reveal the mental maturity of an individual to take decision for achieving his needs and goals. Education is also an important variable since it is a process of bringing about desirable change in human behaviour. Educational status of an individual plays a vital role in enhancing his knowledge level by motivating him towards knowing new things and understanding the things learn. It is generally presumed that higher the educational status higher would be the adoption level. Social participation, land holding, extension contact, mass media exposure, irrigation facilities, risk orientation, economic motivation and scientific orientation are also important variables diversification towards Agro-forestry and that is why these variables were included in the study.

Overall attitude of farmers towards Agro-forestry



The study further revealed that majority of respondent (54.20 %) had most favourable attitude towards Agro-forestry. However, the remaining 40.80 per cent were having favourable attitude, and only 5.00 per cent of the respondent had unfavourable attitude towards Agro-forestry. The results regarding the overall attitude of respondents towards Agro-forestry revealed that almost all the respondents had highly favourable and positive attitude towards Agro-forestry. This might be because the respondents have realized by experience the importance of Agro-forestry as income generating farm technology. Alam et al. (2012) studied that age and occupation of the respondents was the negative correlated with their attitude towards social forestry. This findings lead to the conclusion that young and agriculture occupation respondents were more favourable for showing positive attitude towards social forestry. Respondents viewed the hindrance in agriculture operations and the harboring of insects pests and diseases as negative impacts of tree planting; however, they were outweighed by their perceptions of positive impacts. Tree growing decisions of the respondents were influenced by the opinions of the family, owners/tenants, fellow-respondents. Jacob (2010) studied that majority of respondents had positive attitudes towards cultivation of IFTs; their attitudes were influenced by gender, education level, farm size and occupation status.

Table 2. Mean attitude score of respondent towards Agro-forestry (n=120)

Sr. No.	Statement (s)	Attitude Score			Total Weighted score	Weighted mean score	RANK
		MF	F	UF			
1	Trees under AFS protect the main crop from frost and high temperature	333	18	0	351	2.92	I
2	AFS is useful in minimizing soil erosion	321	26	0	347	2.89	II
3	There is adverse effect of tree's shade on main crop	303	38	0	341	2.84	III
4	AFS is adopted to solve the problem of water logging	300	40	0	340	2.83	IV
5	AFS is best practice for watershed management	291	46	0	337	2.80	V
6	Leaves of the trees act as manure for the main crop in AFS	291	46	0	337	2.80	V
7	AFS protect the soils from degradation	297	20	11	328	2.73	VII

Sr. No.	Statement (s)	Attitude Score			Total Weighted score	Weighted mean score	RANK
		MF	F	UF			
8	Every part of the tree is useful to the respondents	261	60	3	324	2.70	VIII
9	Trees under AFS interfere with the movement of farm machinery	261	62	2	325	2.70	IX
10	AFS is easy to establish	225	80	5	310	2.58	X
11	AFS has traditional social values	240	52	14	306	2.55	XI
12	AFS is a sustainable system	255	32	19	306	2.55	XI
13	AFS is environment friendly	225	70	10	305	2.54	XIII
14	AFS maintain the soil health	225	66	12	303	2.52	XIV
15	AFS provide maximum return to respondents	222	70	11	303	2.52	XIV
16	Everyone has to adopt the AFS	240	44	18	302	2.51	XVI
17	Respondents should not adopt the AFS	74	216	11	302	2.50	XVII
18	AFS has potential for maximum return without additional inputs	216	74	11	301	2.50	XVII
19	AFS is our traditional practice	243	32	23	298	2.48	XIX
20	AFS require minimum inputs	201	84	11	296	2.46	XX
21	AFS is adopted because of soil salinity problem in land	192	86	13	291	2.42	XXI
22	AFS can be adopted along with crop production	207	64	19	290	2.41	XXII

Sr. No.	Statement (s)	Attitude Score			Total Weighted score	Weighted mean score	RANK
		MF	F	UF			
23	AFS is adopted for increasing tree cover of country	210	54	23	287	2.39	XXIII
24	AFS is more complex	207	58	22	287	2.39	XXIII
25	AFS has minimum requirement of irrigation	189	76	19	284	2.36	XXV
26	AFS improve economic conditions of respondents	189	68	23	280	2.33	XXVI
27	AFS is act as wind shield for main crop	183	36	41	260	2.16	XXVII
28	AFS reduce the main crop yield	156	70	33	259	2.15	XXVIII
29	Trees in the field causes harm to the main crop	90	148	16	254	2.11	XXIX
30	AFS is costly affair	147	52	45	244	2.03	XXX
31	Respondent should not adopt the AFS	129	46	54	229	1.90	XXXI
32	No extra labour is required for AFS	57	40	81	178	1.48	XXXII
33	No extra cost is involved in AFS	15	94	68	177	1.47	XXXIII
34	Overall AFS is not profitable for respondents	0	34	103	137	1.14	XXXIV
35	AFS is of no use	0	4	118	122	1.01	XXXV
36	AFS is adopted because I worship trees	0	0	120	120	1.00	XXXVI

An analysis of the data from the Table 2 revealed that 'The AFS protect the main crop from frost and high temperature' was occupied top rank with mean score 2.92 followed by 'AFS is useful in minimizing soil erosion' (mean score -2.89). However, 'There is adverse effect of trees' shade on main crop' (mean score 2.84) and 'AFS is adopted to solve the problem of water logging' (mean score 2.83) fetched IIIrd and IVth ranks, respectively. Both 'AFS is best practice for watershed management' and 'Leaves of the trees act as manure for the main crop in AFS' obtained ranked Vth with same mean score 2.80. The statement 'AFS protect the soils from degradation' got VIIth rank with mean score

2.73. Both the statements 'Every part of the tree is useful to the respondents' and 'Trees under AFS interfere with the movement of farm machinery' were ranked at VIIIth position with mean score 2.70 by the respondents. 'AFS is easy to establish' was ranked Xth in order with mean score 2.58. 'AFS has traditional social values' and 'AFS is a sustainable system' were ranked XIth as both the statements occupied the same mean score i.e., 2.55. 'AFS is environment friendly' was ranked at XIIIth position with mean score 2.54. 'AFS maintains the soil health' and 'AFS provides maximum return to respondents' obtained XIVth rank with same mean score 2.52. 'Everyone has to adopt the AFS' got XVIth ranked with mean score 2.51. Both the statements 'Respondents should not adopt the AFS' and 'AFS has potential for maximum return without additional inputs' occupied the XVIIth rank having same mean score 2.50 and so on.

Earlier conducted studies revealed that farmers very well understand the advantages and disadvantages of growing tree, the result showed that respondents' willingness to grow trees on their farms is a function of their attitudes towards the advantages and disadvantages of growing trees, their perception of the opinions of salient referents and factors that encourage and discourage farm level tree planting. Respondents viewed farm forestry as economically beneficial and environmentally friendly. Tree planting was perceived as increasing income, providing wood for fuel and furniture, controlling erosion and pollution and providing shade for humans and animals. Seline (2014) found that attitude is influenced by the characteristics of the respondent, which include personal characteristics (gender, age, marital status, etc.), socio-economic characteristics (income, assets, education, etc.), personality characteristics (self-confidence, independence, etc.), position in social networks (network size, connectedness, frequency of interaction, etc.), status characteristics (control over political power or economic resources) and familiarity with the technology.

Table 3. Correlation Coefficients of Independent Variables with attitude of respondents towards Agro-forestry (n=120)

Sr. No.	Independent variable (s)	Attitude
1	Age	-0.3215**
2	Education	0.4735**
3	Social participation	0.1344
4	Land holding	0.0641
5	Extension contact	0.3278**
6	Mass media exposure	0.2933*
7	Irrigation facilities	0.0310
8	Risk orientation	0.3168
9	Economic motivation	0.2797
10	Scientific orientation	0.3526

*Significant at 0.05 level of probability

**Significant at 0.01 level of probability

Correlation Coefficients of Independent Variables with attitude of respondents towards Agro-forestry

The zero order correlation was computed to determine the relationship between background variable of respondents with the attitude towards Agro-forestry. The results indicated that the age ($r = -0.3215$) had negatively and highly significant correlation (at 0.01 level of probability) with the attitude of respondent towards Agro-forestry. Education ($r = 0.4735$) and Extension contact ($r = 0.3278$) of the respondents had positively and highly significant correlation

(at 0.01 level of probability) with the attitude of respondent towards Agro-forestry. The study revealed that mass media exposure had positively and significant correlation (at 0.01 level of probability) with the attitude of respondent towards Agro-forestry ($r = 0.2933$). It means that these variables have contributing in formulating positive attitude of respondents towards Agro-forestry and important factors to alter the attitude of the respondents toward the Agro-forestry. The correlation coefficients of social participation ($r = 0.1344$), Land holding ($r = 0.0641$), Irrigation facilities ($r = 0.0310$), Risk orientation ($r = 0.3168$), Economic motivation ($r = 0.2797$) and Scientific orientation ($r = 0.3526$) with the attitude of respondent towards Agro-forestry was not found to be significant (Table 3).

Table 4. Regression Coefficient of respondents' independent variable with the Attitude towards Agro-forestry (n=120)

Sr. No.	Independent Variable (s)	Regression Coefficients	't' value
1	Age	-0.1602	-0.1495
2	Education	2.3415**	4.0005
3	Social participation	0.9713*	2.0245
4	Land holding	0.3952	0.6885
5	Extension contact	0.2389	0.5678
6	Mass media exposure	1.4120*	2.0409
7	Irrigation facilities	0.0938	0.9652
8	Risk orientation	0.5905	0.3527
9	Economic motivation	1.7758*	2.0389
10	Scientific orientation	0.7496	0.2344

*Significant at 0.05 level of probability
R² = 0.6921

**Significant at 0.01 level of probability

Multiple Regression Coefficient of Respondents' Independent Variable with the Attitude towards Agro-forestry

To predict the contribution of background variables on the attitude of respondents towards Agro-forestry, the data were subjected to multiple regression analysis. The results were presented in above Table. The partial regression coefficient of education was highly significant (at 0.01% level of probability) In other words; one unit change in the education may lead to a corresponding change of 2.3415 unit in the attitude of the respondent. While social participation, mass media exposure, and economic motivation were significant (at 0.05% level of probability). The remaining variables viz. age, land holding, extension contact, irrigation facility, risk orientation and scientific orientation were not found to have the predication variable of significant level. The data also showed that all these variables collectively explained 69.21 per cent variation in attitude towards Agro-forestry (Table 4). This shows that there may be some other variables responsible for variation of 30.79 per cent in attitude of the respondents towards Agro-forestry. The data also showed that multiple regression coefficient of age showed negative trend, this lead to the conclusion that an increase in these variable by one unit would lead to decrease in the favourable attitude of the respondents towards the Agro-forestry.

CONCLUSION

The study can be concluded that most of the respondents were from middle age group, were educated up to middle school and had low level of social participation, land holding, extension contact and mass media exposure. They had tube-well, as the main source of irrigation; Ma-

majority of the respondents had medium level of risk orientation, economic motivation and scientific orientation. The present study revealed that a large number of respondents had most favourable attitude towards Agro-forestry. The respondents were of the opinion that the AFS protect the main crop from frost and high temperature and its adoption solve the problem of water logging etc., which contributed to develop the favourable attitude of respondents towards Agro-forestry, whereas the opinion like adverse effect of trees' shade on main crop and 'AFS contributed to develop the unfavourable attitude and ultimately affect the adoption rates for new Agro-forestry practices. Favorable attitudes towards farm forestry system from their beliefs suggested that planting tree would increase income, and meet household requirements for fuel wood and timber and provide them with a healthy environment to work. The awareness campaigns to the respondent on the potential benefits of tree-based agriculture could go a long way in activating the adoption rates.

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