Perception of Farmers' Attitude and Knowledge Towards Agroforestry Sector in North Kashmir

R Banyal, JA Mugloo, AH Mugal, Vaishnu Dutt and SN Zaffar

Faculty of Forestry, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Benhama Watlaar (Jammu & Kashmir)
E. mail:drbanyal08@gmail.com

Keywords:
Agroforestry, adoption, attitude, knowledge, north

ABSTRACT

The present investigation sought to explore the knowledge and attitude of farmers towards agroforestry practices especially in North Kashmir of Western Himalayas. A sample of 60 homesteads (46%) from the Astingo village was selected through random sampling technique. The responses were analyzed by using Frequency & Percentage Method (FMP)with rank order. The data on attitude of farmers towards agroforestry with its benefits reveal that 32.30 per cent respondents fall in the 'agree category' followed by 'neutral' (29.80%), 'strongly agree' (15.60%), "disagree' (19.00%) and 'strongly disagree' (03.30%). It is observed that farmers are also reluctant to go for only agroforestry practices due to smaller land holdings. The present study revealed that high financial return is the only response holding the key as motivational factor for adoption of agroforestry practices. The respondents gave lowest attention to the point 'utilization of free time'. The recommendations of the present investigations are that there is immediate need for making the farmers aware about the significance & benefits of agroforestry practices. They should also have easy access to the knowledge centers for adopting such economical and ecological viable options for mitigating the vagaries of the prevailing scenario.

INTRODUCTION

The perception of farmers' towards attitude & knowledge including motivational factors pertaining to adoption of agroforestry systems holds the key for addressing the current problems like widening the gap between demand and supply of tree products, deforestation and environmental degradation. All theses said factors contributed to ecological imbalances in any system. The adoption of agroforestry systems holds potential for addressing the solution of current problems. However, the development of agroforestry as a viable option for farmers in diverse ecological and socio-economic conditions has become very challenging issue. Forests are important to rural people especially in developing countries like India as they provide many basic needs besides the environmental stability for

perpetual food production. The state of J&K comprising of three regions Jammu, Kashmir and Ladakh, has an area of 2,22,236 km^2 that sustains more than 10 million people. Such huge population has led to extra burden on the existing natural resources to combat the multifarious demands of human masses. Agroforestry not only increases agricultural productivity but also extends resource supplies for peoples' basic needs and promotes the development of animal husbandry, forestry and economics. Sharma et. al. (1989) reported that there is high dependency of people on forests for fuel wood, timber and fodder in the hills of Himachal Pradesh. They further observed that the nature and degree of dependency varied on purpose, agro-climatic conditions & income status and inverse relationship was found between dependence on forests with the size of land holdings.

Therefore, efforts should be made to encourage the protection, regeneration, exploration of alternatives to combat the bonafide needs of the local inhabitants. The general neglect of interdependence in various sectors of the systems of farmers' field retards proper attention of research recommendations and increased gap in transfer of technology from lab to land. This results in low agricultural productivity besides degradation of ecology and unsustainable farming The objectives of the study were to assess the knowledge and attitude of farmers about tree farming, benefits accrued from agroforestry and factors of motivation influencing the adoption of agroforestry practices of north Kashmir in Jammu & Kashmir state.

METHODOLOGY

The study area was Astingo village wgich falls in Bandipura Forest Division of North Kashmir of J&K state. The said village was selected purposively. It is situated 5km from district headquarter Badipura with an elevation of 1510 m amsl. The total population of the study area was 2,927 with literacy rate 59 per cent, sex ratio 881 females per 1000 males. The total number of household was 130 with an average family size of about 8.0. Approximately, more than 45 per cent of its population is dependent on farming.

The villagers have easy access to local market like Bandipura and Sopore for selling their farming produce. The village is devoid of good market and most of the requirements of the farmers met from the adjoining markets of Bandipura and Sopore. The village is situated on the bank of Wular lake which is popularly known as largest fresh water lake in Asia. Most of the water requirement is met from the lake. The drinking water is supplied by Water Works Department through distribution system. Hand pumps are also equally playing good role to meet out the requirement of drinking water. The main tree species of the village are Poplar (*Populus deltoides*), Willow (*Salix spp.*), Elm (*Ulmus wallichiana*), Kikar (*Robinia pseudoacacia*), Chestnut (*Castenia sativa*), Apple (*Malus domestica*), Walnut (*Juglans regia*), Pear (*Pyrus communis*), Chinar (*Platanus spp.*) etc. In agriculture Rice-Maize cropping pattern is followed and pulses are also grown in some areas of village. The topography of the village is almost plain with undulation towards lake side.

A sample of 60 homesteads (46%) from the village was selected through random sampling technique of the survey. Household head was considered as respondents. The data on information on knowledge, attitude, motivational factors and adoption were collected by personal interviews of respondents through well structured pre-tested interview schedule and personal observation of the interviewer. The responses were analyzed by using **Frequency and Percentage Method** (FPM) with **Rank Order** of tested responses.

RESULTS AND DISCUSSION

Knowledge of farmers about tree farming

The results presented in Table 1.0 indicate that majority, 80.00 per cent of the respondents have the knowledge about the application of fertilizers followed by time and stage of tree felling, branch pruning, important fast growing tree species for agroforestry plantation, thinning, weed management, mulching, plantation techniques, disease control measures, insect/pest

management, preparation of planting material, pre-planting treatments, de-budding, root pruning and VAM inoculation as per rank order of the testes responses. It is also observed that 68.00 per cent of the respondents have knowledge to a 'large extent' about branch pruning, 40 per cent about weed management practices of tree farming. Similarly, three fourth of the respondents, 74.00 per cent revealed that they have knowledge to a 'moderate extent' on time and stage tree felling.

The farmers were also assessed regarding the modern techniques of VAM (Vesicular-Arbuscular-Mychorrizae), pre-planting treatments and root pruning. The results revealed that respondents were totally unaware about VAM inoculation techniques used in tree faming. Whereas, they have quantum knowledge about debudding (96.00%),

root pruning (99.00%) and pre-planting treatments (80.00%). Insect-pests and disease management (35.00%) knowledge only falls in 'little extent' category and followed by values 30 and 25 per cent in 'moderate' and 'not at all' categories, respectively. This infers that the majority of the farmers have little and moderate knowledge about the insect-pests and disease management in tree farming aspects especially with forest trees .The data also show that the farmers are quite aware about the thinning practices being followed for providing the proper spacing to the growing trees in the different agro-forestry fashions. The data presented in the Table 1 indicate that 100.00 per cent of the respondents were fully aware about the knowledge that when the trees are to be felled for maximizing the out-put.

Table 1. Knowledge of farmers about tree farming

S. No.	Item(s)	Not at all (%)	To little extent (%)	To moderate extent (%)	To large extent (%)	Rank order
1.	Important fast growing tree species for agro - forestry plantation	(12.00)	(10.00)	(67.00)	(11.00)	**04**
2.	Preparation of planting material	(45.00)	(23.00)	(21.00)	(11.00)	**11**
3.	Weed management	(08.00)	(18.00)	(40.00)	(34.00)	**06**
4.	Pre-planting treatments	(80.00)	(12.00)	(08.00)	-	**12**
5.	VAM inoculation	(100.0)	-	-	-	**15**
6.	Plantation technique	(20.00)	(40.00)	(35.00)	(05.00)	**08**
7.	Application of fertilizers	-	(10.00)	(80.00)	(10.00)	**01**
8.	Insect-pests management	(25.00)	(35.00)	(30.00)	(10.00)	**10**
9.	Disease control measures	(21.00)	(40.00)	(32.00)	(07.00)	**09**
10.	Mulching	(13.00)	(35.00)	(40.00)	(12.00)	**07**
11.	De-budding	(96.00)	(03.00)	(01.00)	-	**13**
12.	Branch pruning	(02.00)	(08.00)	(68.00)	(22.00)	**03**
13.	Root pruning	(99.00)	(01.00)	-	-	**14**
14.	Thinning	(10.00)	(22.00)	(65.00)	(03.00)	**05**
15.	Time and stage of tree felling	-	(08.00)	(74.00)	(18.00)	**02**
	Average	**(34.66)**	**(17.60)**	**(37.40)**	**(09.53)**	

It infers from the Table 1 that the responses of the farmers were mixed regarding the tree farming. In one category farmers showed good knowledge and vice-versa. The study also reveals that 37.40 per cent respondents falls in 'little extent' category followed by 'not at all' with 34.66 per cent value. It is further observed that only 9.53 per cent farmers perceived in 'to large extent' category. Therefore, it is urgent need for popularization of agroforestry practices to increase the diversification of farming systems with increase in economic standard of the local populace where land is the major constraint. This observation is equally advocated by Banerjee (1987) where he suggested that farmers should be motivated to plant trees on their own farm lands at their own cost. This means that the land lying waste must be brought under planting including bunds around farms to have diversified products from same unit of land.

Attitude of the farmers towards agro- forestry and its benefits

The responses of attitude and benefits accruing from the agroforestry practices perceived through testified questionnaire and presented in Table 2. The obtained benefits were represented in ten items and the farmers' responses were categorized as 'strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree', respectively. The items were finally ranked on the basis of percentage of responses in each specific category.

The important benefits of agro-forestry which the respondents perceived were that it helps in becoming 'self-reliant' in terms of fuel, fodder, timber and other minor forest produce (MFPs), 'helps in increasing soil fertility, checking soil erosion and retention of soil moisture', 'capable of improving socio-economic conditions of the farmers', 'meeting the raw material demands of forest based industries', 'overall increase is more than pure forestry and agriculture land use', 'solving un-employment problem', 'every farmer should practice agro-forestry', 'reduces incidence of total crop failure', 'improves the micro climate of the area' and 'performance of trees and agricultural crops in agroforestry is better than

pure agriculture or forestry' based on rank order of the tested parameters, respectively. These benefits were rather visual in nature which the respondents could observe and satisfy some of their most urgently felt needs.

The benefits like 'every farmer should practice agro-forestry', agroforestry reduces incidence of total crop failure', 'improves the micro climate of the area' and 'performance of trees and agricultural crops in agroforestry is better than pure agriculture or forestry' were ranked 7th,8th,9th and 10th, respectively.

It was observed that majority (64.00%) of the farmers fall in 'strongly agree' category that 'agro-forestry helps people to become self-reliant in terms of fuel, fodder, timber and other MFPs (minor forest produce)' followed by the response 'agroforestry helps in increasing soil fertility, checking soil erosion and retention of soil moisture' with 60.00 per cent respondents fall in 'agree' category. Similarly, almost all (90.00%) farmers fall in 'neutral' category with the 'agroforestry improves the micro climate of the area' response followed by 60.00 per cent with the response 'every farmer should practice agroforestry'. Moreover, equal number of farmers (50.00%) indicated that 'performance of trees and agricultural crops in agro-forestry is better than pure agriculture and/or forestry' and 'agroforestry reduces incidence of crop failure' gave 'disagree' category of tested responses. It was observed that the farmers were equally agreed to the tune of 45.00 per cent that agroforestry helps in meeting the raw material need of forest based industries. The response of the farmers that agroforestry improves the micro climate of the area is somewhat neutral. On pretext of the statements, the responses of the farmers were positive and vice-versa. The low response of the farmers to the points interviewed may be due to the lack of exposure towards this venture. Table 2 indicate that on an average 32.30 per cent respondents fall in the category of agree followed by neutral (29.80%), 'strongly agree' (15.60%), 'disagree' (19.00%) and 'strongly disagree' (03.30%) in the

study area. It may be inferred from the data that more than 50 per cent respondents have moderate knowledge about agroforestry. Therefore, more exposure needs to be given to the villagers for increasing the adoption level of agro-forestry systems.

Table 2. Attitude of farmers towards agro forestry and its benefits

S. No.	Item(s)	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Rank order
1.	Agro -forestry helps people to become self - reliant in terms of fuel, fodder, timber and other MFP's	(64.00)	(23.00)	(13.00)	-	-	**1**
2.	Overall income/benefits from agro -forestry more than pure agriculture and/or forestry.	(35.00)	(40.00)	(20.00)	(05.00)	-	**5**
3.	Performance of trees and agricultural crops in agro-forestry is better than pure agriculture and/or forestry.	(15.00)	(10.00)	(20.00)	(50.00)	(05.00)	**10**
4.	Agro -forestry is capable of improving the socio - economic conditions of the farmers	(10.00)	(50.00)	(20.00)	(15.00)	(05.00)	**3**
5.	Agro -forestry reduces incidence of total crop failure	(05.00)	(25.00)	(15.00)	(50.00)	(05.00)	**8**
6.	Agro -forestry helps in increasing soil fertility, checking soil erosion and retention of soil moisture	(02.00)	(60.00)	(20.00)	(10.00)	(08.00)	**2**
7.	Agro -forestry is capable of solving the problem of rural unemployment	(10.00)	(35.00)	(20.00)	(30.00)	(05.00)	**6**
8.	Agro -forestry helps in meeting the raw material need of forest based industries	(10.00)	(45.00)	(20.00)	(20.00)	(05.00)	**4**
9.	Agro -forestry improves the micro -climate of the area	-	(05.00)	(90.00)	(05.00)	-	**9**
10	Every farmer should practice agro-forestry	(05.00)	(30.00)	(60.00)	(05.00)	-	**7**

Motivation factors influencing adoption of agro-forestry practices

The results presented in Table 3 indicate that majority of the respondents expressed that the 'agro-forestry helps people to become self-reliant in terms of fuel, fodder, timber and other MFP's' (78.00%) and 'utilization of unproductive lands high financial returns' (70.00%) as highly motivating factors in influencing adoption of agro-forestry practices. Similarly, 74.00 & 73.00 per cent of the farmers revealed that 'self sufficiency in forest products' and 'environmental amelioration' were the 'moderately' motivating factors in influencing the adoption of agro-forestry practices

followed by 'little investment', 'availability of subsidy' and 'availability of incentives (seedlings and other inputs)'. Likewise, utilization of free time is the least motivating factor as revealed by 53 per cent of the respondents grouped in 'least motivating' category of adoption responses.

'A high financial return' is reported to have top ranked as highly motivating factor for adopting the agro-forestry practices in the farm lands. 'Utilization of free time' is ranked second in the rank order. The other factors of motivation like 'self sufficiency in forest products' 'environment amelioration, and 'little investment' were in the order of 3rd, 4th and 5th position, respectively.

Table 3. Factors of motivation influencing adoption of agro-forestry practices among farmers

S. No.	Factor(s) of motivation	Highly motivating (%)	Moderately motivating (%)	Least motivating (%)	Rank order
1.	High financial returns	(78.00)	(22.00)	-	**01**
2.	Utilization of unproductive lands	(70.00)	(22.00)	(08.00)	**02**
3.	Little investment	(07.00)	(68.00)	(25.00)	**05**
4.	Availability of incentives (seedlings & other inputs)	(35.00)	(60.00)	(05.00)	**07**
5.	Availability of subsidy	(17.00)	(63.00)	(20.00)	**06**
6.	Self sufficiency in forest products	(14.00)	(74.00)	(12.00)	**03**
7.	Utilization of free time	-	(47.00)	(53.00)	**09**
8.	Cottage industry development	(15.00)	(25.00)	(60.00)	**08**
9.	Environmental amelioration	(07.00)	(73.00)	(20.00)	**04**
	Average	**(27.00)**	**(50.44)**	**(22.55)**	

The findings of the present investigation is in tune with the earlier findings of Keith (1986) that people need economic support as motivating force for growing trees despite risk and other difficulties. It is also reported that on an average all the items investigated fall in the motivating category (50.44%) followed by highly motivating (27.00%) and least motivating (22.55%) category in the present study. It may be inferred that it is possible to promote the adoption of agro-forestry practices in the rural areas if due consideration is given to the interviewed items. Moreover, scientific intervention of agro-forestry may prove as a milestone in increasing the adoption level among farmers. The similar observations were also advocated by Banyal et. al. 2011. Uppal and Pathania, 2008 while conducting such study among the farming communities of hills in Himachal Pradesh were also put forth the similar findings. It is also observed that farmers are also reluctant to go for only agro-forestry systems due to smaller land holdings. They only grow trees for their fuelwood, fodder and timber requirements. Only one or two absentee farmers adopted the pure wood lot practices in their farm lands as commercial purpose, whereas, the rest of the farmers only adopted subsistence agroforestry. Farmers are ready to adopt agroforestry system suited to their areas but not practicing due to land constraint.

Neupane et. al. 1998 analyzed the implementation of agro-forestry project and observed that the farmers positive perception towards agro-forestry have significantly positive effects on adoption of agro-forestry among households especially in Dhading district in Nepal. Alavalpati *et. al.,* 1995 recommended that higher income farmers were the main beneficiaries of agro-forestry if only farm forestry is considered or vice versa. They also reported that the identified factors contributed to the sense of security of a producer.

REFERENCES

Alavalapati JRR, Luckert MK and Gill DS 1995 Adoption of agro-forestry practices- a case study from Andhra Pradesh, India. *Agroforestry Systems*, 32, pp:1-14.

Banerjeee AK 1987 Forestry Extension in India: A proposal to Strengthen It. World Bank, New Delhi

Banyal R, Masoodi NA, Masoodi TH, Sharma LK and Gangoo SA 2011 Knowledge and attitude of farmers towards agroforestry practices in North Kashmir- a case study. Indian Forester vol. 137 (12) pp.:1377-1381.

Keith J 1986 Plant more trees. Farm and community forestry in India. Occasional paper no. 16. Department of Environmental Studies and Countryside Planning. Wye college, University of London.

Neupane P Ramji, Sharma R Khem and Thappa B Gopal 1998 Adoption of agro-forestry in the hills of Nepal: a logistic regression analysis-Rural development, gender and resources program, School of Environment Resources and Development. Asian Institute of Technology, klong Luang, Pathumthani, Thailand

Sharma LR, Chand R and Bhatti JP (1989) An analysis of farmers' dependence on forest for fuelwood, fodder and timber in Himachal Pradesh. Agricultural Situation in India, vol.144, No.5.

Uppal R and Pathania MS 2008 Adoption of agro-forestry in hills of Himachal Himalayas. A case study. National symposium on Agro forestry knowledge for sustainability, climate moderation and challenges ahead. (15-17 December, 2008), held at NRCAF, Jhansi, pp:111.