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Attitude and Acceptance of Farmers for Agroforestry in Selected Blocks of West Singhbhum District, Jharkhand, India

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ABSTRACT: The agroforestry practice is intervention of forestry/fruit tree species on cultivated lands for achieving multiple benefits like, fuel wood, fodder, timber, fruit etc. The main objective of this study was to investigate and analyze the reasons for non-adoption of agroforestry by farmers and the problems being faced by them in West Singhbhum district of Jharkhand. A sample of 320 respondents from four randomly selected blocks was interviewed through a structured interview schedule in person and the data were analyzed. It was concluded that the farmers were not adopting agroforestry mainly due to the lack of awareness about the tree benefits. They considered that the trees compete with agricultural crops for water and nutrients uptake and degrade their farmlands etc. The villagers may be educated and convinced with respect to adoption of agroforestry through exposure visits of successful agroforestry models for increasing their monetary benefits. Most of the farmers are found to agree that agroforestry is an option to meet the food, fodder and fuel requirements. Literacy also has bearing on adoption of agroforestry. The response of the respondents that practice of agroforestry contributed to improve vegetation in the area is highly beneficial for restoration of agro-environment.

Keywords: adoption, agricultural crops, agroforestry, constraints, farmlands.

INTRODUCTION

In India the agriculture has been the major land use practice to meet the requirement of food grains and vegetables production for human consumption. The economic conditions of farmers also depend on agriculture, but in most of region of India agriculture practice cannot be throughout the year. As a result their economy and livelihood are affected. To have multiple gain from agriculture field the practice of agroforestry has a support system to agriculture during lean period as in this interactions of tree component (timber, fuelwood, fruit trees etc.) along with agriculture crops are deliberately practiced to have multiple benefits like food grain, fuelwood, fodder, vegetables, fruit to avoid leaving agriculture field for fallow. Agroforestry helps to provide farmers effective and efficient land management system to get high crop yield and income under agri-ecological conditions. The integration of tree components in crop fields may in spatial/temporal sequence. In this under agroforestry integration woody and non-woody components are main target along with economic surety (Kumar and Nair 2004).

Frey *et al.* (2010) estimated financial returns from eight agroforestry and seven forestry systems to compare returns from agriculture on marginal and average lands in the Lower Mississippi Alluvial Valley (LMAV), as an indicator for potential adoption. In all but a few cases, agriculture had higher returns than agroforestry and forestry. However, moderate prices from carbon credits from afforestation and reforestation activities have potential on marginal agricultural that maintains large carbon stock avoiding clear cutting.

Dwivedi *et al.* (2007) studied outcome of socio-economic diagnosis of traditional as well as commercial agroforestry practices being practiced by farmers in Western Uttar Pradesh including tree species such as *Azadirachta indica*, *Acacia nilotica, Dalbergia sissoo* and *Eucalyptus* spp. in traditional system whereas, *Populus deltoids* and *Eucalyptus* spp. were the main species of commercial agroforestry. The net return from tree produce ha^{-1} per annum in traditional system was Rs. 989, 541 and 440 for marginal, small and medium farmers, respectively. In commercial region, B:C ratio has been found higher (3.00) for poplar based agrisilviculture than poplar (2.84) and eucalyptus (2.68) based bund system. The traditional agroforestry seems less promising as compared to commercial agroforestry, but it is most beneficial to the farmers livelihood.

In India, agroforestry practices are carried out over approximately 25.32 million hectare i.e., approximate 8.32% of total geographic area of country. Different variations of agroforestry being observed included Agri-Silviculture (alley cropping, multiple cropping

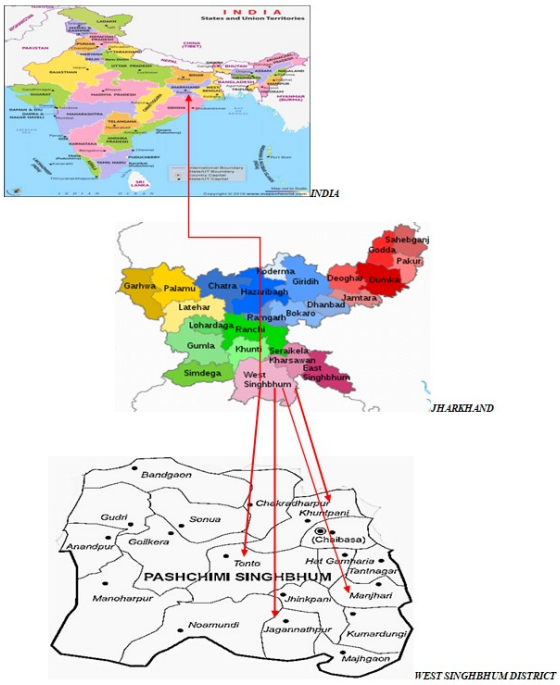
and inters cropping), Aqua-Silviculture (tree-fish-arable crop and tree-fish-livestock systems). As compared to a monoculture, well integrated and managed agroforestry practices have many benefits which have not yet been popularized in country (Kumar *et al.,* 2017).

The main objective for promoting agroforestry is proper utilization of limited land resources by farmers and to get continued income round the year. Although in Jharkhand efforts have been made to assess the farmers' participation in agroforestry, but reasons for its non-adoption in West Singhbhum district of Jharkhand have not been yet worked out. Hence present study was taken to provide the baseline information in this respect.

Materials and Method

In the present study data have been collected from eight villages of West Singhbhum district of Jharkhand State. Four blocks were selected and from each block four villages and from each village twenty households were selected for data generation. Therefore, from each village 20 households and a total no. of 320 respondents were selected from each block as:

4	×	4	×	20	=	320
Block		Village		Household		Total no. of respondents



The map of the study area is shown below:

The study is based on survey of 20 randomly selected household practicing agroforestry from each village with the help of a questionnaire specially designed and pretested for the interviewing the socio-economic survey from four blocks namely- Khuntpani, Jagganathpur, Manjhari and Tonto and from each block four villages and from each villages 20 respondents or households were selected for the observation.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents. The socio-economic characteristics including age, education and source of income are observed and data is shown in Table 1. It is evident that majority of the respondents under West Singhbhum district belonged to middle age group (61%) followed by old age group (22.18%) and young age group (16.87%). Also majority of the respondents (51.20%) were illiterate, 38.40% were pre-matric and 2.19% were up to graduate level. This study also revealed that 71.88% respondents reported to have earned their income mainly from agriculture while, 15.93% from agroforestry and 13.13% from collection of forest products. Similarly, studies have indicated that socio-economic characteristics had much influence on the adoption behavior regarding new practices (Jamal, 2005). FAO (2001) also reported that agroforestry adopters belonged to higher group in their socio-economic status.

It present study also it is observed that illiteracy was also the main reason for less adoption of agroforestry by farmers. The farmers considered this practice harmful for their agricultural crops due to lack of education and awareness for agroforestry. Amir (2003) also reported that education was the main and vital weapon for bringing a positive change in the behavior of individual farmer for adoption of agroforestry. Hence the illiteracy among the farmers is much influencing their behavior to adopt agroforestry practices as it is one of the main hindrances which creating ignorance and unawareness among the individuals.

Glover *et al*. (2013) has witnessed a significant improvement in the adoption and promotion of

agroforestry technologies among smallholder farmers world-wide and in particular, developing countries. They observed that the main socio-economic factors that determine the actual occurrence of agroforestry are household security, access to capital and incentives, labour, gender, land tenure, farm size and knowledge for management. Sustainable development through agroforestry can be achieved through genuine and continuous involvement of farmers in agroforestry activities.

The sources of income and the occupations also determine the social standing of the adoption behaviour of the people because as depicted in Table-1 only a small number of farmers (71.88%) were actively engaged in agriculture and 15.93% were practicing agroforestry. The farmers who were planting selected trees species on their farmlands were also confronted with major problems like timber and fuel wood marketing. Therefore, farmers mainly utilizes tree species as fodder sources for their livestock, as a result they couldn't drive income from their farmland tree.

Table 1: Distribution of the respondents according to their socio-economic characteristics.

Characteristic	Frequency	Percentage
Age (Years)		
Up to 35	54	16.87
35- 50	195	60.93
Above 50	71	22.18
Educational Level		
Illiterate	57	51.20
Pre-matric	85	38.40
Matric	119	10.40
Intermediate	52	16.25
Graduate	07	02.19
Source of Income		
Agriculture	230	71.88
Agroforestry	51	15.93
Collection of forest produces	42	13.13
Government Services/Labor	34	10.62
Fish culture	15	04.69
Growing of vegetables, flowers & fruits	14	04.38
Others (Handicraft & Bee keeping)	14	04.38

Attitude of the respondents towards Agroforestry.

The responses of attitude from the agroforestry practices perceived through pre designed questionnaire (Table 2) consisted benefits obtained in ten items and the farmers' responses were categorized as 'strongly agree', 'agree', 'disagree' and 'strongly disagree', respectively.

Table 2: Attitude of respondents towards Agroforestry.

Sr. No.	Statement	Frequency	Percentage
1.	Agroforestry meets day to day demand for food, fodder and fuel	50	15.62
2.	Agroforestry has no effect on crop production to improve yields	27	08.43
3.	There is no use in planting trees and waiting for 6 to 7 years for return	25	07.81
4.	Agroforestry farming is considered as progressive farming system	28	08.75
5.	Through agroforestry there is substantial improvement in profile and fertility of land Agroforestry has succeeded in reducing poverty among tribal farmers	46	14.37
6.	Agroforestry has succeeded in reducing poverty among tribal farmers	40	12.50
7.	Agroforestry helps to improve vegetation in the local area	37	11.56
8.	Agroforestry encourages subsidiary activities like dairy, fishery, bee keeping etc.	43	13.43
9.	Adoption of agroforestry decreases crop production per unit area of land	24	07.50

It is observed that majority (15.62%) of the farmers fall in strongly agree category, which indicated that agroforestry meets day to day demand for food, fodder and fuel. The response through agroforestry is substantial improvement in profile and fertility of land with 14.37% respondents fall in 'agree' category. Moreover, 13.43% of respondants indicated that agroforestry encourages subsidiary activities like dairy, fishery, bee keeping etc. and 7.50% adoption of agroforestry decreases crop production per unit area of land gave 'disagree' category. It was observed that respondents agreed to the tune of 12.50%.

The response of the respondents that practice of agroforestry contributed to improve vegetation in the area is 11.56% agree. The data in Table 2 indicated that on an average agroforestry farming is considered

as progressive farming system' 8.75% respondents fall in the category of agree followed by 'agroforestry has no effect on crop production to improve yields' i.e, 8.43%, 'strongly, 'disagree' and 'Adoption of agroforestry decreases crop production per unit area of land' strongly disagree' 7.50% in the studied area. It may be inferred from the data that more than 50% respondents have moderate knowledge about agroforestry. Therefore, more exposure needs to be given to the villagers for increasing the adoption level of Agroforestry systems.

Kumar *et al.* (2017) found that major constraint on agroforestry is lack of proper management, shortage of technical support, rigid policy of harvesting of tree products and informal, unstructured market. Due to these reason farmers are disappointing to grow tree on their field. However, there is a great potential for the development of agroforestry in India.

CONCLUSIONS

From this study it is found that farmers have been benefitted by adoption of agroforestry in terms of fodder, fuelwood and improvement of soil condition. The literacy has been also observed as one of important factor of farmers to put this level under agroforestry practices. The agroforestry supports farmers during failure of crops through livestock production system and fruit trees. The agroforestry supports farmers income during total crop failure, improves the micro climate of the area and performance of trees and agricultural crops in agroforestry is better than the pure agriculture or forestry.

The important benefits of agroforestry which the respondents perceived were becoming 'self-reliant' in terms of fuel, fodder, timber and other minor forest produce (MFPs) 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 noticed.

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