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Socio-economic status of agroforestry farmers in Rudauli block of Ayodhya district, Uttar Pradesh

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Abstract
Rudauli, one of the blocks of Faizabad division in Ayodhya district of Uttar Pradesh. The block is located between 26.77°N latitude and 82.14°E of longitude in the central region of India. Being situated within the Ayodhya district puts Rudauli block in a region with significant historical and religious importance. Rudauli plays a key role in implementing rural development programs aimed at improving the lives of residents in the villages it encompasses. This involves initiatives in agriculture, education, healthcare, infrastructure, or social welfare. This study was conducted to understand the socioeconomic status agroforestry farmers of Rudauli block. Agroforestry integrate trees and shrubs into agricultural landscapes enhance the land management. A total of five villages of Rudauli *viz.*, Dasrathmau, Dullapur, Amaraigaon, Jalalpur and Mawai were randomly selected for the study. And, 20 households were randomly selected from each sample village for detailed survey. A total of 100 farmers was interview during the survey. Out of 100 respondents 75 farmers were agroforestry adopters and 25 farmers were non-agroforestry adopters.

Introduction
Socio-economic study of farmers and their relationship to the agroforestry is highly important. This would help to ascertain the opportunities for the development of agroforestry system in our country. Analyzing the household and farm characteristics can help the process of effective planning system for farm forestry. Sinclair and Walker (1999) [8] indicated the lack of quantitative and predictive understanding about traditional agroforestry practices and its importance in making them more adoptable. Developing new strategies for encouraging farmers to grow trees and improvements in existing systems can be designed if characteristics of the farms and farmers in relation to tree growing in existing agroforestry systems are studied. Nair and Dagar, (1991) [4]. Pagdee *et al.*, (2006) [5] also reported various variables that influence community forestry, for instance tenure security, clear ownership, congruence between biophysical and socioeconomic boundaries of the resources, effective enforcement of rules and regulations, monitoring etc.

Rudauli plays a key role in implementing rural development programs aimed at improving the lives of residents in the villages it encompasses. This involves initiatives in agriculture, education, healthcare, infrastructure, or social welfare. Being situated within the Ayodhya district puts Rudauli block in a region with significant historical and religious importance. While the block itself might not be the center of this activity, its contribution to the overall economy and development of the district could be noteworthy. Blocks in India function as administrative units. Rudauli block likely has a Block Development Officer (BDO) who oversees the implementation of various government schemes and programs at the village level.

Study Area
Rudauli, lies between 26.75°N latitude and 82.14°E of longitude. The block is located 50 km west of Ayodhya District Headquarters. Rudali has a total area of 505 square kilometers. This includes 496.54 square kilometers of rural area and 8 square kilometers of urban area. Rudauli has a forest area of 127.62 hectares. The population density of the Rudauli tehsil is 920 people per square kilometer. According to the 2011 census, the population of Rudauli Tehsil in Faizabad district, Uttar Pradesh is 464,250. The Rudauli Nagar Palika Parishad has a population of 43,091, with 22,448 men and 20,643 women. As per Census, 2011 out of total population, 9.3% people live in Urban areas while 90.7% live in the Rural areas. Also the sex ratio of urban areas in Rudauli Tehsil is 920 while that of rural areas is 952.

The population of children of age 0-6 years in Rudauli Tehsil is 77282 which is 17% of the total population. There are 39763 male children and 37519 female children between the ages 0-6 years. Thus as per the Census 2011 the child sex ratio of Rudauli Tehsil is 944 which is less than average sex ratio (949) of Rudauli Tehsil.

The total literacy rate of Rudauli Tehsil is 56.1%. The male literacy rate is 54.71% and the female literacy rate is 38.39% in Rudauli Tehsil. The average literacy rate in urban areas is 63.8% while that in rural areas is 55.3%.

Materials and Methods
The average elevation of the area is 105 m (344 ft) above sea level. There are a total of 239 villages in Tehsil Rudauli, of which five villages *viz.*, Dasrathmau, Dullapur, Amaraigaon, Jalalpur and Mawai were selected for the study. And, 20 households were randomly selected from each sample village for detailed survey. A total of 100 farmers was interview during the survey. Out of 100 respondents 75 farmers were agroforestry adopters and 25

farmers were non-agroforestry adopters.
In this study, Chi-square test was employed as an analytical method to test whether the explanatory socio-economic variables were related to adoption, or not. χ^2 is used when participants can be classified into different categories and can be used for any kind of variable. χ^2 test of independence was computed at 5 percent ($\alpha=0.05$) level of significance.

Results
Age of farmers: Data pertaining to number of family member according to age percentage of farmer in a selected village of Rudauli block of Ayodhya district have been presented in Table 1 and graphically depicted in Fig 1.

Table 1: Age of farmers and association of age with adoption of agroforestry practices

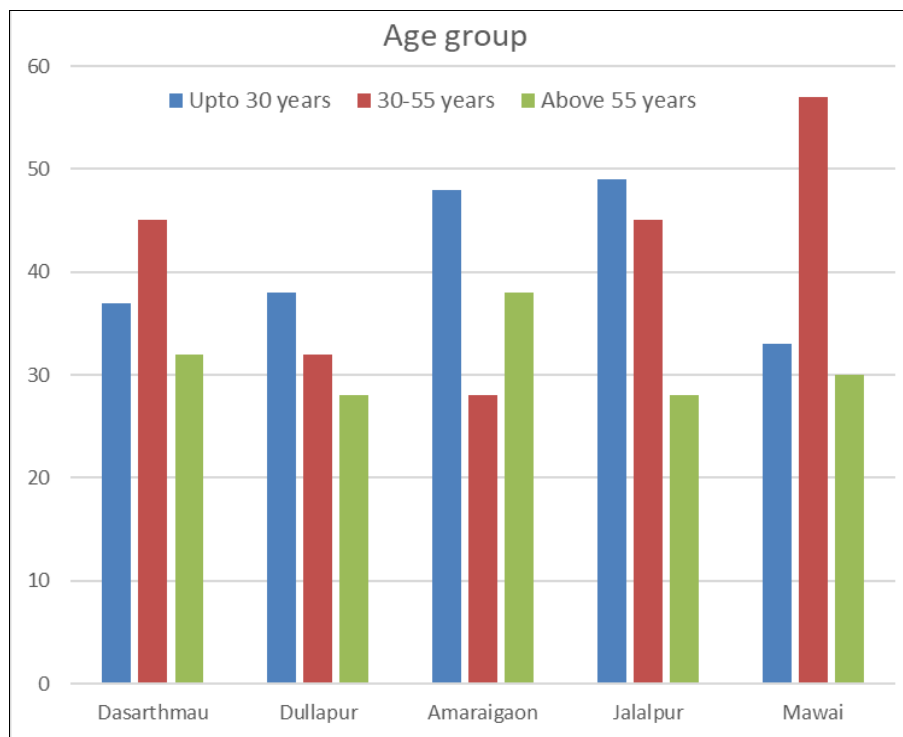| Sl. No.	Villages	Up to 30 years		30-55 years		Above 55 Years		Mean	Chi-square
		F	%	F	%	F	%		
1.	Dasrathmau	37	32.46	45	39.47	32	28.07	38.00	TV statistic = 16.55
2.	Dullapur	38	38.78	32	32.65	28	28.57	32.66	CV table (0.05) =15.51
3.	Amaraigaon	48	42.11	28	24.56	38	32.33	38.00	X^2 statistic is significant at 5% level of significance
4.	Jalalpur	49	40.16	45	36.89	28	22.95	40.66	
5.	Mawai	33	27.50	57	47.50	30	25.00	40.00	
	Total	205	36.10	207	36.44	156	27.46		
	Mean	41.00		41.40		31.20			

Fig 1: Age group between the farmers.

It was revealed from the Table 1 that middle age group of farmers had constituted most of the percentage of selected villages of Rudauli block. Maximum number of family member's upto 30 years of age group (49) was recorded in Jalalpur block. However, minimum upto 30 years age group of family members was recorded in Mawai village of Rudauli block. It was also observed that middle age group (30-55 years) of family member was recorded maximum (57) in Mawai village followed by Jalalpur (45), Dasrathmau (45) and Dullapur (32) of Rudauli block.

Minimum number of middle age group (30-55 years) of farmers was recorded in Amaraigaon village of Rudauli block. Higher age group (above 55 years) of farmer's members was obtained in Amaraigaon village followed by Dasrathmau (32) and Mawai (30), villages of Rudauli block. However, minimum (28) number of farmers of higher age group (above 55 years) was obtained in Jalalpur and Dullapur villages of Rudauli block of Ayodhya district.
In the chi-square analysis, TV (16.55) for this attribute has been found higher than CV (15.51) confirming its

significant association with number of farmer member according to age percentage of farmers in selected villages of Rudauli block of Ayodhya district.

The likelihood of adoption in related to age. In chi-square analysis, TV (16.55) for this attribute has been found higher than CV (15.51) confirming its significant relationship between age percentage of farmers and adoption of agroforestry in selected villages of Rudauli block of Ayodhya district. It means farmer's decision to adopt or not to adopt agroforestry as influence by age. However, age can influence adoption process in both, positive, and negative way. This finding has agreed to Rogers (2003) [6] who mentioned both; the positive and negative influence of age on adoption. Above facts lie behind confirm the significant

association between age and adoption which is proved by x2 analysis for age attribution and adoption of agroforestry. This finding also draw support from Surendra and Mahesh (2015) [11] who concluded that Age as significant socio-economic factor and contradicts Sood *et al.* (2008) [9] who found out no association between on farm tree cultivation and age of the farmer.

Gender
A perusal of data on number of men and women farmers was found in selected village of Rudauli bock of Ayodhya district have been presented in Table 2 and graphically in Fig 2.

Table 2: Gender distribution of farmers and its association with adoption of agroforestry practices

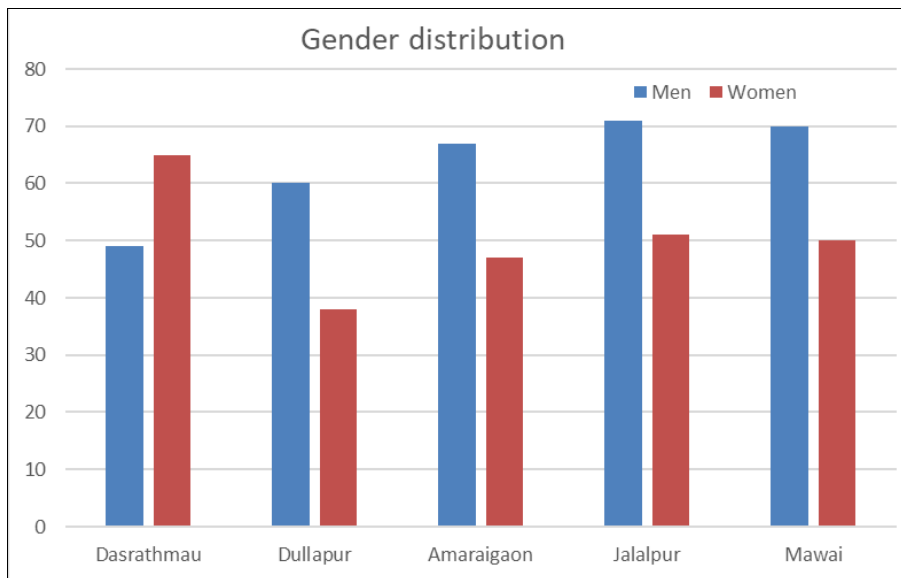| Sl. No.	Villages	Men		Women		Mean	Chi-square
		F	%	F	%		
1.	Dasrathmau	49	42.98	65	57.02	57.00	TV statistic = 9.76
2.	Dullapur	60	61.22	38	38.78	49.00	CV table (0.05) =9.49
3.	Amaraigaon	67	58.77	47	41.23	57.00	
4.	Jalalpur	71	58.20	51	41.80	61.00	X^2 statistic is significant at 5% level of significance
5.	Mawai	70	58.33	50	41.67	60.00	
	Total	317	55.81	251	44.19		
	Mean	63.40		50.20			

Fig 2: Gender distribution among the farmers.

It is clear from the Table 2 that higher number of men farmers (71) was obtained in Jalalpur village followed by Mawai (70), Amaraigaon (67) and Dullapur (60) villages of Rudauli block, however, the minimum number of men (49) were farmers recorded in Dasrathmau village of Rudauli block of Ayodhya district. It was also observed that a greater number of women (65) farmers was found in Dasrathmau village followed by Jalalpur (51), Mawai (50), Amaraigaon (47) villages of Rudauli block. Minimum number of women (38) farmers was obtained in Dullapur village of Rudauli block of Ayodhya district.

Chi-square analysis has shown that TV (9.76) for number of men and women farmers higher than CV (9.49) proven its dependency on each other hence recorded significant association with the adoption of agroforestry practices.

Middle age group of farmers had constituted most of the percentage of selected villages of Rudauli block. Maximum number of family member's upto 30 years of age group (49) was recorded in Jalalpur villages. However, minimum upto 30 years age group of family members was recorded in Mawai village of Rudauli block. It was also observed that middle age group (30-55 years) of family member was recorded maximum (57) in Mawai village followed by Jalalpur (45), Dasrathmau (45) and Dullapur (32) of Rudauli block. Minimum number of middle age group (30-55 years) of farmers was recorded in Amaraigaon village of Rudauli block. Higher age group (above 55 years) of farmers members was obtained in Amaraigaon village followed by Dasrathmau (32) and Mawai (30), villages of Rudauli block. However, minimum (28) number of farmers of higher age group (above 55 years) was obtained in Jalalpur and

Dullapur villages of Rudauli block of Ayodhya district.

Marital status

A perusal of data on number of married and un-married

percentage of farmer in a selected village of Rudauli block of Ayodhya district have been presented in Table 3.

Table 3: Marital status of farmers and its association with adoption of agroforestry practices

Sl. No.	Villages	Married		Un-Married		Mean	Chi-square
		F	%	F	%		
1.	Dasrathmau	31	27.20	83	72.80	57.00	TV statistic = 10.04
2.	Dullapur	24	23.02	74	73.02	49.00	CV table (0.05) =9.49
3.	Amaraigaon	33	28.95	81	71.05	57.00	
4.	Jalalpur	48	39.34	74	60.66	61.00	X^2 statistic is significant at 5% level of significance
5.	Mawai	47	39.17	73	60.83	60.00	
	Total	183	32.22	385	67.78		
	Mean	36.60		77.00			

It is evident from the Table 3 that maximum number of married farmer (48) was found in Jalalpur village followed by Mawai (47), Amaraigaon (33) and Dasrathmau (31) villages of Rudauli block of Ayodhya district. Minimum number of married (24) farmer was recorded in Dullapur village of Rudauli block in Ayodhya district. It was also observed that the number of un- married farmers was found more (83) in Dasrathmau village followed by Amaraigaon (81), Jalalpur (74) and Mawai (73) villages of Rudauli block in Ayodhya district. The minimum number of un-married farmers (71) was recorded in Dullapur village of Rudauli block of Ayodhya district.

Calculated chi-square TV occurred as 10.04 which was higher than CV (9.49), it has indicated a significant association of marital status with the adoption of agroforestry practices.

In results, married farmers had been reported less than that

of unmarried, widow or widower farmers. Unmarried and widow/widower farmers rarely get theses social opportunities/challenges. Since agroforestry practices require management operations demanding relatively more man power which unmarried or widower do not pose in terms of family work force; hence influence negatively. This finding is favoured by Sharma and Mahesh (2015) who concluded marital status as the significant factor. This finding however, goes against to the study of Meijer *et al.* (2015) [3] who found marital status as an independent factor in adoption. Similar results have also been reported by Ruheza *et al.* (2012) [7].

Family size of respondents

A perusal of data on size of family percentage of farmer in selected villages of Rudauli block of Ayodhya district have been presented in Table 4.

Table 4: Family-size of farmers and its association with adoption of agroforestry practice

Sl. No.	Villages	Small		Medium		Large		Mean	Chi-square
		F	%	F	%	F	%		
1.	Dasrathmau	12	17.75	6	90	2	0	6.66	TV statistic = 16.07
2.	Dullapur	3	15.02	14	95	3	0	6.66	CV table (0.05) =15.51
3.	Amaraigaon	5	17.43	13	90	2	10	6.66	
4.	Jalalpur	3	20.03	14	100	3	0	6.66	X^2 statistic is significant at 5% level of significance
5.	Mawai	10	19.52	8	80	2	20	6.66	
	Total	1222.00	17.84	5385	78.61	243.20	3.55		
	Mean	6.60		11.00		2.40			

It is clear from the data showed is Table 4 that small size of family was recorded maximum in Dasrathmau (12) village followed by Mawai (10) and Amaraigaon (5) villages of Rudauli block of Ayodhya district. Minimum number of small size family (3) were recorded in Dullapur and Jalalpur villages of Rudauli block of Ayodhya district. Maximum number of medium (14) size of family was found in Dullapur and Jalalpur villages followed by Amaraigaon (13), Mawai (8) and Dasrathmau (6) of Rudauli block of Ayodhya district. Least number of large size family was recorded is different selected villages of Rudauli block of Ayodhya district.

Calculated chi-square TV occurred as 16.07 which was higher than CV (15.51). It has indicated a significant association of different size of family percentage of farmers

in selected villages of Rudauli block of Ayodhya district.

It has indicated a significant association of different size of family percentage of farmers for adoption of agroforestry practices in selected villages of Rudauli block of Ayodhya district. Household family size indicates the availability of working labour to conduct farming activities or to take up newly introduced innovation such as agroforestry practices. This goes with findings of Sood (2006) [10] that adoption of agroforestry increases when farmers have smaller families.

Number of literate and non-literate

Data on number of literate and non-literate percentage of farmers in a selected villages of Rudauli blocks of Ayodhya district have been presented in Table 5.

Table 5: Number of literate and non-literate in a selected village

Sl. No.	Villages	Literate		Non-literate		Mean	Chi-square
		F	%	F	%		
1.	Dasrathmau	69	60.53	45	39.47	57.00	TV statistic = 10.66
2.	Dullapur	59	60.20	39	39.80	46.00	CV table (0.05) =9.49
3.	Amaraigaon	77	67.54	37	32.46	57.00	
4.	Jalalpur	87	71.31	35	28.69	61.00	X^2 statistic is significant at 5% level of significance
5.	Mawai	63	52.50	57	47.50	60.00	
	Total	355	62.50	213	37.50		
	Mean	71.00		41.40			

It is observed from Table 5 that highest literate person (87) was observed in Jalalpur village followed by Amaraigaon (77), Dasrathmau (69), Mawai (63). Minimum literate person found in Dullapur village in Rudauli block. As far as non-literate person is concerned, maximum number of non-literate person (57) was observed that Mawai village followed by Dasrathmau (45), Dullapur (39) and Amaraigaon (37) villages of Rudauli block. However minimum number of non- literate (35) farmers was recorded in Jalalpur village of Rudauli block of Ayodhya district.

Chi-square test has further confirmed a significant association between these variables (TV 10.66 and CV 9.49).

The finding also reflects that literate person can better understood of technology and practices like agroforestry, but hardly affects his decision to choose agroforestry and any famer with any level of education can practice agroforestry. This finding does not support conclusion as given by Matata *et al*. (2008) [2] who reported a positive effect of education influence adoption of land management practices and; point of view that year of education influence adoption of agroforestry. Similar findings were reported by Sood *et al*., (2008) [9].

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