



## Gender Roles in Agroforestry Systems of Ayodhya district, Uttar Pradesh

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**Abstract:** This study was conducted in all the eleven blocks of Ayodhya district of Uttar Pradesh for a period of two years using questionnaire surveys to study the gender roles in agroforestry systems and tree management, preferences of tree species, access to resources and participation in decision-making, gendered rights to harvesting and processing of agroforestry tree products, marketing of products, spaces and ownership of trees and identified the factors hindering gender adoption of agroforestry and evaluated its implications for agroforestry interventions. The males were involved in majority of the agroforestry activities such as ploughing, tree planting, fertilization, pruning, harvesting, transport and sales. Males had greater access to land ownership, land transfer rights, loan and irrigation facilities. The decision on planting of species, which area to plant, how many numbers of plants to be planted, irrigation, pruning, harvesting and sale was mostly taken by males whereas the females took decision on the season of planting, financial management, fertilizer application and processing. Males enjoyed the rights of harvesting, marketing and tree ownership and the females had the right of processing agroforestry products. Females preferred fruit bearing trees whereas the men preferred timber-yielding trees. Family opposition and limited cash availability was seen as a hindrance by the females in adoption of agroforestry systems and they stressed on policy interventions to improve the adoption rate of agroforestry systems. The societal pressure restricts the females from becoming financial independent and decision makers. High level policy intervention and changes in social behaviour and attitudes is required to cherish the dream of women empowerment in this region.

**Keywords:** Agroforestry adoption, Decision-making, Gendered-rights, Implications, Tree preferences

Over the years the attention paid by scientific community to gender and its role in development and inequalities between men and women has increased (Kiptot et al 2014). If these gender imbalances are addressed, it will increase food security and prosperity. Gender inequalities are determined by the factors such as social norms, institutional rules, gendered division of labour, gendered knowledge systems, gendered differences in access to natural, physical, financial and human capital and gendered differences in decision-making processes (Empacher et al 2001, Ott 2002). Social norms shape the gender decisions and choice. Women are always looked upon as weaker section of the society as compared to their male counterparts. To address the gender imbalances prevalent in the society, it is important to understand the social relations between men and women. Gender roles are defined as the socially accepted tasks and responsibilities that are assigned to men and women (Manfre and Rubin 2012). These gender roles may change with time, within households and caste. Traditionally, women play a lesser role than men in the decision-making process that affect and control their own lives and those of their homesteads and entitlements. Gender division of labor is itself rooted in religious and other cultural belief systems in

which concepts of masculinity and femininity, and norms about behavior that is appropriate for each sex, are intrinsic. So, depending on their roles and responsibilities, the choices and preferences of men and women differ with respect to tree species and agroforestry system choices.

Gender participation in agroforestry, varies according to preferences and values of tree species and products, as well as to the level of complexity of practices (Ratnapuri 2011). In Africa, women's participation is low in agroforestry enterprises that are considered men's domains such as timber and high in enterprises that have little or no commercial value, such as collection of indigenous fruits and vegetables; and women are often confined to the lower end of the value chain of agroforestry products (retailing), which limits their control over and returns from the productive process (Kiptot and Franzel 2012). For women's income, agroforestry value chains are particularly important, but low access to capital, technology and information, constrain women from developing their enterprises further. Furthermore, tree species preferences in agroforestry also vary between male and female household members. The study in Pakistan highlighted that men were keen on *Eucalyptus* species, as it had better survival rates, whereas

women preferred *Dalbergia sissoo*, *Melia azedarach* and *Morus alba*, which could provide better income (Muhammad 2003).

As gender roles are dynamic and depend upon time, circumstances demand and requirements, it is important to understand the complexity of gender roles and social norms. If this is not understood, it will not be possible to improve agroforestry research and development. Once this gap is filled there will be better information on constraints faced by gender in adoption of agroforestry systems, value addition of products which can then be taken up for further research and development. This paper studied the gender-wise roles, preferences, rights, participation in decision-making and factors hindering adoption of agroforestry systems.

### MATERIAL AND METHODS

**Study site:** This study was conducted in the Ayodhya district of Uttar Pradesh which consists of five tehsils and eleven blocks. This district lies between 26.7730 °N and 82.1458 °E. This district is situated 93 m above MSL (Mean Sea Level). The climate of the district is tropical monsoon. The average temperature varies from 32 °C in summers to 16 °C in winters and the average annual rainfall is 1067 mm. The study area includes reserve forests, remnant vegetation patches, rivers, temple ponds, wetlands, gardens, agroforestry systems, paddy fields and human habitations.

**Method:** Questionnaire surveys were conducted for two years (2021 to 2023) to understand gender roles, decision-making, constraints and interventions required in agroforestry systems practiced in Ayodhya district of Uttar Pradesh which consists of eleven blocks. From each block, 10 villages were identified and from each village 10 households were selected. In totality, 1100 households in 11 blocks were surveyed in which 77 households were found to have five agroforestry systems namely agri-silviculture system, agri-horticulture system, silvipastoral system and aquasilviculture system. Questions related to gender roles in agroforestry systems and tree management, gendered preferences on tree species, access to resources and participation in decision-making, gendered rights to harvesting and processing of agroforestry tree products, marketing of products, spaces and ownership of trees, factors hindering gender adoption of agroforestry and its implications for agroforestry interventions were considered. To find out the most preferred tree species as per house owner's opinion, Ahire and Kumar (2006) method was followed. The owners were asked to give a score (from 1-10) to each tree species that the owner's listed as preferred species. The most preferred species was given the highest score and the rest of the tree species were given the scores in

descending order of preferences. The tree species having the highest score was given 1<sup>st</sup> rank and so on in ascending order. Chi-square test was used for analyses using SPSS (version 19.0).

### RESULTS AND DISCUSSION

**Gender roles in agroforestry systems and tree management:** Nine major farming activities were in Ayodhya district namely ploughing, pit digging, tree planting, fertilization, watering, pruning, harvesting, transport and sale (Table 1). In all the eleven blocks, ploughing, tree planting, fertilization, pruning, harvesting, transport, sales activity was performed mainly by males and the least by females (Table 1). Across all the blocks, there was no statistically significant difference for ploughing, tree planting, pruning and harvesting and there was statistically significant difference for fertilization application. According to the studies conducted by other researchers males had major responsibility in ploughing and transportation activities (Catacutan and Naz 2015), tree planting activity (Phiri et al 2004), fertilization and sale activities (Birhanu and Guye 2022), which is similar to present study but dissimilar to the study conducted by Birhanu and Guye (2022) wherein 92.5% of males in four Southern Ethiopia villages were involved in pruning. Across all the blocks, the pit digging and irrigation activity was performed by both genders, and least by males. There was no statistically significant difference across the blocks for pit digging and irrigation activity. Birhanu and Guye (2022) observed that males shared the major responsibility in irrigation activity. The females preferred species such as *Azadirachta indica*, *Prosopis cineraria*, *Tectona grandis*, *Psidium guajava*, *Dalbergia sissoo* and *Mangifera indica* whereas the males preferred species such as *Eucalyptus globulus*, *Madhuca indica*, *Mangifera indica* and *Azadirachta indica* (Table 2).

**Gender-wise access to resources:** There was access to eight major farming resources in Ayodhya district namely land ownership, transfer rights, loans, trainings, seeds, irrigation facilities, market and harvest (Table 3). The males had the highest access to land ownership followed by females and both genders and there was no statistically significant difference across the blocks for land ownership. In all the eleven blocks, the highest access to land transfer rights, loan and irrigation facilities was enjoyed by males, and least by females. There was statistically significant difference across the blocks for access to land transfer rights and irrigation facilities but access to loan was not statistically significantly different across the blocks. Catacutan and Naz (2015) in Vietnam, observed that males had higher access to loans as compared to females which is similar to present

**Table 1.** Gender roles in agroforestry and tree management of selected agroforestry systems in Ayodhya district, Uttar Pradesh.

Activities	Gender	Overall (n=77) (%)	Milkipur (n=12) (%)	Sohawal (n=6) (%)	Harringtonganj (n=7) (%)	Mawai (n=4) (%)	Rudauli (n=7) (%)	Mayabazar (n=6) (%)	Bikapur (n=7) (%)	Masodha (n=3) (%)	Purabazar (n=8) (%)	Amaniganj (n=8) (%)	Tarun (n=9) (%)	p-value
Ploughing	Male	79.22	100.00	66.67	85.7	75.00	71.43	83.33	100.00	66.67	62.50	75.00	66.67	0.66
	Female	2.60	0.00	16.67	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	
	Both	18.18	0.00	16.67	14.3	25.00	28.57	16.67	0.00	33.33	37.50	25.00	22.22	
Pit digging	Male	22.08	33.33	33.33	42.9	50.00	71.43	50.00	100.00	66.67	62.50	62.50	66.67	0.39
	Female	33.77	33.33	16.67	0.0	25.00	0.00	16.67	0.00	0.00	0.00	0.00	11.11	
	Both	44.16	33.33	50.00	57.1	25.00	28.57	33.33	0.00	33.33	37.50	37.50	22.22	
Tree planting	Male	57.14	50.00	50.00	28.6	25.00	0.00	16.67	14.29	33.33	0.00	0.00	22.22	0.59
	Female	10.39	8.33	16.67	28.6	25.00	42.86	50.00	42.86	33.33	50.00	50.00	33.33	
	Both	32.47	41.67	33.33	42.9	50.00	57.14	33.33	42.86	33.33	50.00	50.00	44.44	
Fertilization	Male	45.45	75.00	33.33	57.1	50.00	71.43	50.00	100.00	33.33	0.00	0.00	22.22	0.02
	Female	20.78	8.33	16.67	0.0	25.00	0.00	16.67	0.00	33.33	50.00	50.00	33.33	
	Both	33.77	16.67	50.00	42.9	25.00	28.57	33.33	0.00	33.33	50.00	50.00	44.44	
Irrigation	Male	25.97	16.67	16.67	28.6	0.00	28.57	16.67	28.57	33.33	37.50	37.50	33.33	0.99
	Female	35.06	41.67	33.33	28.6	50.00	28.57	33.33	28.57	33.33	37.50	37.50	33.33	
	Both	38.96	41.67	50.00	42.9	50.00	42.86	50.00	42.86	33.33	25.00	25.00	33.33	
Pruning	Male	77.92	75.00	66.67	85.7	75.00	71.43	66.67	71.43	66.67	87.50	87.50	88.89	0.96
	Female	5.19	8.33	16.67	0.0	0.00	0.00	16.67	0.00	0.00	0.00	0.00	11.11	
	Both	16.88	16.67	16.67	14.3	25.00	28.57	16.67	28.57	33.33	12.50	12.50	0.00	
Harvesting	Male	76.62	83.33	66.67	57.1	75.00	85.71	66.67	85.71	100.00	87.50	75.00	66.67	0.93
	Female	2.60	0.00	0.00	14.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	
	Both	20.78	16.67	33.33	28.6	25.00	14.29	33.33	14.29	0.00	12.50	25.00	22.22	
Transport	Male	97.40	100.00	83.33	100.0	100.00	100.00	83.33	100.00	100.00	100.00	100.00	100.00	
	Female	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Both	2.60	0.00	16.67	0.0	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	
Sale	Male	77.92	75.00	66.67	71.4	50.00	85.71	66.67	71.43	100.00	87.50	100.00	77.78	
	Female	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Both	22.08	25.00	33.33	28.6	50.00	14.29	33.33	28.57	0.00	12.50	0.00	22.22	

The level of significance is ( $p < 0.05$ )

study. In all the blocks, both the genders had the highest access to training, seeds, market, and least by females. There was statistically significant difference across the blocks for access to training, seeds and access to market. In earlier observations females had higher access to seeds (Catacutan and Naz 2015) and market (Birhanu and Guye 2022) whereas in the present study, both the genders had higher access to seeds as well as market. Across all the blocks, access to harvest was highest by both gender and least by males. There was no statistically significant difference across the blocks for access to harvest. Birhanu and Guye (2022) observed that females had higher access to harvest.

**Gender-wise participation in decision-making, harvesting and processing of agroforestry tree products:** Across all the eleven blocks, the decision on planting of species, numbers of plants to be planted, irrigation, pruning, harvesting and sale was mostly taken by males and least by both gender (Table 4). There was no statistically significant difference across the blocks for decision related to planting of species, numbers of plants to be planted, irrigation, pruning and sale whereas there was statistically significant difference across the blocks for decision making on harvesting. Birhanu and Guye (2022) observed that decision on planting of species was taken by females which contradicted the present study, where the males took decision on planting of species. Catacutan and Naz (2015) concluded that decision on numbers of plants to plant, irrigation and sale were taken by males. The decision on which area to plant there was taken mainly by males and least by females and there was no statistically significant difference across the block for the decision on the area to

plant. Across all blocks, the decision on season of planting, financial management, fertilizer application and processing were mostly taken by females and least by both the genders. There was no statistically significant difference across the blocks for decision on season of planting, financial management, fertilizer application and processing. Catacutan and Naz (2015) in Vietnam mentioned that decision on financial management are taken by males. Across all blocks, majority of the males enjoyed the rights of harvesting, marketing, tree ownership and least by both genders. There was statistically significant difference across the blocks for rights to harvesting but this was not the case for rights to market and tree ownership. Across all the blocks, the right of processing was mostly enjoyed by females and least by both gender and there was no statistically significant difference across the blocks.

**Factors hindering gender adoption of agroforestry and its implications for agroforestry interventions:** The lack of transportation, limited business and negotiation skills, high initial investment and lack of extension activity was seen as a hindrance, the highest by males and least by females (Table 6). But lack of transportation, high initial investment and lack of extension activities viewed as a hinderance in agroforestry system was not statistically significantly different across the blocks. Catacutan and Naz (2015) found that high initial investment was seen as a major hindrance by males. The family opposition across all the blocks was seen as hindrance, the highest by females and least by males. Across all blocks, limited products, poor understanding of tree management, limited land availability, absence of a guiding policy on agroforestry were seen as hindrance, the highest by both gender and least by females. There was no statistically

**Table 2.** Gendered ranking of species showing tree preferences in selected agroforestry systems in Ayodhya district, Uttar Pradesh

Name of tree species	Milkipur		Sohawal		Harringtonganj		Mawai		Rudauli		Mayabazar		Bikapur		Masodha		Purabazar		Amaniganj		Tarun	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<i>Eucalyptus spp.</i>	1	10	3	10	2	4	1	3	8	10	4	2	1	6	5	7	3	8	1	10	8	10
<i>Tectona grandis</i>	2	5	1	3	1	5	2	8	10	3	5	1	9	5	10	4	8	1	2	5	10	3
<i>Swietenia spp.</i>	4	8	10	5	10	2	4	5	5	5	8	10	4	8	8	2	9	10	4	8	5	5
<i>Ailanthus excelsa</i>	3	6	8	4	6	8	3	2	7	4	6	7	3	4	7	6	7	6	3	6	7	2
<i>Dalbergia sissoo</i>	5	4	2	8	7	7	5	4	4	8	7	4	5	7	4	5	4	7	5	1	4	8
<i>Mangifera indica</i>	6	1	6	10	5	3	6	6	6	2	1	5	6	3	6	3	6	5	6	3	6	1
<i>Prosopis cineraria</i>	7	7	2	2	8	10	7	9	3	1	10	8	7	2	3	10	5	2	7	4	3	4
<i>Madhuca indica</i>	8	9	4	7	9	6	8	7	1	7	2	9	8	10	1	8	2	9	8	2	1	7
<i>Azadirachta indica</i>	9	2	5	9	4	9	9	1	2	9	9	6	2	9	2	9	1	4	9	9	2	9
<i>Psidium gujava</i>	10	3	7	6	3	1	10	10	9	6	3	3	10	1	9	1	10	3	10	7	9	6

**Table 3.** Gender-wise access to resources of farmers of selected agroforestry systems in Ayodhya district, Uttar Pradesh

Activities	Gender	Overall (n=77) (%)	Milkipur (n=12) (%)	Sohawal (n=6) (%)	Harringtonganj (n=7) (%)	Mawai (n=4) (%)	Rudauli (n=7) (%)	Mayabazar (n=6) (%)	Bikapur (n=7) (%)	Masodha (n=3) (%)	Purabazar (n=8) (%)	Amaniganj (n=8) (%)	Tarun (n=9) (%)	p-value
Land ownership	Male	71.43	83.33	66.67	57.14	100.00	85.71	50.00	85.71	33.33	50.00	75.00	77.78	0.91
	Female	14.29	8.33	16.67	14.29	0.00	14.29	16.67	14.29	33.33	25.00	12.50	11.11	
	Both	14.29	8.33	16.67	28.57	0.00	0.00	33.33	0.00	0.00	33.33	25.00	11.11	
Land transfer rights	Male	49.35	41.67	50.00	85.71	75.00	85.71	66.67	14.29	0.00	50.00	12.50	55.56	0.02
	Female	18.18	41.67	33.33	14.29	0.00	14.29	0.00	14.29	0.00	25.00	12.50	11.11	
	Both	32.47	16.67	16.67	0.00	25.00	0.00	33.33	71.43	100.00	25.00	75.00	33.33	
Loans	Male	54.55	66.67	33.33	85.71	75.00	28.57	33.33	42.86	66.67	50.00	62.50	55.56	0.59
	Female	18.18	16.67	16.67	0.00	0.00	14.29	50.00	14.29	0.00	37.50	12.50	22.22	
	Both	27.27	16.67	50.00	14.29	25.00	57.14	16.67	42.86	33.33	12.50	25.00	22.22	
Trainings	Male	37.66	50.00	16.67	85.71	75.00	28.57	0.00	42.86	33.33	37.50	12.50	33.33	0.01
	Female	23.38	33.33	0.00	14.29	0.00	57.14	0.00	42.86	0.00	37.50	12.50	22.22	
	Both	38.96	16.67	83.33	0.00	25.00	14.29	100.00	14.29	66.67	25.00	75.00	44.44	
Seeds	Male	38.96	41.67	0.00	85.71	0.00	14.29	0.00	85.71	33.33	62.50	50.00	22.22	0.00
	Female	18.18	16.67	0.00	0.00	0.00	14.29	0.00	0.00	0.00	37.50	37.50	55.56	
	Both	42.86	41.67	100.00	14.29	100.00	71.43	100.00	14.29	66.67	0.00	12.50	22.22	
Irrigation facilities	Male	48.05	58.33	16.67	0.00	25.00	28.57	50.00	71.43	33.33	62.50	87.50	55.56	0.01
	Female	23.38	16.67	0.00	85.71	25.00	42.86	16.67	0.00	33.33	12.50	12.50	22.22	
	Both	28.57	25.00	83.33	14.29	50.00	28.57	33.33	28.57	33.33	25.00	0.00	22.22	
Market	Male	38.96	33.33	0.00	85.71	25.00	85.71	50.00	71.43	66.67	12.50	0.00	22.22	0.01
	Female	3.90	8.33	0.00	0.00	25.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	
	Both	57.14	58.33	100.00	14.29	50.00	14.29	33.33	28.57	33.33	87.50	100.00	77.78	
Harvest	Male	20.78	25.00	16.67	0.00	50.00	0.00	33.33	14.29	0.00	37.50	12.50	33.33	0.07
	Female	27.27	16.67	50.00	0.00	0.00	0.00	33.33	28.57	33.33	50.00	62.50	22.22	
	Both	51.95	58.33	33.33	100.00	50.00	100.00	50.00	42.86	66.67	12.50	25.00	44.44	

The level of significance is ( $p < 0.05$ )

**Table 4.** Gender-wise decision making in farming activities of selected agroforestry systems in Ayodhya district, Uttar Pradesh

Activities	Gender	Overall (n=77) (%)	Milkipur (n=12) (%)	Sohawal (n=6) (%)	Harringtonganj (n=7) (%)	Mawai (n=4) (%)	Rudauli (n=7) (%)	Mayabazar (n=6) (%)	Bikapur (n=7) (%)	Masodha (n=3) (%)	Purabazar (n=8) (%)	Amaniganj (n=8) (%)	Tarun (n=9) (%)	p-value
Planting of species	Male	53.25	50.00	33.33	71.43	50.00	57.14	50.00	42.86	66.67	62.50	62.50	44.44	0.98
	Female	33.77	33.33	50.00	28.57	50.00	42.86	33.33	28.57	33.33	25.00	12.50	44.44	
	Both	12.99	16.67	16.67	0.00	0.00	0.00	0.00	16.67	28.57	0.00	12.50	11.11	
Which area to plant	Male	49.35	41.67	66.67	71.43	50.00	71.43	50.00	57.14	33.33	37.50	37.50	33.33	0.98
	Female	31.17	33.33	16.67	14.29	50.00	14.29	33.33	28.57	66.67	37.50	37.50	33.33	
	Both	20.78	25.00	16.67	14.29	0.00	14.29	16.67	16.67	28.57	0.00	25.00	33.33	
How many numbers to plant	Male	71.43	75.00	66.67	42.86	50.00	71.43	50.00	71.43	66.67	87.50	75.00	100.00	0.92
	Female	16.88	16.67	16.67	28.57	25.00	14.29	33.33	14.29	33.33	12.50	12.50	0.00	
	Both	11.69	8.33	16.67	28.57	25.00	14.29	16.67	14.29	0.00	0.00	12.50	0.00	
Season of planting	Male	33.77	33.33	66.67	42.86	50.00	42.86	33.33	42.86	0.00	12.50	25.00	22.22	0.83
	Female	49.35	50.00	16.67	28.57	25.00	28.57	50.00	42.86	100.00	75.00	62.50	66.67	
	Both	16.88	16.67	16.67	28.57	25.00	28.57	16.67	14.29	0.00	12.50	12.50	11.11	
Financial management	Male	66.23	50.00	66.67	85.71	50.00	57.14	83.33	71.43	100.00	75.00	62.50	55.56	0.89
	Female	24.68	41.67	33.33	14.29	25.00	42.86	16.67	14.29	0.00	12.50	25.00	22.22	
	Both	9.09	8.33	0.00	0.00	25.00	0.00	0.00	14.29	14.29	0.00	12.50	22.22	
Fertilizer application	Male	38.96	33.33	66.67	14.29	75.00	42.86	33.33	42.86	33.33	25.00	50.00	33.33	0.88
	Female	48.05	41.67	33.33	71.43	25.00	28.57	50.00	57.14	66.67	62.50	37.50	55.56	
	Both	12.99	25.00	0.00	14.29	0.00	28.57	16.67	0.00	0.00	12.50	12.50	11.11	
Irrigation	Male	50.65	58.33	50.00	42.86	50.00	28.57	66.67	57.14	66.67	75.00	75.00	0.00	0.12
	Female	35.06	25.00	50.00	28.57	25.00	42.86	16.67	28.57	33.33	12.50	12.50	100.00	
	Both	14.29	16.67	0.00	28.57	25.00	28.57	16.67	14.29	0.00	12.50	12.50	0.00	
Pruning	Male	71.43	58.33	83.33	42.86	100.00	57.14	66.67	71.43	100.00	75.00	75.00	88.89	0.74
	Female	19.48	33.33	16.67	42.86	0.00	28.57	16.67	28.57	0.00	0.00	12.50	11.11	
	Both	9.09	8.33	0.00	14.29	0.00	14.29	16.67	0.00	0.00	25.00	12.50	0.00	
Harvesting	Male	48.05	50.00	50.00	71.43	25.00	14.29	66.67	85.71	100.00	75.00	12.50	11.11	0.05
	Female	41.56	41.67	33.33	14.29	50.00	71.43	16.67	14.29	0.00	12.50	75.00	88.89	
	Both	10.39	8.33	16.67	14.29	25.00	14.29	16.67	0.00	0.00	12.50	12.50	0.00	
Sale	Male	57.14	58.33	66.67	42.86	50.00	42.86	66.67	57.14	33.33	75.00	62.50	55.56	1.00
	Female	22.08	25.00	16.67	28.57	25.00	28.57	16.67	14.29	33.33	12.50	25.00	22.22	
	Both	20.78	16.67	16.67	28.57	25.00	28.57	16.67	28.57	33.33	12.50	12.50	22.22	
Processing	Male	23.38	16.67	16.67	28.57	25.00	42.86	16.67	42.86	0.00	12.50	25.00	22.22	0.99
	Female	62.34	75.00	66.67	42.86	50.00	42.86	66.67	42.86	100.00	75.00	62.50	66.67	
	Both	14.29	8.33	16.67	28.57	25.00	14.29	16.67	14.29	0.00	12.50	12.50	11.11	

The level of significance is ( $p < 0.05$ )

**Table 5.** Gender-wise rights to harvesting, marketing, processing and tree ownership in selected agroforestry systems of Ayodhya district, Uttar Pradesh

Activities	Gender	Overall (n=77) (%)	Milkpur (n=12) (%)	Sohawal (n=6) (%)	Harringtonganj (n=7) (%)	Mawai (n=4) (%)	Rudauli (n=7) (%)	Mayabazar (n=6) (%)	Bikapur (n=7) (%)	Masodha (n=3) (%)	Purabazar (n=8) (%)	Amaniganj (n=8) (%)	Tarun (n=9) (%)	p-value
Harvesting	Male	48.05	50.00	50.00	71.43	25.00	14.29	66.67	85.71	100.00	75.00	12.50	11.11	0.05
	Female	41.56	41.67	33.33	14.29	50.00	71.43	16.67	14.29	0.00	12.50	75.00	88.89	
	Both	10.39	8.33	16.67	14.29	25.00	14.29	16.67	0.00	0.00	12.50	12.50	0.00	
Marketing	Male	57.14	58.33	66.67	42.86	50.00	42.86	66.67	57.14	33.33	75.00	62.50	55.56	1.00
	Female	22.08	25.00	16.67	28.57	25.00	28.57	16.67	14.29	33.33	12.50	25.00	22.22	
	Both	20.78	16.67	16.67	28.57	25.00	28.57	16.67	28.57	33.33	12.50	12.50	22.22	
Processing	Male	23.38	16.67	16.67	28.57	25.00	42.86	16.67	42.86	0.00	12.50	25.00	22.22	0.99
	Female	62.34	75.00	66.67	42.86	50.00	42.86	66.67	42.86	100.00	75.00	62.50	66.67	
	Both	14.29	8.33	16.67	28.57	25.00	14.29	16.67	14.29	0.00	12.50	12.50	11.11	
Tree ownership	Male	50.65	50.00	50.00	71.43	50.00	42.86	50.00	28.57	100.00	50.00	50.00	44.44	1.00
	Female	32.47	33.33	33.33	14.29	25.00	42.86	33.33	42.86	0.00	37.50	37.50	33.33	
	Both	16.88	16.67	16.67	14.29	25.00	14.29	16.67	28.57	0.00	12.50	12.50	22.22	

The level of significance is (p &lt; 0.05)

**Table 6.** Factors hindering gender adoption of agroforestry systems of Ayodhya district, Uttar Pradesh

Factors	Gender	Overall (n=77) (%)	Milkipur (n=12) (%)	Sohawal (n=6) (%)	Harringtonganj (n=7) (%)	Mawai (n=4) (%)	Rudauli (n=7) (%)	Mayabazar (n=6) (%)	Bikapur (n=7) (%)	Masodha (n=3) (%)	Purabazar (n=8) (%)	Amaniganj (n=8) (%)	Tarun (n=9) (%)	p-value
Lack of transportation	Male	51.95	41.67	33.33	71.43	50.00	42.86	50.00	57.14	33.33	62.50	50.00	66.67	0.57
	Female	18.18	0.00	33.33	14.29	25.00	28.57	16.67	42.86	33.33	12.50	0.00	22.22	
Limited business and negotiation skills	Both	29.87	50.00	33.33	14.29	25.00	28.57	33.33	0.00	33.33	25.00	50.00	11.11	
	Male	51.95	41.67	33.33	71.43	50.00	42.86	50.00	57.14	33.33	62.50	50.00	66.67	
Family opposition	Female	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Both	48.05	50.00	66.67	28.57	50.00	57.14	50.00	42.86	66.67	37.50	50.00	33.33	
Limited products	Male	42.86	41.67	33.33	57.14	25.00	28.57	50.00	42.86	33.33	50.00	50.00	44.44	0.91
	Female	12.99	16.67	16.67	14.29	0.00	0.00	33.33	14.29	0.00	12.50	25.00	0.00	
High initial investment	Both	44.16	33.33	50.00	28.57	75.00	71.43	16.67	42.86	66.67	37.50	25.00	55.56	
	Male	45.45	66.67	50.00	14.29	75.00	28.57	16.67	57.14	0.00	50.00	50.00	44.44	0.34
Lack of extension activities	Female	19.48	16.67	0.00	28.57	0.00	42.86	33.33	14.29	0.00	12.50	25.00	22.22	
	Both	35.06	8.33	50.00	57.14	25.00	28.57	50.00	28.57	100.00	37.50	25.00	33.33	
Poor understanding of tree management	Male	37.66	33.33	33.33	14.29	50.00	57.14	16.67	57.14	0.00	50.00	62.50	22.22	0.18
	Female	28.57	25.00	0.00	71.43	0.00	14.29	50.00	0.00	66.67	37.50	12.50	44.44	
Limited land availability	Both	33.77	33.33	66.67	14.29	50.00	28.57	33.33	42.86	33.33	12.50	25.00	33.33	
	Male	40.26	33.33	50.00	0.00	100.00	14.29	33.33	42.86	0.00	50.00	62.50	44.44	0.25
Limited cash availability	Female	24.68	25.00	33.33	28.57	0.00	42.86	16.67	28.57	0.00	25.00	12.50	33.33	
	Both	45.45	41.67	33.33	57.14	0.00	42.86	50.00	28.57	100.00	25.00	25.00	22.22	
Absence of a guiding policy on agroforestry	Male	31.17	33.33	0.00	57.14	0.00	14.29	33.33	42.86	0.00	37.50	25.00	55.56	0.18
	Female	40.26	25.00	100.00	14.29	25.00	57.14	50.00	42.86	33.33	37.50	50.00	22.22	
The level of significance is (p < 0.05)	Both	28.57	33.33	0.00	28.57	75.00	28.57	16.67	14.29	66.67	25.00	25.00	22.22	
	Male	35.06	33.33	50.00	14.29	75.00	42.86	16.67	0.00	100.00	12.50	62.50	33.33	0.03
	Female	22.08	33.33	0.00	42.86	0.00	42.86	50.00	0.00	0.00	25.00	0.00	22.22	
	Both	42.86	25.00	50.00	42.86	25.00	14.29	33.33	100.00	0.00	62.50	37.50	44.44	

The level of significance is (p &lt; 0.05)



**Table 7.** Gender-wise recommendations for adoption of agroforestry systems in Ayodhya district, Uttar Pradesh

Recommendations	Gender	Overall (n=77) (%)	Milkpur (n=12) (%)	Sohawal (n=6) (%)	Harringtonganj (n=7) (%)	Mawai (n=4) (%)	Rudauli (n=7) (%)	Mayabazar (n=6) (%)	Bikapur (n=7) (%)	Masodha (n=3) (%)	Purabazar (n=8) (%)	Amaniganj (n=8) (%)	Tarun (n=9) (%)	p-value
Develop infrastructure for transport & storage	Male	35.06	50.00	50.00	28.57	50.00	42.86	16.67	28.57	33.33	37.50	12.50	33.33	0.63
	Female	22.08	16.67	16.67	14.29	0.00	42.86	66.67	14.29	33.33	12.50	25.00	11.11	
	Both	42.86	33.33	33.33	57.14	50.00	14.29	16.67	57.14	33.33	50.00	62.50	55.56	
Training on production of value-added products	Male	37.66	33.33	33.33	28.57	25.00	28.57	16.67	42.86	33.33	62.50	37.50	55.56	
	Female	18.18	16.67	16.67	28.57	25.00	0.00	16.67	28.57	0.00	12.50	25.00	22.22	
	Both	44.16	50.00	50.00	42.86	50.00	71.43	66.67	28.57	66.67	25.00	37.50	22.22	
Training in tree management	Male	59.74	66.67	66.67	57.14	50.00	85.71	83.33	57.14	66.67	50.00	37.50	44.44	
	Female	40.26	33.33	33.33	42.86	50.00	14.29	16.67	42.86	33.33	50.00	62.50	55.56	
	Both	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Easy micro-credit arrangement	Male	15.58	16.67	16.67	14.29	0.00	14.29	16.67	28.57	0.00	25.00	0.00	22.22	0.98
	Female	18.18	16.67	16.67	28.57	25.00	0.00	16.67	28.57	0.00	12.50	25.00	22.22	
	Both	66.23	66.67	66.67	57.14	75.00	85.71	66.67	42.86	100.00	62.50	75.00	55.56	
Policy interventions	Male	20.78	16.67	16.67	14.29	0.00	14.29	16.67	28.57	0.00	37.50	0.00	44.44	0.70
	Female	41.56	50.00	50.00	57.14	75.00	42.86	16.67	42.86	33.33	25.00	37.50	33.33	
	Both	37.66	33.33	16.67	28.57	25.00	42.86	66.67	28.57	66.67	37.50	62.50	22.22	

The level of significance is (p &lt; 0.05)

significant difference across the blocks for limited product, poor understanding of tree management, limited land availability and absence of a guiding policy on agroforestry as a hindrance in agroforestry systems adoption. Birhanu and Guye (2022) concluded that limited product was seen as a major hindrance by males. The limited cash availability across all the blocks was seen as a hindrance, the highest by females and least by both gender and it was not statistically significantly different across the blocks. Across all the blocks, implication of development of infrastructure for transport and storage, training on production of value-added products were seen as interventions, the highest in both genders and least by females (Table 7). There was no statistically significant difference across the blocks for infrastructure development and training on production as interventions. Catacutan and Naz (2015) in Northwest Vietnam, observed that males recommended for better infrastructure for transport and storage in agroforestry systems as compared to that of females. Birhanu and Guye (2022) concluded that females perceived training on production of value-added products as a major intervention than males. Training in tree management was reported to be the foremost requirement, the highest by the males and the least by both the genders. Implication of easy micro-credit arrangement was seen as the intervention the highest in both genders and least by males and there was no statistically significant difference across the blocks for micro-credit arrangement. Implication of policy interventions was seen as an intervention, the highest in females and least by males but it was not statistically significantly different across the blocks.

## CONCLUSION

The agroforestry practices in Ayodhya district were still men-centric and men-dominated. Males were involved in agroforestry activities such as ploughing, tree planting, fertilization, pruning, harvesting, transport and sales and had higher access to land ownership, land transfer rights, loans and irrigation facilities. The decision on planting of species, which area to plant, how many numbers of plants to be planted, irrigation, pruning, harvesting and sale were mostly taken by males. They also enjoyed the rights of harvesting, marketing and tree ownership. Lack of transportation, limited business and negotiation skills, high initial investment, lack of extension activity were seen as hindrances in adoption of agroforestry systems according to the males of the region and were of the opinion that interventions such as easy micro-credit arrangement, development of infrastructure for transport and storage, training on production of value-added products could help in faster adoption of the system. Females preferred fruit bearing trees whereas the men preferred

timber-yielding trees. The decision on season of planting, financial management, fertilizer application and processing were mostly taken by females and they enjoyed the right of processing of agroforestry products. The family opposition and limited cash availability were seen as hindrances by the females in adoption of agroforestry systems and they stressed on policy interventions to improve the adoption rate of agroforestry systems. This study revealed that the societal pressure on females still exists in this region which restricted the females from becoming financial independent and decision makers. So, a high level policy intervention and changes in social behaviour and attitudes is required to cherish the dream of women empowerment in this region.

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