



# ANALYSIS SOCIO ECONOMICS STATUS OF FARMERS ADOPTED AGROFORESTRY OF CHIRGAON BLOCK IN JHANSI DISTRICT, INDIA

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## ABSTRACT

A socioeconomic survey was conducted among farmers in the Chirgaon block of Jhansi District, who rely primarily on agriculture for their income and have adopted agroforestry practices on their land. Despite limited education, most farmers have shown a willingness to adapt to new agroforestry patterns, maintaining small to medium-sized nuclear families to meet economic needs and uphold social status. The farmers' indigenous knowledge of tree cultivation has encouraged them to integrate horticulture crops, agriculture crops, or pasture crops into their farming systems for commercial purposes. Large-scale farmers have taken it a step further by cultivating teak and silver oak plantations to optimize resource use and land-use practices, promoting sustainable income growth. In response to changing climate and rainfall patterns, farmers have diversified their crops to include sugarcane, tomatoes, chilies, ragi, maize, and vegetables, leading to increased social equity and socioeconomic standards.

**KEY WORDS:** Socioeconomic, Agroforestry, Horticulture crop, Agricultural crop.

## INTRODUCTION

Agroforestry is a dynamic land-use system that combines trees with agricultural crops and sometimes animals, leading to diverse practices and definitions. In agroforestry farming, the allocation of land varies, with some farmers dedicating more land to agricultural crops than forest crops, typically in a 4:1 ratio. This approach helps reduce risk, as farmers can balance their income streams. Risk-averse farmers tend to plant more forest crops, while others may adopt a tolerable minimum risk system, allocating 80% of their land to forest crops and 20% to agricultural crops.

Agroforestry projects aim to enhance rural resource efficiency, promote sustainable income growth, and achieve social equity. Evaluating the socioeconomic impact of these projects helps measure their success in meeting these objectives. The uniqueness of agroforestry influences its adoption, highlighting the need for further research. Agroforestry can play a vital role in addressing socioeconomic issues in India, where 70% of the population resides in rural areas. Despite rapid economic growth, rural areas often lag behind, making sustainable land-use practices like agroforestry essential. A 2011 study by Mutonyi and Fungo found that land size, income, land tenure, technology exposure, training, and demonstration sites significantly affected adoption of home garden practices. Land tenure was also crucial for scattered tree practices. The study revealed a low level of awareness about agroforestry technologies, but a high willingness to adopt them if introduced. In 2011, Chauhan and Chauhan identified various constraints that hinder the adoption of short rotation forestry, including legal, financial, technical, and awareness issues. Additionally, researchers like Irshad et al. (2011) have investigated the impact of factors such as credit, information availability, and risk on farmer adoption behavior. These studies have also explored the socioeconomic factors that influence the adoption of agroforestry practices. Research has shown that the adoption of agroforestry practices is influenced by various factors, including farmers' beliefs and perceptions, socioeconomic characteristics, and development constraints. In terms of marketing, a study by Basamba et al. (2012) found that only a small number of agroforestry farmers participate in marketing their products. The study used a logit model to identify the socioeconomic factors that affect farmers' participation in the agroforestry market, including age, household size, education level, farm size, access to credit, and number of extension visits. Hussain et al. (2012) conducted a study to understand the beliefs and attitudes of farmers towards agroforestry in three divisional headquarters. The study found that farmers had a positive attitude towards farm forestry systems, believing that planting trees would increase their income, provide fuel wood and timber for household needs, and create a healthier work environment.

## MATERIALS AND METHODS

The study was conducted in Chirgaon block, Jhansi district, which comprises approximately 1065 households. A random survey of 150 farmers was undertaken to gather socioeconomic data. The respondent farmers were



categorized into three groups based on their landholdings: small, medium, and large farmers. Small farmers were those with landholdings between 1-5 acres, while medium farmers had farm sizes ranging from 6-14 acres. Large farmers, on the other hand, had landholdings exceeding 15 acres. This classification enabled the researchers to understand the socioeconomic characteristics of the farmers in the study area, providing valuable insights into their livelihoods and agricultural practices. The classification of farmers based on their landholdings provided insight into the status of farmers in the region. A structured survey schedule was developed to gather socioeconomic data. Two villages were selected from Chirgaon block in Jhansi district, and 150 farmers practicing agroforestry were chosen from each village. This resulted in two sample units, each consisting of 150 farmers. The data was then categorized by farm-holding size to enable comparisons across different classes. In traditional agroforestry regions, trees often grow naturally, and farmers allow them to thrive. The benefits from these trees, such as firewood, fodder, and fruits, are considered minimal. Therefore, the study focused on the income generated from trees grown on farmland to understand the socioeconomic status of farmers. To gather primary socioeconomic data, researchers conducted key informant and individual farmer interviews. All farmers practicing agroforestry were interviewed about their farms and the perceived socioeconomic benefits they derived from agroforestry practices. The study was limited to one site and one cropping season due to time and resource constraints. To ensure the effectiveness of the socioeconomic survey, the questionnaire was pretested with selected farmers in the study villages. These farmers' primary occupation was agriculture, making them ideal for the pretest. The questionnaire covered a range of topics, including general family information, land holdings, crops cultivated, livestock, and other assets. By gathering this comprehensive data, the study aimed to gain a deeper understanding of the farmers' socioeconomic status. The pretesting phase allowed researchers to refine the questionnaire and make any necessary adjustments before administering it to the larger study population. This helped ensure the accuracy and reliability of the data collected during the socioeconomic survey.

## RESULTS AND DISCUSSION

### Education status

A survey of farmers in Chirgaon block, Jhansi district, found that 79.33% and 78% of farmers in Bithari and Dharam pura villages, respectively, had only primary school education. Despite their limited formal education, the farmers were practicing agroforestry, likely due to traditional knowledge and experience. A statistical test (Z-test) was conducted to compare the educational levels of farmers in the two villages. The results showed that the difference was not significant ( $Z_{cal} < Z_{\alpha}$ ), and the null hypothesis was accepted. This means that there is no significant difference in the educational levels of farmers between the two villages.

### Type of family

In recent years, there's been a trend towards family segregation, with people opting for independent living to improve their living standards. This has led to an increase in nuclear families. A study found that 62% of farmers in Bithari village and 72.67% in Dharam pura village had nuclear families, while 38% and 27.33% had joint families, respectively. A statistical test (Z-test) was conducted to compare the two villages, and the results showed that the difference was not significant ( $Z_{cal} < Z_{\alpha}$ ). Therefore, the null hypothesis was accepted, indicating no significant difference in family structure between the two villages.

### Size of the family

When it comes to family size, the survey found that 63.33% of farmers in Bithari village had small families with 4 members. In contrast, 52.67% of farmers in Dharam pura village had medium-sized families with 5-9 members, including grandparents and unmarried siblings. Interestingly, while most farmers in Dharam pura village had small families, Bithari village had a higher proportion of medium-sized families.

**Table.1 Education level of farmers of Bithari and Dharam pura village (Chirgaon Block Jhansi District)**

| S.No. | Category   | No. of respondent of Bithari village | %     | No. of respondent of Dharam pura village | %    |
|-------|--|--------------------------------------|-------|--|------|
| 1.    | Illiterate   | 4                                    | 2.67  | 3  | 2    |
| 2.    | Primary (1 <sup>st</sup> to 5 <sup>th</sup> class) | 119                                  | 79.33 | 117                                      | 78   |
| 3.    | High school  | 16                                   | 10.67 | 13                                       | 8.67 |
| 4.    | Graduate and above                                 | 11                                   | 7.33  | 4  | 2.67 |



|                      | Bithari village | Dharam pura |
|----------------------|-----------------|-------------|
| Mean                 | 37.5            | 34.25       |
| Known Variance       | 2976.33         | 3063.58     |
| Observations         | 4               | 4           |
| z                    | 0.083636938     |             |
| P (Z<=z) two -tail   | 0.933345098     |             |
| z Critical two- tail | 1.959963985     |             |

Table.2 Types of family of farmers of Bithari and Dharam pura village (Chirgaon Block Jhansi District)

| S.No. | Family type | No. of respondent of Bithari village | %  | No. of respondent of Dharam pura village | %     |
|-------|-------------|--------------------------------------|----|--|-------|
| 1.    | Nuclear     | 93                                   | 62 | 109                                      | 72.67 |
| 2.    | Joint       | 57                                   | 38 | 41                                       | 27.33 |

|                      | Bithari village | Dharam pura |
|----------------------|-----------------|-------------|
| Mean                 | 75              | 75          |
| Known Variance       | 648             | 2312        |
| Observations         | 2               | 2           |
| z                    | 0               |             |
| P (Z<=z) two -tail   | 1               |             |
| z Critical two- tail | 1.959963985     |             |

Table.3 Size of Family of Farmers of Bithari and Dharam pura village (Chirgaon Block Jhansi District)

| S.No. | Family size                  | No. of respondent of Bithari village | %     | No. of respondent of Dharam pura village | %     |
|-------|------------------------------|--------------------------------------|-------|--|-------|
| 1.    | Small (<4 members)           | 65                                   | 43.33 | 95                                       | 63.33 |
| 2.    | Medium (5-9 members)         | 79                                   | 52.67 | 54                                       | 36.00 |
| 3.    | Large (10 and above members) | 6                                    | 4.00  | 1  | 0.67  |

|                      | Bithari village | Dharam pura |
|----------------------|-----------------|-------------|
| Mean                 | 50              | 50          |
| Known Variance       | 1501            | 2221        |
| Observations         | 3               | 3           |
| z                    | 0               |             |
| P (Z<=z) two -tail   | 1               |             |
| z Critical two- tail | 1.959964        |             |

Table.4 Land Productivity by Farmers of Bithari and Dharam pura village (Chirgaon Block Jhansi District)

|                      | Bithari village | Dharam pura |
|----------------------|-----------------|-------------|
| Mean                 | 47.875          | 54.625      |
| Known Variance       | 1020.98         | 871.7       |
| Observations         | 8               | 8           |
| z                    | -0.43884        |             |
| P (Z<=z) two -tail   | 0.660775        |             |
| z Critical two- tail | 1.959964        |             |



| S. No. | Crop      | No. of Respondent of Bithari village | %     | No. of respondent of Dharam pura | %     | Avg. cost |      | Avg. yield (Quintals) |        |
|--------|-----------|--------------------------------------|-------|----------------------------------|-------|-----------|------|-----------------------|--------|
| 1.     | Paddy     | 70                                   | 46.66 | -                                | -     | 1655      | -    | 66.07                 | 66.07  |
| 2.     | Urd       | 17                                   | 11.33 | -                                | -     | 1571      | -    | 71.18                 | -      |
| 3.     | Moong     | 107                                  | 71.33 | -                                | -     | 1425      | -    | -                     | -      |
| 4.     | Wheat     | 64                                   | 42.66 | -                                | -     | -         | 3176 | -                     | 116.89 |
| 5.     | Maize     | -                                    | -     | 64                               | 42.66 | 3077      | -    | 128.36                | -      |
| 6.     | Potato    | -                                    | -     | 46                               | 30.66 | 1647      | -    | 61.17                 | -      |
| 7.     | Sugarcane | -                                    | -     | 75                               | 50    | 2335      | -    | 58.64                 | -      |
| 8.     | Chilli    | 22                                   | 14.66 | 17                               | 11.33 | 2127      | 2335 | 13.36                 | 23.5   |
| 9.     | Gram      | 27                                   | 18    | 34                               | 22.66 | 1177      | 1105 | 9.31                  | 11.41  |
| 10.    | Pea       | 56                                   | 37.33 | 71                               | 47.33 | 1131      | 1134 | 16.48                 | 16.84  |
| 11.    | Barseem   | 20                                   | 13.33 | 25                               | 16.66 | 6440      | 6576 | 15.96                 | 17.95  |
| 12.    | Barley    | -                                    | -     | 105                              | 70    | 1314      | -    | 52.26                 | -      |

Most families surveyed consisted of a husband, wife, and their children living together as a nuclear family, with the children dependent on their parents. A statistical test (Z-test) was conducted to compare the family structures, and the results showed that the difference was not significant ( $Z_{cal} < Z_{\alpha}$ ). Therefore, the null hypothesis was accepted, indicating that there is no significant difference in family structure between the two villages.

### Land Productivity

Farmers in both villages cultivate various crops based on climate and water availability. In Dharam pura village, farmers grow paddy, urd, maize, moong, gram, barseem, and pea. In contrast, farmers in Bithari village cultivate wheat, chili, sugarcane, gram, chili, pea, and moong. A statistical test (Z-test) was conducted to compare the crops cultivated in both villages. The results showed that the difference was not significant ( $Z_{cal} < Z_{\alpha}$ ), and the null hypothesis was accepted. This indicates that there is no significant difference in the types of crops cultivated between the two villages.

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