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Constraints faced by farmers and reasons for adoption of agroforestry systems

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Abstract
The study was conducted in Saraswa, Jatwa and Keolari village of Panagar block of Jabalpur district during 2024-25. The respondents were interviewed with the help of questionnaires. The data was collected by personal interviews. The finding of the study revealed that most of the farmers practice agroforestry systems because of agroforestry requires less attention (95%) this reason ranks 1st followed by reduced usage of inputs in agroforestry (2nd rank), risk reduction (diversified yield) from agroforestry (3rd rank). The 100% farmers thought about the lower agriculture crop yields, long tree rotation period (95%), tree species and crop competition for water, light, nutrient (86%), lack of agroforestry knowledge (80%) were the constraints faced by farmers for adoption of agroforestry systems.

Keywords: Agroforestry, farmers, respondents, agriculture, rotation, adoption, constraints

Introduction
Following the green revolution, India's economy has grown quickly. However, the nation is also dealing with the effects of a rapidly expanding human population (Gupta *et al*., 2017) [11]. It has an impact on household socioeconomic circumstances, land holdings, land use patterns and cropping patterns (Sarvade and Singh, 2014) [19, 23] (Sarvade *et al*., 2020) [17]. According to the National Agroforestry Policy (NAP, 2014), agroforestry systems are the sole way to enhance tree cover. According to the Sub-Mission of Agroforestry (SMAF) Operational Guideline (2016), trees cultivated outside of forests provide almost 65% of the nation's timber needs. Agroforestry currently covers 13.7 million hectares (FSI, 2013) and growing trees outside the forest (TOF) on farmlands can be a practical way to increase the designated forest cover by 33%. In order to produce extra sporadic revenue, it is crucial to raise farmers' awareness of the benefits of implementing promising agroforestry systems in their fields (Berry *et al*., 2021) [7]. Promoting a variety of agroforestry models appropriate for varied agro-ecological zones and land use circumstances is the aim of the Sub-Mission of Agroforestry. There are several promising agroforestry systems, such as the Gmelina + Bach+ Paddy system (Sah *et al*., 2002) [18], the Babul + Paddy, Sagon + Musli (Berry *et al*., 2005) [3], the Bamboo based agroforestry system (Berry *et al*., 2008) [8], the Flemingia based silvi-agri-lac system (Berry *et al*., 2018a) [4], the Gmelina + Pan (Berry *et al*., 2018b) [5], and the Gmelina + Adarak (Berry *et al*., 2021) [7] for Madhya Pradesh.
Farming communities must consider the ramifications and adopt integrated farming methods. Agriculture productivity and output could be increased with integrated farming (Yadav *et al*., 2019) [27]. Farmers should pursue income crops to a certain degree in addition to integrated farming, since this will enhance their standard of living and ensure

they have access to nutrient-dense food (Arora, 2013) [2]. One of the finest options for sustainable agriculture may be to implement agroforestry systems. Field crops, fodder crops, horticultural crops, fruit trees and multipurpose tree species can all be grown in agroforestry. In order to lower production risk and uncertainty in economic advantages, agroforestry systems may provide a variety of products (Sarvade and Singh, 2014; Sarvade *et al*., 2014; Singh *et al*., 2015; Sarvade *et al*., 2019b; Sarvade and Upadhyay, 2019) [19, 23 26, 24, 20, 22]. In addition to reducing production costs to some degree, agroforestry systems also contribute to better soil health (Sarvade *et al*., 2014; Sarvade *et al*., 2017; Sarvade *et al*., 2019a) [23, 21, 24]. People who adopted an agroforestry system expressed moderate to low preferences for medicine, cottage industry/handicrafts, fiber/floss, oilseeds, animals/birds/insects etc., while expressing a preference for fuel wood, fodder, vegetables, fruit and timber (Gupta *et al*., 2017; Islam *et al*., 2015) [11, 12]. According to Banyal *et al*. (2011), the sole response that held the key as a motivating factor for the implementation of agroforestry practices was the significant financial return. Despite these advantages, agroforestry adoption is extremely limited because of laws requiring the planting and removal of multifunctional tree species which prioritize the detrimental effects of tree species on crops (Sharma *et al*., 2017) [25]. Furthermore, farmers' reluctance to adopt agroforestry systems can also be attributed to policy issues (Chavan *et al*., 2015) [8].
Hence, the present study was carried out in selected three villages of Panagar block of Jabalpur districts of M.P with the following objectives-

* To know the constraints faced by farmers for adoption of agroforestry systems
* To know the reasons for adoption of agroforestry systems.

Methodology

The study was carried out purposively in three selected villages in the Panagar block of Jabalpur district during the FWE programme. Thirty farmers were selected from each village allotted to the FWE student. The aforementioned data was gathered in 2024-2025 and a survey of 90 farmers and three villages in the Panagar Block was conducted.

Results and Discussions

It was operationally defined as the factors or problems or difficulties measured by the respondents in agroforestry system. There respondents were requested to express their constraints in agroforestry systems. The constraints reported by the respondents are presented in Table 1.

Table 1: Constraints faced by farmers for adoption of agroforestry systems

S. No.	Constraints	Percentage	Rank
1	Lack of agroforestry knowledge	80%	IV
2	Concerns about the law in relation to tree harvesting	77%	V
3	Lower agriculture crop yields	100%	I
4	Allelopathic consequences	71%	VI
5	Insufficient supply of high-quality planting materials	56%	IX
6	Long tree rotation period	95%	II
7	Tree species and crop competition for water, light, nutrient	86%	III
8	New diseases and insects appear in tree-based crops	61%	VII
9	Poor market infrastructure	60%	VIII
10	Difficulties in tee species transportation	44%	X

Data presented from Table revealed that 'lower agriculture crop yields in agroforestry systems' expressed by majority of the agroforestry respondents were ranked first with 100 percent. The next important constraint reported by the respondents were long tree rotation period, tree species and crop competition for water, light, nutrient, lack of agroforestry knowledge, concerns about the law in relation to tree harvesting, allelopathic consequences which ranked second, third, fourth, fifth and sixth with 95 percent, 86 percent, 80 percent, 77 percent and 71 percent, respectively.

Analysis of Table 1 further shows that 61 percent, 60 percent, 56 percent and 44 percent of the respondents expressed difficulties like, new diseases and insects appear in tree-based crops, poor market infrastructure, insufficient supply of high-quality planting materials and difficulties in tee species transportation, respectively. Similar finding was also reported by Nair (1979) [15], Pagar (1996) [16], Mahatab (2010) [13], Anand et al. (2016) [1], Mulukh (2017) [14] and Dhenge (2018) [10].

Table 2: Reasons for adoption of agroforestry systems

S. No	Reasons	Percentage	Rank
1	Low Labour requirement	63%	VII
2	Increased revenue from agroforestry	66%	VI
3	Agroforestry requires less attention	95%	I
4	Reduced usage of inputs in agroforestry	90%	II
5	Advantages for the environment	44%	IX
6	Risk reduction (diversified yield) from agroforestry	88%	III
7	More money which enhances socioeconomic status	80%	V
8	Increasing the health of the soil	43%	X
9	Can use degraded lands for practice of agroforestry	83%	IV
10	Supply the forest-based businesses with raw materials	50%	VIII

Most of the farmers practice agroforestry systems because of agroforestry requires less attention (95%) this reason ranks 1st followed by reduced usage of inputs in agroforestry (2nd rank, 90%), risk reduction (diversified yield) from agroforestry (88%), can use degraded lands for practice of agroforestry (83%), more money which enhances socioeconomic status (80%), increased revenue from agroforestry (66%), low labour requirement (63%), supply the forest-based businesses with raw materials (50%), advantages for the environment (44%) and increasing the health of the soil (43%). Similar finding was also reported by Sarvade et al., (2020) [17], Dahiphale et al., (2022) [9].

Conclusion

On the basis of above findings, it can be concluded that lower agriculture crop yields in agroforestry systems and long tree rotation period, tree and crop competition for water, light, nutrient (80%), lack of agroforestry knowledge were the major problems and reasons for adoption of agroforestry systems were agroforestry requires less attention, reduced usage of inputs in agroforestry, risk reduction (diversified yield) from agroforestry and more money which enhances socioeconomic status. The farmers' awareness of the advantages of the agroforestry system was also noted by the study. Traditional agroforestry systems are used by the majority of farmers.

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