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Adoption level of high-yielding papaya variety Taiwan 786 in Barwani District, Madhya Pradesh

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Abstract
Papaya (*Carica papaya* L.) is a highly nutritious tropical fruit that is widely consumed across the globe. In India, papaya is cultivated extensively due to its adaptability to various agro-climatic conditions and its potential for high yields. The adoption of improved papaya varieties can significantly enhance the productivity and livelihoods of farmers. This research paper aims to assess the adoption level of the high-yielding papaya variety Taiwan 786 in Barwani District, Madhya Pradesh. The study explores the factors influencing adoption and its impact on the socioeconomic status of farmers in the region. Data was collected through surveys, interviews, and field observations, and was analyzed using descriptive and inferential statistics. The findings indicate that the adoption of Taiwan 786 papaya variety is gradually increasing in Barwani District, driven by factors such as higher yield potential, disease resistance, and market demand. Furthermore, the adoption of this variety has led to an improvement in farmers' income, food security, and overall well-being. The study recommends the promotion of Taiwan 786 papaya variety through extension services, capacity-building programs, and market linkages to further enhance its adoption and impact on rural livelihoods in the region.

Keywords: Adoption level, high yielding variety, papaya, socio-economic status

Introduction
Papaya (*Carica papaya* L.) is a tropical fruit crop of significant economic importance in India (Koul *et al*., 2022) [3]. It is valued for its rich nutritional content, quick maturity, and adaptability to various agro-climatic conditions (Santhi *et al*., 2020; Karan 2022) [8, 2]. Its adaptability to various climates and relatively short growth cycle make it a valuable crop in regions with diverse agro-climatic conditions (Concepcion *et al*., 2023; Swain *et al*., 2023) [1, 10]. In India, papaya cultivation is of paramount importance due to its potential to enhance farmers' incomes, particularly in small and marginal farm settings (Saha *et al*., 2020; Panwar *et al*., 2021) [7, 5]. Papaya serves as a vital source of livelihood for many rural communities, and its export potential contributes to the nation's agricultural economy (Paudel *et al*., 2022) [6]. Additionally, papaya's role in Indian cuisine and traditional medicine further underscores its significance in the country, where it is valued not only as a nutritious fruit but also for its various health benefits. Among the numerous papaya varieties cultivated in India, Taiwan 786 has gained popularity for its high yield potential, disease resistance, and fruit quality (Singh and Singh 2019; Mitra and Sharma 2020) [9, 4]. The adoption of improved papaya varieties can play a vital role in increasing agricultural productivity and improving the livelihoods of farmers. This research paper focuses on assessing the adoption level of Taiwan 786 papaya variety in Barwani District, Madhya Pradesh, and understanding the factors influencing its adoption. The primary objectives of this research paper is to evaluate the adoption level of the Taiwan 786 papaya variety among farmers in Barwani District, Madhya Pradesh with identification of the factors influencing the adoption of Taiwan 786 papaya variety. This paper also assess the impact of adopting this high-yielding papaya variety on the socioeconomic status of farmers in the region.

Materials and Methods
Study was conduction in Barwani district of Madhya Pradesh in year 2021-23. The Barwani district is recognized as one of the administrative divisions within the state of Madhya Pradesh, located in the country of India. The district's administrative headquarters is located in Barwani.

The Barwani district encompasses a land area of 5,427 square kilometers and is inhabited by a population of 1,385,881 individuals. The district is situated in the south western region of Madhya Pradesh, with the Narmada River serving as its northern boundary. The location map of study area is presented in Fig. 1.

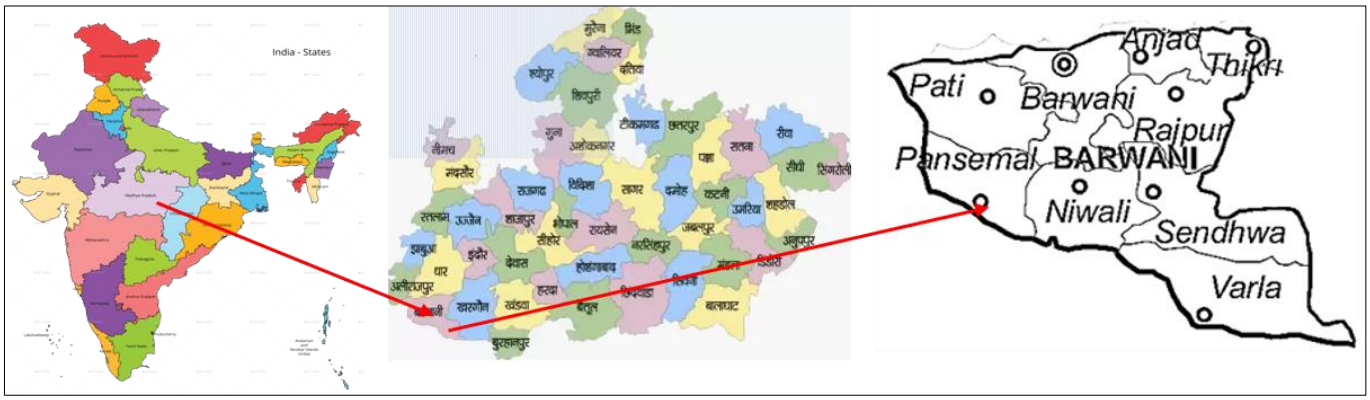

Fig 1: Location map of study area

Data collection

Data for this study was collected through a combination of surveys, interviews, and field observations. A structured questionnaire was administered to a random sample of farmers in Barwani District. The survey covered aspects such as demographic information, farm characteristics, adoption of Taiwan 786 papaya variety, reasons for adoption or non-adoption, and the impact on farm income and livelihoods.

Results and discussion

The study aimed to assess the adoption level of the high-yielding papaya variety Taiwan 786 in Barwani District, Madhya Pradesh, considering various socio-economic, communication, and psychological attributes of the respondents. A total of 200 respondents participated in the study. The results are presented in Table 2, which outlines the distribution of respondents based on different characteristics.

Table 1: Distribution of the respondents (n=200)

S. No	Characteristics	Category	Frequency	Percent (%)
1	Age	Young (< to 35)	54	27
		Medium (36 to 55)	102	51
		Old (> to 55)	44	22
2	Education Status	Illiterate	51	25.5
		Primary education	98	49
		Middle education	32	16
		Primary	4665 (23.0043)	
		Higher secondary education	14	7
		Above higher secondary	5	2.5
3	Family Size	Small (Upto 5 members)	56	28
		Medium (6 to 10 members)	82	41
		Large (above 10 members)	62	31
4	Family type	Nuclear	132	66
		Joint	68	34
5	Annual income	Low	64	32
		Medium	116	58
		High	20	10
6	Information source utilization	Low	104	52
		Medium	78	39
		High	18	9
7	Mass media exposure	Regularly	46	23
		Frequently	109	54.5
		Never	45	22.5
8	Cosmopoliteness	Low	92	46
		Medium	65	32.5
		High	43	21.5
9	Economics motivation	Low	52	26
		Medium	125	62.5
		High	23	11.5
10	Scientific orientation	Low	51	25.5
		Medium	99	49.5
		High	50	25
11	Knowledge about papaya variety 786 cultivation practices	Low	69	34.5
		Medium	98	49
		High	33	16.5

In socioeconomic attributes among the respondents, 27% were categorized as young (below 35 years), 51% fell into the medium age group (36 to 55 years), and 22% were classified as old (above 55 years). Approximately 25.5% of the respondents were illiterate, 49% had primary education, 16% had middle education, 7% had education up to the higher secondary level, and 2.5% had education above the higher secondary level. Family sizes varied, with 28% having small families (up to 5 members), 41% having medium-sized families (6 to 10 members), and 31% having large families (above 10 members). The majority (66%) of the respondents belonged to nuclear families, while 34% were from joint families. Income levels were diverse, with 32% reporting low income, 58% reporting medium income, and 10% reporting high income.

In communication attributes in terms of information source utilization, 52% of respondents had low utilization, 39% had medium utilization, and 9% had high utilization. Mass media exposure varied, with 23% of respondents reporting regular exposure, 54.5% reporting frequent exposure, and 22.5% reporting no exposure. Cosmopoliteness levels also varied, with 46% having low cosmopoliteness, 32.5% having medium cosmopoliteness, and 21.5% having high cosmopoliteness.

In psychological attributes economic motivation levels ranged from low (26%), medium (62.5%), to high (11.5%). Scientific orientation was distributed as low (25.5%), medium (49.5%), and high (25%). Knowledge about papaya cultivation practices was categorized as low (34.5%), medium (49%), and high (16.5%). These findings provide a detailed overview of the demographic and psychological attributes of the respondents, offering valuable insights into factors that may influence the adoption of the high-yielding papaya variety Taiwan 786 in Barwani District, Madhya Pradesh.

The adoption of Taiwan 786 papaya variety in Barwani District has shown an increasing trend over the past few years. Among the surveyed farmers, approximately 65% had adopted this variety in their papaya cultivation practices.

The following factors were identified as significant drivers for the adoption of Taiwan 786 papaya variety. Farmers recognized the higher yield potential of Taiwan 786 compared to traditional papaya varieties as a primary reason for adoption. The variety's resistance to common papaya diseases, such as papaya ring spot virus (PRSV), was another key factor influencing adoption. The demand for Taiwan 786 papayas in local and regional markets contributed to its adoption as it ensured better market prices for the produce.

The adoption of Taiwan 786 papaya variety had several positive impacts on the socioeconomic status of farmers in Barwani District. Adopting Taiwan 786 resulted in higher papaya yields, leading to increased income for farmers. The availability of a surplus papaya crop improved food security at the household level. The additional income generated from papaya cultivation contributed to improved living standards, including better housing and access to education and healthcare.

Conclusion

The adoption of Taiwan 786 papaya variety in Barwani District, Madhya Pradesh, is gradually increasing due to its high yield potential, disease resistance, and market demand. The adoption of this variety has positively impacted the socioeconomic status of farmers, leading to increased income, enhanced food security, and improved living standards.

To further promote the adoption of Taiwan 786 papaya variety, the following recommendations are made

a. **Strengthen Extension Services:** Extension officers should provide farmers with technical support and information on the cultivation practices of Taiwan 786.
b. **Capacity Building:** Training programs and workshops should be organized to educate farmers about the benefits and best practices associated with this variety.
c. **Market Linkages:** Efforts should be made to establish strong market linkages to ensure a stable and profitable market for Taiwan 786 papayas.

Overall, the adoption of high-yielding papaya varieties like Taiwan 786 has the potential to transform papaya cultivation in Barwani District, Madhya Pradesh, and improve the livelihoods of farmers in the region. Further research and development efforts are essential to maximize the benefits of this variety and ensure its sustainable adoption.

Conflicts of interest

The authors have no conflicts of interest.

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