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## Farmers' Views on Two Well-known Mango Cultivars (Amrapali and BARI-4) in Chapainawabganj District

Mithun Kumar Ghosh<sup>1\*</sup>, Md. Mahbub Alam<sup>2</sup>, Ajnabi Sultana<sup>3</sup>, Most. Rowson Ara<sup>2</sup>, Md. Kamrul Hasan<sup>2</sup>, Md. Nayeem Bin Masud<sup>2</sup>, Md. Sohan Ali<sup>2</sup>

<sup>1</sup>Department of Agricultural Extension & Rural Development, EXIM Bank Agricultural University Bangladesh, Chapainawabganj-6300, Bangladesh

<sup>2</sup>Faculty of Agriculture, EXIM Bank Agricultural University Bangladesh, Chapainawabganj-6300, Bangladesh

<sup>3</sup>Coordinator-agriculture, World Vision Bangladesh, Khulna

ARTICLE INFO	ABSTRACT
<p><b>Received date:</b> June 06, 2023 <b>Accepted date:</b> August 11, 2023</p>	<p>In Chapainawabganj district, Amrapali and BARI-4 emerge as the predominant hybrid mango varieties, garnering attention for their distinctive characteristics. This research adopts a descriptive research design to comprehensively explore mango farmers' perceptions concerning the performance of these two widely cultivated mango varieties. It aims to portray the current landscape of farmers' viewpoints, experiences, and preferences related to the cultivation of these specific mango cultivars. Through a random sampling method, the study focuses on mango farmers across five upazillas within the district, examining socio-demographic factors, cultivation practices, and encountered obstacles to provide a detailed exploration of the farmers' perspectives. The study reveals that Amrapali emerges as the preferred choice among farmers, capturing the majority of votes for its superior taste (83.85%), flavor (83.85%), higher yield, taller plant structure (68.3%), drought resistance (52.3%), heat tolerance (52.3%), waterlogging adaptability (92.3%), greater market demand (69.2%) and productivity (92.3%). Despite these advantages, Amrapali is more susceptible to pests (55.4%) and diseases (41.5%), yet a significant portion of farmers (60%) remain satisfied with their cultivation results. Conversely, BARI-4, alongside Amrapali, is extensively cultivated within the research area, with 78.46% of farmers growing both varieties. The study highlights various challenges faced by farmers, including lack of technology, insufficient government funding, flower or fruit dropping, lack of quality storage facilities, labor shortage with high labor charges and lack of fruit preservation facilities. Reflecting the genuine conditions of these varieties in the region, the study suggests a careful selection between Amrapali and BARI-4 or the cultivation of both, considering consumer demand, cultivar productivity, and growth characteristics. It also underscores the need for further research to address the identified challenges and to discover innovative solutions for improving mango cultivation in Chapainawabganj.</p>

**Keywords:** Amrapali, BARI 4, Chapainawabganj district, Mango, Socio-demographic

### \*CORRESPONDENCE

Mithunbsmrau88@yahoo.com

Department of Agricultural Extension & Rural Development, EXIM Bank Agricultural University Bangladesh, Bangladesh

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## 1. INTRODUCTION

Mango (*Mangifera indica*) is one of the most delicious, attractive and tropical fruit in the world. It is the king of fruits among all the fruits in the world (Kobra et al., 2012; Purseglove, 1972; Popenoe, 1921). It has also strong economic impact on the economy of Bangladesh. Mango shares 31.22% of the area and 24.38% production fruit crops in Bangladesh (Hamjah, 2014). Bangladesh is the world's 8<sup>th</sup> largest mango producing country as it produces about 1,047,850 tons of mangos every year which accounts for 3.9 percent of the world total mango production (The Daily Star, 2016). Innovation of modern variety mangoes, now a days mango can be cultivated in many districts of Bangladesh (Rahman et al., 2019). On the other hand, agricultural development is accelerated through adoption of improved agricultural technologies and formulating policies favouring appropriate institutional and infrastructural changes (Jain et al., 2009). Adoption of improved mango varieties is the key to higher production of fruits and higher incomes to farmers (Singh et al., 2010). The leading mango growing districts of the country are Chapainawabganj, Rajshahi, and greater Dinajpur. Mango is seasonal cash crop of North-Western region of Bangladesh which dominates the economy of Chapainawabganj and Rajshahi district. Rajshahi region, specifically Chapainawabganj district produces over 270 varieties of mango (Ahmed et al., 2019). It is estimated that around 85% people of the mentioned districts are directly or indirectly dependent on mango cultivation and business (Dhaka Tribune, 2018a). Chapainawabganj is called the capital of the mango in Bangladesh. In the summer, mango businesses lead the economy of this district. Most of the farmlands of this district are full of mango orchards where various kinds of mango are producing by farmers. Chapainawabganj alone produces almost 187174MT of mangoes on 62800 acres of land (BBS, 2020). The main parts of the mango production area are Shibgonj, Bholahat and Gomastapur upazilla.

Bangladesh Agricultural Research Institute (BARI) has developed 11 types of improved high-yielding mango varieties (Azad et al., 2017). Out of 11 BARI mango varieties, four varieties such as BARI Aam-1, BARI Aam-2, BARI Aam-3 and BARI Aam-8 were further evaluated by Barua et al. (2013) as suitability where BARI Aam-8 and BARI Aam-4 gave higher yield per plant. Adoption of improved production practices is the key to higher production of fruits and higher income for farmers. Bangladesh Agricultural Research Institute (BARI) invents the "BARI-4" mango. The characteristics of this variety is fibrous inner fleshy part & outer ripe part both are yellow this variety can be cultivated all over Bangladesh. The color is ripe fruit is the attractive and the average weight of the fruit is about 200-500 gm. BARI-4 Aam has obtained from a cross of local variety Ashwina and another hybrid of a variety of M3896 a variety from Florida of the US (The Daily Star, 2021). BARI-4 Aam hits the markets from the last week of July and is available till August. This mango

variety took about 17-18 years to gain popularity. Mangoes can only be guaranteed to be of the highest quality, flavor, and taste when they are harvested after reaching physiological maturity (Kader, 2002; Slaughter, 2009). Overripe fruits have different physiological and biochemical activity than mature fruits in terms of respiration rate, transpiration, starch-to-sugar conversion, and storage life (Hulme, 1971; Kader et al., 2002). Because specific gravity is simple to use and nondestructive, it offers several advantages over other maturity-determining criteria. When harvesting mangoes, skin color was employed as an indicator of maturity (Anjum, 2006; Jha et al., 2006; Abbasi et al., 2011).

BARI-3 Aam is locally known as Amropali. This variety of mango is developed by crossing between Kiron (female) and Deshari (male) (Hossain et al., 2003). At field level, this variety is well known as Amropali. The tree is Dwarf, regular bearer, cluster bearing, small-sized fruits and good keeping quality. Its flesh is deep orange-red, and the fruit contains approximately 2.5–3.0 times more  $\beta$  carotene content than other commercial varieties of mango. This mango starts arriving in the market on June 15 and continues to be available up to mid-July. It became popular among consumers for its flavor, size, color, and taste. These mangos can be cultivated all over Bangladesh. Orchards with shorter trees, planted closer to each other, are on the rise in the district where traditional mango orchards have taller and fewer trees. With mango farming increasing every year in Chapainawabganj, more and more farmers these days are planting mango trees of hybrid varieties like Amropali and BARI-4 as the trees do not grow too tall and do not need much space. The farmers prefer the hybrid varieties alongside the traditional varieties such as Fazli, Langra and Khirsapat and others as the former are more profitable and the trees produce fruits sooner. The shorter hybrid mango trees grow as tall as six to seven feet, whereas the traditional mango tree varieties are 30 to 40 feet tall.

Now a days in time of urbanization cultivated land area is decreasing day by day. Farmers are cutting down old mango trees at Chapainawabganj districts in many areas as production is low. According to scientists, the hybrid and grafted varieties are high yielding, colorful and sweeter than the existing varieties. Hybrid mango BARI -3 (Amropali) and Bari-4 are the most popular among them. Our study has been designed to collect information on the farmer's perception of performance about BARI-4 and Amropali cultivation, its adoption and reasons behind acceptability, their knowledge on cultivation process, problems faced by farmers and their possible solutions related these two varieties. Farmers of Chapainawabganj earn huge amount profit from mango cultivation. But now a days production is in danger due to various constrains like high labor charge, high rate of pesticides and fertilizers, lack of fruit processing and preserving system and marketing facilities and determining the better variety of mango between these two cultivars. So, we conducted the study to recognize the socio-demographic status of farmers, to determine the farmers'

perception, to the performance of Amrapali and BARI-4 and to investigate the challenges experienced in the cultivation of these two varieties.

## 2. MAERIALS AND METHODS

### 2.1 Research design

Descriptive research design with a cross-sectional approach. The primary goal of utilizing a descriptive research design in this study is to provide a thorough and detailed portrayal of the perceptions held by mango farmers in Chapainawabganj district regarding the performance of two widely cultivated mango varieties: Amrapali and BARI-4. The main objective is to outline the current panorama of farmers' perspectives, experiences, and preferences related to the cultivation of these specific mango cultivars. This research aimed to capture the nuanced landscape of farmers' viewpoints, their encounters with these mango varieties, and the preferences that guide their choices in mango cultivation practices.

### 2.2 Sampling Technique

The sampling technique employed for this research involved a random sampling approach, with a specific focus on mango farmers in Chapainawabganj District cultivating the BARI-4 and Amrapali varieties. This ensured representation of farmers cultivating BARI-4 and Amrapali, enhancing the likelihood of obtaining a diverse and comprehensive dataset. The approach aimed to capture the nuances of mango farming practices and perceptions among farmers specifically engaged in the cultivation of the BARI-4 and Amrapali varieties in Chapainawabganj District.

The focus of our study extended to five subdistricts in Chapainawabganj, namely Chapainawabganj Sadar, Nachole, Volahat, Shibganj, and Gomostapur. These subdistricts were strategically chosen as representative areas for the selection of our study population. The selection of these specific subdistricts took into account factors such as varying agro-climatic conditions, cultural practices, and the prevalence of mango farming. This geographic diversity allows for a more comprehensive understanding of the perceptions and preferences of mango farmers cultivating BARI-4 and Amrapali across different subdistricts in Chapainawabganj.

### 2.3 Variables and their measurement

#### 2.3.1 Socio demographic characters

Farmer's Age, Education, Total farm size, Total Annual income, Farming experience, Extension contacts considered as the socio demographic characters in this study. The age of the respondents was measured in terms of actual years from their birth to the time of the interview and expressed in years. Age of a respondent was measured according to their statements and organized into young (up to-30 years), middle age (31-50 years), and old (above-50 years). The education was measured by the number of years of schooling. During collection data were organized into primary (1-5 class), secondary (6-10 class), higher secondary

(11-12 class), graduated (above 12 class) and cannot read or write (0). The farmer's farm size was calculated based on the amount of land he owned and the unit of measurement was acre for the total farm size. Land sizes were categorized into 3 categories: Small farm (Up to-2.5 acre), Medium farm (2.5-7.5 acre), Large farm (Above-7.5 acre). The income of the farmer from different sources counted as the source of income of the farmers. Farming experience was determined by the duration of experience of a farmer in agricultural works and the unit counted in years. Experience of a respondent was measured according to their statements and organized into low (up to 5 years), medium (6-10 years) and high (above 10 years) Training exposure was determined if respondent received training any training in mango cultivation in his/her entire life on farming from different organizations.

#### 2.3.2 Current scenario of Amrapali and BARI 4 in this area

In exploring the current landscape of Amrapali and BARI-4 mango varieties within the study area, an in-depth evaluation was conducted with a focus on three dimensions. An overview of farmers' interest in cultivating both BARI-4 and Amrapali was examined, employing various selected parameters to provide a comprehensive understanding: a) Cultivation Status: The current cultivation status provides insights into the preferences and choices made by mango farmers. Understanding whether farmers are not cultivating, opting for BARI-4, Amrapali, or both cultivars help paint a descriptive picture of the prevailing trends in mango cultivation; b) Yield and Productivity: The evaluation of yield and productivity involves a close examination of the quantity of mangoes produced per acre or hectare; and c) Market Demand and Price: Delving into the market dynamics, this facet explores farmers' perceptions regarding the demand for and pricing of Amrapali and BARI-4 mangoes.

#### 2.3.3 Characteristics comparison between Amrapali and BARI-4

In this study, a concise comparison is undertaken to highlight the distinguishing characteristics between Amrapali and BARI-4 mango varieties. The focus is on key features such as color, taste, size, plant height, shelf life, etc. providing an overview of the distinct attributes of these cultivars within the study area.

#### 2.3.4 Problems found by the farmers regarding cultivation

In the pursuit of a comprehensive understanding of mango cultivation practices, this study incorporated a focused investigation into the challenges faced by farmers engaged in the cultivation of BARI-4 and Amrapali varieties. The primary objective was to identify and document the key issues hindering the successful cultivation of these mango varieties.

## 2.4. Data Collection Procedure

Data collection involved the random selection of mango farmers through face-to-face interviews, utilizing a pre-structured questionnaire. A total of 130 farmers were selected as sample of the study. The sampling was stratified across the 5 sub-districts, with specific allocations as

follows: 25 samples each from Chapainawabganj Sadar, Nachole, Gomostapur, and Volahat, 30 samples from Shibganj. The larger sample size in Shibganj was determined based on the geographical concentration of a significant number of mango orchards in this sub-district. This approach

Table 1 Distribution of the respondents according to their socio demographic characteristics (N =130)

Characteristics	Scoring Method	Categories	Respondents		Mean	SD
			Frequency	%		
Age	No. of Year	Young (Up to 30)	36	27.7	4	11.069
		Middle aged (31-50)	20	56.9		
		Old (above 50)	74	15.4		
Educational Qualification	Year of Schooling	No education (0)	6	4.6	7.55	1.199
		Primary level (0.5-5)	26	20.0		
		Secondary level (6-10)	50	38.5		
		Upper secondary level (11-12)	16	12.3		
		Graduated (above 12)	32	24.6		
Farm Size	Acre	Small (up to 2.5)	42	31.8	6.5666	5.58488
		Medium (2.5-7.5)	48	37.6		
		Large (Above 7.5)	40	30.6		
Source of income	BDT	Mango cultivation	40	30.8	4.89	2.807
		Business	2	1.5		
		Cultivation and business	54	41.5		
		Cultivation and service	10	7.7		
		Cultivation and labor	18	13.8		
		Cultivation and others	6	4.6		
Farming Experience	Years	Low (Up to 5)	56	43.1	33.42	16.18
		Medium (6-10)	66	50.8		
		High (Above 10)	8	6.2		
Training Exposure	Minimum a single time	Yes	58	44.6		
		No	72	55.4		
Extension Officer Visit	Minimum a single time	Yes	16	12.3		
		No	144	87.7		

ensures a comprehensive representation of the diverse mango cultivation practices across the entire study area.

## 2.5. Statistical analysis

Collected data from respondents was edited, coded, aggregated, revised to remove any unnecessary material, and analyzed according to the purpose of the survey. Data analysis was performed using Statistical Package for Social Science (SPSS) version 25.0. Microsoft Excel was used for the making of different graphs, charts, and tables. To understand the descriptive data, basic statistics including frequency counts, percentages, and means were used.

## 3. RESULTS

### 3.1. Socio demographic characters

In Table 1, data highlights a prominent age group with 56.9% falling in the middle age range (31-50). The young age group (Up to 30) comprises 27.7%, and individuals above 50 represent the smallest proportion at 15.4%. The middle age and young respondents exhibit a strong interest in exploring new ideas and taking risks, especially in cultivating new and hybrid varieties. Education-wise, 38.5% attained a secondary level, 24.6% are graduates, 20.0% have primary education, and 12.3% completed higher secondary education. The study area has a 4.6% illiteracy rate. In family sizes, 76.9% are in medium-sized families (5-10 members), 15.4% in small families (2-4 members), and 7.7%

in large families (above 10 members). For farm holdings, 37.6% are medium-sized (2.5-7.5 acres), 31.8% small (up to 2.5 acres), and 30.6% large (above 7.5 acres). Business engagement alongside mango cultivation is seen in 41.5%, 30.8% depend solely on mango cultivation, and 13.8% and 7.7% combine cultivation with labor or service. Around 4.6% engage in cultivation alongside another occupation, and 1.5% are involved in business. Farming experience shows

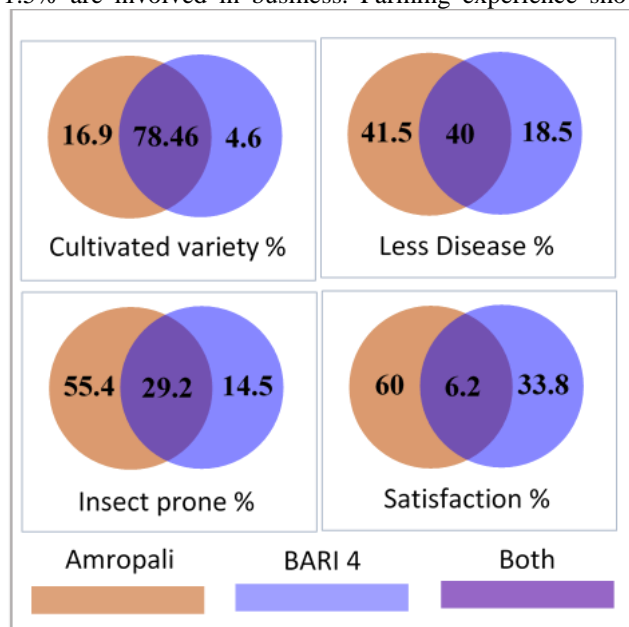


Fig 1 Cultivation status of BARI-4 and Amropali.

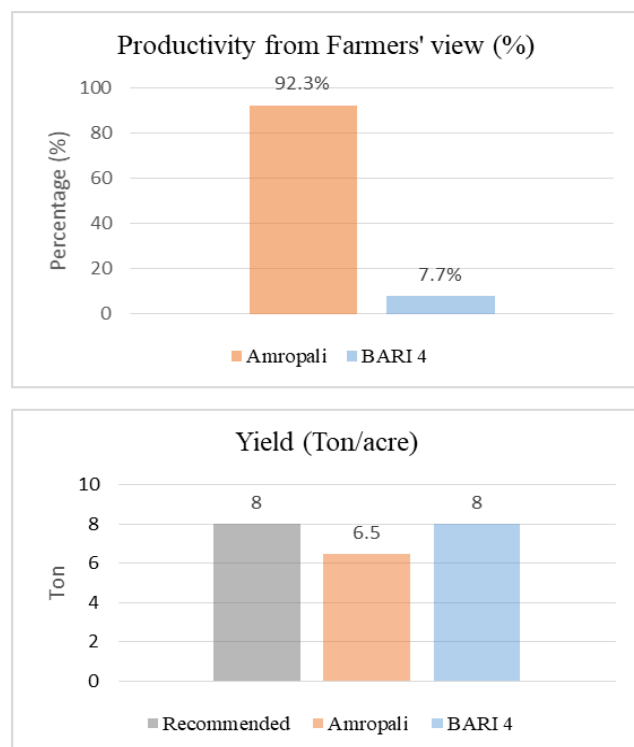


Fig. 2 Yield and productivity of Amropali and BARI 4 mango.

50.8% with less than 6-10 years, 43.1% with up to 5 years, and 6.2% with over 10 years. In terms of training, 55.4% lack mango cultivation training, relying on previous experience. Near 44.6% received training, mainly from local horticultural centers. Regarding orchard visits, 87.7% had no extension officer visits, while 12.3% reported occasional visits, emphasizing their rarity.

### 3.2 Farmers perception on Amropali and BARI 4

#### 3.2.1 Cultivation status of BARI-4 and Amropali

Out of the 130 respondents, a significant majority of 78.46% cultivate both Amropali and BARI-4 varieties (Fig.1). About 16.9% respondents exclusively cultivate Amropali, while 4.6% have BARI-4 alongside another variety of mango in their orchards.

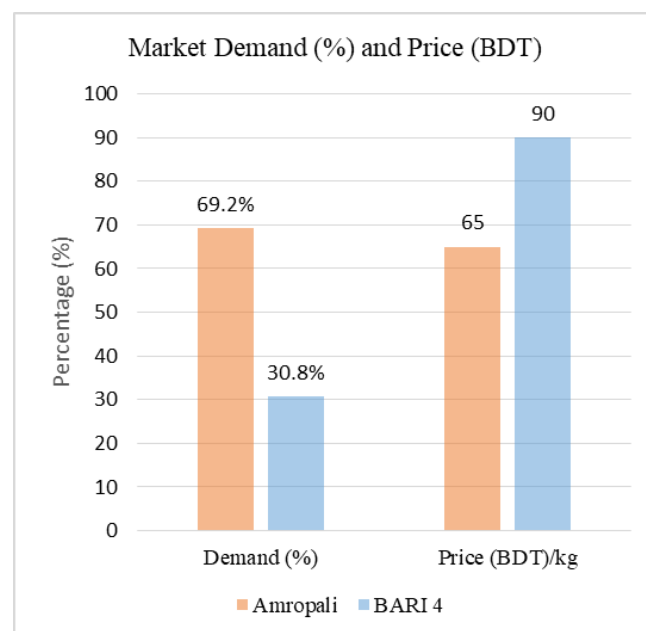


Fig. 3 Market demand and price of Amropali and BARI 4 mango.

When queried about disease susceptibility, 41.5% of respondents indicated that Amropali is less prone to infection, while 18.5% stated the same for BARI-4 (Fig.1). Approximately 40.0% reported that both varieties exhibit lower susceptibility to diseases. In terms of insect attacks, the majority of respondents (55.4%) identified Amropali as more susceptible, while 29.2% voted for BARI-4. Interestingly, 15.4% of respondents perceived both varieties as equally vulnerable to insect attacks (Fig.1). When it comes to satisfaction with performance, a substantial 60.0% of respondents cultivating Amropali expressed satisfaction. For BARI-4, 33.8% of respondents were satisfied, and for those cultivating both varieties, 6.2% reported contentment with their performance (Fig.1). These findings shed light on the perspectives of mango growers regarding disease resistance, insect susceptibility, and overall satisfaction with the performance of Amropali, BARI-4, and the combination



of both varieties in their orchards while BARI-4 has a lower satisfaction rate compared to Amropali, it still holds a significant share in cultivation. Some growers perceive BARI-4 as less susceptible to diseases, which could be an appealing feature for certain farming contexts. Amropali appears to have a higher satisfaction rate among growers, indicating positive performance perceptions. It is considered less prone to diseases, which could be a crucial factor in

decision-making for farmers who prioritize disease resistance. The majority of growers cultivate Amropali, suggesting a strong preference for this variety.

### 3.2.2 Yield and Productivity

The majority of respondents (92.3%) conveyed that Amropali is more productive, attributing its higher productivity (Fig.2).

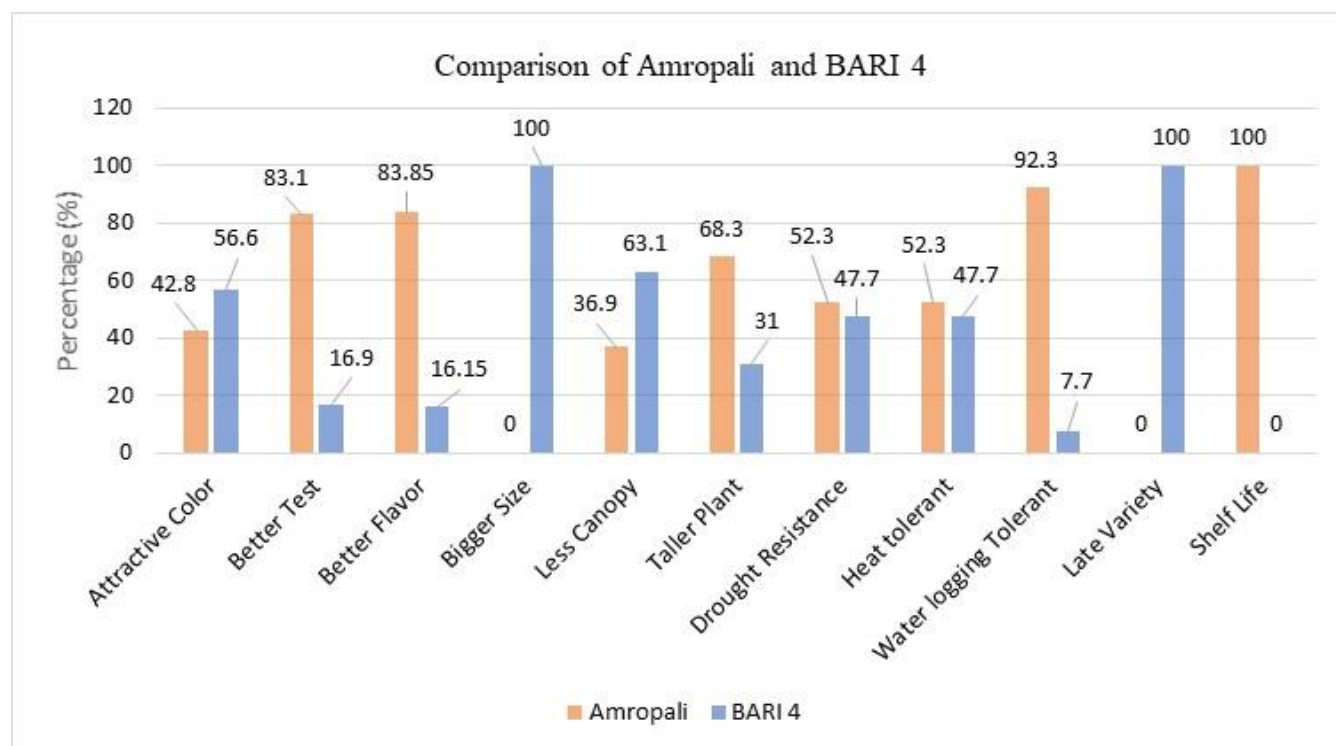


Fig. 4 Characteristics comparison of Amropali and BARI-4.

### 3.2.3 Market Demand and Price

In contrast, 7.7% of respondents expressed the opinion that BARI-4 is more productive, emphasizing its larger fruit size (Fig.2). The recommended yield for both Amropali and BARI-4 is set at 8 tons per acre. However, farmers' reported yields deviate slightly from the recommended standards. On average, respondents reported yields of 6.5 tons per acre for Amropali and 8 tons per acre for BARI-4 (Fig.2). These insights into actual yields provide valuable information about the practical productivity experienced by farmers cultivating Amropali and BARI-4 varieties in their orchards. The reported yield, while slightly lower than the recommended standard, still indicates a respectable level of productivity. The majority perception aligns with Amropali being considered more productive, suggesting it is a preferred choice among respondents. BARI-4, though not the majority choice, has a noteworthy percentage of farmers who perceive it as more productive, emphasizing its larger fruit size.

Approximately 69.2% of the respondents highlighted that the demand for Amropali is higher, primarily because of its smaller size (Fig.3). With more fruits per kilogram, it proves convenient for distribution, especially in families with multiple children or smaller households where individuals can easily consume a whole fruit. In contrast, 30.8% stated that BARI-4 enjoys greater demand due to its late ripening and appealing color. The larger size attracts people's attention. The average price per kilogram for Amropali was reported at 65 tk, while BARI-4 commanded a higher price at 90 tk (Fig.3). This leads to the conclusion that the price of BARI-4 is comparatively higher than that of Amropali, likely influenced by factors such as demand, size, and aesthetic appeal. Amropali has a higher demand, primarily driven by its smaller size, which caters to specific consumer preferences, especially in households with particular consumption patterns. BARI-4, while not the majority choice, enjoys demand due to its late ripening and appealing color, factors that attract consumers who prioritize these characteristics.

### 3.2.4 Characteristics comparison of Amropali and BARI-4

In the preference survey, 56.6% of respondents favored Bari-4 for its attractive color, while 42.8% chose Amropali over Bari-4 (Fig. 4). The standard brix for taste and flavor was reported as 23.40% for Amropali and 24.5% for Bari-4. The majority (83.1%) of respondents voted for Amropali for better taste, while 16.9% favored Bari-4. For better flavor, 83.85% of respondents chose Amropali, and 16.15% favored Bari-4. The average weight of Bari-4 and Amropali was reported as 600 grams and 210-220 grams, respectively. Bari-4 had an average fruit size of 12 cm in length and 7.6 cm in width, while Amropali's standard size was 8.3 cm in length and 6.0 cm in width. All respondents (100%) agreed that Bari-4 is bigger in size than Amropali. Regarding canopy size, 63.1% of respondents chose Bari-4 for having fewer canopies, while 36.9% voted for Amropali for having less canopy. Fully grown Amropali trees were reported to be 10-40 feet in height, while Bari-4 plants can grow up to thirty feet. A total of 68.3% of respondents voted for Amropali, and 31.7% voted for Bari-4 regarding taller plant criteria. Concerning drought tolerance, 52.3% of respondents voted for Amropali, while 47.7% believed Bari-

4 could tolerate water scarcity. In terms of heat tolerance, 52.3% of participants thought Amropali could endure high temperatures, while 47.7% believed Bari-4 was more heat-tolerant. A significant majority (92.3%) voted for Amropali as more tolerant to waterlogging than Bari-4 (7.7%). Bari-4, harvested from mid-July to mid-September, was unanimously chosen by 100% of respondents as a late variety. For having a shorter shelf life, 100% of respondents chose Amropali over Bari-4.

Summarily, respondents favored Amropali for better taste, flavor, higher yield than local varieties, taller plant, need for more management practices, drought resistance, heat tolerance, water logging tolerance, early variety, more market demand, and having a shorter shelf life. Conversely, Bari-4 received the highest votes for bigger fruit size, fewer canopies, late variety, higher price, and market value characteristics.

### 3.3. Problems found by the farmers regarding cultivation

In the study, various production and marketing challenges were identified based on farmers' perceptions, and these issues were subsequently ranked according to the responses

Table 2 Distribution of the respondents according to the problem

Characteristics	Frequency	Percentage	Rank
Lack of quality storage facilities	130	100	1 <sup>st</sup>
Not enough labor & High Labor charge	124	95.4	2 <sup>nd</sup>
Lack of fruit preservation facilities	120	92.3	3 <sup>rd</sup>
High price of pesticide or insecticide	116	89.2	4 <sup>th</sup>
Lack of processing industries	114	87.7	5 <sup>th</sup>
Insect & Disease infestation	102	78.5	6 <sup>th</sup>
Lack of modern technology	102	78.5	7 <sup>th</sup>
Lack of Govt. Funding/loan	96	73.8	8 <sup>th</sup>
Short self-life of mango	94	72.3	9 <sup>th</sup>
Dropping of fruits and flower	78	60	10 <sup>th</sup>
Lack of marketing facilities	16	12.3	11 <sup>th</sup>
Mechanical injury during harvesting	12	9.2	12 <sup>th</sup>
Lack of transportation facilities	8	6.2	13 <sup>th</sup>

received (Table 2). The primary concern, identified as the most significant problem, was the lack of quality storage facilities, ranking 1st. Following closely, the second-ranked challenges were the insufficient availability of labor and high labor charges during harvesting. Other notable issues included the lack of fruit preservation facilities (ranked 3rd), the high price of pesticides or insecticides (ranked 4th), and the absence of processing industries (ranked 5th). Additionally, challenges such as the lack of modern technology and insect and disease infestations were collectively ranked 6th. Further down the list, respondents highlighted issues like the lack of government funding/loan (ranked 7th), the short self-life of mango (ranked 8th), fruit dropping and flower loss (ranked 9th), the lack of marketing facilities (ranked 10th), mechanical injuries during harvesting (ranked 11th), and the scarcity of transportation facilities (ranked 12th).

All respondents (100%) indicated a lack of quality storage facilities. A majority (95.4%) reported an increase in labor charges, ranging from 350-450 tk per day, with a shortage of labor during harvesting. Furthermore, 92.3% expressed the belief that there is insufficient fruit preservation infrastructure, while 7.7% disagreed. Concerning the cost of pesticides, 89.2% of respondents felt it was high and increasing over time. However, 10.8% did not share this sentiment. While 70.8% stated that high pesticide costs did not reduce their profits, 29.2% reported a profit reduction. A substantial majority (87.7%) identified a lack of fruit processing industries, whereas 12.3% disagreed. Disease and insect infestation were reported by 78.5% of respondents for both varieties, with 16.9% facing issues in Amropali and 4.6% in BARI-4. Meanwhile, Sultana et al. (2018) found a similar result. Fruit cracking was a prevalent issue, affecting 95.4% of Amropali and 4.6% of BARI-4.

Anthrachnose, a significant malady, was encountered by 43.1% of survey participants, with 36.9% confronting it in both varieties, mirroring findings in Sarker et al. (2015), Rahman and Akter (2019). Specifically, 20.0% reported anthrachnose in BARI-4. A majority 98.5% expressed the belief that attacks by insects and diseases did not diminish fruit quality, though 1.5% dissented. Mango hopper was identified by 53.8% in both varieties, 30.8% in Amropali, and 15.4% in BARI-4, aligning with the observations in Sultana et al. (2018). Fruit fly infestations were acknowledged by 69.2%, with 23.1% in Amropali and 7.7% in BARI-4. A significant portion 78.5% highlighted a lack of modern technology, consistent with Uddin et al., (2018) findings, where a similar deficit in training on modern mango cultivation technologies was observed. In terms of government funding, 73.8% perceived a shortage, while 26.2% differed, asserting no funding challenges. This concurs with Uddin et al. (2018) research, indicating a parallel issue in their study. Concerning shelf life, 72.3% believed Amropali had a shorter shelf life, 15.4% thought the same for BARI-4, and 12.3% believed both had a reduced shelf life.

Fruit dropping was reported by 60% in Amropali, 32.2% in BARI-4, and 7.7% in both varieties. Despite this, 96.9% stated it did not reduce their yield, and 95.4% used preventive measures, incurring additional maintenance costs. Regarding marketing facilities, 87.7% saw no lack, while 12.3% disagreed. The majority (90.8%) reported no mechanical injuries during harvesting, while 9.2% occasionally faced such injuries. Transportation facilities were deemed sufficient by 93.8% of respondents, with 6.2% facing occasional shortages.

#### 4. CONCLUSION

This comprehensive survey of mango growers in Chapainawabganj District sheds light on the nuanced dynamics of cultivating Amropali and BARI-4 varieties. While Amropali emerges as the primary choice among farmers for its perceived productivity and disease resistance, BARI-4 holds its own niche appeal, particularly for its resilience to certain diseases and attractive market characteristics. Despite slightly lower satisfaction rates for BARI-4, its unique features make it a viable option in specific farming contexts. Market dynamics reveal distinct preferences, with Amropali favored for its smaller size and convenient distribution channels, while BARI-4 commands higher prices owing to its late ripening and appealing color. Additionally, Amropali's superiority in taste and flavor further cements its position as a preferred choice among consumers. These insights are invaluable for guiding future research endeavors, informing policy decisions, and strategizing for sustainable agricultural practices in mango

cultivation. Collaborative efforts between stakeholders are essential to capitalize on the strengths of each variety, address existing challenges, and uplift mango cultivation practices in Chapainawabganj District. By leveraging these findings, we can foster innovation, enhance productivity, and promote economic prosperity in the mango industry, ensuring its resilience and growth in the face of evolving agricultural landscapes and market dynamics.

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#### REFERENCES

- Abbasi, K. S., Anjum, N., Sammi, S, Masud, T., & Ali, S. (2011). Effect of coatings and packaging material on the keeping quality of mangoes (*Mangifera indica* L.) stored at low temperature. *Pakistan Journal of Nutrition*, 10(2), 129-138.
- Ahmed, M. A., Chowdhury, A. T., Mohib, A. A., & Hossain, M. F. (2019). Value chain analysis of mango in Bangladesh. *AIUB Journal of Business and Economics*, 16(1), 1-14.
- Anjum, N., Masud, T., & Latif, A. (2006). Effect of various coating materials on keeping quality of mangoes (*Mangifera indica*) stored at low temperature. *American Journal of Food Technology*, 1(1), 52-58.
- Azad, A. K., Goshami, B. K., Rahman, M. L., Malakar, P. K., Hasan, S., & Rahman, H. H. (2017). Edited KRISHI PROJUKTI HATBOI Bangladesh Agriculture Research Institute (BARI), Gazipur-1701, Bangladesh.
- Azad, A. K., Miaruddin, M., Ohab, M. A., Sheikh, H. R., Nag, B. L., & Rahman, H. H. (2020). Edited *Krishi projukti hatboi*. Bangladesh Agricultural Research Institute, Gazipur-1701, Bangladesh.
- Barua, H., Patwary, M. A., & Rahman, M. H. (2013). Performance of BARI mango (*Mangifera indica* L.) varieties in Chittagong region. *Bangladesh Journal of Agricultural Research*, 38(2), 203-209.
- BBS. (2020). *Statistical Yearbook of Bangladesh*. Statistical Division, Ministry of Planning, Government of the people's Republic of Bangladesh. Dhaka.
- Daily Star, (2016). Mango exports fall on concern, *The Daily Star*, 17 August, pp. 3.
- Daily Star, (2021). New mango varieties gaining ground, *The Daily Star*, 17 August, pp. 12.
- Dhaka Tribune (2018a), Mango plays vital role in improving livelihood in Rajshahi, *The Dhaka Tribune*, 3 June , pp. 11.
- Hamjah, M. A. (2014). Forecasting major fruit crops productions in Bangladesh using Box-Jenkins ARIMA model. *J. Econ. Sustain. Dev*, 5(7), 96-107
- Hossain, Z., Quaiyum, M., Jakariya, M., & Akter, N. (2003). An assessment on the performance of BRAC nursery seedlings with special emphasis on Amrapali.



- Research and Evaluation Division (RED) Archive*, 31, 159-173.
- Hulme, A. C. (1971). *The biochemistry of fruits and their products*. Academic Press. UK, London.
- Jha, S. N., Kingsly, A. R. P., & Chopra, S. (2006). Physical and mechanical properties of mango during growth and storage for determination of maturity. *Journal of Food Engineering*, 72(1), 73-76.
- Kader, A. A. (2002). *Postharvest technology of horticultural crops*. Agriculture and Natural Resources. University of California Agriculture and Natural Resources, Oakland, USA.
- Kobra, K., Hossain, M. A., Talukder, M. A. H., & Bhuyan, M. A. J. (2012). Performance of twelve mango cultivars grown in different agroecological zones of Bangladesh. *Bangladesh Journal of Agricultural Research*, 37(4), 691-710.
- Popenoe, W. (1921). Manual of tropical and sub-tropical fruits. *Agricultural Journal of South Africa*, 12(1), 80.
- Purseglove, J. W. (1972). *Tropical crops, Monocotyledons*. Halsted Press Division, Wiley. London.
- Rahman, M. S., Khatun, M., & Miah, M. M. (2019). Profitability analysis of mango cultivation and its impact on farmer's livelihood in some areas of Bangladesh. *Bangladesh Journal of Agricultural Research*, 44(1), 139-152.
- Jain, R., Arora, A., & Raju, S. S. (2009). A novel adoption index of selected agricultural technologies: Linkages with infrastructure and productivity. *Agricultural Economics Research Review*, 22(1), 109-120.
- Rahman, H., & Akter, A. (2019). Performance of Mango (*Mangifera indica* L.) Genotypes at Jamalpur Region of Bangladesh. *International Journal of Genetic Engineering and Recombination*, 5(1), 19-37.
- Sarker, S. R., Islam, M. R., & Hossain, I. (2015). Prevalence and eco-friendly management of some important nursery diseases of mango in Bangladesh. *J. Agric. Sci*, 8, 205.
- Singh, K.V., G. P. Singh & Priyadarshi, A. (2010). Extent of adoption of improved practices of mango production by mango growers in Muzaffarnagar district of Uttar Pradesh. *Indian Res. J. Ext. Edu.* 10 (3), 107-113
- Slaughter, D. C. (2009). *Nondestructive maturity assessment methods for mango*. University of California, Davis, USA.
- Sultana, A., Chowdhury, M. F., & Pervez, A. K. M. K. (2018). Present status of mango cultivation in Bangladesh: Case of Shibgonj upazila of Chapainawabganj district. *Journal of Agricultural and Rural Research*, 2(3), 47-55.
- Uddin, M. J., Begum, M. E. A., Chowdhury, S. M. K. H., & Rahman, K. S. (2018). Adoption of BARI mango varieties in selected sites of Chittagong district. *Bangladesh Journal of Agricultural Research*, 43(2), 235-252.