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Attitude of farmers towards major millets production technology in Saurashtra region

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Abstract

Millets are nutritiously dense, drought-tolerant grains primarily grown in India's arid and semi-arid tropics, as other food crops cannot be cultivated in that terrain due to low rainfall and poor soil fertility. They are small-seeded grasses from the *Poaceae* family. These are a vital source of food and fodder for millions of farmers with limited resources in India and play a crucial part in the country's ecological and economic security. Major millets are a group of cereal crops widely cultivated and consumed as staple foods. A few examples of major millets are sorghum millet, pearl millet, and finger millet. Sorghum and pearl millet are the most important crops in the Saurashtra region. The present research study is related to these two major millets (sorghum and pearl millet). Keeping this in view, present study was undertaken to analyse the attitude of farmers towards major millets production technology and explore the relationship between the profile of farmers and attitude of farmers towards major millets production technology.

An ex-post facto research design was used for the present investigation. Three districts of Saurashtra region were selected purposively viz. Junagadh, Porbandar and Jamnagar. Three talukas from each district and two villages from each taluka were selected randomly. Total twelve villages from six talukas and fifteen farmers from each village were selected randomly. Thus, a sample of total 180 farmers was considered for the study. Data were gathered using a pre-tested interview schedule through personal interactions. For analysis, appropriate statistical tools such as frequency, mean, percentage, correlation analysis, standard deviation and arbitrary methods were used.

The result of the research study reflected that exactly half (50.00 per cent) of the farmers had moderately favourable attitude, followed by 24.44 per cent of farmers had favourable attitude, 13.34 per cent farmers had unfavorable attitude, 07.78 had highly favourable attitude and remaining 04.44 per cent had highly unfavorable attitude towards major millets production technology.

The characteristics of the farmers like education, extension contact, source of information and innovativeness had positive and highly significant association with attitude of farmers. Whereas, farming experience, occupation, annual income, social participation and risk orientation had positively and significantly correlated with attitude of farmers. While, size of land holding and cropping intensity were found non-significant association with attitude of farmers. The age was negative and significantly correlated with attitude of farmers.

Keywords: Attitude, major millets production technology, farmers

Introduction

Millets are small-seeded grasses that have been cultivated for thousands of years and are an important source of food for both people and animals. In many parts of the world, especially in arid and semiarid regions, millet is a staple grain. They are a great food option for persons with dietary limitations and those looking for nutrient-dense substitutes for traditional grains because they are high in nutrients and gluten-free.

The arid and semi-arid tropics of India are the primary locations for the cultivation of Indian millets, which are nutrient-dense, drought-tolerant grains. The low rainfall and low soil fertility in these regions make it impossible to grow other food crops. They are small-seeded grasses from the *Poaceae* family.

Millets are grown in 131 countries worldwide. The production of millet is dominated by Africa and Asia, with the European Union, America, and Australia following

closely behind. With 42% of the world's millets produced, India is the biggest producer, followed by China (9.00%) and Niger (10%). Of the total millets produced in India, 62% are pearl millet, 26% are sorghum, 9% are ragi, and the remaining 3% are tiny millets. A total of 9.07 million hectares were used for millet agriculture in India in 2023-2024, yielding 12.84 million metric tons of millets (USDA, 2024) [3].

Rajasthan, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana are India's top millet-producing states. Approximately 98% of India's total millet production comes from these ten states combined (Banerjee *et al.* 2024) [6]. In India total sorghum production in 2023-24 was 40.33 lakh tonnes and total pearl millet production was 95.30 lakh tonnes. In Gujarat total sorghum production in 2023-24 was 0.56 lakh tonnes and pearl millet production were 3.63 lakh tonnes (APEDA, 2024) [2].

Major millet is a significant crop that has been grown for thousands of years, particularly in areas with limited land and severe weather. However, a move toward more contemporary and processed meals has resulted in a reduction in both their production and consumption in recent decades. Over time, the area planted to millets has substantially decreased. Therefore, it would be necessary to conduct a thorough analysis of the issue and investigate the reasons behind the low productivity and production of key millets at farmers' fields in the Saurashtra region.

The Indian government is working to address the nation's issues with food security, nutrition, and sustainability by encouraging the production and use of millet. Through a number of regulations and programs, the government seeks to encourage small-scale farmers, increase the availability of wholesome food options, and advance sustainable farming methods by boosting millets. The current research study on "Knowledge and Attitude of Farmers Towards Major Millets Production Technology in Saurashtra Region" is suggested to be conducted with all of these factors in mind.

Methodology

For this investigation, a multistage sampling technique was employed. The sampling method is explained as follows. The study was carried out in the Saurashtra region's districts of Jamnagar, Porbandar, and Junagadh. The research design used for the study was ex-post facto. Because the independent variables have already manifested or are not manipulable by nature, the scientist does not have direct control over them in this systemic empirical investigation. Three districts Junagadh, Porbandar, and Jamnagar from the Saurashtra area were specifically chosen for the study. Using the random sample approach, two talukas were chosen at random from each of the districts that were chosen. Six talukas in all were chosen for the research. A random selection technique was used to choose two villages from each of the chosen taluka. Twelve villages in all were chosen for the study from a total of six talukas. Out of the chosen villages, fifteen responders were chosen. For the study, a total of 180 respondents were chosen at random from twelve villages spread over six talukas.

The interview schedule was pre-tested in the non-sample area and translated into Gujarati. Before completing the actual timetable, the appropriate adjustments were made in light of the pre-testing experience. The right statistical tools were used to analyze the data. The researcher conducted in-person interviews with each respondent, and pertinent

information was directly entered into the timetable. In order to provide statistical treatment that may provide appropriate responses to the particular study objectives, the data was gathered, scored, calculated, and examined. The study employed statistical measurements, including the mean, percentage, standard deviation, arbitrary method, and coefficient of correlation.

With the appropriate modifications, this variable was measured using a scale created by M. K. Trivedi and N. B. Chauhan (2009) ^[18]. There are ten statements on the scale. A five-point scale strongly agree, agree, uncertain, disagree, and strongly disagree was used to record the respondents' responses. Positive comments received ratings of 5, 4, 3, 2, and 1, while negative statements received the opposite numbers of 1, 2, 3, 4, and 5. On the scale, a person may have a maximum score of 50 and a minimum score of 10.

Results and Discussion

A. Attitude of farmers towards major millets production technology

The degree to which farmers feel positive or negative about the main technologies used in millet production is known as their attitude. An individual's attitude is how they think, act, or feel about a situation or cause. It is well acknowledged that a person's attitude has a significant impact on how they behave. Table 1 and Figure 1 provide information on farmers' attitudes toward the main technologies used in millet production.

The data presented in Table 1 revealed that attitude level of farmers towards major millets production technology. It can be concluded from the table that exactly half (50.00 per cent) of the farmers had moderately favourable attitude followed by 24.44 per cent of farmers had favourable attitude, 13.34 per cent farmers had unfavourable attitude, 07.78 had highly favourable attitude and remaining 04.44 per cent had highly unfavourable attitude towards major millets production technology.

Hence, it can be concluded that (74.44 per cent) of the farmers had moderately favourable to favourable attitude. A probable reason might be due to the fact that many farmers had moderate levels of social participation, were farmers had moderately favourable to favourable attitude. A probable reason might be due to the fact that many farmers had moderate levels of social participation, were more innovative in nature, maintained frequent and close contact with extension functionaries and had medium to high risk-bearing ability, which helped them change their attitude.

Table 1: Distribution of farmers according to their attitude towards major millets production technology (n=180)

Sr. No.	Category	Frequency	Percentage
1	Highly unfavourable attitude (10.00 to 18.00 score)	08	04.44
2	Unfavourable attitude (18.00 to 26.00 score)	24	13.34
3	Moderately favourable attitude (26.00 to 34.00 score)	90	50.00
4	Favourable attitude (34.00 to 42.00 score)	44	24.44
5	Highly favourable attitude (42.00 to 50.00 score)	14	07.78
Total		180	100.00

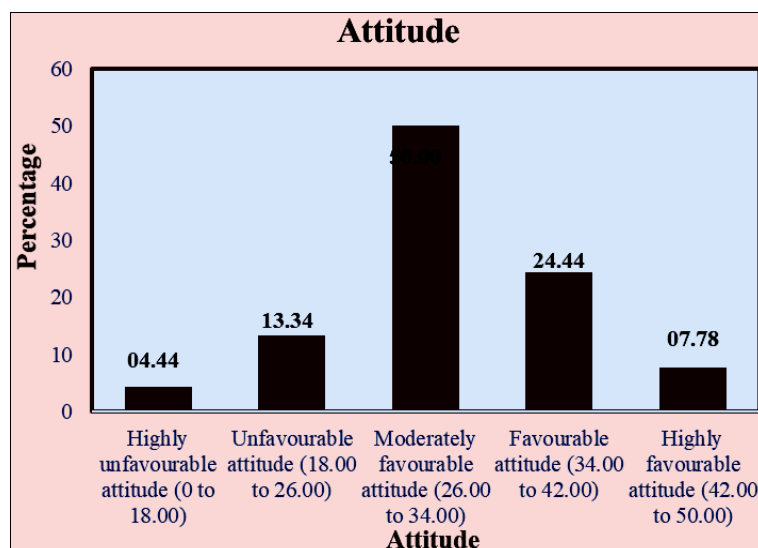


Fig 1: Distribution of farmers according to their attitude towards major millets production technology

The finding is more or less similar to result Paraw (2019)^[12], Bagri (2020)^[5], Borade (2021)^[9], Kumar *et al.* (2022)^[10], Rathva *et al.* (2022)^[15], Anju (2023)^[1], Pokar (2023)^[14], Verma (2023)^[19].

B. Relationship between the profile of farmers and their attitude towards major millets production technology

In order to ascertain the relationship between the attitude level (dependent variable) of the farmers and each of their selected characteristics (independent variables), the correlation co-efficient ('r') were calculated. The empirical hypotheses were stated for testing the relationship and its significance on zero order correlation are given in Table 2.

Table 2: Correlation between independent variables and attitude of farmers (n=180)

Sr. No.	Name of the independent variables	'r' value
1	Age	-0.1557*
2	Education	0.2003**
3	Farming experience	0.1677*
4	Occupation	0.1514*
5	Annual income	0.1754*
6	Size of land holding	0.1425 ^{NS}
7	Social participation	0.1915*
8	Cropping intensity	0.1189 ^{NS}
9	Extension contacts	0.2202**
10	Source of information	0.1987**
11	Innovativeness	0.1980**
12	Risk orientation	0.1714*

* = significant at 5% level, ** = significant at 1% level, NS = non significant

Age and Attitude

There was no relationship between the age of the farmers and their attitude towards major millets production technology. Thus, null hypothesis was rejected. It can be concluded that age of farmers had negative and significant association with attitude level. The association's negative direction showed that farmers' attitude levels declined in direct proportion to their advancing age. This pattern can be explained by the fact that younger farmers were more interested in and knowledgeable about the advanced major

millets production technique, which resulted in a more optimistic outlook than that of older farmers.

This finding was in line with the finding of Anju (2023)^[1].

Education and Attitude

There was no relationship between the education of the farmers and their attitude towards major millets production technology. It can be inferred that farmers' education positively and significantly correlated with their attitude level. The positive direction of the correlation showed that farmers' attitude levels rose in direct proportion to their level of education. The likely explanation is that farmers' attitudes toward better production techniques are greatly influenced by their education. It also highlights that farmers with higher educational levels tend to be more aware and responsive to the information about major millets production technologies

This finding was in line with the finding of Singh *et al.* (2014)^[17], Paraw (2019)^[12] and Rathva *et al.* (2022)^[15].

Farming experience and Attitude

There was no relationship between the farming experience of the farmers and their attitude towards major millets production technology. It can be concluded that farming experience of farmers had positive and significant association with attitude level. The positive direction of the correlation showed that farmers' attitude levels rose in direct proportion to their increased agricultural experience. This may have happened as a result of increasing opportunities for seasoned farmers to come across and comprehend issues relating to farming. Through peer exchanges and personal experience, individuals eventually acquired insightful knowledge. Their opinions regarding the value and use of such enhanced production techniques were frequently impacted and molded by this body of knowledge.

This finding was in line with the finding of Rathva *et al.* (2022)^[15], Ray (2022)^[16], Binh (2023)^[8] and Verma (2023)^[19].

Occupation and Attitude

There was no relationship between the occupation of the farmers and their attitude towards major millets production

technology. The occupation of farmers was shown to have a positive and substantial correlation with attitude level. The positive direction of the correlation showed that farmers' attitude levels rose in direct proportion to their increased occupation. The reason for this could be that farmers were more cautious, aware of things that could help them learn about improved agricultural technologies, and more cautious in order to supplement their income from sources other than agriculture. Their profession therefore encourages them to learn more and cultivate a favourable attitude toward important millet producing technologies that impart superior techniques.

This finding was in line with the finding of Paraw (2019) ^[12] and Anju (2023) ^[11].

Annual income and Attitude

There was no relationship between the annual income of the farmers and their attitude towards major millets production technology. It is possible to draw the conclusion that farmers' yearly income and attitude level were positively and significantly correlated. The positive direction of the correlation showed that farmers' attitude levels increased in direct proportion to their annual revenue increases. This may have happened because farmers who made more money each year were better able to embrace and use new agricultural technologies. They were able to gain more from the training and assistance given since they had access to resources including high-quality inputs, equipment, and irrigation, which resulted in a more positive attitude.

This finding was in line with the finding of Borade (2021) ^[9], Anju (2023) ^[11] and Bhosale (2023) ^[7].

Size of land holding and Attitude

There was no relationship between the size of land holding of the farmers and their attitude towards major millets production technology. It may be said that their attitude level and the amount of land they owned were positively and non-significantly correlated. It suggests that farmers' attitudes were not significantly influenced by their land holding size. The fact that extension services were intended to assist all types of farmers, irrespective of the size of their landholdings, was likely one factor in this. Both small and large farms might easily access and benefit from the training, assistance, and information offered in the programs. Therefore, rather than land size, views toward this technique were probably influenced more by awareness, exposure, and personal interest.

This finding was in line with the finding of Rathva *et al.* (2022) ^[15].

Social participation and Attitude

There was no relationship between the social participation of the farmers and their attitude towards major millets production technology. The social engagement of farmers was found to have a favourable and significant correlation with their attitude level. According to the positive orientation of the association, farmers' attitude levels rose in direct proportion to their increased social participation. This could be because social interaction frequently gives access to resources, support systems, and information. Social group participation frequently entails educational activities that raise awareness of important technologies used in the

production of millet.

This finding was in line with the finding of Kumawat (2015) ^[11], Borade (2021) ^[9] and Rathva *et al.* (2022) ^[15].

Cropping intensity and Attitude

There was no relationship between the cropping intensity of the farmers and their attitude towards major millets production technology. The calculated correlation coefficient value ($r = 0.1189$) was found positive and non-significant at 0.05 level. Thus, null hypothesis was accepted. It can be concluded that crop intensity of farmers had positive and non-significant association with attitude level. It means attitude of respondents not related with cropping intensity of the respondents. This might be due to fact that cropping intensity related to all of the crops which are taken in one farming year. That is not related to only major millets crop. That's why cropping intensity not relate with farmers attitude towards major millets production technology.

The finding was similar with the finding of Patel and Vyas (2021) ^[13].

Extension contact and Attitude

There was no relationship between extension contact of the of the farmers and their attitude towards major millets production technology. It can be concluded that extension contact of farmers had positive and highly significant association with attitude level. The positive direction of association indicated that attitude level of farmers found to be increased proportionally with increase in extension contacts of farmers. The most likely explanation for this outcome is that those who had more frequent contact with extension staff and activities may have learned more, developed a deeper comprehension, and ultimately learned more about the newest and most varied agricultural technologies. Their understanding and confidence in embracing new technologies were probably raised by this regular contact, which resulted in a more favourable attitude toward the main technology used in the production of millet. The finding was similar with the findings of Singh *et al.* (2014) ^[17], Athira (2017) ^[4] and Ray (2022) ^[16].

Source of information and Attitude

There was no relationship between the source of information of the farmers and their attitude towards major millets production technology. We can conclude that their attitude level and the information source were positively and significantly correlated. The association's positive direction showed that farmers' attitude levels rose in direct proportion to their new knowledge sources. This may be because farmers obtain knowledge about new technologies from a variety of sources, including newspapers, television, the Internet, veterinarians, KVK/university, and friends and family. Having a positive attitude toward major millets technology is facilitated by this information.

The finding was in conformity with to Kumawat (2015) ^[11], Borade (2021) ^[9], Rathva *et al.* (2022) ^[15] and Ray (2022) ^[16].

Innovativeness and Attitude

There was no relationship between the innovativeness of the farmers and their attitude towards major millets production technology. We may conclude that farmers' innovativeness

was positively and significantly correlated with their attitude level. The positive direction of the connection showed that farmers' increased innovativeness was positively correlated with their attitude level. One possible explanation for this could be that farmers who were open to trying new farming techniques became more receptive to innovation and change. Their positive attitude about the upgraded large millets technology probably increased as a result of their willingness.

The finding was supported by the finding of Borade (2021)^[9] and Rathva *et al.* (2022)^[15].

Risk orientation and Attitude

There was no relationship between the risk orientation of the farmers and their attitude towards major millets production technology. It may be inferred that farmers' risk orientation was positively and significantly correlated with their attitude level. The positive direction of the correlation showed that farmers' attitude levels rose in direct proportion to their increased risk orientation. This may have resulted from the fact that farmers who were prepared to take a chance would have greater success later on. Their favorable opinion of the upgraded main millets technology most likely increased as a result of this willingness.

The finding was supported by the finding of Borade (2021)^[9] and Rathva *et al.* (2022)^[15].

Conclusion

It can be concluded that exactly half (50.00 per cent) of the farmers had moderately favourable attitude followed by 24.44 per cent of farmers had favourable attitude. This indicated that majority of them active in social participation and found medium extension contact. The characteristics of the respondents viz., education, extension contact, source of information and innovativeness had positive and highly significant relationship with attitude of farmers. The characteristics of the respondents like; farming experience, occupation, annual income, social participation and risk orientation were positively and significantly related with attitude of farmers. The characteristic of the respondents like; age was negatively and significantly related with attitude of farmers. The remaining characteristic of the respondents like; size of land holding and cropping intensity had no significant relationship with attitude of farmers.

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