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# Study on the Level of Knowledge and Adoption of Improved Urd Production Technology and Its Relationship with Socio-Demographic Profile of The Farmers

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## ABSTRACT

*Black gram, also known as urad dal or black lentil, is a type of legume that belongs to the Fabaceae family. It is extensively cultivated in the Indian subcontinent and is a staple in various cuisines of the region. Black gram is highly nutritious and has several health benefits.* The study was conducted to find out thelevel of knowledge and adoption of Urd crop production technology and its relationship to the socio-demographic profile of the farmers. A sample of 120 farmers was drawn by following a multistage random sampling method from the Mirzapur district of Uttar Pradesh.The collected data were analyzed using the chi-square test to find the level of knowledge and adoption of Urd crop production technologyand their relationship on each independent variable. The findings of the study revealed that the majority (58.33%) of the farmers were middle-aged groups, Graduation was the highest educational level among farmers (40.83%), and 86.66 percent of the farmers had a medium level of annual income. The results further revealed that the independent variables like age, education, occupation, land holding, and mass media exposure were found to havea significant relationship with their level of knowledge and adoption of Urd crop farmers.

**Keywords:** Adoption, Education, Fabaceae, Knowledge, Socio-demographic profile

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## INTRODUCTION

Black gram, also known as urad dal or black lentil, is a type of legume that belongs to the Fabaceae family. It is extensively cultivated in the Indian subcontinent and is a staple in various cuisines of the region. Black gram is highly nutritious and has several health benefits that not only provide valuable nutrition but also play a vital role in sustainable crop production, soil fertility improvement, and the economy of countries like India and its neighbouring nations. Its adaptability to various growing conditions and seasons makes it a versatile and valuable crop for farmers in the Indian subcontinent and beyond. Pulses play an important role in the human diet as a major protein source, three times more than cereals and rich in sulphur, calories, and vitamins especially B-complex, as well as in the farm economy of our country. They are an integral component of sustainable crop production, especially in rainfed areas(Swaminathan*et al., 2023)*. Black gram (*Vigna mungo* L) is reported to have originated in India. Its references have also been found in Vedic texts such as Kautilya's 'Arthasasthra' and 'Charak Samhita' which lend support to the presumption of its origin in India.Black gram (*Vigna mungo* L. Hepper) goes to the family Fabaceae, subfamily Papilionaceae also popularly known as urd bean,urid, or mash, etc. It is mainly grown for its dry beans and it is also one of the most significant short-duration pulse crops grown in a wide range of agro-climatic conditions across all three seasons. Black gram grows in cropping systems as a mixed crop, catch crop, sequential crop, and solitary crop under residual soil moisture conditions after the harvest of rice and also before also after the harvest of other summer crops under semi-irrigated and dry landconditions (Reddy *et al*., 2022). Black gram (*Vigna mungo* L. Hepper), is an important pulse crop of Indian origin. It supplies a major share of the protein requirement of the vegetarian population of India. It is grown in almost all agroecological zones of the country. Though several improved varieties have been developed, most of them show inconsistent performance under varied environmental and climatic conditions due to genotype x environment interactions (Shanthi *et al*., 2007). The lack of suitable varieties and genotypes with adaptation to local conditions is one of the important factors causing a significant decline in pulse production in India. In the context of climate change adaptation strategies, crops with adaptation to a wider range of temperature and moisture stress play an important role. The optimum temperature for black gram ranges between 25$^0$C to 35$^0$C, but it can tolerate up to 42$^0$C. It is a hardy and drought-resistant plant and can be grown in areas receiving moderate or low rainfall (Sivaprakash *et al*., 2004).

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## RESEARCH METHODOLOGY

The study was conducted in the Mirzapur district of Utter Pradesh. Three villages of Mangraha, Sikhad, and Ramgarh were selected randomly after making a list of the villages having black gram cultivation. The present study employed an ex-post-facto research design. A sample of 120 farmers was drawn by following a multistage random sampling method. An interview schedule was prepared to collect the information in line with the objective of the study. A personal interview technique was used for data collection. The collected data has been analyzed with the help of the Statistical Package for Social Sciences (SPSS, 16.0version). Chi-Square was used with a .05 level of significance. The $\chi^2$test was first used by Karl Pearsonin the year 1900. The $\chi^2$ testisone of the simplest and most widely non-parametrictest in statistical works. The equation for Chi-Square($\chi^2$) is stated as follows:

$$X^2 = \frac{\sum(f_o - f_e)^2}{f_e}$$

Here,

$f_o$ = frequency of occurrence of observed or experimentally determined facts.

$f_e$= expected frequency, $f$o occurrence on independent hypothesis.

## RESULTS DISCUSSION

### Socio-demographic and Communication Profile of the Farmers

The results revealed (Table 1) that the majority of the farmers (58.23 %) fell into the age group 31 to 46 years followed by the 47years age group and above (23.44%) and below to 30 years age group (18.33%) of the farmers. Thus, it may be concluded that the majority of farmers belonged to the age group of 31 to 46 years. All the farmers were middle-aged. The study findings were consistent with a previous study conducted by Patel *et al.* (2023).The cent percent majority (100%) of the farmers were male this gender imbalances in certain professions can be a result of historical, cultural, and societal norms that limit the participation of one gender. In this case, it appears to be a reflection of a male-dominated society, where traditional roles and expectations have limited the involvement of women in farming. According to their level of education, the farmers were divided into six groups for this study. The majority of the farmers (40.84%) were education level up to Graduation and above followed by *25.83 percent studied up to intermediate level, whereas20.00 percent farmers studied up to* High school, 09.17 percent middle school and 04.16 *percent* Primary *school while none of the farmers was* reported Illiterate. The majority of the farmers (60.83%) had a medium-sized family (5 to 7), followed by small families (up to 5) and large families (07.51%). This result could be explained by the fact that the majority of farmers' families were joint families. The research supported the conclusions made by Limje*et al.* (2023).Three-fifths (54.16 %) of the farmers had a medium level (From Rs. 156733 to 553403) of annual income, followed by less than half of (42.51%) farmers had a low level of annual income (Below Rs. 156733) whereas3.33 percent farmers were annual income above Rs. 553403. In regards to the farmers occupations the majority of farmers (48.33%) were only farming, followed by 42.51 percent Farmers were involved in both Farming and Business and 9.17 percent farming and service respectively. The study was validated by Chandra and Singh (2021).The mass media exposure of the farmers (Table 1) indicates that 89 (74.16%) farmers had a medium level of mass media exposure, followed by 20 (16.67%) farmers who had a high level of mass media exposure, and 11 (9.17%) of the farmers had the low level of mass media exposure. Thus, it can be concluded that maximum farmers had a medium level of mass media exposure, followed by the high and low level of mass media exposure of the farmers. The findings of this study that the farmers' exposure to the mass media were supported by the study done by Chandra and Singh (2021).

**Table 1:** Distribution of respondents based on their Socioeconomic and communication profile(n=120)

| Sl. No. | Variables | Categories | f | % |
|---|---|---|---|---|
| 1. | Age | Young (Up to 30) | 22 | 18.33 |
| | | Middle(31 to 46) | 70 | 58.23 |
| | | Old (above 47 years) | 28 | 23.44 |
| 2. | Gender | Male | 120 | 100.00 |
| | | Female | 00 | 00.00 |
| 3. | Education | Illiterate | 00.00 | 00.00 |
| | | Primary | 05 | 04.16 |
| | | Middle | 08 | 09.17 |
| | | High school | 17 | 20.00 |
| | | Intermediate | 21 | 25.83 |
| | | Graduation&above | 49 | 40.84 |
| 4. | Family Size | Small (Up to 5 ) | 38 | 31.66 |
| | | Medium (5 to 7) | 73 | 60.83 |
| | | Large (7 & above) | 09 | 07.51 |
| 5. | Land Holding | Marginal (Less than 1 ha) | 91 | 75.83 |
| | | Small (1 to 2 ha) | 24 | 20.00 |
| | | Large (more than 2 ha) | 05 | 04.17 |
| 6. | Family Annual Income | Below Rs. 156733 | 51 | 42.51 |
| | | From Rs. 156733 to 553403 | 65 | 54.16 |
| | | Above Rs. 553403 | 04 | 3.33 |
| 7. | Occupation | Only Farming | 58 | 48.33 |
| | | Farming and Service | 11 | 09.17 |
| | | Farming and Business | 51 | 42.50 |
| 8. | Mass Media Exposure | Low (below 10.11) | 11 | 09.17 |
| | | Medium (10.11 to 12.93) | 89 | 74.16 |
| | | High (above 12.93) | 20 | 16.67 |

**Level of Knowledge on selected independent socio-demographic profile of the farmers**

The findings revealed (Table 2) that the age of farmers (.014) was significantly associated with the level of knowledge at a 0.05 level of significance. It means the variables significantly wielded their influence on the level of knowledge of the farmers. Hence the result confirms the alternate hypothesis. This result was similar to the findings of Juturu *et al.* (2020) found that significant correlation between age and extent of adoption towards respondents of black gram production practices. Yadav *et al.* (2020) found asignificant correlation between age and the technological gap in different practices among chickpea growers. The result of the analysis suggests that the p-value for the association between gender and level of knowledge was (0.591) which means that the association is not significant at the 0.05 level of significance findings concerning the education of the farmers and the level of knowledge revealed that *there was a positive association between* variables *at a 0.05% level of significance*. This result was similar to the findings of Singh *et al.* (2012) found a significant correlation between the education level of farmers with knowledge of recommended technology for mustard cultivation by farmers. Suman (2017). Found asignificant correlation between education and Knowledge Level of the State Department of Agriculture and Farmers Practices on Nutrient Management in vegetable cultivation. The correlation between family size and the level of knowledge of the farmers was found to be (0.890). However, it is also mentioned that this result was not significant at the 0.05% level of significance. This means that the correlation between family size and the level of knowledge of the farmers may have occurred by chance and is not strong enough to reject the null hypothesis. This result was similar to the findings of Singh et al. (2016) found that no significant correlation between family size and the knowledge of farmers toward improved wheat production technology. The correlation between the size of land holding and the level of knowledge of the farmers was found to be (.023*). However, it is also revealed that this result was significant at the 0.05% level of significance. The study findings were consistent with a previous study accompanied by Patel *et al.* (2023).The result of the analysis suggests that the p-value for the association between the annual income of farmers and the level of knowledge is 0.668, which means that the relationship is not significant at the 0.05 level of significance. Therefore, the outcome approves the null hypothesis. Similarly, Patel *et al.* (2023) found that there was no relationship between the annual income and training needs of pulse farmers. The result of the study depicted that the p-value for the relationship between the occupation of farmers and their level of knowledge is 0.416, which means that the relationship is not significant at the 0.05 level of significance. This result was similar to the findings of Juturu *et al.* (2020) found no significant correlation between occupation and the extent of adoption respondents of black gram production practices.A statistical analysis was carried out to investigate the relationship between the farmers' level of knowledge and their exposure to the mass media, based on the data shown in

**Table 2:** Relationship between Knowledge and selected independent variables of the farmers(n=120)

| S. No. | Independent Variables | Knowledge | | |
|---|---|---|---|---|
| | | Pearson Chi-Square | | |
| | | Calculated Value | Degree of freedom | P-Value |
| 1. | Age | 12.367 | 4 | **0.014*** |
| 2. | Gender | 1.052 | 2 | 0.591 |
| 3. | Education | 19.093 | 4 | **0.007*** |
| 4. | Family size | 1.125 | 4 | 0.890 |
| 5. | Land Holding | 11.323 | 4 | **0.023*** |
| 6. | Annual Income | .806 | 2 | 0.668 |
| 7. | Occupation | 3.930 | 4 | 0.416 |
| 8. | Mass Media Exposure | 10.474 | 4 | **0.033*** |

**Significant at 0.05 level; NS= Non-significant*

Table 2. As per the analysis, there was a significant association ($p<0.05$) between the farmers' knowledge level and their exposure to mass media. The findings are in line with the findings of Bahadur *et al.* (2008) that Communication media possession and information source utilization patterns of farmers in respect to fertilizer use in paddy production. Verma *et al.* (2019) and Verma *et al.* (2020) also found that mobile applications affected Knowledge gain among commercial dairy farmers.

**Level of Adoption on selected independent socio-demographic profile of the farmers**

The findings revealed (Table 3) that the age of farmers (.001) was significantly associated with the level of adoption at a 0.05 level of significance. It means the variables significantly wielded their influence on the level of adoptionof the farmers. Hence the result confirms the alternate hypothesis. This result was similar to the findings of Juturu *et al.* (2020) found that significant correlation between age and extent of adoption towards respondents of black gram production practices. The result of the analysis suggests that the p-value for the association between gender and level of adoption was (0.150) which means that the association is not significant at the 0.05 level of significance. findings regarding the education of the farmers and the level of adoption revealed that there was a positive association between variables at a 0.05% level of significance. This result was similar to the findings of Juturu *et al.* (2020) found that significant correlation between Education and the extent of adoption towards respondents of black gram production practices and Jakhar *et al.* (2016) also found that significant correlation between Education and the extent of adoption Practices of Mungbean. The association between family size and the level of adoption of the farmers was found to be (0.508). However, it is also mentioned that this result was not significant at the 0.05% level of significance. This means that the correlation between family size and the level of

adoption of the farmers may have occurred by chance and is not strong enough to reject the null hypothesis.This result was similar to the findings of Juturu *et al.* (2020) found that significant correlation between family size and the extent of adoption towards respondents of black gram production practices. The results revealed that the level of adoption of the farmers' and the size of their land holdings were significant at the significance level of 0.05%.The study findings were consistent with a previous study accompanied by Yadav *et al.* (2020) found asignificant correlation between the size of land holding and the technological gap of chickpea growers. The analysis's findings indicate that the relationship between the annual income of the farmers and the level of adoption was a p-value of 0.327, indicating that it is not significant at the 0.05 level of significance. Consequently, the result supports the null hypothesis. Similarly, Patel *et al.* (2023) revealed no connection between pulse farmers' annual income and their training needs. The result of the study demonstrated that the relationship between the occupation of farmers and their level of adoption is 0.000, which means that the association is significant at the 0.05 level of significance. This result was similar to the findings of Natwadia *et al.* (2022) which were significantly related to the adoption of drip systems of irrigation of vegetable growers and their occupation.A statistical analysis was carried out to investigate the relationship between the farmers' level of adoption and their exposure to the mass media, based on the data shown in Table 2. As per the analysis, there was a significant association ($p < 0.05$) between the farmers' knowledge level and their exposure to mass media. The findings are in line with the findings of Paradva *et al.* (2022) thatmass media exposure of the green gram growers hada positive and significant correlation with their level of knowledge about recommended green gram production technology.

**Table 3:** Relationship between Adoption and selected independent variables of the farmers(n=120)

| S. No. | Independent Variables | Adoption | | |
|---|---|---|---|---|
| | | Pearson Chi-Square | | |
| | | Calculated Value | Degree of freedom | P-Value |
| 1. | Age | 17.678 | 4 | **0.001*** |
| 2. | Gender | 3.789 | 2 | 0.150 |
| 3. | Education | 16.790 | 4 | **0.002*** |
| 4. | Family size | 3.307 | 4 | 0.508 |
| 5. | Land Holding | 15.622 | 4 | **0.003*** |
| 6. | Annual Income | 2.234 | 2 | 0.327 |
| 7. | Occupation | 90.386 | 4 | **0.000*** |
| 8. | Mass Media Exposure | 12.827 | 4 | **0.012*** |

**Significant at 0.05 level; NS= Non-significant*

## CONCLUSION

The study showed that the majority of the respondents had a medium level of annual income, the majority of respondents belonged to middle-aged groups and had graduation as the highest educational qualification. The results also indicatea strong and significant relationship between selected independent variables like age, education, occupation, land holding, mass media exposure, and the level of knowledge and adoption of Urd crop farmers.

## CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest among the authors.

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