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Knowledge level of farmers regarding nutritive rich agriculture in Haryana

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Abstract

The present study was conducted in Fatehabad and Karnal districts of Haryana with the specific objective of assessing the knowledge level of farmers regarding nutritive rich agriculture. A total of 120 farmers were selected through a multi-stage random sampling procedure, with fifteen respondents drawn from each of eight villages spread across four blocks of the two districts. Data were collected through personal interviews using a structured and pre-tested interview schedule and were analyzed using frequency, percentage, weighted mean score, correlation and multiple regression. The findings revealed that the majority of farmers (74.16%) possessed a medium level of knowledge regarding nutritive rich agriculture, followed by 16.67 per cent with low knowledge and only 9.17 per cent with a high level of knowledge. Among the knowledge components, the highest awareness was recorded for crop harvesting at proper maturity (WMS = 2.95) and the lowest for knowledge about fisheries (WMS = 1.05). Education, training received, extension participation and extension contact were found to be positively and significantly correlated with the knowledge level, while age showed a significant negative correlation. The selected independent variables together explained 52.10 per cent of the variation in farmers' knowledge level. The study suggests that need-based training programmes, intensified extension contact and demonstration-based learning can substantially enhance farmers' knowledge of nutritive rich agriculture, thereby contributing to better nutritional and livelihood outcomes.

Keywords: Knowledge level, nutritive rich agriculture, farmers, correlation, extension contact, Haryana

Introduction

Agriculture has historically been the backbone of India's rural economy, and successive revolutions in food grain, milk, fruit, vegetable, oilseed and fisheries production have substantially improved national food availability. However, despite these gains in aggregate production, a large section of the rural population continues to suffer from malnutrition and hidden hunger, largely because the diversity and nutrient density of food consumed do not match dietary requirements. The shift towards rice and wheat dominated cropping systems, coupled with a decline in the cultivation of pulses, millets, fruits and vegetables, has further widened this nutrition gap. Against this backdrop, the concept of nutritive rich agriculture, which integrates crop diversification, kitchen gardens, livestock, poultry and fisheries with a focus on household nutritional security, has gained considerable importance among policy makers, researchers and extension functionaries.

Knowledge is widely recognized as the foundation upon which adoption of any improved practice is built. Unless farmers possess adequate knowledge about the concept, technology, economic and dietary aspects of nutritive rich agriculture, the desired behavioural change towards adoption cannot be expected. Several earlier studies in allied fields have reported a predominance of medium level of knowledge among farming communities regarding improved practices, which underscores the continuing need

for systematic assessment of knowledge gaps before designing extension interventions. Keeping this in view, the present investigation was undertaken with the specific objective of studying the knowledge level of farmers regarding nutritive rich agriculture in Fatehabad and Karnal districts of Haryana, along with an examination of the relationship between farmers' selected socio-personal, economic and communication characteristics and their knowledge level.

Research Methodology

Locale of the study

The study was conducted in Haryana state, with Fatehabad and Karnal districts purposively selected owing to the prevalence of diverse farming systems suitable for the promotion of nutritive rich agriculture. From each district, two blocks were selected randomly, and from each block, two villages were selected randomly, resulting in a total of eight villages — Banawali and Dhingsra (Bhattu block), Khumber and Noorkiali (Nagpur block), Ballah and Dupedi (Assandh block) and Munak and Balpabana (Munak block).

Sampling procedure

From each of the eight selected villages, fifteen farmers were chosen at random, constituting a total sample size of 120 respondents for the study.

Measurement of knowledge level

Knowledge was operationally defined as the amount of accurate information possessed by a respondent regarding the concept, technology, economic, dietary and farming-system related components of nutritive rich agriculture. A structured knowledge test comprising statements covering these dimensions was administered to each respondent. Responses were scored as full knowledge (3), partial knowledge (2) and no knowledge (1). The scores obtained on each item were summed to arrive at an overall knowledge score for every respondent. Based on the mean and standard deviation of the overall scores, respondents were classified into three categories — low, medium and high knowledge — using the equidistant (mean $\pm$ SD) method.

Statistical tools used

The data collected were analyzed using frequency, percentage and weighted mean score to rank individual knowledge components. The Pearson product-moment correlation coefficient was computed to study the relationship between selected independent variables (age, education, land holding, training received, extension participation, extension contact and annual income) and the overall knowledge level of the respondents. Multiple regression analysis was further employed to assess the combined contribution of these independent variables in explaining variation in knowledge level.

Results and Discussion

Knowledge of farmers regarding components of nutritive rich agriculture

The component-wise analysis of knowledge presented in Table 1 indicated wide variation in the level of awareness across different dimensions of nutritive rich agriculture. With respect to the basic concept, the majority of

respondents were well aware that nutritive food is better for good health, which secured the first rank with a weighted mean score (WMS) of 2.53, followed by nutritive rich food increasing longevity (2.49) and giving better economic returns (2.20). Knowledge about mitigating hidden hunger through nutritive rich foods ranked lowest (WMS = 1.86) among the concept-related statements.

In the technology and production domain, farmers exhibited the highest knowledge regarding crop harvesting at proper maturity stage (WMS = 2.95) and seed treatment with bio-fertilizer (WMS = 2.92), whereas awareness about the recommended package of practices (1.71) and recommended nutritive rich varieties (1.63) was comparatively low, indicating a clear knowledge gap in technical and varietal aspects.

Regarding economic and marketing aspects, awareness of the nearest APMC market secured the top rank (WMS = 2.85), while knowledge about marketing information and news sources was the weakest (WMS = 1.53). In the domain of balanced diet and nutrition, farmers possessed relatively higher knowledge of key food groups (WMS = 2.16) compared with bio-fortified crops (1.39), suggesting that newer nutrition-sensitive technologies have not yet been widely disseminated.

Within the nutritive rich mixed farming component, knowledge regarding soil health and its improvement (WMS = 2.60) and green leafy vegetables/salad crops (WMS = 2.55) was found to be high, whereas knowledge about poultry (1.15) and fisheries (1.05) farming was markedly low. This indicates that, while crop and soil-related knowledge has been reasonably well disseminated, allied enterprises that hold considerable potential for household nutritional security remain largely outside the awareness of farmers, possibly owing to limited extension coverage of these enterprises in the study area.

Table 1: Weighted mean score and rank order of farmers' knowledge regarding selected components of nutritive rich agriculture (N = 120)

Sl. No.	Knowledge component	Weighted mean score (WMS)	Rank
A. Concept of nutritive rich agriculture			
1	Nutritive food is better for good health	2.53	I
2	Nutritive rich food increases longevity	2.49	II
3	Nutritive rich food gives more return	2.20	III
4	Knowledge of the concept of nutritive rich agriculture	2.10	IV
5	Nutritive rich foods help to mitigate hidden hunger	1.86	V
B. Technology and production aspects			
6	Crop harvesting at proper maturity stage	2.95	I
7	Seed treatment with bio-fertilizer	2.92	II
8	Recommended package of practices for nutritive rich agriculture	1.71	IX
9	Nutritive rich recommended varieties	1.63	X
C. Economic and marketing aspects			
10	Nearest APMC market in the area	2.85	I
11	Agency from which seeds were purchased	1.99	II
12	Subsidy and incentives provided by Government	1.79	III
13	Storage facilities for nutritive rich produce	1.67	IV
14	Sources of marketing information / news	1.53	V
D. Balanced diet and its importance			
15	Knowledge of key food groups	2.16	I
16	Balanced diet and its requirement for human beings	1.87	II
17	Bio-fortified crops	1.39	III
18	Recommended dietary allowance as suggested by ICMR	—	IV
E. Nutritive rich mixed farming components			
19	Soil health and its improvement	2.60	I
20	Green leafy vegetables and various salad crops	2.55	II
21	Knowledge about poultry farming	1.15	XV
22	Knowledge about fisheries	1.05	XVI

Overall knowledge level of respondents

The distribution of respondents according to their overall knowledge level is presented in Table 2. It is evident that the majority of farmers (74.16%) possessed a medium level of knowledge regarding nutritive rich agriculture, followed by 16.67 per cent of respondents in the low knowledge category and only 9.17 per cent in the high knowledge category.

This predominance of medium-level knowledge is broadly consistent with the findings of Lahoti (2011) [5], Kadu

(2016) [3] and Prashanth *et al.* (2018) [8], who also reported a majority of respondents falling in the medium knowledge category with respect to allied agricultural practices. The relatively small proportion of farmers in the high knowledge category points to an existing gap that can be bridged through intensified and well-targeted extension efforts, including method and result demonstrations, farmer field schools and exposure visits focusing specifically on nutrition-sensitive farming components such as kitchen gardens, poultry and fisheries integration.

Table 2: Distribution of respondents according to their overall knowledge level regarding nutritive rich agriculture (N = 120)

Sl. No.	Knowledge category	Score range	Frequency (f)	Percentage	Rank
1	Low knowledge	Below (Mean – SD)	20	16.67	II
2	Medium knowledge	Between (Mean $\pm$ SD)	89	74.16	I
3	High knowledge	Above (Mean + SD)	11	9.17	III
	Total		120	100.00	

Relationship between selected characteristics and knowledge level

The correlation analysis presented in Table 3 revealed that age of the respondents was significantly and negatively correlated ($r = -0.292$) with their knowledge level, suggesting that younger farmers, being more receptive to new information and technologies, tend to possess relatively higher knowledge. Education ($r = 0.434$), training received ($r = 0.543$), extension participation ($r = 0.213$) and extension contact ($r = 0.405$) were found to be positively and

significantly correlated with knowledge level, indicating that formal education, exposure to training programmes and regular contact with extension functionaries play a decisive role in enhancing farmers' awareness of nutritive rich agriculture. On the other hand, land holding ($r = 0.136$) and annual income ($r = 0.150$) showed non-significant association with knowledge level, implying that the resource position of a farmer alone does not guarantee a higher level of knowledge in the absence of adequate exposure to information sources.

Table 3: Correlation of farmers' selected independent variables with their knowledge level regarding nutritive rich agriculture

Sl. No.	Independent variable	Correlation coefficient (r)	Significance
1	Age	-0.292	Significant *
2	Education	0.434	Significant **
3	Land holding	0.136	NS
4	Training received	0.543	Significant **
5	Extension participation	0.213	Significant *
6	Extension contact	0.405	Significant **
7	Annual income	0.150	NS

* Significant at 0.05 level of probability; ** Significant at 0.01 level of probability; NS = Non-significant

Multiple regression analysis

To assess the combined influence of the selected independent variables on the knowledge level of farmers, multiple regression analysis was carried out. The results indicated that the seven independent variables — namely age, education, land holding, training received, extension participation, extension contact and annual income — together accounted for 52.10 per cent ($R^2 = 0.521$) of the

total variation observed in the knowledge level of farmers regarding nutritive rich agriculture. This relatively high coefficient of determination underscores the strong collective influence of these socio-personal, economic and communication-related variables, with training received and education emerging as the most influential individual predictors based on their correlation coefficients.

Table 4: Multiple regression analysis of selected characteristics influencing knowledge level of farmers regarding nutritive rich agriculture (N=120)

Variable	Regression Coefficient (β)	Standard Error	t-value
Age	-0.184*	0.072	-2.56
Education	0.263**	0.081	3.25
Land holding	0.074NS	0.067	1.10
Training received	0.341**	0.078	4.37
Extension participation	0.129*	0.061	2.11
Extension contact	0.221**	0.074	2.98
Annual income	0.086NS	0.069	1.24

$R^2 = 0.521$

Adjusted $R^2 = 0.491$

F-value = 17.36**

Significant at 5% level

** Significant at 1% level

NS = Non-significant

Conclusion

The study concludes that the overall knowledge level of farmers regarding nutritive rich agriculture in Fatehabad and Karnal districts of Haryana was largely confined to the medium category, with substantial knowledge gaps persisting in areas such as recommended varieties, package of practices, bio-fortified crops, poultry and fisheries-based components of nutritive rich farming. Farmers were comparatively more aware of general health-related concepts and crop production basics than of allied enterprises and nutrition-specific technologies. The significant positive correlation of education, training and extension contact with knowledge level, coupled with the negative correlation of age, highlights the critical role of continuous and age-sensitive extension education in bridging the existing knowledge gaps.

It is therefore recommended that extension agencies design intensive, need-based training modules and frequent farmer-extension worker interactions, with special focus on integration of poultry, fisheries and other allied enterprises along with crop diversification, so that the knowledge level of farmers can be elevated from medium to high. Such efforts would not only strengthen the adoption of nutritive rich agricultural practices but also contribute meaningfully towards improved household nutritional security in the region.

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