



Knowledge Test for Extension Personnel on National Food Security Mission

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ABSTRACT

National Food Security Mission is one of the pertinent programmes of Indian Government. Developing a knowledge test to measure knowledge level of Extension Personnel on National Food Security Mission was required to study the programme in details. The locale of the study was Uttar Pradesh and Karnataka, hence the knowledge test items were selected keeping the locale under consideration. A Knowledge test comprising 33 items was subjected to relevancy test sought from extension specialists eventually selecting 29 items for the test. The 29 items were pretested on 30 extension personnel from other than the study area. Based on the scores obtained from the pretesting, item analysis eliciting difficulty index, discrimination index and point biserial correlation were done. The items with difficulty index ranging from 0.2 to 0.8, discrimination index above 0.1 and point biserial correlation significant at 5 per cent level of significance were selected. The reliability of the test was measured by using split half method and found to be 0.8. Eventually 24 items were selected for the final knowledge test for extension personnel on National Food Security Mission. This knowledge test can address the knowledge gap existing among the extension personnel by equipping them with right kind of information on NFSM through trainings.

INTRODUCTION

According to the FAO definition agreed at the World Food Summit-1996 and thereafter expanded upon at the 2001 Summit, “food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. It suggests people will be food secure only if sufficient food is available accessible, and utilized by all. The National Development Council (NDC) in its 53rd meeting held on 29th May, 2007 adopted a resolution to launch a Food Security Mission comprising rice, wheat and pulses to increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons by the end of the Eleventh Five Year Plan (Parmar & Bhaveshkumar, 2020). Thereafter, a centrally sponsored scheme, ‘National Food Security Mission’ (NFSM), was launched in October 2007. The flag bearers of this scheme are extension

personnel of line departments, who are the connecting link between farmers and government.

The Training & Visit (T&V) system introduced in the 1970s with World Bank assistance was key to the science society interface as it established a cadre of agriculture extension specialists at the local level (The Hindu, 2018). The role of extension personnel became significant during green revolution period and henceforth. The focus then was food security and now it is nutritional security. National Food Security Mission has been replacing the soiled facet of agriculture for food security to sustainability of food systems and nutritional security (Vijayan & Nain, 2020). Nutrition indicators have marginally improved over the years. However, macro and micronutrient malnutrition is widespread, with 18.7 per cent of women and 16.2 per cent of men unable to access enough food to meet basic nutritional needs, and over 32 per cent of children below five years still underweight as per the recently released fifth National Family Health Survey (2019-2021), (Sivagnanam et al., 2019). India

is ranked 101 out of 116 countries in the Global Hunger Index, 2021 (The Hindu, 2021). To ensure proper implementation of NFSM, there should be efficient and laudable execution of the programme by the officials.

The extension personnel can function foolproof only if they have enough grasp on the nitty gritty of the programme. Not having access to right information at right time, at right place often stymie the progress of the programme. There can be a plethora of reasons for the knowledge gap in the extension personnel such as cognitive, attitudinal, perceptual, institutional etc. These problems may eventually result in hampering of the implementation of the programme. Hence it is an imperative to assess their knowledge on the programme. Knowledge is a body of understood information possessed by an individual (Bhatt & Patel, 2009). The knowledge here is operationalized as the level of information possessed *vis-à-vis* NFSM, the program's drafting, selection of beneficiaries, planning and implementation aspects by the extension personnel. The knowledge test on NFSM was developed for the use on the extension personnel/line department officials of Uttar Pradesh and Karnataka.

METHODOLOGY

The knowledge test on National Food Security Mission was developed by employing the standard methodology. The knowledge test comprised questions (items) on National Food Security Mission. By reviewing literature, referring to textbooks, visiting NFSM and related websites as well as by conducting discussions with subject matter specialists and field extension personnel, a question (items) bank was created culminating into a thorough scrutiny of the items were done with the aid of subject matter specialists. The questions were designed to test the knowledge level of extension personnel on National Food Security Mission. A total of 33 knowledge items were constructed for relevancy test as followed by Kumar et al., (2016). The item statements were subjected to scrutiny by an expert panel of judges to determine the relevancy and screening for inclusion in the final test (Kline, 1986). For this, the 33 items were sent to panel of 30 judges experts in the field of extension education with a request to critically evaluate each item for its relevancy to measure knowledge level of extension personnel on National Food Security Mission. The judges were requested to give their response on a five point continuum *viz.*, highly relevant, relevant, undecided, less relevant and not relevant with scores 5, 4, 3, 2 and 1 respectively. The relevancy score of each item was established by adding the scores on the rating scale for all the judges' responses. From the data three types of tests *viz.*, relevancy percentage, relevancy weightage and mean relevancy scores was worked out for all the items. The items satisfying the standard criterion (Relevancy % >70, Relevancy weightage >0.70 and Mean relevancy score > 3.0) were selected. A total of 29 items were selected.

The items collected for the construction of the knowledge test were in objective form. The items were of multiple choice as well as a few yes or no questions also. The 29 items selected were subjected to thirty respondents who were from outside the locale of data collection. The respondents were asked to indicate their responses to each item in the knowledge test, and the correct

answers were assigned a score of '1' and incorrect answers a score of '0'. The total knowledge score for each item was calculated by summing up the scores given by all the respondents to the item (Kaur et al., 2020). Based on this, the difficulty index and discrimination index were calculated.

The item difficulty index P, was worked out in this study as the percentage of respondents giving correct response to an item.

$$P = \frac{NC}{N} \times 100$$

It was calculated using the formula Where, P = Difficulty index, NC = Number of respondents who answered correctly and N is total number of respondents. In the present study, the items having P values between 20 and 80 were considered and included in the final knowledge test. The discrimination power of all the 29 items were worked out using E1/3 method to find out the item discrimination. In this method, those 30 respondents were divided into six equal groups, each having five respondents and they were arranged in descending order of their magnitude of their knowledge scores as obtained from them. The middle two groups were eliminated. Only four extremes groups i.e. the groups with highest and lowest scores were considered in order to calculate the 'Discrimination Index'. It was calculated by the following formula:

$$E1/3 = \frac{(S1 + S2) - (S5 + S6)}{N/3}$$

Where, N = Total number of respondents to whom the items were administered.

S1 and S2 are the frequencies of correct answers of highest and higher scores, respectively.

S5 and S6 are the frequencies of correct answers of lower and lowest scores, respectively.

Items with discrimination index above 0.1 are selected in the final knowledge test.

A correlation between a continuous and a dichotomous variable is known as the point-biserial correlation (**R_{p bis}**) (Demirtas & Hedeker, 2016). To check the internal consistency of an item, its relationship with the total score when it was found to a dichotomised answer to a given item, point biserial correlation was computed.

$$R_{p\ bis} = \frac{M_p - M_q}{\text{Sigma}} \times \sqrt{pq}$$

Where, R_{p bis} is the point biserial correlation

M_p is the mean of the total score of the respondents who answered an item correctly

M_q is the mean of the total score of the respondents who answered an item incorrectly

Sigma is the standard deviation of the entire sample

p is the proportion of the respondents giving correct answer to an item

q is the proportion of the respondents giving incorrect answer to an item

The calculated point biserial correlation values were statistically tested with n-2 degrees of freedom. 24 items having point bi serial correlation value which was significant at 5 per cent

Table 1. Difficulty and Discrimination Index of the Knowledge Items on National Food Security Mission (Final items)

S. No.	Items	Difficulty Index	Discrimination Index	Point Biserial Correlation (Rpbis)
1	National Food Security Mission's (NFSM) major objective is Food Security- T/F	60.00	0.2	0.16*
2	NFSM cereals include only rice – T/F	80.00	0.5	0.64*
3	NFSM is centrally sponsored programme -T/F	66.67	0.2	0.27*
4	The components of NFSM are NFSM-Cereals, NFSM-Pulses, NFSM- Commercial Crops – T/F	50.00	0.5	0.38*
5	30 percent of the budgetary allocation was earmarked for women beneficiary farmers- T/F	56.67	0.6	0.49*
6	Panchayat Raj Institutions were actively involved in selection of beneficiaries- T/F	66.67	0.4	0.40*
7	NFSM incorporates Integrated Nutrient Management Integrated Pest Management and Cropping System based training - T/F	36.67	0.2	0.27*
8	NFSM line personnel are given exposure visit to related State Universities, ICAR institutes, as well as CGIAR institutes in India -T/F	56.67	0.6	0.39*
9	NGO's can be entrusted to carry out cluster demonstrations in inaccessible areas if they have at least 3 years' experience of successful execution of agriculture/rural development projects in remote/backward areas of the specific state- T/F	56.67	0.6	0.60*
10	A farmer can avail benefits under NFSM limited to 10 hectare per season –T/F	53.33	0.2	0.06*
11	NFSM pulse component include Cluster demonstrations, Seed hub programme, Seed Kit – T/F	63.33	0.4	0.49*
12	NFSM Wheat comprises Cluster demonstration, Distribution of HYV seeds and assistance for irrigation equipments - T/F	53.33	0.5	0.36*
13	NFSM Oil seed major components include Area Expansion Inputs component, Production Inputs component, Transfer of Technologies component – T/F	80.00	0.5	0.62*
14	NFSM enshrines food security by focusing on Enhancing Crop Productivity, Incorporating Pulse component, Including nutri-cereals/milletts - T/F	36.67	0.2	0.17*
15	NFSM and fund allocation is in the form (Centre: State, 60:40 (normal states), 90:10 (North eastern and hill states)- T/F	73.33	0.3	0.19*
16	NFSM Coarse cereals include, Cotton Jute, Sugarcane - T/F	70.00	0.4	0.30*
17	Nutri-cereals in NFSM means Milletts - T/F	70.00	0.2	0.25*
18	As per mandates of NFSM in terms with fund allocation no specific accounts are maintained by State through Public Financial Management System (PFMS) - T/F	50.00	0.5	0.48*
19	Nutri-cereal programme incorporates the following crops Jowar/Sorghum, Bajra and Ragi - T/F	60.00	0.6	0.47*
20	Strengthening of credit facilities is also an objective of NFSM – T/F	43.33	0.2	0.25*
21	Package of Practice of NFSM crops are given in the NFSM portal : T/F	63.33	0.2	0.15*
22	Geo-tagging is done for NFSM components – T/F	53.33	0.3	0.13*
23	Nutritional security is intended through NFSM-Pulses and NFSM-Nutri-cereals – T/F	73.33	0.5	0.48*
24	The fixation of price of seed minikits of oil seeds/pulses is done by State Agricultural Dept.- T/F	53.33	0.3	0.24*

level of significance were selected as final items of the knowledge test.

RESULTS AND DISCUSSION

The content validity of the knowledge test was ensured by purposively selecting items in consultation with various subject matter specialists. The domains from which the items were selected include, food security, nutritional security, crops specific to NFSM and transfer of technology components of NFSM, which in line with the study of Kumar et al., (2020). The reliability of the knowledge test was determined using split half method (Kerlinger, 2004). Reliability was found to be 0.8, which indicates high reliability of the test. Then the test items were subjected to difficulty index, discrimination index and point biserial correlation. The knowledge items, having difficulty index value within 0.2 to 0.80 and discrimination index value above 0.1 and point biserial correlation value which was significant at 5 per cent level of significance were selected as final items of the knowledge test. Eventually 24 items (Table 1) were selected for the knowledge test on National Food Security Mission, which would distinguish the well informed personnel from the less informed ones.

CONCLUSION

This knowledge test could be used for assessing the knowledge level of line department officials involved in the execution of NFSM. A knowledge test is quintessential to identify the lacunae existing in the programme implementation. This test can pave way for planning need based training of line department officials and also in addressing the knowledge gap. The test can be used for assessing the knowledge level of line department officials/extension personnel on National Food Security Mission implementing regions of India with suitable modifications.

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