Knowledge, Attitude and Practice (KAP) on Nutrition among Rural Farm Women of Chickballapur District of Karnataka, India

K. Geetha a*, Geetha M. Yankanchi a, A. B. Sunitha a and Sneha Shigihalli a

All India Coordinated Research Project on Women in Agriculture, University of Agricultural Sciences, GKVK, Bengaluru, Karnataka, India.

Authors’ contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

ABSTRACT

The present study was carried out with the objectives to assess Knowledge, Attitude, and Practice (KAP) of rural farm women on nutrition along with personal, socio economic profile. A total of 200 rural farm women from five villages of Shidlaghatta block, Chickballapur district, Karnataka, India were selected purposively for the study as Chikkaballapur district falls in the Eastern dry climatic zone and about 76% of the net sown area is under rainfed condition. Random sampling technique was used for the selection of the respondents. The data on socio-economic status, personnel characteristics and nutritional Knowledge, Attitude and Practice of the subjects were collected through a pre tested questionnaire. Study results reveals that 44.5% of the rural farm women belongs to middle age, 28.0% had high school education followed by 24.0% illiterate. Majority (93.0%) are married, most (63.5%) of them have agriculture as main occupation, More than half (53.0%) belongs to nuclear family, 47.5% have small family, nearly three fourth (69.0%) have 2-4 earners in the family. About 53.5% have marginal land holdings followed by 27.5% small, 65.0% belong to medium family income, 65.5% had medium mass media exposure, and 70.5% had medium level of extension contact. More than one third (34.5 %) of the rural farm women had high knowledge, followed by low (33.5%) and medium (32.0%). Thirty six percent had less favorable
attitude towards nutrition, whereas 34.0% had favorable attitude and 30.0% had more favorable attitude. In case of nutrition practice 40.0% had poor practice, 35.5% had fair practice, and 24.5% had good practice. From present study it is concluded that there was more knowledge of rural farm women on nutritional aspects, less favorable attitude and poor practice of nutrition. Hence, intervention strategies like promotion of Nutri-gardens in Schools, Households and the rural Community, promotion of Nutri-sensitive crops or biofortified crops to address the malnutrition, promotion of Nutrition Thali through integrated farming system model, Awareness programmes or modules to educate the farm families for cultivation of nutri crops or bio-fortified crops and their nutritional importance and Nutritional deficiencies and its prevention through ICT, skill trainings for development of value added products or Nutrification of traditional recipes, encourage farm families to develop value added products and establish microenterprises to achieve economic security, convergence with all line departments (Women and Child welfare, Agriculture, Horticulture, Fisheries, livestock departments, health department etc.) for achieving the food, nutrition and health security of rural farm women.

**Keywords: Knowledge; attitude and practices (KAP); nutrition; rural farm women; socio economic profile.**

### 1. INTRODUCTION

Malnutrition is a complex global Problem; though green revolution has increased food production, still poverty and malnutrition continue to exist and even today malnutrition remains a pressing global challenge. Food and nutrition security would be the major challenges for growing population. Agriculture and nutrition are closely linked and agriculture has strong potential in many ways which it can influence the underlying determinants of nutrition outcomes through improving global food availability and access and through enhancing household food security, dietary quality, income and women’s empowerment.

Traditionally agricultural interventions have focused on increasing food production and rising incomes to reduce malnutrition, hunger and poverty. Although this remains part of a valid approach, it is now recognized that higher levels of production and income alone have limited impact on improving nutrition. More comprehensive approach is necessary to optimize agriculture’s contribution to good nutrition and make agriculture nutri-sensitive.

According to the World Food Programme, 135 million suffer from acute hunger largely due to man-made conflicts, climate change and economic downturns. The COVID-19 pandemic could double the number in upcoming years [1]. Malnutrition, in all its forms, includes undernutrition (wasting, stunting, and underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases. 1.9 billion adults are overweight or obese, while 462 million are underweight. Globally in 2020, 149 million children under 5 were estimated to be stunted (too short for age), 45 million were estimated to be wasted (too thin for height), and 38.9 million were overweight or obese. Around 45% of deaths among children under 5 years of age are linked to undernutrition. These mostly occur in low- and middle-income countries. At the same time, in these same countries, rates of childhood overweight and obesity are rising. The developmental, economic, social, and medical impacts of the global burden of malnutrition are serious and lasting, for individuals and their families, for communities and for countries [2].

To address this nutritional supplementation is done through many modes like commercial fortification, medical supplementation, dietary diversification and bio fortification.

Nutritional supplements are expensive it estimated that Rs. 41,764 lakh crore is required a year to deliver 14 essential nutrition interventions at full coverage across India [3]. Despite a National Nutritional Anaemia Prophylaxis Programme addressing anaemia through supplementation over the past 50 years, more than half of India’s children under five (58.6%) and women (53.1%) were anaemic in 2016 [4].

Nutrition intervention strategies are selected to change nutritional intake, nutrition-related knowledge or behavior, environmental conditions, or access to supportive care and services. Nutrition intervention goals provide the basis for monitoring progress and measuring outcomes. Nutrition intervention refers to
corrective measures that are undertaken to rectify the occurrence of overall malnutrition on specific nutrient deficiency or excess when there is a nutritional problem in a country and if the magnitude and the causes of the problem are known intervention can be planned.

The nutritional status of a community is influenced by a lot of interrelated and complex factors. Nutrition knowledge, their attitude and practice is also one among them. Knowledge of nutrition is one of the factors that shape the nutritional behavior of individuals as well as communities. It is crucial for encouraging healthy eating habits and is also a need to promote a positive attitude and practice towards healthy eating habits. Hence the present study was undertaken to assess the nutrition knowledge, attitude and practices of the respondents so that gaps can be identified and suitable effective intervention can be designed.

2. MATERIALS AND METHODS

The present investigation was carried out in Chickballapur district of Karnataka State, India during 2021-22. A total of 200 rural farm women were interviewed from five villages viz. Thippenahalli, Bodaguru, Basavapattana, Yenanguru and Hosapete of Shidlaghatta taluk using a pre-tested interview schedule developed by [5] with required modifications. “Ex-post facto” research design was used.

Information regarding socio-demographic characteristics viz., age, education, marital status, occupation, family size, family type, number of earners in the family, land holding, family income, mass media exposure and extension contact was analyzed using percentage, frequencies, mean, standard deviation and correlation coefficient.

Nutritional KAP (Knowledge, Attitude and Practice) in the present study is operationally defined as the ‘know how about nutrition, positive or negative feelings towards nutrition and usage of nutritional food in their daily diet’. It was analyzed using pre-tested interview schedule developed for the study. Knowledge component consists of 23 statements and each statement was measured using Yes or No by assigning a score of 1 and 0, respectively. The minimum and maximum score one could get was 0 and 23, respectively. Higher the score indicates that the rural farm women having more knowledge towards nutrition and lesser the score indicates that the rural farm women having less knowledge towards nutrition. Based on mean (11.87) and standard deviation (4.33), the rural farm women were categorized into low, medium, and high categories.

| Category       | Criteria Score | Score |
|----------------|----------------|-------|
| Low            | (Mean – ½ SD)  | <9.71 |
| Medium         | (Mean + ½ SD)  | 9.71-14.1 |
| High           | (Mean + ½ SD)  | >14.1 |

Mean =11.875; Standard deviation = 4.335

Table 1. Categorization of knowledge level of rural farm women based on mean and standard deviation

Attitude component consists of 23 statements and each statement was measured on a three-point continuum namely agree, disagree, and do not know by assigning a score of 2, 1 and 0, respectively. The summated score for all the 23 attitude statements was considered as attitude score. The minimum and maximum score one could get was 0 and 46, respectively. Higher the score indicates that the women possess favorable attitude towards nutrition and lesser the attitude score indicates that the women possess unfavorable attitude. Based on mean (32.18) and standard deviation (3.92), the rural farm women were categorized into less favorable, favorable, and more favorable attitude categories.

| Category       | Criteria Score | Score |
|----------------|----------------|-------|
| Less favorable | (Mean – ½ SD)  | <30.22 |
| Favorable      | (Mean + ½ SD)  | 30.22-34.13 |
| More favorable | (Mean + ½ SD)  | >34.13 |

Mean = 32.18; Standard deviation = 3.92

Table 2. Categorization of attitude level of rural farm women based on mean and standard deviation

Practice component consists of 23 statements and each statement was measured using Yes or No by assigning a score of 1 and 0, respectively. The minimum and maximum score one could get was 0 and 23, respectively. Higher the score indicates that the rural farm women practicing more nutritional food and lesser the score indicates that the rural farm women practicing less nutritional food. Based on mean (10.32) and standard deviation (3.61), the rural farm women
were categorized into poor, fair and good categories.

Table 3. Categorization of practice of rural farm women based on mean and standard deviation

| Category | Criteria                  | Score          |
|----------|---------------------------|----------------|
| Poor     | <(Mean - ½ SD)            | <8.51          |
| Fair     | (Mean + ½SD)              | 8.51-12.12     |
| Good     | > (Mean + ½ SD)           | >12.12         |

Mean = 10.32; Standard deviation = 3.61

Correlation coefficient: This was used to find out the relationship between the independent and dependent variables.

3. RESULTS AND DISCUSSION

3.1 Socio-Demographic Profile of Rural Farm Women

Results in Table 4 highlights that 44.5% of the rural farm women belong to middle age category followed by young (32.0%) and old age (23.5%). It was incidental that more number of respondents was in the middle age group. Moreover, middle aged farm women have more family responsibility, efficiency, and sensibility. They may also work with a sense of commitment and involvement.

It could be seen from Table 4 that 28.0% had high school education followed by 24.0% illiterate, 14.0% middle school, 13.0% intermediate, 11.0% graduation and above, 10.0% up to primary school. It is universal fact that education plays a key role in moulding and bringing desirable changes among human beings. All the respondents were relatively educated, which could be the result of a common social environment. As the majority of the farm women were educated, they were able to gather knowledge on nutritional practices in the present scenario. Contradictory findings were reported by [5,6].

Majority (93.0%) of rural farm women are married, negligible number (06.0%) is separated and none of them are divorced/single.

It is evident that most (63.5%) of the rural farm women have agriculture as main occupation, followed by 22.0% are house wife, 06.5% are labor, 06.0% are service (Govt./Private) and 02.0% have small business.

It is observed that 47.5% of rural farm women have small family followed by medium family (33.0%) and large family (19.5%). The present trend in the villages is also to have a small family for better decision making, economic progress, and quality of life. Similar findings were reported by [6-8].

More than half (53.0%) of the rural farm women belongs to nuclear family, 36.5% belongs to joint family and only 10.5% belongs to extended family. The findings are in line with the findings of [9].

It could be seen in Table 4 that nearly three fourth (69.0%) of rural farm women have 2-4 earners in the family followed by less than 2 earners (21.0%) and more than 4 earners (10.0%).

Table 4. Demographic profile of rural farm women

| Characters    | Category            | No. | %   |
|---------------|---------------------|-----|-----|
| Age           | Young (18-35yrs)    | 64  | 32.0|
|               | Middle (36-50yrs)   | 89  | 44.5|
|               | Old(above 50yrs)    | 47  | 23.5|
| Education     | Illiterate          | 48  | 24  |
|               | Up to Primary School| 20  | 10  |
|               | Middle School       | 28  | 14  |
|               | High School         | 56  | 28  |
|               | Intermediate        | 26  | 13  |
|               | Graduation& Above   | 22  | 11  |
| Marital Status| Single              | 0   | 0   |
|               | Married             | 186 | 93  |
|               | Divorced            | 0   | 0   |
|               | Widow               | 12  | 6   |
|               | Separated           | 2   | 1   |
| Occupation    | Agriculture         | 127 | 63.5|
|               | Labour              | 13  | 6.5 |


3.2 Socio-Economic Profile of Rural Farm Women

From Table 5 it could be seen that 64.5% of rural farm women have marginal land holdings followed by 27.5% small, 5.5% semi-medium, 1.5% medium and none were in large land holding category. The land holding distribution is matching with the general trends in the country that 80 per cent of the land holding in the country are small and medium size. The possible reason that could be attributed to this may be that agriculture was found to be the main occupation of the family who has inherited it from their ancestors and almost all depend on their land for living.

It is evident from the Table 5 that 65.0% of rural farm women belong to medium family income followed by 34.5% low and 0.5% was in high income category.

A glance at the Table 5 reveals that 65.5% of the rural farm women had medium mass media exposure, followed by low (18.0%) and high (16.5%). Farmers in present days are having more access to the mass media such as television, radio, newspapers, and farm magazines. They have the habit of reading newspaper and farm magazines, listening to radio programmes and watching television for agricultural information in general and nutritional aspects in particular. Mass media are known for their accuracy, consistency, security, timeliness, completeness, reliability, accessibility, objectivity, relevancy, usability, understandability, reputation, usefulness, efficiency and value-addition. Majority of the rural farm women had medium participation in mass media which explains that they were very much dependent on mass media not only as a source of news and information, but also as a source of entertainment and leisure. In general, it increases the awareness levels of the farm women on the nutritional KAP. They help to update latest developments which are a good sign and speak about the interest of respondents to view the things. Thus, their mass media exposure helps for upgrading nutritional knowledge.

It is accounted from Table 5 that 70.5% of rural farm women had medium level of extension contact which is followed by high (16.0%) and low (13.5%). Different sources of information influence the knowledge, attitude, and practice of the individual towards nutrition. The medium extension contact of rural farm women was due to the fact that extension contact results is a purposeful action to seek more information and to clarify the doubts pertaining to the nutrition from the officials of the development departments and other selected organizations.

3.3 Nutritional Knowledge, Attitude and Practice of Rural Farm Women

3.3.1 Nutritional knowledge of the rural farm women

A glance of Fig. 1 reveals that more than one third (34.5 %) of the rural farm women had high knowledge, followed by low (33.5 %) and medium (32.0 %). These results of the study are in conformity with that of [10]. However, the findings are contradictory to that results reported by [11].

3.3.2 Statement-wise nutritional knowledge of rural farm women

The results in Table 6 presents the data on the statement-wise nutritional knowledge of rural farm women, nearly cent per cent of rural farm women have knowledge on Kitchen garden
provides fresh fruits and vegetables (98.5 %) and cutting nails timely is hygienic practice (98%). Rural farm women having sufficient knowledge on most of the nutritional statements considered under present study probable reason could be their mass media exposure, extension contact. But only few have knowledge on awareness of super foods (14%), nutrithali (27.5%), GLV’s are good source of folic acid (33.0%) and Supplementary diet is necessary to overcome deficiency of nutrients (36.0%), hence, more capacity building programmes, awareness campaigns, skill trainings etc needs to be conducted to enhance the knowledge on these aspects.

3.3.3 Nutritional attitude of the rural farm women

It is evident from Fig. 2 that 36.0% of rural farm women had less favorable attitude, whereas 34% had favorable and 30.0% had more favorable attitude towards nutrition. The findings are in line with the results reported by [11].

3.3.4 Statement-wise nutritional attitude of the rural farm women

Data in Table 7 reveals that statement-wise nutritional attitude of the rural women, the statement. Rural farm women have positive attitude on maintenance of personal hygiene, consuming raw vegetables for good health and sprouted. They have less favourable attitude towards consumption of super foods is essential for getting phytonutrients, include green leafy vegetables in daily diet to prevent anaemia and avoid drinking direct tap water. The probable reason could be lack of capacity building programmes, literacy programme etc, hence, interventions needs to be planned to change the mindset of people on above mentioned nutritional statements.

3.3.5 Nutritional practice of the rural farm women

Fig. 3 revealed that 40.0% of rural farm women had poor practice, 35.5% had fair practice, and 24.5% had good practice of nutrition. The findings are in line with the results reported by [11].

3.3.6 Statement-wise nutritional practice of the rural farm women

Data in table 8 reveals that statement-wise nutritional practice of the rural farm women. Most of the rural farm women have poor practice on use of Chia seeds, Quinoa seeds and flax seeds in their diet, supplement diet, consumption of GLV’s daily, maintaining kitchen garden at home, daily walk and jogging, exercise or walk, work out to maintain ideal body weight, consists of all five foods in their daily diet and consumption of roots and tubers daily and many other statements mentioned in Table 8. The probable reason could be less favourable attitude, lack of awareness, lack of time to practice as they engaged in farm activities.

3.3.7 Correlation between socio-demographic profile with KAP

Data in Table 9 indicates the relationship between independent variables and KAP. The variables like land holdings, family income, number of earners in the family, family size, extension contact had positive relationship with nutritional knowledge and attitude, whereas age and mass media exposure had negative relationship. In case of nutritional practice age, number of earners in the family, family size, mass media exposure and extension contact had negative relationship, whereas land holdings, family income had positive relationship.

| Characters                  | Category                                | No. | %  |
|-----------------------------|-----------------------------------------|-----|----|
| Land Holding (hectors)      | Marginal holding (Up to 1 hectares)     | 129 | 64.5 |
|                             | Small holding (1-2 hectares)            | 57  | 27.5 |
|                             | Semi-medium holding (2-4 hectares)      | 11  | 5.5 |
|                             | Medium holding (4-10 hectares)          | 3   | 1.5 |
|                             | Large holding (10 hectares or above)    | 0   | 0   |
| Family Income               | Low (BPL) upto 1,32,000                  | 69  | 34.5 |
|                             | Medium (1,32,000 to 5,72,000)           | 130 | 65.0 |
|                             | High (APL) (above 5,72,000)             | 1   | 0.5 |
| Mass media exposure         | Low                                     | 36  | 18.0 |
| Mean = 7.46                 | Medium                                  | 131 | 65.5 |
| SD = 1.103                  | High                                    | 33  | 16.5 |
Table 6. Statement-wise nutritional knowledge of the rural farm women

| No. | Statements                                                                 | No. | %  |
|-----|---------------------------------------------------------------------------|-----|-----|
| 1   | Are you aware of super foods                                              | 28  | 14.0|
| 2   | Millets are better for health than rice and wheat                         | 142 | 71.0|
| 3   | NutriThali is nothing but a balanced diet                                 | 55  | 27.5|
| 4   | Balanced diet is essential for good health                                | 142 | 71.0|
| 5   | Skipping meals is good for health                                        | 29  | 14.5|
| 6   | Cutting nails timely is hygienic practice                                 | 196 | 98.0|
| 7   | Anaemia is due to deficiency of Vit. A                                    | 113 | 56.5|
| 8   | Ideal body weight is necessary to maintain good health                    | 126 | 63.0|
| 9   | Intake of green leafy vegetables (GLV) enhances Vit. C                   | 73  | 36.5|
| 10  | Drinking tap water is not good for health                                 | 127 | 63.5|
| 11  | Washing hands before eating food is not a good practice                   | 37  | 18.5|
| 12  | Morning walking and jogging are good for health                           | 178 | 89.0|
| 13  | Kitchen garden provides fresh fruits and vegetables                       | 197 | 98.5|
| 14  | Cereals are rich source of carbohydrates                                  | 93  | 46.5|
| 15  | Sprouting will not improve nutrient availability                          | 68  | 34.0|
| 16  | Obesity may be due to excess intake of fat                                | 154 | 77.0|
| 17  | Egg is complete protein                                                   | 101 | 50.5|
| 18  | Regular consumption of junk food is good for health                       | 40  | 20.0|
| 19  | Milk and milk products enhance calcium and is important for bone health   | 157 | 78.5|
| 20  | Females need more iron in diet than male                                  | 108 | 54.0|
| 21  | GLV’s are good source of folic acid                                      | 66  | 33.0|
| 22  | Supplementary diet is necessary to overcome deficiency of nutrients       | 72  | 36.0|
| 23  | Protein is necessary for good Hb status                                   | 73  | 36.5|

* (-) – indicates negative statements
**Fig. 2. Nutritional attitude of the rural farm women**

**Table 7. Statement-wise nutritional attitude of the rural farm women**

| No. | Statements                                                                 | Score | Rank |
|-----|-----------------------------------------------------------------------------|-------|------|
| 1   | Consumption of super foods is essential for getting phytonutrients           | 234   | 18   |
| 2   | Millets helps in management of lifestyle disorders                           | 297   | 13   |
| 3 (-) | NutriThali is not essential for all age group                        | 186   | 19   |
| 4   | We should consume balanced diet                                            | 323   | 10   |
| 5   | We should not skip meals                                                   | 335   | 7    |
| 6   | We should cut nails regularly                                              | 367   | 4    |
| 7   | We should maintain personal hygiene                                        | 381   | 1    |
| 8 (-) | There is no need to maintain ideal body weight                          | 161   | 20   |
| 9   | We should include green leafy vegetables in daily diet to prevent anaemia    | 270   | 17   |
| 10  | We should avoid drinking direct tap water                                   | 272   | 16   |
| 11 (-) | We should not wash hands before food intake                             | 36    | 23   |
| 12  | Morning walk and jogging improves the health                                | 348   | 6    |
| 13  | Kitchen garden is necessary to get fresh fruits and vegetables              | 363   | 5    |
| 14  | Protein rich food should be included in our diet                           | 294   | 14   |
| 15  | We should consume sprouted grains                                          | 368   | 3    |
| 16  | Fried, baked foods should be restricted                                    | 289   | 15   |
| 17  | Consuming raw vegetables is good for health                                | 380   | 2    |
| 18 (-) | Junk and road side food are healthy and hygienic                        | 111   | 22   |
| 19 (-) | There is no need for diet diversification Diet should include variety of foods | 325   | 9    |
| 20  | Diet should include cup of milk                                            | 330   | 8    |
| 21  | Egg should be included in daily diet                                       | 314   | 11   |
| 22  | The daily diet include grains, root and tubers                            | 308   | 12   |
| 23 (-) | Nuts and oilseeds should be avoided in daily diet                        | 143   | 21   |

* (-) – indicates negative statements
Table 8. Statement-wise nutritional practice of the rural farm women

| No. | Statements                                                                 | No. | %  |
|-----|------------------------------------------------------------------------------|-----|----|
| 1   | Do you use Chia seeds, Quinova seeds and flax seeds in your diet             | 5   | 2.5|
| 2   | Do you use millets in your daily diet                                        | 170 | 85.0|
| 3   | Your daily diet consists of all five foods                                   | 49  | 24.5|
| 4   | Do you consume balanced diet daily                                          | 64  | 32.0|
| 5   | Do you skip meals                                                           | 133 | 66.5|
| 6   | Do you cut your nails frequency                                              | 167 | 83.5|
| 7   | Do you keep yourself hygiene                                                 | 170 | 85.0|
| 8   | Will you do any work out to maintain ideal body weight                       | 42  | 21.0|
| 9   | Do you consume GLV’s daily                                                  | 28  | 14.0|
| 10  | Do you drink tap water                                                       | 70  | 35.0|
| 11  | Do you wash your hands before having food                                    | 192 | 96.0|
| 12  | Will you do daily walk and jogging                                           | 37  | 18.5|
| 13  | Are you maintaining kitchen garden at home                                   | 31  | 15.5|
| 14  | Do you consume cereals in daily diet                                        | 184 | 92.0|
| 15  | Do you consume sprouted grains                                               | 175 | 87.5|
| 16  | Do you consume fried, baked foods daily                                      | 44  | 22.0|
| 17  | Do you eat enough fruits and vegetables                                      | 104 | 52.0|
| 18  | Do you drink milk and milk products daily                                    | 151 | 75.5|
| 19  | Do you exercise or walk daily                                                | 38  | 19.0|
| 20  | Do you consume roots and tubers daily                                        | 50  | 25.0|
| 21  | Do you take supplement diet                                                  | 16  | 8.0 |
| 22  | Do you eat egg daily/frequently                                              | 66  | 33.0|
| 23  | Do you eat fruits and vegetables daily                                       | 78  | 39.0|

* (-) – indicates negative statements

Table 9. Correlation between socio-demographic profile with KAP

| Variable                        | Knowledge | Attitude | Practice |
|---------------------------------|-----------|----------|----------|
| Age                             | -0.131    | -0.149   | -0.110   |
| Land holdings (Acres)           | 0.058     | 0.094    | 0.105    |
| Family Income                   | 0.261     | 0.182    | 0.157    |
| Number of earners in the family | 0.138     | 0.116    | -0.026   |
| Family Size                     | 0.075     | 0.030    | -0.064   |
| Mass Media Exposure             | -0.035    | -0.044   | -0.118   |
| Extension Contact               | 0.017     | 0.024    | -0.040   |
4. CONCLUSION

From present study it is concluded that there was more knowledge of rural farm women on nutritional aspects, less favorable attitude and poor practice of nutrition. Hence, intervention strategies like promotion of Nutri-gardens in Schools, Households and the rural Community, promotion of Nutri-sensitive crops or biofortified crops to address the malnutrition, promotion of Nutrition Thali through integrated farming system model, Awareness programmes or modules to educate the farm families for cultivation of nutri crops or bio-fortified crops and their nutritional importance and Nutritional deficiencies and its prevention through ICT, skill trainings for development of value added products or Nutrification of traditional recipes, encourage farm families to develop value added products and establish microenterprises to achieve economic security, convergence with all line departments (Women and Child welfare, Agriculture, Horticulture, Fisheries, livestock departments, health department etc.) for achieving the food, nutrition and health security of rural farm women.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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