

Integrating Gender and Nutrition within Agricultural Extension and Advisory Services

Discussion Paper 2

MANAGE- Centre for Agricultural Extension Innovations, Reforms, and Agripreneurship (CAEIRA)



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About the Publication

The research report is based on the research conducted by Satarupa Modak as MANAGE Intern under the MANAGE Internship Programme for Post Graduate students of Extension Education during April-June, 2017.

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Director General's Message

Smt. V. Usha Rani, IAS

Director General, MANAGE

Women are the back bone of agriculture development. Women alone participate in specific agriculture activities like transplantation, weeding, winnowing etc., However, the contribution of women is not acknowledged enough due to gender biased discrimination in our society.

Women centric agricultural policies, Research, and training and capacity building programs are often ignored. The research project has taken up by MANAGE intern Ms. Satarupa Modak clearly brings out need to focus on gender in agriculture.

Decision making by women in various agriculture activities, value addition, and marketing will not only provide better livelihoods for rural women but also will have rippling effect rural economy. Hence, the study is very much useful for sensitizing the relevant organizations for the urgent need to look into gender related issues in agriculture.

Similarly, good agriculture should lead into good nutrition and good health to mankind. Unfortunately good agriculture is not proportionately reducing malnutrition especially in children and in adults in general.


If farmers are sensitized to plan crops as per the nutrition requirements of family and also society at large, the distress due to lack of adequate marketing opportunities is automatically redressed. Nutrition needs of a family are not often kept in mind in deciding the cropping pattern. If agriculture is to be integrated with nutrition, automatically multiple cropping, crop rotation, integrated farming system would emerge, which also provide solution for many of the farmers problem today.

At present nutrition related education and programs are implemented by women and child welfare department, that too targeting only children, pregnant and lactating women. If various departments like agriculture, Health and Women and Child Welfare work together, agriculture can be integrated with nutrition, and if present schemes giving nutrition education only to children and women are reoriented to address nutrition needs of complete family including old and elder people, the scenario will change leading to healthy society.

This report clearly brought out the need for innovative system of extension through building teams to achieve common objective.

Let me heartily congratulate Dr. Saravanan Raj, Director (Agril.Extn.) and Dr.Suchiradipta Bhattacharjee, MANAGE Fellow for effectively guiding the MANAGE interns to select the topic of the hour and bringing out good insights and recommending the steps required for 'Integrating Gender and Nutrition within Agricultural Extension and Advisory Services'.

09.01.2018


(V.Usha Rani)

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Abstract

Perceptions of gender are deeply rooted in our society, differ extensively within and between cultures, and change over time. But in all cultures, gender determines power and resources. And in the case of rural areas, inequalities between men and women in their access to productive resources, services and opportunities such as land, livestock, financial services and education is one of the causes of underperformance in the agriculture sector, and contribute to deficiencies in food and nutrition security, economic growth and overall development. Agriculture is the single largest employer in the world, providing livelihood for 40% of today's global population. Investing in smallholder farmers is an important way to increase food security and nutrition for the poorest, as well as food production for local and global markets. Agricultural Extension Services can assist rural communities to become gender-responsive, nutrition-sensitive and, by assessing and responding to the needs of both men and women farmers, build more robust institutions, projects and programmes. They can also create approaches in rural households to remove gender barriers by disseminating gender-appropriate and nutrition-enhancing technologies to improve nutritional mal-practices. From this study, several innovative approaches were identified to integrate nutrition and gender within agricultural extension and advisory services, such as 'katori' method, sustainable extension model, and multidisciplinary PPP model, even though lack of sensitised manpower and myths regarding food habits are critical challenges in rural areas.



Executive Summary

Agricultural activities do not occur in a vacuum, but rather in a social context which clearly defines what roles are appropriate or should be performed by men and women in production, reproductive and community development activities. Gender issues in agriculture severely hinder agricultural development. Globally, women make up approximately 43% of the agricultural labour force and typically carry a heavier burden than men, having both field and household duties. Despite these extensive roles, most developing countries' extension systems do not sufficiently address the needs of female farmers or rural workers. Further, while advances have been made in many areas of development, 70% of the world's poor live in rural areas, and nutritional problems such as wasting and Vitamin A deficiency remain very high. In India, which has more than one-third of the world's undernourished children, progress against under-nutrition has been slow. In spite of vulnerability to malnutrition, women are in a unique position to improve nutrition in their households. They are often primarily responsible for growing, purchasing and preparing foods; collecting fuel and water; and child-rearing. Yet, vulnerable women, especially those in male-headed households, frequently have limited access to nutrition information and the resources they need to improve food security, such as income, land, equipment, financial services and training. Gender matters because initiatives to improve nutrition cannot achieve lasting success without taking into consideration the social, economic and biological differences between men and women and, in particular, the gender inequalities which stand in the way of good nutrition. Despite these extensive roles, most developing countries' extension systems do not sufficiently address the needs of female farmers or rural workers. The concept of nutrition-sensitive agriculture was initiated for promoting gender equity and providing nutrition education by targeting poor households. Agriculture can influence nutrition through improving consumption patterns of households, introducing nutrition-dense food preparations, upgrading expenditure on nutritious foods and also by helping to reduce gender barriers on food intake patterns of households. Introducing gender and nutrition as a new cross-cutting theme of Agricultural Extension helps to build more robust, gender-responsive and nutrition-sensitive institutions, projects and programmes to assist in considering and responding to the needs of both men and women of a community. It is an identified, scale-proven mechanism to apply effective extension approaches for delivering improved advisory services for both men and women farmers; to disseminate gender-friendly, nutrition-enhancing technologies; to improve women's access to agricultural inputs and enhance intra-household dynamics. From the study, several innovative approaches were identified to integrate nutrition and gender within agricultural extension. These were biofortification–agronomic aspect, biofortification–genetic approach, 'katori' method, sustainable extension model, multi-disciplinary PPP model, supporting nutrition and generating income, kitchen gardening, value addition, non-farm activity, custom hiring centres, nutrient-rich products, special interventions, celebration of special days, researching and identifying local technology special care. Problems identified in the particular study were lack of sensitised workforce, fewer women extension workers, lack of participation, and misconceptions about food intake. Recommendations suggested that to prevent malnutrition a family approach rather than a group or individual approach was required, along with more efforts to sensitise grassroots-level workers about nutrition; more efforts to grow nutrition gardens in

households and schools; inclusion of information about nutrient values of different local food items in the school curriculum; sensitisation of more women and men Village Level Workers (VLWs) about gender and nutrition perspective; selection of suitable timing and venue for meeting for women; solicitation of support for women from male members of family as they are often decisions makers of social mobility of women. Men should also be convinced to join in the nutrition- and gender-related meetings for better understanding and implementation. Approaches should be need- and problem-based and should create empathy about the situational factors of the particular area. There is a need to select appropriate groups of beneficiaries, and to research on focused areas (intra-household dynamics, preferred nutrition-rich alternatives). There were several ongoing initiatives to improve agricultural livelihoods focusing on strengthening extension and advisory services to empower and engage smallholder farmers, male and female.



Gender, critical for agricultural development

Agricultural activities do not occur in a vacuum. Rather, the activities occur in a social context which clearly defines what roles are appropriate or should be performed by men and women in production, reproductive, and community development activities. These socially defined roles are commonly referred to as 'gender roles' (Me-Nsope, 2015). Perceptions of gender are deeply rooted in our society, differ extensively within and among cultures, and change over time. But in all cultures, gender determines power and resources for females and males. And in case of rural areas, inequalities between men and women in their access to productive resources, services and opportunities such as land, livestock, financial services and education are one of the causes of underperformance in the agriculture sector, and contribute to deficiencies in food and nutrition security, economic growth and overall development. Numerous studies underscore the social costs of rural women's lack of education and assets, linking it directly to high rates of under-nutrition, infant mortality etc. There are also high economic costs: wasted human capital and low labour productivity that suppress rural development and progress in agriculture, and ultimately threaten food security both for women and men.

About 70% of the agricultural workers, 80% of food producers, and 10% of those who process basic foodstuffs are women and they also undertake 60 to 90% of the rural marketing; thus making up more than two-thirds of the workforce in agricultural production.

Table 1. Status of men and women contribution as agricultural labour force in few country

S.N	Country	Contribution
1.	Sri Lanka	35% of women in the labour force were employed in the agricultural sector compared to 42% of men (2012).
2.	Pakistan	76% of women in the labour force were employed in the agricultural sector compared to 34.5% of men (2014).
3.	Nepal	83% of the female working-age population was part of the labour force, while in case of male 89% (2013).
4.	Bangladesh	60% of the female working-age population was part of the labour force, while in case of male 87% (2013).
5.	India	60% of women in the labour force were employed in the agricultural sector compared to 43% of men (2012).
6.	Liberia	48% of women in the labour force were employed in agriculture compared to 50% of men (2010).
7.	Ghana	38% of women in the labour force were employed in agriculture compared to 46% of men (2010).
8.	Vietnam	49.5% of women in the labour force were employed in the agricultural sector compared to 45% of men (2012)
9.	The Philippines	In 2013, 20% of women in the labour force were employed in the agricultural sector compared to 38% of men in the labour force.
10.	China	women constitute about 70% of the agricultural labour force and perform more than 70% of farm labour (2012)

Source: <http://www.wikigender.org>

Yet it is found that women have less access to extension services and inputs compared to men and the role of women in these economically important activities has remained obscure for long because women seldom played any major roles in political activities or decision-making processes. Despite the fact that women produce much of the food in the developing world, they also remain more malnourished than most men are. In many rural societies, women eat less food than men do, especially when the food is scarce, such as just before the harvest, or when the workload increases without a corresponding increase in the food intake.

“Although women do the majority of work in agriculture at the global level, elder men, for the most part, still own the land, control women’s labour, and make agricultural decisions in patriarchal social systems.” – Dr. Carolyn Sachs, Professor of Rural Sociology, Penn State College of Agricultural Sciences.

(Source: Sachs, C. and M. Alston. 2010. Global Shifts, Sedimentations and Imaginaries. SIGNS: Journal of Women Culture and Society 35(2):277-288)

Women provide one half of the labour in rice cultivation in India. In the plantation sector women are the crucial labourers. Depending on the region and crops, women’s contributions differ but they contribute crucial labour requirement from planting to harvesting and post-harvest operations. In rural India, agriculture and allied industrial sectors employ as much as 89.5% of the total female labour. (FAO, 2016).

Gender may influence the composition of diets within households, as indicated that the higher proportion of food budgets allocated to nutrition by female-headed households than male-headed households. The studies described that despite low levels of income, certain female-headed households are able to provide better levels of nutritional status than wealthier male-headed ones, and also suggested that there is a need to fully understand the interactions between income and gender as they affect child health and nutritional wellbeing (Kennedy and Pauline, 1992).

In 2016, FAO documented examples of good practices during Gender and Rural Advisory Services Assessment Tool (GRAST). It implemented an enabling environment through the national agricultural extension policy which includes rural women among the targeted population; it considers objectives of the national gender equality plan and includes gender indicators at outcome and output level. At the organisational level, through commitment to empowering rural women and reducing gender inequalities clearly stated in policies and strategies, it provides extensive and regular staff training to develop staff capacity in gender-sensitive service delivery; all adults in the household can register rather than just the household head. At the individual level, strong sensitivity on the part of managers and field staff to gender issues, and the personal commitment and knowledge required to address them; communication with women farmers in the local language; employment of female farmer-to-farmer advisers to reach female clients who are not comfortable working with male advisers, promotion of small-scale rural businesses that enhance women’s mobility and economic autonomy.

Agriculture for reducing malnutrition

The vast majority of the world's hungry people live in developing countries, where 12.9% of the population is undernourished. Asia and Sub-Saharan Africa are the regions with the hungriest people – two-thirds of the total population. Poor nutrition causes nearly half (45%) of deaths in children under five – 3.1 million children each year. One in four of the world's children suffer stunted growth. In developing countries the proportion rises to one in three. 66 million primary school-age children in developing countries attend classes hungry, with 23 million in Africa alone. Agriculture is the single largest employer in the world, providing livelihoods for 40% of today's global population. Investing in smallholder farmers is an important way to increase food security and nutrition for the poorest, as well as food production for local and global markets. In 1990, 53% of all Indian children were malnourished and it shows a declined figure in 2015 up to 40%, but still the figures remain high than expectation. As, today agricultural sector is equipped with genetic engineering, hi-tech agriculture, precision farming, automated farm machineries, harvesting tools and various food processing industries etc., but failed to eradicate hunger and provide nutritional security. The framing of agriculture remained more or less unchanged until the early 2000s, with agriculture being portrayed as a key driver of economic growth and the foundation of food security. During the last 10-15 years the awareness of the potential of agriculture for a balanced, diversified and nutritious diet gradually increased in the policy debates; however, deeply-rooted beliefs and perceptions about agriculture remain and may hinder the development of more nutrition-sensitive agricultural programmes and policies. The Study recommended promoting the primary role of agriculture for the production of nutritious food for a productive and healthy Indian population, agricultural diversification for a varied diet of the Indian population and to raise consumers' awareness of, and create demands for, a varied diet including non-cereal agricultural products (Barnett and Srivastava, 2016).

Nutrition-sensitive agriculture is an approach that seeks to maximise agriculture's contribution to nutrition. It encompasses more than just cereal crop production—from horticulture to forestry and fisheries, agriculture should be seen not only a means but, it is an essential process for improving the quality of foods available to the community and ensuring healthy soils and ecosystems for farming in the future. Nutrition-sensitive agriculture also leads to targeting poor households, promoting gender equity, and providing nutrition education. Agriculture has great impact on household consumption, as it is primarily associated with nutrition through food preparation, increase expenditure on nutrition-dense food and empowerment of women (Herforth and Harris, 2014). It can be possible with value addition of produce, which can meet off-season nutrition requirement, backyard poultry provide protein rich food and also generate source of income for economic empowerment of women. Nutrient-dense foods are those that provide high levels of nutrients per unit of energy (typically measured as a kilocalorie), and are a focus of many nutrition-sensitive agriculture interventions. It involves linking agriculture to all sectors that address other causes of malnutrition, namely education, health and social protection (FAO, 2014).

For better understanding the links between agriculture and nutrition, there is a need to create global awareness of those agriculture sectors which can contribute to improved nutrition. Beyond

just producing or having access to nutritious foods, we also know there are three main pathways that potentially improve nutrition: agricultural production, agriculture-derived income, and women's empowerment. Extension workers are often considered as a promising vehicle for the delivery of nutrition knowledge and practices to improve the nutritional health of rural communities because they reach and interact closely with farmers in different settings and act as significant service providers of crop, livestock, and forestry aspects of food security, consumption and production.

Food-based approaches can focus on cultivation and availability of nutrition-rich crops at the farm level, linking farmers to markets and value chains at the farm gate level, knowledge for preservation of nutrient content of food through cooking, storing, and processing at household level. Non-food based approaches such as providing women with the gender-friendly tools and technology to improve their own livelihoods and reduce their labour and time, generating income through raising livestock by improved husbandry practices, and by adopting sustainable agricultural practice which have a direct impact on nutrition and health.

Agricultural variables influence dietary diversity and nutrition intakes. Diversification – either in terms of crop production and livestock ownership or in terms of income – improves and positively influences dietary diversity. Moreover, higher the education of the household head, better is the dietary diversity due to improved awareness of access to basic amenities like good quality water, better sanitation facilities, a smoke-free cooking environment, and an employment status that is less strenuous. (Viswanathan et al., 2015).

The goals of the African Green Revolution cannot be limited only to increase the yield of staple crops, improve poor access to markets and tackle extreme poverty in rural areas; it must be designed as a driver of sustainable development, which includes gender empowerment and nutrition elements, just as the Asian Green Revolution, which critically gave importance to all components of agricultural systems; specifically gender and nutrition which should be integrated to ensure the long-term success of the endeavour (Fanzo et al, 2015). With sustainable funding of food-based nutrition programs, specific nutrition interventions could be rolled out with agriculture-focused Green Revolution projects. Though raising smallholder agricultural productivity increases incomes and allows families to purchase more food, farmer-focused initiatives focusing on the production side can also improve diet diversity and the associated micronutrients lacking in the diet of sub-Saharan populations (Fanzo and Haddad, 2009).

FAO promoted nutrition-sensitive agriculture through a variety of partnerships, such as, with the African Union's New Partnership for Africa's Development (NEPAD) to help countries mainstream nutrition, with the World Food Programme (WFP) and the United Nations Children's Fund (UNICEF), through school gardens, healthy school meals and integration of nutrition education in school curricula to improved school nutrition. Other partnerships were with the government, UN agencies and civil society organisations to develop local procurement of fruits, vegetables, beans and fish from local producers to diversify school meals; with Ministries of Agriculture and Health to implant

nutrition objectives in agriculture policies; integrating agricultural interventions in member countries to increase nutrition; and capacity development initiatives, such as working with extension workers and women's social services to introduce improved complementary foods, using local ingredients through cooking demonstrations.

The Horticultural Mission has the mandate to diversify agricultural production towards horticulture and livestock growth. Alongside this, the National Agriculture Development Programme, Rashtriya Krishi Vikas Yojana (RKVY), was launched to incentivise states to develop comprehensive plans for district-level agriculture specific to particular agro-climatic zones and natural resources. These flexible plans also aimed to allow a better integration of livestock, poultry and fish farming with the crop sector (Kadiyala et al., 2011). At present, the State Department of Horticulture only gives assistance to avail of subsidies, which is not fulfilling the aim of all these schemes, and is unable to ensure consumption of nutritious food in rural community. Nutrition must be incorporated into all aspects of the value chain starting with nutrient-rich soils, and extending to food safety, food processing, food fortification, proper food preparation and adequate consumption in households (www.ingenaes.illinois.ed, April, 2017).

In Bangladesh, men consider themselves responsible for food production and marketing, so believe in getting good food to maintain good health and nutrition, essential for being strong and productive on the farm. They have the least interest in women's activities and leave all household chores and food preparation to women. Yet, decisions about spending on food fall predominantly to men, since they buy the food.

In Zambia, it is a man's responsibility to have food in the home, but it is not a man's role to distribute the food. In my community, a man must ensure that there is enough food in the house at all costs because if there is not enough food for the family, a man is considered weak by his peers. He becomes a laughing stock.

(Source: Otieno et al., 2016)

Men often have priority when it comes to food. They may eat before everyone else and enjoy the most nutritious food. Women and children can be left with smaller portions and less nutritious meals. This exposes women and especially adolescent girls to a range of harmful physical and emotional health outcomes. Malnutrition has intergenerational consequences because undernourished women give birth to low-birth-weight babies. Such children can face cognitive and other limitations all their lives, making it difficult to escape from poverty. When women face food discrimination on a national scale, the human capital of the nation is put at risk. Integrating men in nutrition initiatives helps turn this situation around. By virtue of their power and privilege, men are in a prime position to tackle malnutrition in their own homes and in the broader community. In many households and communities, men make key decisions about what to grow and which animals to raise. They often decide what to sell, how much to store, and what foods to buy. However, many initiatives target women and girls, and ignore men. Women may learn a lot from courses on good nutrition, but excluding men means

that women may not be able to act on their improved knowledge. Men may feel angry because their own nutritional needs are ignored. Encourage men to think about the benefits to the whole family of eating nutritious food together with women and children rather than separately. Discuss the special needs of women during pregnancy, childbirth and breastfeeding. Emphasise the importance of good nutrition towards children's development.

As a precondition to achieving food security and nutrition, and to realising other human rights, eradication of gender inequalities and the guarantee of equal opportunities for women and men had been extensively documented internationally. It has been recognised by the World Bank, FAO and the International Fund for Agricultural Development (IFAD) that gender inequalities are the main limiting factor for agricultural productivity and efficiency and also demoralise development agendas.

Integrating gender and nutrition within Agricultural Extension and Advisory Services

Integrated approach may be the precise in present situation to combat issues of gender and nutrition. Agricultural Extension and Advisory Services (AEAS) is the only service or system which directly deals with farm people through educational procedures to improve farming methods and techniques, increasing production efficiency and income, bettering their standard of living and lifting social, educational standards and facilitating for empowerment.

Integrating Gender and Nutrition within Agricultural Extension System empowers families, helps women contribute to household incomes, increases productivity and reduces gender gaps in agriculture, and improves nutrition outcomes for farming (www.ingenaes.illinois.edu). There is a need for extensive recognition of integrating gender in agricultural research and development processes. As it is gaining importance and acknowledgement that gender equity and agricultural development are supporting each other, most donors in the international development field now require gender integration (Me-Nsope, 2015).

There are several delivery mechanisms to deliver better nutrition that Extension Advisory Services could use, including on-farm demonstrations, farmer field schools and associations, public health and school platforms, water and sanitation programmes. If we want to see behavioural change, it is important for AEAS to understand farmers' decision-making processes and how these impact livelihoods, incomes, and nutrition outcomes. This would include increasing awareness and interest, decision and uptake, evaluation, adaptation, and finally, adoption. The capacities that extension agents need to effectively integrate nutrition into AEAS include: technical knowledge regarding crop production for improving nutrition, in addition to training on diets, food preparation, preservation, and hygiene. Training of extension agents should include emphasis on creating awareness of the potential causes of malnutrition. Extension agents need soft skills such as facilitation, negotiation, communication, gender sensitivity, and sensitisation to minimise harmful effect (Fanzo, 2015). Integrating Gender and Nutrition within Agricultural Extension Systems (INGENAES) team members

work with United States agencies, civil society, farmer organisations, and private sector service providers to build the system more robust, gender-responsive, and nutrition-sensitive. Extension Advisory Services (by action-oriented training, learning exchanges, and mentoring programmes) capable of assessing and responding to the needs of both men and women farmers in 'Feed the Future' countries. (MEAS, 2014).

There is a need for focused area-based experimental designs with less ambiguity; specialised household surveys to interlink nutrition and economic component to break conventional consumption pattern. It is likely that the frontier in agriculture–nutrition research will need to be broadened; needing careful measurement of nutritional impacts from large-scale policies and programmes with the help of nutrition-sensitive macroeconomic simulation model and that can be possible by interdisciplinary academic collaborations (Kadiyala et al., 2014). Evidence of effective models of connecting agriculture with the nutritional outcomes generated through this study could be used to frame gender- and nutrition-sensitive farming systems in different agro-ecological zones of the country and the region. The study will also help to assess the role bio-fortification of crops (Das et al., 2014).

In order to harness technology development and diffusion for positive development impacts, a holistic, gender transformative, farming- and food systems approach is recommended. Yet, to build broad support for mainstreaming such integrated approaches in agricultural research and development projects, further evidence of their potential and specific challenges is needed. (Beuchelt and Badstue, 2013).

Most of the stakeholders from India, Pakistan and Bangladesh highlighted production, income, and food prices as pathways through which agriculture can influence nutrition; a much smaller proportion highlighted the role of women in agriculture and how it impacted their health, use of time, and control over resources; key challenges, such as inadequate nutrition literacy and technical capacity, from policy makers to extension workers to communities; lack of political leadership on nutrition and a related lack of accountability, as well as influence by powerful private sector lobbies that dominate the political agenda; insufficient coordination between relevant sectors on nutrition issues; infrequent collection and limited availability of quality data on both agriculture and nutrition; ineffective communication of evidence to policy makers; and insufficient technical capacity among extension workers, civil servants, and even researchers (Van den Bold et al., 2015).

Statement of the problem

The association between agriculture and nutrition in India was found between 1965 and 1975 when undernutrition was framed as a problem of food shortage and the primary aim of agriculture was to increase food supply lead to focus only on large quantities of cereals production for consumption but not on the variety of foods necessary for a balanced and nutritious diet. While the link between agriculture and nutrition was strong, it was far from a nutrition-sensitive agriculture. Then, between 1975 and 1997, undernutrition was framed as a poverty issue with multiple and multi-sectoral

underlying causes, and during this era agriculture was mainly perceived as the generator of income, employment and economic growth leading to an improvement in a population's nutritional status, but the improvement is often far smaller than anticipated (Haddad et. al., 2003). Since 1997, the public interest in nutrition has increased and undernutrition has been defined as a food and nutrition security problem. While agriculture is still seen as the primary provider of food, the importance of agriculture for a balanced and healthy diet is recognised more and more in policy debates (Barnett and Srivastava, 2016). The National Horticulture Mission (Government of India (GoI), 2014) and the National Rural Livelihood Mission recognise the link between agriculture and nutrition (Van den Bold et al., 2015).

In most developing countries, women are extensively involved in various activities of agriculture and household, but extension systems (consisting of public, private and non-profit organisations) have less concern to address the needs of female farmers or rural workers. Furthermore in many developing nations, chronic hunger and poverty lead to malnutrition or under-nutrition problems. AEAS has disputes because of insufficient resources to dedicate gender-nutrition focused activities in terms of trained extension agents, communication gap, and multiple work agenda. So, there is a need to integrate gender and nutrition within AEAS in present context and find out the most fitting extension approaches for the integration. Keeping this in view, the present study was planned with the following objectives:

1. To understand the status of gender and nutrition as part of AEAS in different regions of the world.
2. To find out extension approaches adopted by various organisations to address gender and nutrition in AEAS in India.
3. To critically analyse the challenges faced by existing AEAS and opportunities for strengthening these services.



Plan of study

As a first step to identify and explore key players working for integrating gender and nutrition both in AEAS within India and across the globe, mapping exercises and focused group discussions were carried out, followed by reviews from secondary sources and informal conversations with experts in agriculture, nutrition and gender, consisting of representatives from government, research/academia, non-governmental organisations (NGOs)/civil society organisations, bi- and multilateral organisations, all of them with varying levels of expertise in agriculture, nutrition and gender.

Then, multi-disciplinary stakeholders were categorised according to their level of influence in the gender and nutrition policy space, their support for improving the gender- and nutrition sensitivity of agriculture, the sector(s) and organisation within which they primarily worked, the reasons that they were included in the list, and whether they had been interviewed recently on a similar topic. In the second phase, more structured studies were conducted among the stakeholders based on their specialised services, and, with the help of an interview guide with open-ended interview schedules and notes, were categorised in an Excel sheet according to codes representing the three objectives.

Area of the study and selection of the respondents

Complete enumeration was needed for selection of organisations established and working for gender, nutrition and integration of both in India with the help of secondary sources of information focused on above mentioned areas, such as Google search, annual reports, list of government programmes, working papers etc. ICAR- Central Institute For Women In Agriculture (CIWA), Bhubaneswar; National Institute Of Nutrition (NIN), Hyderabad; and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad; with simple random sampling, prepared an exhaustive list of stakeholders working in the project related to gender, nutrition and its integration with AEAS. From the reference list, respondents were selected through snowball sampling procedure for individual data collection. Data were collected with the help of interview guide.

Table 2. List of Institutes Visited During Research

S.N.	List of establishments	Place / Regional Offices
1.	Central Research Institute for Dryland Agriculture (CRIDA)	Hyderabad
2.	Food and Nutrition Board (FNB)	Hyderabad
3.	Central Institute For Women In Agriculture (ICAR-CIWA)	Bhubaneswar
4.	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Hyderabad
5.	Krishi Vigyan Kendra (KVK), (CRIDA)	Hyderabad

S.N.	List of establishments	Place / Regional Offices
6.	AICRP- Home Science	Hyderabad
7.	National Institute of Nutrition (NIN)	Hyderabad
8.	College of Home Science (PTJSAU)	Hyderabad
9.	National Institution of Rural Development	Hyderabad
10.	Mandal ICDS office	Ibrahimpattanam
11.	Village Anganwadi Centre	Gummadavelly, Narrapally, Gaddamallaiguda

* Randomly selected for the study

Research design

In order to achieve these objectives, a mixed methods approach was necessary to follow. The data collected included some secondary data mainly from literature reviews. However, because very little had been written and published on this specific topic, it was necessary to collect primary qualitative data from experts on the topic by semi-structured interviews with expert stakeholders. Thus, data collection was performed with a systematic literature review and semi-structured key informant interviews. These methods were used to achieve the same elements of a single objective, which were allow to support and better triangulate than a single method.

Table 3. List of Keyword for literature search and Indicator for study

Keywords for Literature Search	Indicators for the research study
Agricultural advisory services	Gender inequality
Rural advisory services	Gender poverty
Gender and agriculture	Gender malnutrition or under-nutrition
Nutrition Sensitive Agriculture	Nutrition policy for gender in India and abroad
Extension advisory services	Extension approaches to address gender malnutrition
Integrated approach	Documentation of extension strategies, policies and programmes for nutritional security of gender
Agricultural extension services	Local food culture and gender
Agricultural extension approaches	Income-generating activities and spending income on nutrition
College of Home Science (PTJSAU)	Hyderabad
National Institution of Rural Development	Hyderabad

Tools and techniques for the study

In this study, non-experimental research design (descriptive research), one which describes, records, analyses and interprets the conditions that exist were adopted to discover the relationship between

existing variables without manipulating the condition. Descriptive research provides a detailed summary of an existing phenomenon by assigning numbers to characteristics of objects or subject involved. Data collection tools were as follows:

Systematic literature review

The starting point for the literature review was the use of the Global Forum for Rural Advisory Services (GFRAS), Worldwide Extension Study, to seek out relevant information on nutrition, diets, gender and home economics within EAS programs. Thereafter, the following literature databases were searched across the three main objectives of the study with a specific emphasis on case studies resulting from extension programs. The following key words were used: rural advisory service or agricultural advisory service or agricultural extension or rural extension or participatory extension and nutrition or diet or home economics or gender and nutrition or integrated approach or gender in agriculture (Table 3). The following sources for gray and unpublished literature were searched: Good practices in agriculture, International Food Research Policy Institute (IFPRI), Food and Agriculture Organisation, and World Bank. Lastly, only recent studies published in English were considered.

Snowball process

To attain the second objective, a snowball process was used to identify the stakeholders primarily working for gender, nutrition and integration of both from the randomly selected establishments or programmes, whereby the reference list was used to discover further more potential stakeholders to identify supplementary information. The snowball process was also used to identify gray literature and information papers that have not been published in peer-reviewed journals. Some of the programmes being implemented in India with a limited history of documentation were also included by reference or recommendations. The inclusion criteria for review of the primary and gray literature were: it must be focused on underdeveloped and developing countries; it must have a fixed positive objective of contributing to improved nutritional, gender, consumption or home economic outcomes and integration of both nutrition and gender, integrated AEAS; must have an intention of possible interaction between agriculture and nutrition, agriculture and gender, or both, in agriculture and should emphasise most recent (published in last five years) initiatives.

The studies were screened in two stages. In the first stage, by reading titles and abstracts, studies that were written in English and relevant to the topic were selected. In the second stage, independent review of the full text was carried out and those that did not meet the standard set by the review were excluded.

Snowball sampling was also employed to reach actors involved with community workers and AEAS professionals. For these, individuals who fit the inclusion criteria were identified, and in turn they recommended others who also met the same criteria. During the interviews, questions asked were selected from the interview guide, but in varying order. The questions were selected depending on

the flow of the interview as well as on the level of expertise of the interviewee about the various objectives. The interviews were audio recorded and written briefly. A daily interpretive analysis was performed to assemble and interpret the information that was collected; reviewed the notes and tapes, and write a log that synthesised the bulk of the interview information. Qualitative data analysis consisted of identifying, coding, and categorizing major themes that corresponded with the research objectives. Interview responses were reviewed and analysed to identify trends and case examples and to obtain expert opinions with respect to the three main objectives of the study. Several interviews were conducted with experts from government agencies, national and international organisations, research and academic institutions, and NGOs.

Measurement technique

After data collection, the qualitative and quantitative data were analysed concurrently. For the literature review, articles were included in the study if they provided information on one of the three objectives grounded within implementation of programmes. The face-to-face interviews, the analysis were performed at two levels: within each case and across cases. Each interview was audio-taped precisely. Initial exploration of the data was done by reading through the transcripts and coding data by coding the text. These codes were then used to develop themes. The themes were then connected and interrelated across all three methodologies, and a case study narrative were constructed across the three objectives to get a detailed overview of the status related to gender, nutrition and integration of both in AEAS. The case study method was followed by interviewing the key informants of the organisations selected for the study by pulling up examples of challenges and best practices.



Gender and nutrition as part of Agricultural Extension and Advisory Services (AEAS) in different regions of the world

Sex-disaggregated data in countries as diverse as Kenya, Senegal, Uganda, and Bangladesh show that both men and women are taking up new agricultural practices that are likely to enhance their resilience to the effects of drought (World Bank, 2015).

Numerous case studies on gender-sensitive AEAS were implemented by the Gender and Rural Advisory Services Assessment Tool (GRAST) funded by FAO in 2016, in Bangladesh, Ethiopia, India and Peru. The case studies identified and practiced innovative good practices used by the rural AEAS providers. These were categorised under enabling environment i.e., includes rural women as targeted population in national agricultural extension policy, in agricultural policy with objectives of the national gender equality plan and also includes gender indicators at outcome and output level; at organisational level: to empowering rural women besides reducing gender inequalities clearly stated in policies plus strategies, organisation should provide extensive and regular staff training for capacity building in case of gender-sensitive service delivery and organisation supports to cooperatives for allowing registration of any adults in the household rather than just the household head; individual level: strong sensitivity all field staff to gender issues, more commitment plus knowledge required to address and communicating with women farmers, Employment of female farmer-to-farmer advisers to reach female clients who are not comfortable working with male advisers and promotion of small-scale rural businesses that enhance women's mobility and economic autonomy. GRAST also helped to identify the strengths and weaknesses of the selected Rural Agricultural Services programmes, which lacked a dedicated budget for gender-specific project activities.

The public and private sector-led Extension Advisory Services can integrate nutrition-sensitive measures in their work depending on their mandate and also can motivate them for integrating nutrition-sensitive measures in their services which will put additional strain on staff, timing and resources. (Stefan et al., 2016). This study examines some of the overarching approaches taken to connect AEAS and nutrition. AEAS for the most part, focus thematically on crops and food, and to a certain extent on livestock and natural resources management. They also focus on the education pieces that fit within these themes. Extension agents do not tend to work in sectors such as public health, or on health-related activities, for instance malnutrition screening or treatment. Most of the approaches have focused on improving the nutritional quality of food production, as well as on nutrition education and on awareness messages regarding better utilisation of foods. One reason is that because many extension agents have experience of working in the food availability sphere, including nutrient-rich crops in their portfolio is an easy transition. Responsibility for food availability falls into the remit of the Agriculture ministries. Less work has been done regarding concerns of food access and utilisation in rural households. This may be because interventions in these areas are less known, less demonstrated, are supported by less research, and have less evidence of impact.

These areas also involve integrating other actors, including value chain actors, for increased access to nutritious foods and public health in the case of utilisation, which can be more difficult to coordinate under time and resource constraints. In some cases, the integration of nutrition within EAS is a direct objective of programmes or projects, while in others, it takes place indirectly as new technology or models present unique entry points for integration to occur. Very few of the integrated approaches are at scale and very little has been documented on their effectiveness.

In Brazil, nutrition-sensitive agriculture is included in all of the current food and agriculture policies and those plans related to promotion of the family farming model are especially nutrition sensitive. The National Food and Nutrition Security Policy and the other associated plans take an inclusive approach to improving food and nutrition security in the country for the creation of nutrition education processes, development and promotion of sustainable food systems, and increased integration of food and nutrition in all levels of health care. The policy identifies adequate food as a human right even among the most vulnerable. The plan also includes interventions targeting food production and supply, healthy eating education, and strengthening of family farming. In Malawi, national policies indicate for diversified production, especially of leguminous crops. Knowledge and emerging practices using indigenous crops, cooking and preparation exists at a local level, which can contribute to nutrition-sensitive agriculture need to be promoted. In Mozambique, several international development donors play an important role in setting the agenda for nutrition in the country, advocating multi-sectorial coordination and action, funding and implementing projects. Agricultural policies analysed were not based on nutritional criteria, even if they include some aspects of nutritional programming. The focus is on cash crops and starchy staple foods rather higher nutritive value crops. The main challenge is insufficient promotion of dietary diversification and lack of broader strategic documents.

In Nepal, National Planning Commission developed three main plans: (1) the Multi-Sectoral Nutrition Plan for Nepal (MSNP), (2) the Agriculture Development Strategy (ADS), and (3) the Food and Nutrition Security Plan of Action (FNSP). The MSNP sets to check prevalence of stunting, underweight, and wasting among children younger than five years and undernutrition among women ages 15-49. The four tactical components of the ADS are to improve food and nutrition security either directly or indirectly through poverty reduction, agricultural trade surplus, and higher income for rural households. The FNSP targets the poorest households to reduce hunger and poverty by improving sustainable agriculture-based livelihoods. It has nine components focused mainly on increasing food availability: 1) Agriculture Crops, 2) Fisheries, 3) Food Quality and Safety, 4) Forestry, 5) Gender Equity and Social Inclusion, 6) Horticulture, 7) Human Nutrition, 8) Legislation, and 9) Animal Health and Production. In Senegal, nutrition sensitivity is integrated into the agricultural policy documents but not in a broader spectrum. Current agricultural programmes give more emphasis by targeting the vulnerable population groups; empowerment of women; increasing production by diversification and improvement of processing of agricultural products; collaboration between sectors and for sustainable approaches. Main challenge documented was that there were no clear nutritional goals and no use of any nutritional indicators, along with lack of technical agency collaboration. In Sierra

Leone, increase of agricultural production has been documented as well as promising efforts to diversify crop choices and inputs. Gender issues and promoting women’s business are gaining strong support. Even though women participate in most of the agricultural production, but they have no right to land and lack decision-making power for marketing and other production-related issues. (Fanzo, et al., 2013).

Extension approaches adopted by various organisations to address gender and nutrition in AEAS in India.

Table 4. Integrating Gender in Agricultural Advisory Services

S.N	Approach	Details	Strength	Weakness
1.	Research on local technology	Encourage and identified local and drudgery reduction technologies.	Easily acceptable for local people as those are familiar to them.	Limited resources.
2.	Parichay	Display improved tools-explain interest basis	farm women visit the extension personnel	Totally depends on visitors’ reaction.
3.	Non-farm activity	Tailoring, embroidery, food processing	Encourage farm women for income-generation activities.	It may divert farm women from agricultural works.
4.	Custom hiring center	Available drudgery reduction	People can easily hire on rental basis.	It may not available in time.
5.	Special consideration	Suitable timing and venue	Farm women feel more comfortable.	Social barrier can restrict participation.

Descriptions

- **All India Coordinated Research Project (AICRP)** on Home Science has 14 centres across the country, each centre involved in identifying local problems; research was going on to develop drudgery-reduction tools and technology to save time and energy from farm activities. Krishi Vigyan Kendra (KVK) and the ICAR-Central Research Institute for Dryland Agriculture (CRIDA) facilitate drudgery-reduction tools in the villages through custom hiring centres, so everyone get benefited and can able use by the group of women farmers. Because in the rural areas women have low purchasing powers compared to men for owning the implements. Often rural women are overburdened with household as well as farming activities, these improved tools can help to save time and reduce chances of injuries during harvesting.
- **Parichay**, an innovative extension methodology. Introduced several technologies, especially drudgery-reduction technologies, to farm women because people are not aware about it. First of all, technologies available in the AICRP research centre were displayed in the village marketplace called ‘Shandey’, where farmers gather every week to buy and sell their produce. Then, allow the villagers to notice all those, and, when people, especially farm women, start showing interest, experts described each technology in detail. The advantage of this new concept is without

wasting time and efforts on forceful intervention of new technology, let people observe and arouse interest their own.



Fig 1. Easy planter

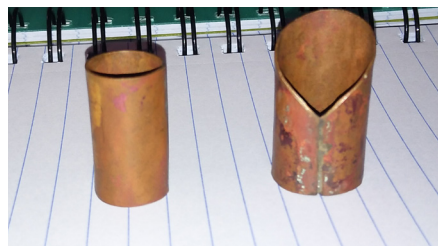


Fig 2. Finger guard



Fig 3. Hand Gloves



Fig 4. Handmade apron

- All India Coordinate Research Project on Home Science also encourage non-farm activities of farm women like to develop protective clothes, aprons and gloves for drudgery reduction and also preparation of eco-friendly colours and natural dyes from extracts of flowers and leaves.

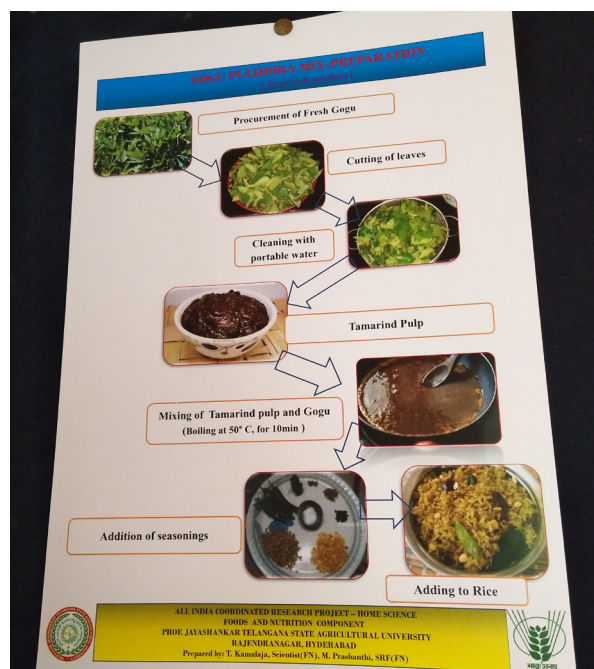
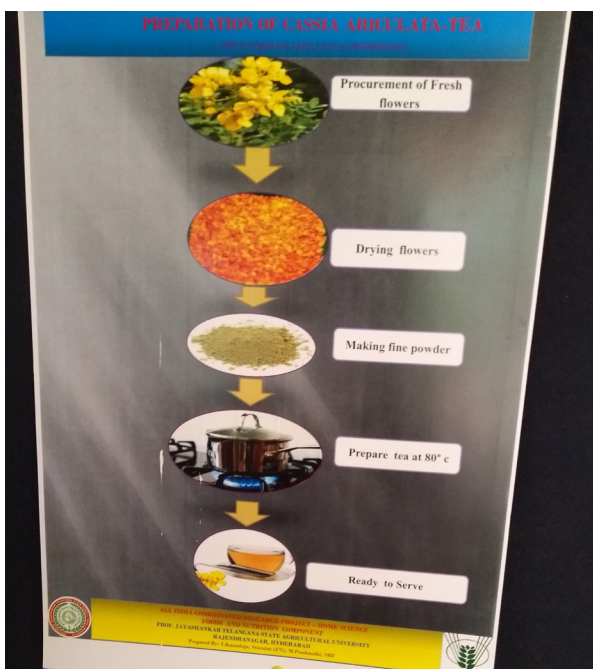


Fig 5. AICRP Home Science activity for farm women

- Non-farm activities initiated by KVK for economic empowerment of women by training them on tailoring, embroidery, food processing (i.e., preparing jam, jelly, pickle, candy, juice etc.) depending on the interest.



Fig 6. Tailoring school at Narrapally, Hyderabad for farm women. a KVK (Hyathnagar) initiative



Fig 7. Prepared by KVK trained farm women



Fig 8. Prepared by trained women of AICRP Home Science

- KVKs help to set up custom hiring centre each village where all costly farm machinery and drudgery-reduction tools are made available for the villagers. Thus, people can hire those on rental for particular time period.
- Farm women are often busy with their farm and household activities during the day, so extension agents need to conduct meetings during evenings or late afternoons and also give special consideration regarding venue of the meeting.

Table 5: Integrating Nutrition in Agricultural Extension and Advisory Services

S.N.	Particular	Details	Strength	Weakness
1.	Bio-fortification-agronomic aspect	Nutrient-rich vegetables–backyard farming	Need not spend much to meet nutrition requirement.	Even rural areas have adopted modern housing, so lack of space for gardening.
2.	Bio-fortification-genetic aspect	Cost effective method: induce micro-nutrient	An easy way to solve nutrition requirement in form of staple food	Lack of awareness may hinder it.
3.	Nutrient rich products	Double-fortified salt, millet products, Balamrutham, multi-grain atta.	Ensure supply of target nutrient through food product.	Lack of promotion and distribution of this products.
3.	Katori method	Quantitative information-consumption pattern	Almost accurate measurement food intake	No standard measurement.
4.	Kitchen gardening	Facilitate and encourage growing of vegetables and fruits	Supply daily nutrition within home	No space in modern housing
5.	Value addition	Off-season nutrition requirement	Limit wastage of food.	Laborious
6.	Special interventions	Braille books, CDs, radio programmes	Useful for illiterate and specially challenged people	Inadequate number of publications.
7.	Diet Counseling	Prescribed diet plans	Give diet chart to patients	Adopted only in small scale.
8.	SMS service	Daily diet alert	Act as a daily reminder	Service provider need to up-to date regularly and consistency need to maintain.
9.	Celebration of special days	Create awareness	Initiate people’s participation and give out messages in a playful manner	Lack of fund is the barrier of a successful program.
10.	Research on local technology	Identified and promote nutritious food and recipes.	Food recipes of locally available food cut the cost of preparation and also encourage more people.	Need strong researcher and farmer collaboration.
11.	Burrakatha, street play	Create awareness	Playful manner of spreading message.	Lack of expertise may create mirage.

Descriptions

- **Research on nutrition aspects:** Existing food systems are failing to provide sufficient minerals and vitamins to a vast segment of women and children around the world. CRIDA was conducting

trials of growing bio-fortified crops in the village adoption programme. There are four types of nutrient deficiencies found by some scientists of CRIDA i.e., iron, zinc, vitamin A and iodine. Bio-fortification by agronomic practices can be helpful to the rural community. It will be a more cost-effective and cheap source of fortified food than those available in urban supermarkets. As, initiatives have been taken to disseminate knowledge of no or less inorganic farming. Instead of using chemicals, organic fertilisers will allow plants to absorb essential micronutrient and minerals. As rice is considered as a staple food by the rural community of India, the Directorate of Rice Research and the Indian Institute of Rice Research are trying to genetically modify rice varieties of different cultivars to ensure consumption of nutrient-rich food as part of the daily diet of the Indian population. Once proper awareness is created and the rice is made available in the market, dissemination will also be easier. Research is an important component of the NIN to provide nutrition education in a better way, with user-friendly curriculum. Also research is going on to develop technology for fortification of macronutrients of energy and protein; vital micronutrient i.e., vitamin A, iron and iodine in most preferred food items.

- **Nutritious food production:** The field units of the FNB have been developing low-cost, nutritious recipes from locally available foods, keeping in view the requirements of infants and preschool children, and propagating the same through training courses and nutrition education programmes. The preparation of 'sattu'-like instant foods using locally available food grains and nuts/oilseeds and other nutritious preparations for children standardised by CFNEUs have been adopted by some State Governments in their nutrition programmes and distributed through anganwadi centre of villages.



Fig 9. Balamruthan, nutrient mix for infants

ICRISAT is following an inclusive market-oriented development model, where the farmer is the major beneficiary by linking farmers to the market. It has developed an agribusiness innovation platform to support entrepreneurs by creating a demand pool with validation for marketing. This initiative helps emerging entrepreneurs to get organisational support for agribusinesses. Double-fortified salt, enriched with iodine and iron, is a low-cost technology developed by the

NIN, as its ingredients are easily available. Consumption of this fortified salt can save people from two types of nutrient deficiencies.



Fig 10. Nutrient rich alternative food products and beverages

- Nutrient-rich recipes with locally available ingredients (til/sesame laddoo with jaggery, amla pickle, fish pickle, dried vegetables etc.) can boost the nutrient requirement of farm women and adolescent girls. •



Fig 11. Iron rich food product



Fig 12. Dried cowpea to meet off-seasonal nutrient requirement

- NIN, Hyderabad uses different extension methodologies to create awareness about appropriate dietary guideline among under-prevailing group of people with help of print media like posters, leaflets folkways, jingles and drama, street plays, puppet show, Burrakatha, i.e., giving nutrition message to the people by depicting mythological stories about obesity, a big health issues of

today's population, importance of protein requirement, human health, energy requirements, micronutrient rich foods, adolescence growth requirement, nutrition during pregnancy. Anybody can register free of cost (one-to-one interaction methods) for diet counselling; these programmes help people to learn about proper diet requirement and plan accordingly. An alarming number of people of urban areas suffer from obesity and diabetes, which are the result of wrong food habits and lack of knowledge.

- FNB, Telangana, and KVK-CRIDA celebrate different events with the motive of making people aware about food and nutrition issues, minor millets by organising quizzes, painting competitions, etc. on nutrition themes. Also, there are displays of different nutrient-rich food specimens, and lectures on nutrition issues. Celebration of these events helps to create awareness and sensitise rural people, ICDS officials, and Anganwadi teachers.
- AICRP on Home Science is developing audio-video CDs in regional languages to create awareness in its adopted villages about nutritious vegetables and fruits, balanced diet, production of millets, and hygiene issues.
- The NIN has developed various games, such as Snakes & Ladders, to educate people about the worst effect of wrong food habits, symptoms and causes of deficiency disorders, unscientific beliefs and taboos prevailing in people's minds, and locally available nutritious foods. These approaches help people to easily understand the wrong practices followed by them (e.g. myths about diet during pregnancy), while not directly affecting their moral values.
- The NIN also conducts visits of school children to the Nutrition Museum, where specimens are displayed, and also arranges interest-based interactive sessions of the children with scientists. This concept of 'Seeing is Believing' helps to educate children about available food varieties and their nutrition value. The NIN also arranges campaigns to provide field-level nutrition education in schools and slum areas. Publishing Braille books for visually challenged people and already distributed 800 copies to Blind Schools library through NGOs all over India.
- Efforts are being made to improve diet diversity in rural communities by individual and community approaches, healthy food choices by mixed methods, and recommended dietary allowances (RDA) by scientists to decide dietary guidelines every 10 years for mother and children nutrition. And, guidelines are published in a simple understanding and practical manner people. •
- Use of social media channels like Facebook and Twitter, and mobile apps in local languages is encouraged to sensitise the public about nutrition. The NIN is going to develop a mobile app named 'Nurify India Now', which will be downloadable from Google Play with more than 300 recipes collected from various regions of India along with their nutrient values. All these are done by a standardised method by IFCT (Indian Food Composition Data Table) to analyse nutrient content in the food and moisture level which was previously known as NVIF (Nutritive Value of Indian Foods). So, one can easily calculate his/her consumed items' nutrient value and can check their nutrient intake accordingly. It will be a user-friendly tool to maintain a proper diet.
- Nutri-education given by ICRISAT to cooperatives and farmer-producer organisations (FPOs) about a package of practices for millet which have a good market value and also linking farmers to market, entrepreneurs and FPOs.



Fig 13. Agribusiness innovation platform initiated by ICRISAT

Approaches Identified in integrating Gender and Nutrition in AEAS

Table 6: Integrating Gender and Nutrition in Agricultural Extension

S.N	Approach	Details	Strength	Weakness
1.	Sensitising farm women	Demonstration, classroom teaching and exposure visit	Give outlook and increase Cosmopolitaness	Lack of participation due to social norms
2.	Sensitise extension workers	Training at regular interval	Keep updating knowledge	Lack of empathy of local situation
3.	Sustainable extension models	Income generation-long term	Backyard poultry on small scale can provide protein requirement of family and also generate liquid money.	Some rural society has norms of consumption of poultry products.
4.	Multi-disciplinary PPP model	Support system of multi-agency	Ensure input supply and marketing of the produce	If one agency fails then entire system may break down.
5.	Support nutrition and generate income	Encourage small fish culture	Suitable in backyard ponds, so rural women need not to move from their house.	People like to rear big fish rather than small ones.

- KVK conducts exposure visits of rural women to various project sites to educate them about nutrition and gender-friendly tools/technology as 'Learning by Seeing' is the most effective tool for adult education. Method demonstration of women-friendly tools (bhendi cutter, hand gloves, apron, maize sheller, improved sickle, head load managers, cotton-picking machine) and of nutritious food recipes, multi-grain atta, post-harvest technology, food preservation techniques, kitchen gardening, etc., and result demonstration on nutrition deficiency, malnutrition abnormality. They have published brochures on local languages as a take-home material to educate people on nutrient security, value addition, and micro-nutrient deficiency. KVK also arranges classroom teaching and lectures to sensitise rural women about consumption of nutrient-rich food. Gender-friendly tools and drudgery-reduction tools are demonstrated at first, and then free distributed in the custom hiring centre of village.
- Training is the main component to create knowledge about nutrition and gender activities. Extension workers and officials working at the grassroots level are not sensitised properly. For gender mainstreaming, there is a need to make rural women economically strong by involving them in income-generating activities like tailoring, embroidery, marketing of value-added products, etc.; For all of these activities, training is needed. To ensure incorporation of leafy vegetables in daily diet rural women need to be trained about the kitchen gardening of nutrient vegetables and fruits, so that they are not dependent upon high-value products from the market to meet daily nutrient requirement.
- Scientists from research centre in action research area encourage farm women to adopt backyard poultry for income generation and daily nutrition. Here, in this sustainable model, scientists suggest to rear country chicken and duck varieties, as they are local varieties and easily adapted to climatic condition, increasing the sustainability of the scheme. It ensures availability of daily protein requirement of family; women can easily maintain the country bird poultry in their backyard. It will also act as liquid money for women; whenever in crisis they can quickly sell the egg and meat to generate quick cash.
- In multi-agency approach, scientists, during their action research period, employ a male para-extension worker and female para-extension within the community and also give financial support to develop a poultry bird unit to rear up to one-month old chicks. Then, they encourage farm women to adopt poultry in their backyard. Along with that they also link the para-extension with the feed provider, hatching unit and marketing channels for free flow of inputs and outputs. The first few years, scientists provide all financial support and advisory till the system starts running. The main advantage of this approach over others is the linkage between input provider and marketing agencies to ensure continuous running of the system.

Identified challenges faced by existing AEAS

Rural Indian community has taboos which encourages many myths, not only about social customs but also about the dietary intake for adolescent girls, and pregnant and lactating women. All these beliefs are deeply rooted in the elderly female members of the family, who lead all intra-household dynamics. All these years, interventions were only made to educate and reach out to the pregnant

and lactating women but not to the head of household or elderly member. In rural families, decisions of food and management of family resources are made by the head of the household or an elderly member. Thus, the interventions found very low participation by the targeted beneficiaries (pregnant and lactating women, and adolescent girls) which leads birth of babies with micronutrient deficiencies due to poor health of mother.

While Anganwadi workers are good in extension work, auxiliary nurse midwife (ANW) may lack extension skills as there is no collaboration between Anganwadi and ANW of a same gram-panchayat. Women in Asia and Africa do not have rights to land; therefore they have no decision-making power and no purchasing power, often leading to gender discrimination. Women are often given the jobs of handling lower productive animals such goat, sheep, duck, poultry etc. They can only grow crops in their backyard and most of the time work as family labour, which indicates that women are intentionally not allowed by their rural community to become economically empowered. Most dairy management practices are carried out by women but they get no rights to take decisions about marketing of milk, animal products and sale or purchase of dairy animals. It is found that due to various job opportunities, men tend to migrate to big cities, leaving women to solely handle the crop husbandry practices even despite lack of land rights. Apart from all the other shortcomings, extension workers are very reluctant about the timings for visiting and meeting, especially when target audience are women.

Identified opportunities for strengthening AEAS

At present, many African and Asian countries (including India) suffer from acute malnutrition, which may be the result of lower purchasing power, lack of knowledge and awareness or due to gender discrimination. Rather than individually, prevention of malnutrition requires a whole family approach, where each and every member needs to be aware about proper dietary intake. More efforts are needed to the grassroots-level workers about nutrition as they play the role of key communicator. An extension and advisory services provider needs to convince people to grow a nutrition garden in every household and even schools, so that children can learn about the importance about consumption of nutritive vegetables and fruits. Schools need to include information about nutrient values of different locally available food items in the syllabus. Practices classes should be organised on how to grow nutrition gardens within school premises; The concept behind it is that if children start showing interest to have greens, then that family will slowly start to include more green vegetables in their everyday meal. There is need to employ equal number of women and men VLWs to sensitised effectively about gender and nutrition in the community. Selection of suitable timing and venue of meeting for women is another intervention to get maximum women audience. Also, it is critical to get support of male members of family as they most often take decisions about social movement of women and even try to convince them to join in the nutrition and gender awareness campaigns, programmes and meetings for better understanding and easy implementation. Approaches should be based on the need and problem, and should create empathy about the situational factors of the particular targeted area. Selection of an appropriate beneficiary group is another important factor,

otherwise wrong selection often lead to zero results. More research is needed on focused areas such as intra-household dynamics, preferred nutrition-rich alternatives, local nutrition recipes, indigenous varieties of fruits and vegetables, small fish aquaculture, country chicken and indigenous breeds of duck etc.



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Terminology used

Gender roles	Those behaviours, tasks and responsibilities that a society considers appropriate for men, women, boys and girls.
Gender analysis	It is the study of the different roles of women and men in order to understand what they do, what resources they have, and what are their needs and priorities.
Gender mainstreaming	It is the globally recognised strategy for achieving gender equality
Gender-disaggregated data	Collected information should be disaggregated with respect to male and female, and data set should contain issues and variables related to gender.
Nutrition education (NE)	It is defined as any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food and nutrition related behaviours conducive to health and well-being. Nutrition education is delivered through multiple venues and involves activities at the individual, community and policy levels.
Integrated	Blended with and joined a society or a group of people, often changing to suit their way of life, habits, and customs.
Wasting	It refers to the process by which a debilitating disease causes muscle and fat tissue to waste away. Wasting sometimes referred as acute malnutrition because it is believed that periods of wasting have a short duration, in contrast to stunting, which is regarded as chronic malnutrition.

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