



Incorporating nutrition in farmer field schools

In many developing countries, food insecurity combined with a high incidence of infections continues to affect detrimentally the nutrition and health status of poor households. Wasting and stunting are important indicators of under-nutrition. Wasting reflects acute food shortages and health problems, and stunting reveals the longer-term presence of nutrition problems. The signs and symptoms of specific micronutrient deficiencies are much less commonly known or recognized by local people and therefore not acted upon as frequently. However, specific micronutrient deficiencies frequently go hand-in-hand with general undernutrition.

The consequences of undernutrition for human well-being and development are serious. The results include reduced physical development and activity, impaired intellectual development, lowered resistance to infection and, in the most severe cases, death. Over the past decade, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) has further compounded the situation in different ways.

The immune system of people who are poorly nourished tends to be weak. Poor nutritional status can therefore aggravate and accelerate the development of AIDS. Maintaining good nutrition (i.e. eating a healthy and varied diet, drinking clean water, practising good sanitation when handling food, etc.) is therefore one of the key determinants in the life expectancy and health status of people who are living with the disease. Micronutrients and the foods from which they are derived play a key role in keeping the body healthy and well nourished through their impact on the immune system. Good nutrition can therefore help individuals who are infected to extend the period during which they can remain socially and economically active and able to support their families.

Improving poor people's access to food and disseminating knowledge about different foods and the skills needed to grow, purchase, process and prepare these foods on a daily basis, are essential components of a holistic strategy for preventing micronutrient deficiencies and promoting good nutrition. Agriculture in the broad sense plays a key

Karel Callens is a Nutrition Officer in the FAO Food and Nutrition Division and Kevin D. Gallagher is a Senior Integrated Pest Management Officer in the FAO Field Operations Division.

role in this strategy. While there are many factors that affect poor people's ability to produce enough nutritious food, it is beyond doubt that a functional agricultural extension system is as crucial for food security as are effective health services for disease prevention and treatment. Just as health services in

rural health care and functional literacy programmes. Today, FFS have spread to over 50 countries and have been expanded to encompass such areas as water and soil management, dairy and poultry management, and organic agriculture. In Indonesia alone, the FFS movement now includes a national FFS

but is not seen as the "all-knowing source" of the "right information";

- a focus on farmers becoming experts and "farmer facilitators" in their own communities.

A typical FFS lasts for one to two seasons and is timed to coincide with the regular cropping season. A group of 20 to

It is beyond doubt that a functional agricultural extension system is as crucial for food security as are effective health services for disease prevention and treatment

developing countries are often not easily accessible to poor people, agricultural extension services have been inhibited by similar problems. Although a wide range of technological options for the improvement of agricultural production and productivity are readily available, extension services have tended to work in a directive manner, which, from a pedagogical perspective, has not generally been very effective or efficient. From a human perspective, directive extension approaches have often bypassed the poor because the technological options offered were not adapted to their needs and potentials.

New methods appropriate for government extension, community groups and non-governmental organizations are emerging, including the farmer field schools (FFS) approach. This article focuses on these field schools and presents suggestions for improvements that incorporate nutrition and household food security objectives and considerations within the programme.

The FFS approach

Farmer field schools were developed in 1989 in Indonesia to improve upon existing systems called "Training and Visit" (T&V), which were extension methods for bringing hands-on skills and decision-making capacity to farmers as part of integrated pest management (IPM). FFS evolved from various models, but borrowed particularly from primary

alumni association of over one million farmers, 7 000 farmer facilitators and a newspaper, *Petani*, with a circulation of 10 000.

The central characteristics of FFS include:

- hands-on training methods in which farmers test management methods for themselves and learn concepts directly;
- flexible, non-lecture field study using a group field that allows the "field to be the teacher";
- strong emphasis on observation, analysis, discussion and debate, which allows new ecological concepts to be combined with local knowledge;
- the use of a technically competent facilitator who leads group activities,

30 farmers sets up a group study field to observe the crop or crops of their choice (often a poultry "crop" is also included). The group is responsible for the care and maintenance of the crops from soil preparation to harvest or post-harvest. Groups meet weekly for annual crops and monthly for perennial crops. During each meeting, the farmers, together with their facilitator, make structured observations of their crop and analyse the situation using an "agro-ecosystem analysis" method. Group discussion follows and a consensus on required management is reached. During this process, farmers make drawings and give their own views to reinforce learning. Because the problems and decisions being studied overlap with similar issues in the



Community members and a nutrition monitor working in one of the project gardens

K. Callens

participants' own fields, there is a strong "learning readiness" motivation.

In addition to the field analysis, which takes two to three hours, two "special topics" are covered each week. One topic deals with group dynamics, to strengthen the groups' team-building and organizing skills. The other is a concept-based activity of the farmers' choice, usually a special study on a specific pest or disease, a discussion on varieties that grow well in the community or the preparation of other activities such as rat-management schemes.

In some countries, the extension officers have been suggesting new special topics such as filtering and boiling water, and nutrition-related topics. Currently,

advantages to a self-financing approach. First, it provides both the opportunity and the process for focusing the extension programme on the needs and priorities of those who ask for the services. Second, it helps build financial and business skills, which are essential for the transition from subsistence into a mainstream-type economy.

Moving FFS beyond integrated pest management

While the FFS programmes do not focus directly on nutrition, many FFS and other agricultural extension activities could be enhanced to play a key role in linking food production in poor households with

although it provides an excellent opportunity for improving nutrition and household food security. Moreover, at a time when HIV/AIDS is increasingly draining households of productive labour, time and resources, home gardening provides a low-external-input technology that may help HIV/AIDS-affected households in various ways. Because home gardens are located near the homestead, women do not spend as much time travelling long distances. Moreover, home gardens in general produce a wide variety of crops and often include micronutrient-rich vegetables and fruits, spices, medicinal plants and even small animals. Improving the management of soil fertility, weed and

First, there is a need for the FFS programmes to link crop choice and diversification to food consumption, nutritional needs and dietary practices within local communities

these are limited to topics such as combining food groups, the importance of each food group and the use of local vegetables and fruits. The special topics usually take one hour, so the entire FFS session lasts for four to five hours.

The costs of an FFS depend mainly on the facilitator's travel costs: some may cost as little as US\$50 for a season if the facilitators live nearby, but others cost as much as US\$500 because the facilitators live far away. The training of local farmer facilitators is one way to reduce costs and increase community ownership. New methods of self-financing are emerging from East African FFS, in which the group raises money by means of a "commercial plot" in the group study field, which is set aside specifically for growing market crops. The produce is sold and the funds are kept by the FFS group to cover their costs and enable them to continue their community study activities. Group-based savings and lending may also be able to help groups of poor farmers accumulate funds for the purchase of inputs for the FFS programme. There are two

nutrition and healthy eating. First, there is a need for the FFS programmes to link crop choice and diversification to food consumption, nutritional needs and dietary practices within local communities. Indigenous fruits and vegetables harvested from the wild are generally not recognized for their agronomic potential and nutritional benefits. Improving the production or domestication of these wild varieties is a low-cost option for improving the nutrition and health of poor households. However, in order to convey nutrition messages and link them with existing food consumption and dietary practices, basic knowledge about food and nutrition will be required, along with a more flexible FFS curriculum.

Second, agricultural education programmes must recognize more openly the specific skills and knowledge needs of women. In poor households, access to nutritious foods largely depends on what the women produce in home gardens. Home-garden technology is another area often ignored by extension programmes,

pest management, water management and crop choices in home gardens is crucial to food and nutrition security for poor households. Again, a more flexible, participatory and pro-poor extension approach is needed. Relatively small changes in the current FFS process could produce significant improvements in nutrition and health, if more attention were given to improving diet and food-production aspects of relevance to the poor, including wider variety in food supplies and improved nutritional intake. Such changes could result in increased nutritional value of local diets and a healthier population.

A relatively small change in the current FFS process could produce significant improvements in nutrition and health

The way forward

While agricultural extension workers may have received training in food and nutrition, there is much scope for the collaboration of health workers and community development workers with

TABLE 1

Examples of links between locally perceived nutrition-related health problems and food and agricultural issues

LOCAL PERCEPTIONS OF NUTRITION-RELATED HEALTH PROBLEMS	POSSIBLE FOOD AND NUTRITION LINKS	POSSIBLE AGRICULTURAL LINKS
Child is short for its age (stunted) and does not develop well physically and mentally	Long-term undernutrition with insufficient intake of a good variety of nutritious foods A diet chronically deficient in energy, protein and micronutrients Food taboos and child-feeding practices during the first two years of life Diseases and parasitic infections	Overemphasis on growing of starchy staple and neglect of food legumes, oil crops, vegetables and fruits Neglect of the importance of indigenous food crops by agricultural extension services Influence of traditional knowledge on crop choice
Child is thin (wasted) and underweight for its age, inactive and does not learn well	Acute undernutrition with insufficient intake of nutritious foods A diet deficient in energy (e.g. low in fat), protein and micronutrients Lack of nutritious complementary foods or an acute food shortage Infectious diseases, diarrhoea, malaria, etc.	Same as above Women's workload for child care and feeding may be too heavy
Individual suffers from poor vision at night (night blindness) or complete blindness (in more severe cases)	Lack of dietary vitamin A from animal sources or beta-carotene from plant sources (e.g. green leafy vegetables and orange or yellow fruits) Lack of fat in the diet, required for the body to absorb vitamin A and beta-carotene Children with measles particularly at risk of developing serious clinical vitamin A deficiency	Small animals not used as food source – agricultural extension services underestimate this possibility Low importance given to vegetables and fruits for home consumption Perception that indigenous vegetables and fruits are “poor people's foods” Preference for market gardening over home consumption
Individual suffers from iron deficiency, anaemia	Absence of animal proteins in the diet Poor consumption of food legumes (e.g. beans, peas) rich in iron Irregular consumption of vitamin C (e.g. from fruits and some vegetables) or as part of a mainly plant-based diet – vitamin C enhances absorption of iron from plant foods Parasitic infection (i.e. worms) an important factor leading to blood loss Malaria often reinforces the effect of poor iron content of the diet	Same as above Inadequate production of iron-containing foods, especially legumes
Individual suffers from swelling of the throat (goitre) in adults, particularly women of reproductive age: problems include mental and physical retardation (in more severe cases) from early childhood	Iodine deficiency caused by lack of iodine in soil and water Goitrogenics in specific foods, e.g. poorly processed cassava	Leaching of soil due to poor soil and water management Inappropriate cassava-processing practices
Babies born with a low birth weight	Maternal undernutrition Insufficient rest during pregnancy	Overemphasis on starchy staple and neglect of food legumes, oil crops, vegetables and fruits Traditional knowledge influencing crop choice and utilization Women's heavy workload and increased nutritional needs during pregnancy

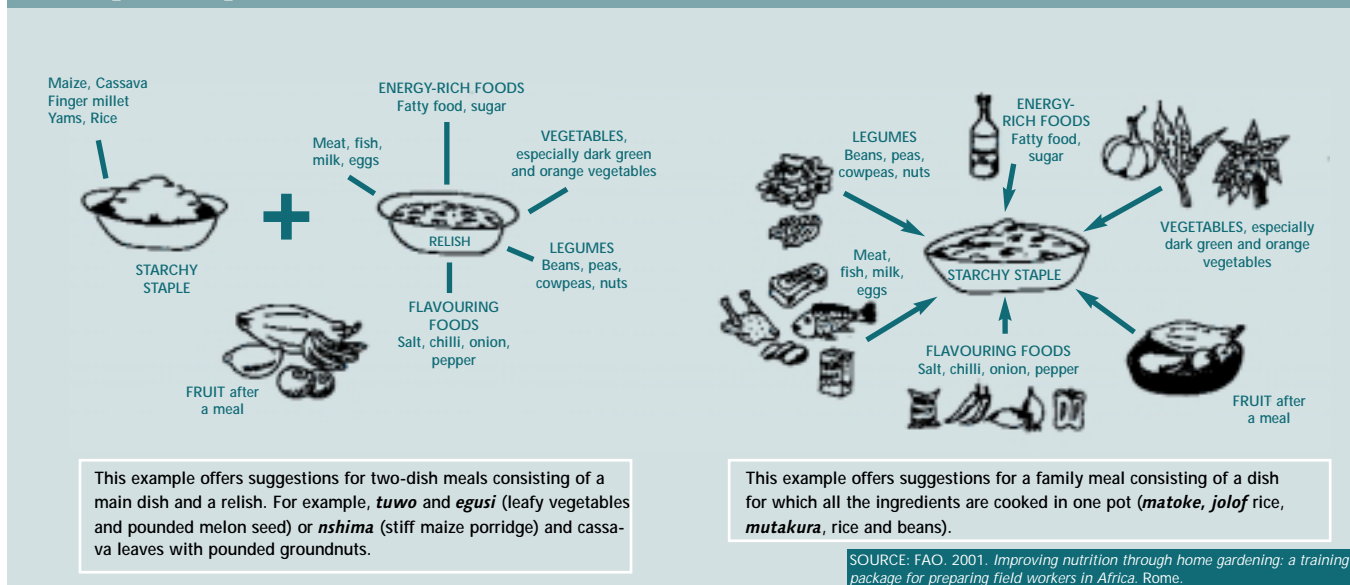
extension agents in planning and implementing a locally adapted curriculum to cover special topics focusing on issues of nutrition and household food security. Depending on the topics, their involvement may be required at different stages of the FFS process. For example, a community health worker or other person with a good knowledge of health

and nutrition may initiate the development of a locally adapted FFS curriculum with farmers by discussing how specific problems of health, child growth and development are linked to food intake. This important first step raises awareness about these problems and leads naturally into a broad discussion about the underlying causes.

Examples of possible links among some locally perceived nutrition and health problems, food and nutrition issues, and ultimately agricultural issues are provided in Table 1. It is recommended that the community health worker and community members work together to develop a similar table adapted to the specific local context, to help guide the

FIGURE 1

Examples of possible meal combinations in an African context



discussion and provide the FFS group with a reference point for monitoring and evaluation. The community health worker may discuss specific health- and care-oriented issues during growth-monitoring and promotion sessions.

While the community health worker may address underlying health and care issues, the agricultural extension worker must lead the discussion into issues of food security. Given that the main goal of FFS is to address agricultural production problems, the nutrition and food consumption issues raised by the health worker need to be picked up by the agricultural extension worker and linked to issues of access to food and agricultural production. Such a discussion almost always goes beyond aspects of food availability, and often raises issues regarding women's time; who has access to and control over different resources; decision-making in the household about expenditures, choice of crops to be grown and what to do with the harvest, etc.

While the method described above may sound rather academic and complex, in practice the discussion can easily be facilitated by asking farmers about the different roles that the men and women assume along the food chain. These roles range from responsibility for crop choice and preparation of the land and who is in

charge of weeding and harvesting, to the preparation of meals and eating. From the discussion, a simple table can be elaborated according to the crops being produced. It is recommended that this exercise be carried out for each of the food crops that make up a typical meal (e.g. starchy staple, vegetable relish, food legumes, oil crops and fruits). Figure 1 provides an example of how various crops may be combined in a meal in an African context. The elements in the table provide a good opportunity to encourage farmers to talk more about the specific constraints they face in carrying out their different tasks, which in turn raises a variety of issues ranging from the purely agronomic to questions of gender equity in the division of labour, social organization and traditional beliefs and practices. The role of the community health worker, the agricultural extension agent and the community development worker in this discussion is to highlight and guide the discussion on these issues and to retain those that are most prominent and may be addressed in an FFS.

The introductory session leads the farmers into discussing how local resources can be applied to solve the problems that are encountered along the food chain, and facilitates choosing the content of the FFS curriculum, the crops

to focus on and the agronomic and non-agronomic issues that need to be tackled simultaneously. Undertaking the analysis of the food chain also helps identify the most appropriate stages of the crop cycle for addressing specific non-agronomic issues. While agronomic aspects form the core of the FFS curriculum, other issues may be incorporated into the curriculum or be discussed during special sessions. Table 2 gives an example of specific food and nutrition topics that may be covered in an FFS programme on cassava cultivation. Since the health and community development workers participated in the initial discussion and curriculum development, their roles in these special sessions are clear, and resources for facilitating such sessions are included in the field school plan and budget.

Because FFS are designed to incorporate aspects of participatory monitoring and evaluation of production, there is also scope for involving farmers in monitoring and evaluating the impact on nutrition and household food security. The initial analysis of the food chain provides a tool for demonstrating and evaluating how specific changes along the chain can affect nutrition outcomes at the household level. Community health workers may facilitate

TABLE 2

Gender-perspective analysis of steps in the food chain: a cassava farmer field school, expanded with legume and vegetable crops appropriate for dietary needs

STEPS ALONG THE FOOD CHAIN	FFS CURRICULUM
Choice of staple crop and relish crops (e.g. a vegetable and a food legume) and cropping methods	Nutrition Need for cash to cover non-food expenditures How women's and men's time is used Labour and input requirements in the light of HIV/AIDS
Land preparation	Who has access to land and who has responsibility for land preparation
Planting	Access to planting material Selection of variety focusing on use as vegetable, root or combined use
Intercropping	Crop choice from agronomic and nutritional perspective along the major food groups as shown in Figure 1 Who decides to give preference to cash crops over nutritious foods Consequences for child feeding
Pest control	Preference of leaves infected with cassava mosaic virus for vegetable use Cultivation of special leaf varieties in home garden
Weed control	Gender roles and time for child care and feeding use of specific weeds as wild foods
Harvesting roots	Access to means of transportation from field to homestead labour and time implications on child care and feeding
Harvesting leaves	Preparation of nutritious relish using food legumes or oil crops
Soaking roots	Gender roles: how much time men/women spend at this task Awareness of cyanide content and goitre
Drying roots	Firewood collection, tree planting, how the division of labour affects women's time for child care and feeding, care for the sick
Marketing	Household money management and use of resources for nutrition, health, education over other less basic expenditures
Preparation of cassava porridge	Child feeding Balanced family diet Weaning-food preparation

this tool by linking their input in the FFS to an existing community-based growth-monitoring and promotion system. Such an approach would present three distinct advantages. First, it would help demonstrate the impact of the changes in agronomic and other practices introduced through the FFS on resolving specific nutrition and food security problems. Second, it would provide an opportunity to follow up the specific health and care issues raised during the initial discussion with the farmers. Third, it would give community workers an opportunity to provide poor households with more comprehensive and targeted support that goes beyond addressing issues in isolation.

Conclusions

While the methodology outlined in this article is simple and straightforward and

accommodates easily the incorporation of nutrition aspects, various institutional issues need to be addressed for it to work. Community-based study approaches such as FFS will require a high level of flexibility in the implementation of agricultural extension, along with crucial links with health and community development services. To establish these links systematically, the three services need to be coordinated at the district level. Joint work programmes must be established and the focus must be on a set of common goals that are relevant to the needs of the poor. Adequate resource allocation must underpin these programmes.

In the absence of an adequate supply of nutritious food from locally owned production, people from poor households lack the ability to purchase what is needed for a balanced diet. They generally

give priority to starchy staple crops, and any micronutrient-rich vegetables and fruits, if grown, are often sold for cash. A good argument therefore exists for helping poor households learn how to grow and utilize these foods more efficiently so as to achieve a more balanced diet while still generating income to cover expenditures for other basic necessities. Community study programmes such as those provided by the FFS approach provide a good vehicle for raising awareness about the importance of simple activities that can help poor households improve their nutrition using the resources available to them. Linking agricultural extension with participatory learning and action on nutrition and health can potentially improve the sustainability and impact of food and agricultural programmes on nutrition and household food security.

Incorporating nutrition in farmer field schools

IN MANY DEVELOPING COUNTRIES, FOOD INSECURITY – in combination with the high incidence of infections – continues to have a detrimental effect on the nutrition and health status of poor households. However, there are a large number of agricultural extension activities, including large-scale farmer field school (FFS) programmes in more than 50 countries. The FFS are participatory and hands-on adult education courses that focus on topics ranging from pest management and dairy production to food security.

This article provides an overview of the FFS processes and describes how nutrition topics can effectively be incorporated into these agricultural extension activities. For nutritionists, the paper offers a guide to working with FFS. For FFS facilitators, the article gives advice on incorporating nutrition into ongoing programmes. Linking agricultural extension with participatory learning and action on nutrition and health can potentially improve the sustainability and impact of food and agricultural programmes on nutrition and household food security.

Intégration de la nutrition aux activités des écoles pratiques d'agriculteurs

DANS NOMBRE DE PAYS EN DÉVELOPPEMENT, l'insécurité alimentaire et la forte incidence des infections continuent d'avoir des effets néfastes sur l'alimentation et l'état de santé des ménages pauvres. Pourtant, de nombreuses activités de vulgarisation agricole, et notamment des programmes de grande ampleur menés dans le cadre des écoles pratiques d'agriculteurs, sont en cours dans plus de 50 pays. Les écoles pratiques d'agriculteurs dispensent aux adultes une formation participative et pratique sur des sujets qui vont de la protection contre les ravageurs à la production laitière, en passant par la sécurité alimentaire.

Cet article présente une vue d'ensemble du fonctionnement de ces écoles et montre comment les questions relatives à la nutrition peuvent être intégrées avec succès aux activités de vulgarisation agricole. Les nutritionnistes y trouveront des indications sur la marche à suivre pour travailler en collaboration avec les écoles pratiques d'agriculteurs, et le personnel des écoles des conseils sur l'inscription de la nutrition aux programmes de formation en cours. Les effets conjugués de la vulgarisation agricole, de l'apprentissage participatif et des actions menées dans les domaines de la nutrition et de la santé peuvent contribuer à améliorer la durabilité et l'impact sur la nutrition et la sécurité alimentaire des ménages des programmes axés sur l'alimentation et l'agriculture.

Incorporar la nutrición en las escuelas de agricultores sobre el terreno

EN MUCHOS PAÍSES EN DESARROLLO, la inseguridad alimentaria, unida a la gran incidencia de infecciones, sigue teniendo efectos negativos sobre la nutrición y el estado de salud de las familias pobres. Se están desarrollando, sin embargo, un gran número de actividades de extensión agrícola, incluso programas de escuelas de agricultores sobre el terreno en gran escala, en más de 50 países. En dichas escuelas tienen lugar cursos participativos y prácticos de educación sobre distintos temas, desde la lucha contra las plagas y la producción lechera hasta la seguridad alimentaria.

En este artículo se ofrece una visión general de las escuelas de agricultores sobre el terreno y se expone cómo se pueden incorporar los aspectos nutricionales a esas actividades de extensión agraria. Se ofrece a los nutricionistas información para cooperar con las escuelas. Al mismo tiempo, se orienta a los facilitadores sobre la forma de incorporar la nutrición en los programas en curso. La vinculación de la extensión agraria con el aprendizaje participativo y las actuaciones en materia de nutrición y salud puede potenciar la sostenibilidad y los efectos de los programas de alimentación y agricultura sobre la nutrición y la seguridad alimentaria familiar