Enhancing the role of smallholder farmers in achieving sustainable food and nutrition security

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Abstract

One of the agricultural pathways towards sustainable food and nutrition security is through local production of nutritious food, activity in which smallholder farmers play a crucial role. As food consumers, all rural and urban people in developing countries count heavily on the efficiency of their local smallholder farmers to satisfy their food needs. The purpose of this paper is to provide background information on the potential role smallholder farmers in sustainable food and nutrition security; The paper identifies and synthesizes key literature concerning the effectiveness of small-scale agricultural interventions in improving nutrition outcomes and highlight some national and international policy recommendations aiming at improving the productivity of smallholder farming systems with the objective of ensuring food and nutrition security. The overall objective of the paper is to contribute to the 'nutrition-enhancing agriculture and food systems' organized by FAO's Food Security and Nutrition team in the framework of the ICN2 process.

Keywords: food security; nutrition; smallholder farmers; sustainable development

1. Introduction

Today, one of the main global challenges is how to ensure food and nutrition security for a growing population whilst adjusting to an overall net increase of disasters, including those caused by climate change, and increased economic volatility, and ensuring long-term sustainable development. Food security and nutrition are different but closely related concepts. There is an extensive literature on the definition and concepts of food security. One of the widely used definitions is provided by the Committee on World Food Security which stated that *food security* "*exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability*" (Committee on World Food Security, 2012). At the same time as the nutritional dimension is integral to this concept, nutrition security is considered to exist when *food security is combined with a sanitary environment, adequate health services, and proper care and feeding practices to ensure a healthy life for all household members* (UNSCN, 2010). Food security and nutrition are directly related to the Millennium Developments Goals (MDG) and particularly to MDG1 (eradicate extreme poverty and hunger). However, as food and nutrition are keys to human well-being and global development, slow progress on MDG1 will jeopardize the achievement of the other MDGs *(*UNSCN, 2010). Among the indicators used to assess progress towards MDG1, two are of particular interest to the scope of this paper, and namely the one concerning the *prevalence of underweight (or stunting) in children younger than 5 years* (indicator 1.8), and the one concerning the prevalence of undernourishment i.e., the *proportion of the population whose dietary intake is below the minimum level of dietary energy consumption* (indicator 1.9). If some countries have made progress in reducing the number of people suffering from hunger, worldwide, however, progress towards reducing the number of undernourished people leaves much to be desired. According to a

recent report on the State of Food Insecurity in the World, the number of hungry people in the world remains unacceptably high with almost 870 million people chronically undernourished (IFAD, WFP and FAO, 2012). The report indicated that the vast majority of these people live in developing countries, where about 850 million people are estimated to be undernourished. This challenge is further complicated by the paradoxical and contradictory fact that most of the chronically food insecure and undernourished populations are smallholder farmers who have yet agriculture and food production as core business. This is mostly due to the fact that smallholder farmers buy more food than they sell as they are not able to grow enough foods to feed themselves adequately throughout the year, and as a result make up about three quarters of the world's hungry and undernourished (Wiggins and Keats, 2013). This paradox has its roots in a number of challenges faced by smallholder farmers:

- Production constraints: Very low average productivity due to the farming of predominantly rain-fed crops, cultivated using unsuitable agricultural practices that increase the erosion of the soil, therefore resulting in low yields.

- Lack of comprehensive land policy. For example many farmers and mostly women farmers have no rights to the land they farm.

- Lack of investments: Low output prices, high cost of inputs and limited access to credit make it difficult for smallholders to produce food sufficiently and efficiently.

- Lack of postharvest processing and storage equipment as well as of appropriate marketing systems: Consequently, to avoid postharvest losses (up to 30% in some regions), smallholder farmers sell their product almost immediately after harvest, when prices are very low, thereby losing market share.

- Social constraints: The majority of smallholder farmers are women. Yet, the crucial role of women farmers in agricultural production tends to be underestimated.

- Environmental constraints: The actual most crucial challenge is climate change and its related impacts on food production.

Nonetheless, despite all these challenges, the contribution of smallholder farmers to global food production is significant: they supply up to 50% of the worlds' cereal, 60% of the world's meat and 75% of the world's dairy production (Kremen et al., 2012). Indeed, both urban and rural food consumers in developing countries count heavily on the efficiency of their local smallholder farmers to satisfy their food needs. Within this figure, women who are the substantial majority of the smallholder farmers produce most of the food that is consumed locally. Smallholders, as gross domestic food and nutrient providers have therefore a special role to play in the global efforts to improve food and nutrition security. Unfortunately, until recently small-scale farmers have not been the primary focus of agricultural development, and their actual and potential contribution to food and nutrition security is not

valorized as it deserves it. There is widespread literature, two extensive to review here, on the contribution of agriculture to ending hunger and malnutrition (Bonnard, 1997; Berti et al., 2003; Wenhold et al., 2007; Matshe, 2009; UN CSD, 2011; Masset et al., 2012; Herforth et al., 2012; Wiggins and Keats, 2013; to name the few) but few papers highlighted the specific role of smallholder farmers. The scope of this paper is to investigate the role and contribution of smallholder farmers to the global efforts of achieving sustainable food and nutrition security. It is by no means all-inclusive in its coverage, but is intended to document and bring together important publications on the topic. The paper provides contextual and background information on the role of smallholder farmers in achieving sustainable food security and nutrition. The paper is organized in four sections. The first section introduces some issues related to global food security and nutrition highlighting the challenges and opportunities of small-scale agriculture, the second section discusses the role of smallholder farmers in sustainable food and nutrition security with a particular attention paid to the role of women farmers. The fourth section will present the measures needed to enhance the role of smallholder farmers in food security and nutrition, followed by concluding remarks**.**

2. Role of smallholder farmers in food and nutrition security

The links between agriculture and food security and nutrition have long been recognized and a number of conceptual frameworks were developed to show the pathways in which agriculture is affecting food and nutrition security (Haddad, 2000; Johnson-Welch et al., 2007; Pinstrup-Andersen and Watson, 2011; Fan, 2011; Gillespie et al., 2012; Hawkes et al., 2012; Dorward, 2013). Most of these frameworks were built upon the widely known UNICEF's framework which identified three main determinants of good nutrition: availability and access to food; optimal quality of feeding and caring practices; and a healthy environment and adequate access to health care services. At the same time as the simplicity of the UNICEF's framework aids communication between multiple stakeholders and sectors, it is not necessarily optimal for highlighting specific pathways (Gillespie et al., 2012). As such the UNICEF framework has been adapted and applied to the needs and interests of different stakeholders and institutions. For example, Johnson-Welch et al. (2007) modified the UNICEF framework to develop a framework called *agriculture-nutrition advantage framework* which included agriculture**,** nutrition and food, with food as the common link between agriculture and nutrition. The framework postulated that agriculture helps ensure good nutrition, and good nutrition builds human capital, which is also an input for agricultural production, creating a circular pathway between agriculture and nutrition. One of the advantages of this framework is that it takes a new approach by integrating a gender approach and the issue of livelihood sustainability. Generally, in most of the existing frameworks describing the links between agriculture and nutrition, the production of food by smallholder farmers is presented as having the potential to influence the nutrition of members of their households, either through direct consumption or indirectly by generating income which then allows them to buy food locally (Hawkes et al., 2012). This bi-directional impact of agriculture on nutrition is also described in Haddad (2000), World Bank (2007) and Wenhold et al. (2007), where the impacts of agriculture on food and nutrition security are classified in two main categories: specific (or direct) impacts if food and not something else is produced, and generic (or indirect) impacts where the

impacts are not sector-specific. Smallholder farmers as main domestic food and nutrient producers are both direct and indirect contributors to food security and nutrition.

2.1 Direct contribution of smallholder farmers to nutrition

Household production for its own consumption

Agriculture as a source of food is the most direct pathway by which household agricultural production translates into consumption. Own production has more impacts on smallholder farmers since their food consumption and nutritional status is usually affected by what they grow (Dorward, 2012; van Averbeke and Khosa, 2007; World Bank, 2007).

Impacts on food prices

Smallholder farmers are the main food producers in developing countries, increased smallholder agricultural production means more food enters the marketplace, leading to lower food prices and better diets; The link between agricultural policy and food prices involves a range of supply-and-demand factors that affect the prices of various marketed food and nonfood crops, which, in turn, affect the incomes of net sellers and the ability to ensure household food security (including diet quality) of net buyers. This is particularly critical for rural and urban people in low-income countries who spend a large share of their incomes on food expenditures (Johnson-Welch et al., 2007). The impact of food prices on nutrition are widely discussed in the 2012 Global Monitoring Report.

Nutrient availability through post-harvest and preparation

When they have the right equipments, smallholder farmers can contribute to reducing post-harvest losses of nutrient dense foods. Reducing post-harvest provides gains to agricultural income and nutrition and contributes to the quality and quantity of the food supply. Post-harvest activities such as storage, commercial and in-home processing and preparation can affect nutrient availability through (i) increasing the general use of nutrient-rich foods, (ii) increasing the nutrient density of foods consumed by infants, and (iii) decreasing nutrient losses from the processing of widely available foods (Wenhold et al., 2007).

Empowerment of women

Research from a number of countries indicates that women farmers are more likely to channel the income that they control into the nutrition, health and education of their children. Women who are reached by agricultural programs that relay information on nutrition issues appear to be particularly effective in delivering improved nutrition outcomes (World Bank, 2007).

2.2 Indirect contribution of smallholder farmers to nutrition

Effects of increased agricultural productivity on income: The question here is how income derived from agriculture *is actually spent*, especially the degree to which nonfood expenditures are allocated to nutrition-relevant activities such as expenditures for health, education, and social welfare (Gillespie et al., 2012). An increase in income enables smallholders to diversify the diet and also to buy more non-foods, and this tends to imply a greater dietary quality. For example, the smallholders who produce cash crops can increase their food security and nutrition, since commercial production is often associated with increased food production and higher incomes, allowing individuals and households greater access to nutritious foods. Economic growth from agriculture can also improve access to health care and education, either at the household or national level (Hawkes et al., 2012; Wiggins and Keats, 2013).

Impacts on farmers' time allocation patterns: Generally, smallholder farmers are very hard working people and their agricultural activities can affect their time for child care. This is particularly important for women farmers who are the main contributors to nutritional outcomes in the household. For example, an agricultural activity can have negative effects on nutrition when it reduces the time that women allocate for child care. The central question here is how compatible are farmers activities with time investments in nutrition.

Changes in decision-making within farmers' household: These activities include distribution systems such as intra-household decision-making which can influence household decisions and affect household members. For example, this concerns women's socioeconomic status and their ability to influence household decision-making and intra-household allocations of food, health, and care.

Impacts on farmers' nutrient requirements: These include impacts on the nutritional status of household members (men and women) when their work-related energy expenditure exceeds their intakes or, their dietary diversity is compromised; hard labour may create high demands for energy that cannot be met from limited access to nutritious food (Wiggins and Keats, 2013).

Health impacts: Agricultural activities run the risk of having negative impacts on human health which, in turn, may affect their nutritional status.

In a nutshell, growth in smallholder agricultural productivity contribute to the well-being of both urban and rural populations in three key ways: lower food prices for consumers (improving food access, both for staples and more diverse nutrient rich foods); higher incomes for farmers (and mostly women farmers); and growth multiplier effects through the rest of the economy as demand for other goods and services increases (UNSCN, 2010; Dorward, 2013).

2.3 Smallholder farmers, gender, food security and nutrition

For smallholder farming to have real impacts on nutrition, it needs to be gender-sensitive, i.e., it has to consider both the role of the men and the women in agriculture and the role of the men and the women in the farmers' household (taking into account intra-household gender dynamics). Gender analysis will take into account factors such as women's roles as agricultural producers and caregivers, their time and labour allocation, and their decision-making roles relative to the use and distribution of resources and benefits within the household (Wenhold et al., 2007; ACF, 2011). One of the strengths of the *Agriculture-Nutrition Advantage* framework discussed earlier is its focus on who is responsible for the food and income pathway to good nutrition. Rural women play a key role in supporting their households and communities in achieving food and nutrition security, generating income, and improving rural livelihoods and overall well-being (FAO, 2011). Successful examples and case studies showing the impacts of gender-sensitiveness in curbing hunger and malnutrition are provided in Tripathi et al. (2012). However, despite these known and widely accepted facts, agricultural policies and programs historically have failed to address women's production-oriented constraints, including their lack of access to and control over assets and resources, thus having little decision-making power at the household level. Over the last few years an unparalleled attention has been given to the issue of food security and the importance of smallholder agriculture, with particular recognition of the role of women farmers. Efforts to ensure that women benefit from agricultural development interventions can be broadly classified into three types of approach: "women-only" projects; projects targeted to both women and men but with some resources allocated specifically for women; and projects in which gender issues are fully "mainstreamed (World Bank, 2007).

2.4 Sustainable food and nutrition security

Due to the world triple challenge of food production, nutrition security and environmental concerns, the international agricultural community began to focus on the role of smallholder farmers in sustainable development. Sustainable development is defined as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", all this being done in socially acceptable, economically efficient and environmentally friendly manners (WCED, 2012). Sustainable agriculture can be defined as a farming approaches which include environmentally-friendly methods of farming that allow the production of crops or livestock without damage to the farm as an ecosystem, including effects on soil, water supplies, biodiversity, or other surrounding natural resources. According to the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD, 2009) there are close linkages between food security and sustainable agriculture and places smallholder farmers at the heart of sustainable food and nutrition security. One of the greatest advantages of smallholder farming is that it can contribute to food security and nutrition outcomes while being sustainable (Ramirez, 2002; ACF, 2011; ActionAid, 2011; Wiggins and Keats, 2013). One of the widely advocated models of sustainable agriculture is agroecology. Agroecology is defined as a set of agricultural practices that seek ways to enhance agricultural systems by mimicking natural processes, thus creating beneficial biological interactions and synergies among the components of the agro-ecosystem (de Schutter, 2010). The core principles of agroecology include recycling nutrients and energy on the farm, rather than introducing external

inputs; integrating crops and livestock; diversifying species and genetic resources in agro-ecosystems over time and space; and focusing on interactions and productivity across the agricultural system, rather than focusing on individual species. As for the questions of nutrition is concerned, agroecology promotes on farm crop diversification, which can help to secure a healthier and more balanced diet for smallholder producers, particularly in regions where most farming households consume a large share of their production, and bring more diversified market offering for consumers (Egal, 2012)..

3. Strategies enhancing the role of smallholder farmers in food security and nutrition

There is extensive literature on the agricultural interventions that improve nutrition outcomes (Wenhold et al., 2007; ACF, 2011; Traoré et al., 2012; Herforth et al., 2012; FAO, 2013; Wiggins and Keats, 2013; Ruel et al., 2013; to name the few). The contribution of smallholder farmers to global efforts to food and nutrition security can be enhancing through the following common interventions:

Promote homestead food production

Increasing homestead food production through vegetable gardens, horticulture and/or animal husbandry carries great potential for improving food intake while using household labour intensively on small land surfaces within the homestead. It allows women farmers to grow fruits and vegetable and rear small animals while fulfilling their domestic and child care responsibilities. It can be promoted both as a primary occupation and a means to access diversified foods all year round, including during the counter season. Micronutrient deficiencies result from diets based mainly on cereals. These diets are not only often low in several micronutrients, but they are also important sources of phytic acid and dietary fibre, which inhibit the absorption and/or retention of nutrients such as iron and zinc. Homestead food production is a great way increase the micronutrient contents of the diet, provided the produce is consumed at home. Micronutrient deficiencies can be reduced by the promotion and consumption of animal sourced foods, sources of protein, minerals and vitamins. In addition to homestead gardening, the availability of a greater variety of nutritious foods at community and household level can be increased through (i) mixed cropping, (ii) the introduction of new crops, (iii) the promotion of under-exploited traditional food crops (Wenhold et al., 2007).

Promote micronutrient-rich crop varieties

Instead of basing your crop selection only on local climate (e.g. drought tolerance, disease resistance), taste preference and cost, take into account the nutritional content of the crop and the prevalence of micronutrient deficiencies in the area. For instance, maize is a good source of energy but it contains less protein, vitamins and minerals than e.g. millet or sorghum. Refer to Annex 8 for comparison of nutrient values of different crops, including carbohydrate, protein, fat, and minerals and vitamins.

Promote biodiversity and sustainable agricultural practices

The conservation and sustainable use of biodiversity for food and agriculture play a critical role in the fight against undernutrition, by ensuring environmental sustainability while increasing food and

agricultural production. Agricultural biodiversity is one sustainable way to cope with the coming challenges and uncertainties, including the decreased availability of natural resources. It helps to raise the productivity of small-scale farmers and increase resilience to climate change. Promoting diversity will help maintain and rehabilitate productive ecosystems to supply future generations with abundant food and agriculture. Encourage integrated farming systems where livestock and crops coexist independently from each other but interact to create a synergy; with recycling allowing the maximum use of available resources.

Improve post-harvest handling

Optimal practices in harvesting, storage and processing are crucial in maximising the benefits of agricultural interventions. It is estimated that over 20% of the physical harvest is lost due to bad storage and handling practices. In addition, inadequate handling and storage causes the loss of valuable micronutrients. Maintaining micronutrient levels in commonly eaten foods should become an objective per se.

Empower women smallholder farmers

Women should directly benefit from the intervention as much as possible because i) they already have less access to resources and opportunities than men, and ii) they play a key role as the gatekeeper of household food security, health and nutrition. Studies show that increases in women's income are more strongly associated with improvement in the health and nutritional status of their children than increases in men's income. It is however crucial to avoid increasing the already heavy work burden of women. Manual work in agro-sylvo-pastoral or in for-work activities is usually time consuming and physically demanding, which may put strain on their nutritional status and the time dedicated to childcare. As much as possible, the intervention should advocate for women's access to land, livestock, education, childcare, financial services, extension services, technology, markets and employment.

Do no harm principles

Agriculture carries natural risks as farmers are exposed to disease and pollutants. These risks may arise from agricultural practices (irrigation, pesticides) or from improper food processing leading to the presence of anti-nutrients. Thus any agricultural interventions should be geared towards ensuring the health status of smallholder farmers.

Provide nutrition education

Nutrition education is crucial to ensure that increased food supply translates into improved dietary quality, and ultimately improved nutritional status. Nutrition messages should include a strong programme of nutrition education and behaviour change, targeted principally towards women, in order to ensure that increases in food supply and income lead to improved household nutrition (Wenhold et al., 2007; Traoré et al., 2012).

Requirements for a participatory approach

For all these interventions to have real impacts on smallholder farmers' nutrition, they need to be participatory. Effective use of a participatory process allows for a wide range of people to be involved in the decision-making process regarding the planning, implementation, monitoring and evaluation of the project. Hunger and under-nutrition are most visible at the individual and household levels; community input is therefore invaluable. Involvement of individual farmers and farmer organizations will ensure that indigenous knowledge complements formal scientific knowledge (Wenhold et al., 2007; ACF, 2011).

4. Discussion and concluding remarks

There is a growing understanding that agricultural development provides an obvious and needed entry point for efforts to improve nutrition (Herforth, 2013). At global level, smallholder agriculture contributes in a massive, indispensable and strategic way to sustainable food and nutrition security (C2A, 2011; CFS, 2012) and the food crises of the last decade have brought into light the fundamental role of smallholder farmers, as first domestic food and nutrient providers in developing countries. However, while smallholder farmers play the most fundamental role in securing global access to food, agriculture as one of the main pillars in ensuring food and nutrition security cannot just be the responsibility of farmers alone (FSN, 2012). One of the structural causes of food insecurity and malnutrition is the lack of coherence in policymaking at international and national level, resulting from inadequate governance of food security and nutrition (CFS, 2011). For smallholder farmers to play their actual role in food and nutrition security there is a need for the design of strategies and programmes backed by a firm national, regional and international commitment and conductive policy environment in which smallholder farmers, as key players, need to play a central role. There are many examples worldwide showing that food security and nutrition can effectively be met by smallholder farmers when governments are ready to give priority to the development of their agricultural sector through long-term strategies. However, it needs commitment and it needs resources and investments and it needs good governance. As stated in the 2012 Global Monitoring Report, in developing a twin-track approach to nutrition and food security, national government need to plan long-term agricultural investments to raise productivity, especially for smallholder farmers, and to work across sectors, especially to link nutrition to health, agriculture, and social protection as well as other related sectors.

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