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Subsistence farming and rural food security: A review

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Abstract

Subsistence farming is a set of techniques used by the poor rural farmers to meet their food and nutritional requirements. Through increasing revenues and food supplies, subsistence farming provides poor households with a foundation for improving their household food security and ultimately producing extra income for other household needs. In the past, rural households were largely self-sufficient in producing their own food. However, recent research indicates a remarkable increase in market purchases made by both urban and rural households. In addition to enhancing livelihoods and assisting to reduce the high food prices, the subsistence farming can play a significant role for lowering food prices both in rural and urban areas. This paper helps us to understand the importance of subsistence farming that how it is useful to

rural farmer for getting food and income for other needs. To meet their food needs, many smallholders rely mainly on rainfed, low-input subsistence farming. However, the majority of rural households cannot consistently produce enough food through subsistence farming to prevent starvation. In order to guarantee long-term food security, subsistence agriculture production can be increased by motivating the farmer for better production by using sustainable and better inputs. This will be possible only when farmer be facilitating by providing low price organic and inorganic fertilizer and by lowering transport and transaction cost. This study will be helpful for policymakers, development experts, and anyone interested in how nations facing comparable difficulties to rural economic growth. © 2018 The Author(s)

Keywords: Agro-food markets, Farm inputs, Food security, Hunger, Livelihoods, Subsistence farming

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Introduction

The term "subsistence farming" refers to a conventional method of cultivation on a small scale, associated with peasant communities and characterized by low-output or traditional farming techniques (Onakuse, 2012). Subsistence farming has diverse origins. In its early stages, it emerged due to the absence of suitable market facilities, limited awareness of new cultivation technology, and the division of labor. It is also noteworthy that subsistence farming coexists with commercial farming; this coexistence can be explained as a response to high transaction costs and precarious environments. When examining subsistence production, it is crucial to explicitly consider market distortions in areas such as inputs, outputs, consumer goods, labor, capital, and security. Despite operating at a low level of productivity, subsistence farming is relatively stable and fulfills the basic requirements of people. It has the capacity to provide sustenance to low-income individuals in both rural and urban areas by increasing production and reducing dependence on food purchases (Onakuse, 2012).

Subsistence farming constitutes over 60% of all global agricultural activity, contributing between 15% and 20% of the world's food (Francis, 1986). In contrast to modern farming practices, subsistence farmers employ techniques such as mixed cropping and the cultivation of varietal or

landrace varieties. For a considerable period, it seemed that subsistence farming was predominantly practiced in developing nations, with limited instances in Western Europe (Caillavet & Nichele, 1999). Subsistence farming, a production method aimed at meeting the basic needs of the household, disregards market conditions and often inefficiently utilizes resources when faced with constraints. To engage in subsistence farming, also referred to as smallholder farming, a farmer must produce sufficient food for their family and themselves (Spedding, 1979). This approach results in low labor and land productivity, soil erosion, environmental damage, food shortages, increasing food prices, and an economic environment that proves unfavorable to the advancement of mechanized farming (Atta-Konadu, 1974).

According to Haines (1982), the primary objective of subsistence agriculture is to maximize crop yield by converting it into food for both people and animals with minimal waste. Haines argues that once this stage is reached, farmers become more focused on maximizing their revenue rather than increasing physical productivity. This shift in focus may lead them to reduce output in the hope of raising prices. Furthermore, while the main goal of most subsistence farms is to increase the quantity of food produced, intensive subsistence farms aim to maintain a sustainable level of output, producing close to the maximum amount that can be sustained. By improving the supply system and consequently reducing food prices, subsistence agriculture ensures food security for rural

households. This is achieved by creating new employment opportunities for the unemployed and increasing household income to facilitate the procurement of food for domestic use (Machethe, 2004; Altman et al., 2009). Subsistence farming plays a crucial role in enhancing food accessibility and reducing price fluctuations, thereby improving the food security of low-income households in rural areas (Department for International Development [DFID], 2004; Baiphethi & Jacobs, 2009). It is worth noting that over 90% of the food produced in many developing nations is attributed to subsistence farming (Baiphethi & Jacobs, 2009).

Subsistence production and food security

Household food acquisition involves three primary methods: market purchases, subsistence farming, and support from government programs or other households (Ruel et al., 1998). These sources encompass production, exchange, and transfers, collectively referred to as entitlement categories (Sen, 1982). In the past, rural households were largely self-reliant in producing most of the food they consumed, whereas urban households primarily relied on purchases (Ruel et al., 1998). Recent studies indicate a significant increase in market dependency for both urban and rural households (Maxwell et al., 1998; Ruel et al., 1998). Consequently, food expenses can constitute 60–80 percent of the total income for low-income households (Ruel et al., 1998). Research by Reardon et al. (2001) revealed that non-farm income contributed 40% to rural household incomes across 11 Latin American nations. Given that many households use non-farm income to procure their main food staples, the ability of households, particularly rural ones, to sustain themselves depends on both this income and their agricultural production (Chapman & Tripp, 2004). Therefore, it is crucial to understand subsistence farming in the context of multiple sources of income. Jayne et al. (1999) observed that 61% of Kenyan households cultivating maize are net importers of maize. These households might be more interested in efforts to boost subsistence output than in decreasing food prices. However, surpluses from non-farm sources of income might provide farmers with the financial stability needed to increase on-farm innovation. This largely depends on whether households are taking advantage of exceptionally high demand for their labor off-farm or diversifying their households away from agriculture due to a lack of prospects for on-farm innovation (Chapman & Tripp, 2004). Furthermore, when non-farm activity is brief and the home farm has not been neglected, on-farm investment is more likely to take place.

Food security and source of income

Subsistence agriculture is the farming method employed by rural families, especially those with small landholdings, to

fully satisfy their food needs and as a source of income. Davidova et al. (2009) conducted a research study examining the contribution of subsistence farming to household income generation in five new European Union member states. The study revealed that subsistence farming predominantly involves horticultural family units. The analysis demonstrated that the contribution of subsistence cultivation to the household capital was particularly significant for less economically prosperous households overall, with Bulgaria and Romania standing out. In Romania, economically disadvantaged families reported that subsistence farming contributes to approximately half of per capita earnings. Older household units constituted the largest segment (46% of the sample), mainly organized around subsistence farming, with subsistence production accounting for approximately 19% of their actual family earnings. The study suggests that significant subsistence production is likely to persist in the short to medium term. The assessment of subsistence production for agricultural family units was emphasized, especially regarding its impact on vulnerability and resilience estimates. This study makes it evident that the role of subsistence farming in contributing to family incomes is highly significant in poor rural families overall, and notably in Bulgaria and Romania. De Janvry and Sadoulet (2009) noted that subsistence practices are utilized as a secure means to meet food needs and generate income. Furthermore, they reported that agricultural provisions are predominantly used by middle- and high-income nations, which is unsuitable for poorer and rural countries. The researchers identified that limited landholding poses a challenge to subsistence farming in developing nations such as India, Peru, and Guatemala.

Employment opportunities

The majority of developing countries have recognized the subsistence farming sector as one of the most significant areas for employment generation (Baiphethi & Jacobs, 2009). Moreover, Baiphethi and Jacobs (2009) illustrate how productivity gains in rapid subsistence agricultural output could create jobs on or outside the farm for people living in rural areas. As crop production increases on small agricultural farms, there is a growing need for labor in tasks such as land preparation, planting, weeding, and harvesting (DFID, 2004). According to DFID (2004), when smallholder subsistence farmers earn more income from their crops, they tend to hire labor instead of relying on family labor, providing more opportunities for the poor to find work. Furthermore, by strengthening connections between agriculture and the broader rural economy, smallholder farms with higher production also generate new, well-paying off-farm jobs for the poor (Baiphethi & Jacobs, 2009). Increased employment, both within and outside of small-scale subsistence farming, can benefit the rural labor market by elevating farm earnings and improving the ability of the poor to access and purchase food from marketplaces (DFID, 2004).

Subsistence production

Kalibwani (2005) contends that many subsistence farmers in developing countries grow crops primarily for their own needs, and only a small portion of the produce is sold in the market. Smallholder subsistence farmers have the potential to produce additional or surplus goods that can be sold in the market to generate extra income, thereby meeting their other needs. This is because the majority of subsistence farmers focus on producing for personal consumption (Kalibwani, 2005; South African Social Investment Exchange [SASIX], 2007).

Increase food purchasing power

For the vast majority of rural poor people, smallholder subsistence agricultural production is crucial for ensuring family food security as it boosts income, enabling households to purchase food from the market to supplement and meet their dietary needs. Over 70% of rural residents depend on this sector for their livelihoods, with the majority being employed by it. This employment allows them to earn income for their families by selling surplus food beyond their personal requirements (Feynes & Meyer, 2003). According to Aliber (2005), rural families derive 15% of their total household income from agriculture, and the poorest obtains up to 35% of their total income from this source. While smallholder subsistence agriculture is believed to contribute up to 40% of household income in most developing nations, providing the poor with the means to buy food for domestic consumption from markets enhances household food security (van Averbek & Khosa, 2007). These earnings include money from selling farm products and wages, allowing them to buy more food from markets.

Food poverty alleviation

Smallholder subsistence farming holds clear potential in addressing food insecurity. Small-scale subsistence farming can alleviate food insecurity by generating employment, increasing food availability, and boosting farm income (Machethe, 2004). According to the Millennium Project Hunger Task Force (2004), it is conditionally conceivable that by enhancing agricultural productivity in smallholder farms, the percentage of hungry people could be halved by 2015 to meet the Millennium Development Goals. Furthermore, in the rural areas of most developing countries, improving market performance is considered a key solution to the issue of hunger. It is widely recognized that the success of these interventions depends on policy adjustments that eliminate barriers to progress and establish an enabling environment (Millennium Project Hunger Task Force, 2004).

Market problem

Kostove and Lingard (2004) revealed that subsistence farming is a deliberate choice for local growers. Moreover, financial constraints and a lack of both local and international markets are considered major challenges in subsistence farming. It contributes to the income of the family unit. Additionally, a social interest aspect encourages subsistence farming. Dixon et al. (2003) reported that subsistence farmers produce crops solely for family needs, which is comparable to people in developed countries earning as much as USD 50,000 a year. Adam and He (1995) conducted a study among five wage source integral areas of horticulture and domesticated animals. Family farm income sources depend on the farmer's landholdings, soil quality, fertility, and irrigation facilities. However, subsistence agriculture provides options and opportunities for household income generation in rural communities.

Environment friendly

Styger et al. (2007) outlined the characteristics of subsistence farming in their research study. Primitive subsistence farming involves dynamic and diverse cultivation methods, encompassing cut and burn practices, as well as peaceful nomadic livestock rearing. Wehrheim and Wobst (2005) reported that preparing the soil for farming involves cutting and burning parts of the woodland vegetation. Subsistence farming is dependent on the general population's efforts and various other factors. Additionally, growers may utilize cleared land for subsistence farming for one to three years and may leave it fallow when clearing another piece of land for subsistence farming.

Peaceful way of farming

Dixon et al. (2001) discussed the framework of subsistence agriculture, covering aspects of the farming system and poverty alleviation. This research was conducted in close collaboration with the FAO. The study revealed that subsistence farming is viable in areas where the land is more suitable for cultivation. This peaceful mode of farming is considered a form of agribusiness. In contrast, nomadic groups move with their animals, seeking fields, water, and shelter. Carloni (2001) reported that innovation is not employed in primitive subsistence farming in some developing countries of Sub-Saharan Africa. The decline in cultivated land is attributed to a lack of new tools, crop variety, labor, soil fertility, and climatic changes. Moreover, the influence of a high population reduces the availability of land for primitive subsistence farming. Consequently, fallow periods are shortened, and plots are cultivated for more extended periods, rendering them unsustainable. In developed countries, agricultural reforms have transformed the old system into intensive subsistence agribusiness. Dixon et al. (2001) reported that subsistence farming involves meeting maximum food needs on a small-sized farm, where growers practice continuous intercropping on small pieces of land without leaving furrowed areas. While

this ensures minimal land wastage, continuous cultivation contributes to soil fertility decline. The Food and Agriculture Organization (FAO, 2005) highlighted that farmers often fail to use the proper amount of fertilizer to enhance crop yield. Livestock are frequently allowed to graze on land unsuitable for crops. Grigsby (2002) reported that intensive subsistence farming typically involves farms ranging from 0.25 to 10 acres due to socio-economic factors and land tenure systems. Smithson and Lenne (1996) emphasized the diversification of farming systems, incorporating mixed crop and livestock cultivation. This involves planting a variety of annual and perennial crops together.

High rates of crops

Ellis (2000) identified factors contributing to low crop yields, such as improper farm management and the use of outdated agricultural techniques including continuous cropping. Additionally, the non-availability of inputs such as fertilizer and quality seeds, along with market-related issues, are prominent factors leading to reduced production. Consequently, small-scale landholding farmers face challenges in achieving the desired yield. In addition to the aforementioned factors, unfavourable climatic conditions and pest attacks further contribute to decreased yields. Similarly, the absence of irrigation facilities and appropriate technologies can adversely impact crop production, especially in the face of unreliable weather patterns. FAO (2005); Wallace and Knausenberger (1997) reported deficiencies in the application of purchased inputs (seeds, fertilizers and pesticides) in the crop production process, with a particular focus on inorganic fertilizer use in Africa. Some farmers neglect the proper application of fertilizers and pesticides for commercial crops, resulting in adverse effects on crop yields. Most of the subsistence farmers who lack access to markets, may not apply any crop inputs. For instance, in Africa, only 2% of the world's fertilizer was consumed in 2003 and 2004, while in North America, 15% of fertilizers were used. In Sub-Saharan Africa (excluding the Republic of South Africa), the average fertilizer application was only 10 kg/ha in the farming pattern.

Subsistence farming vs transportation

Key et al. (2000) found that high transportation and transaction costs, coupled with the absence of a suitable market for inputs and outputs, have a detrimental impact on subsistence farming. These transaction costs include expenses related to searching for the appropriate market to sell products, acquiring inputs, and assessing potential sellers for the reliability of securing the best price. All these components contribute to increased transport and input prices. Moreover, farmers face challenges in accessing credit for crop cultivation, obtaining credit only from informal sources particularly in rainfed areas where crop production failures are common. Lipton (2012)

reported that intensive subsistence farming is a type of farming that requires significant labor for crop cultivation, and in subsistence farming, women contribute 60-80% of the labor worldwide.

Conclusion

In most developing nations, subsistence agriculture plays a significant role in providing food and income. The majority of rural households achieve food security through subsistence farming, ensuring their own consumption affordability. Additionally, by saving and using the income generated from their production to supplement other household needs, including food, this sector helps alleviate food poverty and hunger conditions for most households. Some rural residents engaged in subsistence farming can financially support their families by working on farms, increasing their ability to purchase food from other sources. However, due to low productivity, inadequate resources, and a lack of appropriate agricultural inputs, several households struggle to meet their food needs despite subsistence agriculture making substantial contributions to family food security. However, this industry holds great potential for improving household food security. The practice of subsistence agriculture should be seen in a broader context, not solely as a necessity or method for the poor to survive but also as a potential source of high income, employment, and improved food security. Despite its contributions to nutritional food security, the development of informal jobs, and diet variety, the subsistence farming sector remains underutilized in developing nations.

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