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## Review Article

# The sensitivity of food security to agricultural input subsidies in Uganda

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## Abstract

The agricultural sector plays a crucial role in addressing food insecurity and malnutrition in developing countries, and smallholder farmers are significant contributors to food production. In Uganda, the National Agricultural Advisory Services (NAADS) program was initiated in 2001 to provide extension services and agricultural input subsidies to farmers. However, the program has faced criticism for its high levels of corruption, militarization, and political influence, as well as for its failure to reach its intended beneficiaries, and smallholder farmers. This paper aims to examine the contribution of smallholder farmers to food security and its sensitivity to agricultural input subsidies in Uganda, with a focus on the NAADS program. Additionally, it covers the evolution of agricultural input subsidy policy in Uganda from 1987 to the present and analyses the findings on the impact of these subsidies on smallholder farmer productivity and food security. The findings conclude that the NAADS program contributes less to the target beneficiaries, and its priorities do not align with the set goals. The study further suggests several recommendations for improving the program and addressing the issues facing smallholder farmers in Uganda.

## Introduction

Food insecurity, hunger, and malnutrition are the greatest threats to humanity on a global scale [1-3]. According to the FAO, roughly 12% of the global population, or 928 million people, were extremely food insecure in 2020, up from 148 million in 2019, with 50% of the population in Asia and 33% in Africa, followed by Latin America and the Caribbean [1,4]. East Africa has 44.4% of the world's undernourished people, West Africa has 26.7 percent, Central Africa has 20.3%, North Africa has 6.2 percent, and Southern Africa with 2.4 percent. Uganda ranks second after Tanzania, with 9.6 million people suffering from severe food insecurity and 30.6 million suffering from moderate food insecurity, accounting for more than half of the country's population [4].

Several interventions have been used to address food insecurity ranging from minimizing international food price

influence on national food prices an example of the rice stockpile project in Japan to social protection measures like cash transfers and school feeding in Brazil to early warning signs monitoring for the price, production consumption, and nutrition indicators to inform policies in India [5,6]. Other interventions include sustainable agricultural projects like Grain for Green Program in China and the Sustainable Rural Development Program in Mexico promote the adoption of agro-ecological practices, reduction of environmental degradation and increased crop diversity among smallholder farmers[1,7]. However, many governments in developing continue to prioritize agricultural support to farmers through subsidized inputs, farm credit, extension services, and marketing facilities, as well as market control [8,9].

Researchers argue that agricultural subsidies rarely achieve their targeted impact due to capture by wealthier farmers leaving out the rural smallholder farmers it's intended for, or what can

be referred to as “starving the poor” [8,10,11]. Smallholder farmers play a vital role in agriculture, and their contribution to food production in developing nations cannot be overlooked. Studies in Sub-Saharan Africa and Brazil concluded that local food production can be achieved if smallholder farmers are accorded the necessary policy, financial, and institutional support [12]. It is also argued that Uganda navigated the 2008, 2012, and 2022 food insecurity crises with the help of staple foods produced by smallholder farmers since most foods were not internationally traded [13,14].

However, the government has still not accorded the smallholder farmers audience and support but rather advocated for the transformation of the agricultural sector from subsistence farming to mechanized and commercial agriculture through input subsidies, easy access to finance, and tax-free agricultural machinery imports. [15-17]. Thus this study examines the contribution of smallholder farmers to food security and its sensitivity to agricultural input subsidies in Uganda. It also offers insights into the availability of input subsidies and their distribution to smallholder farmers. The paper reviews different academic articles and reports from reputable institutions, and it's organized into sections introduction, clarification of concepts, smallholder farmers, agricultural input subsidies, understanding NAADS program, a conclusion, and recommendations.

### Clarification of concepts

The study offers an interpretive approach as explained by Wagenaar [18]. In this paper smallholder farmers are considered individuals practicing farming on a subsistence basis, majorly growing food crops or/and keeping a few animals on an acreage less than 2 hectares in rural and peri-urban areas [19-22]. These smallholder farmers majorly produced local staple foods that are greatly linked to the food security of households, communities, and the nation. “Food security” at a national scale is when food availability, food accessibility, food utilization, and stability are integrated as key measurement indicators that are vital in policy formulation [23].

Additionally, the available of food at all times [24], aligns with the definition that “all persons have means of access food that is nutritionally adequate in terms of quantity, quality, and variety, and is acceptable within a given culture” [25].

Agricultural Input subsidies are a form of social protection policy instrument aimed at improving the agricultural productivity of farmers [26]. According to Kato and Greely [8] the subsidies target majorly smallholder farmers as shown in the studies by Druilhe and Barreiro-Hurle [27] and Liverpool-Tasie [28] in neighboring Kenya, Rwanda, Tanzania, Malawi, Zambia, Mozambique, Nigeria, and Ghana. Uganda is not any different, it has agricultural input subsidies embedded in the agricultural and development programs by the government to reduce input costs and improve the access to quality inputs. The considerable debate in the literature on the access, distribution and outcomes of these subsidies informs this paper. For the purpose of this paper, arguments are premised on the

consideration that input subsidy access increases productivity among smallholder farmers if equitably distributed and utilized for production [29].

### Smallholder farmer's engagement in food security

Measures to achieve food security have evolved from stabilizing food prices (Maxwell, 2001:4) to ensuring enough income for all households to buy food (World Bank, 1986:5). Critics argue that the increased income does not translate into increased food security [30,31] at the different levels of availability, accessibility, and utilization [24]. A community is considered food secure when food “is available at all times, to which all people have means of access, that is nutritionally adequate in terms of quantity, quality, and variety, and is acceptable within the given culture” [25].

The definition above is dependent on agricultural production levels, climate conditions, and agricultural markets, which influence the seasonality of food production, availability and prices. The seasonality leads to rural farmers selling their produce at a low price after harvest due to lack of storage facilities and the need for finances to buy other necessities. This leaves farmers with no food for consumption but also less income to buy alternative foods they do not produce [32].

Food diversity is another major indicator of food accessibility and availability [33,34], which varies depending on culture, staple food, agricultural production knowledge and cropping systems [35,36].

Deborah et al. [19] argue that rural smallholder farmers primarily consume what they produced but still spend a high percentage of their income on food compared to their urban counterparts. It has been noted that they are now selling more food for income beyond the traditional cash crops, escalating food stability [37,38].

Smallholder farmers who constitute 80% of the agricultural sector contribute about 70% of the national food production mostly women in rural areas [21,39]. According to the Ministry of Agriculture Animal industry and Fisheries (MAAIF), input subsidies and advisory services by NAADS were expected to enhance the productivity of small farmers cultivating their 0.8 to 1.6 hectares pieces of land depending on the region of Uganda [21]. Smallholder farmers produce primarily food crops, such as maize, millet, sorghum, rice, cassava, sweet potatoes, potatoes, beans, peas, groundnuts, soya beans, sesame, and plantains. They also keep like chickens, pigeons, ducks, rabbits, turkeys, goats, sheep, and cattle under poor management [21,40].

Figure 1 depicts the level of production of food crops in metric tonnes according to the Uganda Bureau of Statistics survey conducted in 2019, the highly produced crops are plantain a staple food for the western and central region, cassava consumed in the eastern and northern region, and maize which is consumed nationally. Other crops include sweet potatoes, beans, ground nuts, and then Irish potatoes rice, millet, sorghum, and soya beans which have been adopted by several communities.

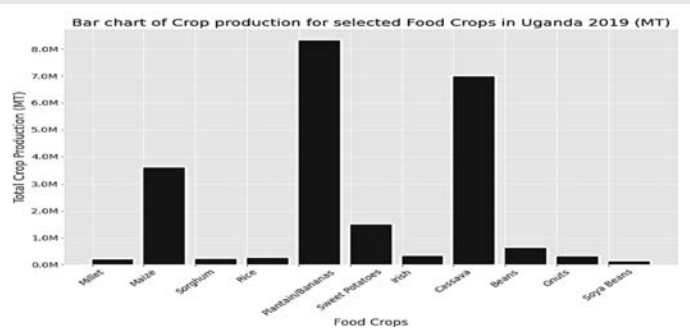


Figure 1: The bar graph depicts Uganda's total food crop production [21].

### A review of input subsidies in agricultural and the development programs

Agricultural input subsidies constitute policy efforts to intensify the use of improved technologies like improved hybrid seeds, fertilizers, agrochemicals, irrigation techniques, and mechanized agriculture, all intended to increase public and private investment in agriculture [41]. Morris, et al. [42] define smart subsidies as promoting fertilizer, irrigation equipment, agrochemicals, and hybrid seeds as part of a wider strategy favoring market-based solutions promoting input supply in response to the demands insisting on economic efficiency empowering farmers [42].

Smart subsidies give exceptional precedence to poverty reduction and food security goals over efficiency and sustainability goals [42]. This can be achieved through demonstration packs, vouchers, rationing, targeting, matching grants, and loan guarantees aimed at successfully addressing wider input supply chain problems [11,43,44]. The main remit of this review is to look at the distribution and impact of government-supported agricultural input subsidies on production by smallholder farmers and food security. However, other governments and non-government input subsidies are excluded to avoid bias and miss leading results since they are target-specific (women, people with disabilities, vulnerable regions, youth, and people living with HIV/AIDS) [42,45,46]. The evolution of the agricultural input subsidies policy of Uganda is limited from 1987 to date with a key focus on the NAADS (National Agricultural Advisory Services) that is still under implementation [47,48].

Government support fro smallholder farmers dates back from 1987 with the IMF/World Bank-supported Economic Recovery Programme (ERP) which introduced the liberal approach to the economy (MoFPED, 2000). Failures and weaknesses of ERP widened the poverty gap and reduced farmers' income and growth leading to a 10-year planning policy framework (1997–2007) to address these failures by enhancing incomes of rural communities through agriculture, rural roads, education, and health. Its major contribution was the adoption of the Plan for the Modernisation of Agriculture (PMA), which created the National Agricultural Advisory Service (NAADS) as the implementation program [47,49].

The Plan for Modernisation of Agriculture (PMA) is rooted in programs like the National Agricultural Advisory Service (NAADS), National Development Plan (NDP) I, II, and III, and Operation Wealth Creation (OWC) that aim at intensification,

industrialization, and commercialization of agriculture for poverty eradication [47,50]. Since 2001, NAADS has been a donor-funded program focusing on capacity building and modernization of farming techniques in Uganda, both of which are critical for agricultural policy and institutional arrangements in the sector. NAADS was designed to offer extension services and agricultural input subsidies to farmers like free improved planting materials, inorganic fertilizers, crossbred calves, ox ploughs, and beehives depending on the agroecological zoning of the nation. Extension services, input subsidies like tax subsidies on inputs, and providing inputs to farmers (seed, fertilizers, animals, machinery) are fundamental features of these programs [47,48,51,52].

### Understanding the NAADS programming

There is a consensus in the literature that agricultural input subsidies represent a fraction of Uganda's public finances, loans, and donor grants, thus imposing a financial burden on the taxpayer [17,53,54]. NAADS is not any different, with 20% of its budget financed by the government of Uganda, complemented by 41% by the International Development Agency, 16.2% by the International Fund for Agriculture Development, and 21% by bilateral agencies, with the Global Environment Facility contributing the remaining fraction [55]. However, Jenrola [56] agrees with Sebaggala and Matovu [20] and Rwakakamba and Lukwago [48] that the NAADS program has not achieved its objectives of transforming agriculture by providing agricultural inputs, agricultural value chain development, and support to improve food security and household income.

The program's performance has continuously been questioned based on corrupt and incompetent staff, overwhelming complaints about the quality of the inputs, off-season distribution of seedlings, politically biased selection of beneficiaries, lack of effective extension support, and wealthy farmers' influence on the implementation of the program raised daily [8,56,47,48]. MAAIF in collaboration with the district local governments (DLGs) through the NAADS program distributes the inputs at the sub-county level majority of seeds, seedlings, animals, and equipment as shown below [57].

Figure 2 depicts the crop enterprise materials such as; seeds, suckers, and cuttings distributed by the program to farmers of the program through the district local government the highest distributed planting materials are tea and coffee crops.

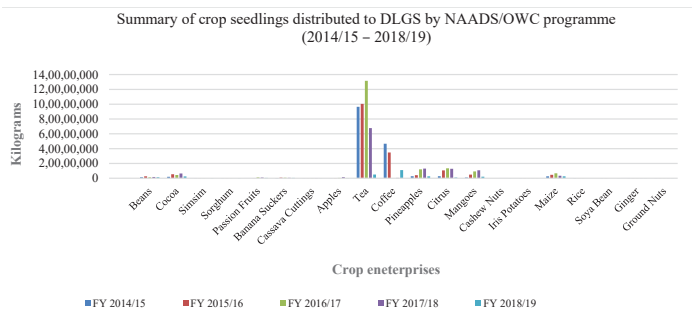
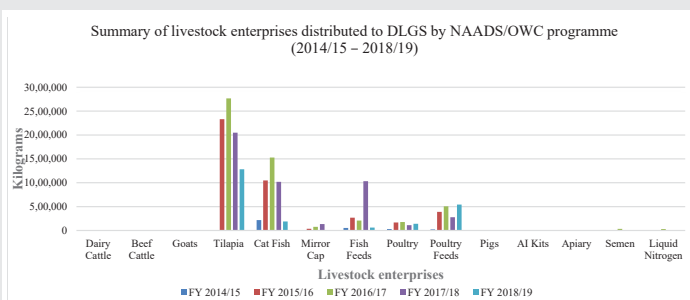


Figure 2: A summary of crop enterprise seedlings distributed to DLGS by NAADS/OWC-NAADS 2021.

According to Figure 2, enterprises of staple food crops like plantain (banana suckers), cassava (cassava cuttings), maize, and other crops which are majorly produced by smallholder farmers as shown in Figure 1, are the least distributed planting materials. Other food crops like maize and beans were distributed at the second least level with a decline in numbers for the financial year 2018/19. While enterprises of commercial crops like tea, coffee, and pineapple are highly prioritized by the program. The priority enterprises require large acreages of land, intensive management, and production on a commercial scale which contradicts the program objective of achieving increased agricultural production and food security.

Figure 3 depicts the animal enterprise materials distributed including live animals, feeds, and management materials all presented in kilograms with Tilapia and Catfish fingerlings being the highest distributed materials.



**Figure 3:** A summary of livestock enterprise inputs distributed to DLGS by NAADS/OWC – NAADS 2021.

Figure 3 also shows a trend similar to Figure (2) where the key livestock input investment is put into aquaculture resources such as tilapia, catfish, and fish feeding which is the venture of the wealthier farmers due to its investment demands and perishability of the products. While enterprises like goats, pigs, poultry, and cattle are traditionally kept by rural and smallholder farmers receive less in some cases no priority in the investments by the program [19,48,56,58]. NAADS priorities and the capture of the input subsidies by wealthier farmers have rendered the program ineffective, leaving the targeted beneficiaries (smallholder farmers) starved of much-needed quality inputs and improved seeds, fertilizer, and machinery [10,12,48].

Thus, smallholder farmers plant locally preserved seed grains from previous seasons, with poor farm and pest management thus producing lesser quantities that either do not fetch a good price or face a disadvantage in the international markets, and they are left for local consumption [59,60]. Jenrola [56] and Okoboi, et al. [55] found an insignificant impact of NAADS input subsidies and services on agricultural productivity, as earlier suggested by Benin, et al. [61] that there was a significant change in yield between participants and non-participant households. Reports by International Monetary Fund [62] show that the use of improved seeds, fertilizers, and inorganic pesticides increased crop yields in Rwanda and Ethiopia but not in Uganda, possibly associated with a lack of access, training, and information on their use [63-69].

Finally, Jenrola [56], Rwakakamba and Lukwago [48] and Okoboi, et al. [55], just like other scholars, agree that the programming of the NAADS program contributes less to the target beneficiaries and several fundamental changes have to be made like (1) a review of the program administration to empower beneficiaries to participate in the selection of enterprises, and (2) improving the efficiency of the extension support system. The program administration should (3) gradually transition back from the military to civilian professionals and (4) ensure quality and timely distribution of the seeds, seedlings, fertilizer, and livestock. The government should further (5) invest in irrigation and mechanization equipment which can be stationed at the sub-county to supplement the supplied inputs [48]. However, the study could not provide a clear size of the effect and correlation between national food insecurity and the failures of the program due to the limited number of studies about the NAADS program and the lack of disaggregate data at the regional, district, and farmer levels for further analysis.

## Conclusion

Increasing food production is undeniably important in developing countries Uganda inclusive, the contribution of smallholder farmers is crucial and should be accorded the necessary government support. Agricultural input subsidies have not translated into improved food production and food security, nor reached the intended beneficiaries in most cases and NAADS is no exception. NAADS program faces several challenges that are not restricted to poor administration, quality of inputs, distribution criteria, corruption, and militarisation, among others, but also poor priorities with an up-bottom approach to supporting farmers that have gravely affected the impact of the program. Future studies are necessary to conclude the effect of agricultural input subsidies on productivity among smallholder farmers. It is vital to evaluate the farmers' knowledge of agricultural input use and their contribution to agricultural input to productivity and food security in their households.

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