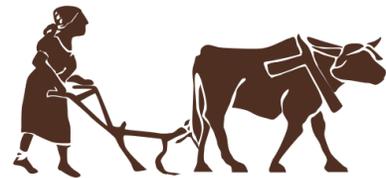


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Resilience of Subsistence Farming Systems to Food Insecurity in Uganda

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Resilience of Subsistence Farming Systems to Food Insecurity in Uganda

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Abstract

More than 80% of the Ugandan population are subsistence farmers inhabiting the rural areas, producing food to feed both their families and the communities around them, even though they face numerous social, economic, ecological, climatic, environmental, and other related challenges. In the context of modernisation and mechanisation, where the most prominent narrative is that food production can only be increased by monocultural large-scale farms, subsistence farmers feeding their households are rendered irrelevant in policy debates and government interventions. While subsistence farming systems are regarded as failed ventures, mostly in need of rescue, farmers' families continue to depend on these farms for all their needs. What stands out in practice, is the question of how the subsistence farmers survive, in such cruel policy regimes, to feed their families, and to ensure food security for their households. The stresses and shocks faced by such households are part of their daily routines, highly motivated by their need to survive, at the most basic level, by making sure that there is food to eat for the household members. However, there is minimal understanding of such circumstances and the conditions under which food makes it to the table in these households, or to the market. Furthermore, very little attention has been given to understanding the ability of these households to withstand stresses and shocks to food insecurity. This paper, based on an exploratory study in Wakiso District, Central Uganda, interrogates the subsistence farming system and its resilience constituents. Firstly, the focus is on understanding shocks and stresses to the subsistence farming system; secondly, it unpacks what constitutes resilience in the face of shocks and stresses. The findings revealed that subsistence farming systems face numerous and multiple shocks, from which they survive by drawing on their own individual household resources and networks in their communities. With 99% of the respondents reporting that they faced shocks and stresses, the findings also revealed that they recovered and focused their energies on their major goal, – providing food for the households. The paper draws on resilience theories to argue that subsistence farming systems might be fragile, like any other system, but they ensure resilience through their own local strategies. The shocks and stresses they face might present a setback; however, they also set the stage for learning and re-organising to ensure that food is provided. From the study, it is recommended that policy debates and processes recognise and support the subsistence farming system, as it presents an effective strategy for reducing hunger in households and communities.

Keywords: subsistence farming systems, resilience, shocks, stresses, food systems, subsistence agriculture, smallholder farmers, stressors, Uganda

Introduction

In the world currently, one billion people are hungry or undernourished (FAO, 2012), while a continuously increasing 1.5 billion are overweight or obese (Tendall et al., 2015) – all challenges manifesting an unpleasant global food security landscape. On the African continent, the situation

is even worse with two-thirds of its population employed within the agricultural sector, with the majority working on subsistence farms, and the total food output from subsistence farms accounts for 90% of all agricultural produce (FAO, 2019; Mzali et al., 2019). In sub-Saharan Africa, which is home to the majority of the hungry, 60% of the farmers have very small pieces of land – less than one hectare – which means that the food they are able to produce is squeezed onto tiny pieces of arable land. Of the 41 million Ugandans, 41% are characterised as undernourished, while 28.9% of all children under the age of 5 are considered stunted. This is contradictory, as Uganda is considered a very high-performing nation in agriculture. Some studies have attributed this to the lack of useful information as regards nutrition and food preparation, while others have argued that the capitalist outlook of regarding the market as the panacea for development and progress, is to blame for this occurrence. Nevertheless, there is ample documented evidence to show that Uganda produces more food than it can consume and exports food to some of the neighbouring countries. In Uganda, a country that has a very huge deprivation gap and is considered poor, the majority of the population live in the rural areas (83.6%), 72.9% of whom work in the agricultural sector, on their farms as subsistence farmers. The farming system in Uganda is characterised by a mixed cropping culture, partly because of the small pieces of land that people own. As the population increases, more land fragmentation is done, leaving even smaller pieces of arable land for agriculture.

In Uganda, subsistence farming systems are the main producers of food for the country. However, the policy regimes that have targeted agriculture have mostly been focused on modernising and transforming the subsistence sector, with limited success. Since the colonial period, when cash crops were introduced in Uganda, the government, through different policies, has clearly indicated that modernised agriculture is the way out. Some scholars argue that the introduction of cash crops changed the way farmers in Uganda understand and perceive agriculture (see for example, Mamdani, 1975). By the time Uganda gained independence in 1962, the leading sector was commercial agriculture, producing cotton, coffee, tea, and sugar cane, but alongside this was a very vibrant subsistence sector, producing food to feed the population. Later in the 1970s, the agricultural sector suffered a setback when many owners of commercial farms were expelled from Uganda and the country went into recession. To avoid a deeper recession, the government started forcing farmers into cash crop production or be slapped with cash fines. This enabled smallholder farmers who were in rural areas to concentrate on food crops, making them the major suppliers of food to the urban areas, a situation that has persisted to date.

In 1986 however, when the current government came into power, structural adjustment policies were instituted. Most farmer-support institutions like farmer co-operatives and marketing boards were abolished and most systems were liberalised and privatised. By the 1990s, with the introduction of the structural adjustment programmes of government, the main intention of the government was to modernise the subsistence agricultural system to increase agricultural outputs, especially for export purposes. In 2000, the major plan for modernisation of agriculture was launched as a government programme, with the aim of changing the subsistence farming system to a modern system, based on science, with a market orientation (MAAIF, 2000). However, when the plan was evaluated, it was discovered that the intended beneficiaries did not benefit; instead, a new class of farmers had been created. The subsistence sector still remained active and vibrant, despite being targeted by government policies to change it. The government of Uganda is still pursuing its plan of transforming subsistence farmers into modern farmers, while still acknowledging that they are the ones who are feeding the nation. Some authors (see for example,

Mamdani, 1975) have argued that the reason Uganda has survived many crises, is because the sector that produces food is still subsistence-based with a limited interaction with markets. The majority still produce their own food for home consumption; therefore, external negative forces and factors are not able to affect food provision.

There is agreement that climate change, seasonal changes, environmental changes and other economic and social changes have had a negative impact on agriculture, amidst this policy outlook and focus. With such changes, the methods that subsistence farmers have always found useful in the face of these changes, have in some cases been rendered ineffective, exposing farmers to shocks and stresses. The subsistence farming system in Uganda is rain-fed with very limited reliance on other alternatives for water provision, such as irrigation. Uganda has an annual average rainfall of between 1,000 mm to 1,500 mm, with two seasons of rain per year, affording it two planting seasons every year. This means that with climate change, among other things, sometimes there are sudden changes in the weather patterns affecting a wide range of crops, or long dry spells also affecting a season's crops, especially food crops. Farmers therefore tend to face many challenges alongside limited support from government, other bodies. It is unfortunate that the government tends to regard subsistence farmers as the failures of past policies that need change and transformation.

This study focuses on re-inserting the farmer into the picture to understand, from their own perspective, the shocks and stresses to their subsistence farming system and the responses to such challenges. Specifically, the study asks the following questions: (a) What are the shocks and stresses to a subsistence farming system? (b) What constitutes the capacity of a subsistence farming system to absorb the shocks and stresses associated with the production of crops? (c) What constitutes the capacity of subsistence farming systems to withstand shocks and stresses associated with food availability at the household level? (d) What is the capacity of subsistence farming systems to learn and adapt to changes resulting from the shocks and stresses?

Research on the resilience of farming systems is rooted in environmental research, especially research on sustainability (Mijatovic et al., 2012), sustainable livelihoods (Chambers and Conway, 1992), vulnerability studies (Gaillard, 2015), and natural resources management studies (Darnhofer et al., 2015). From materials science to ecological systems, resilience has been applied extensively to describe the strength and transformation capacity of systems. What most agree upon is that, in the current farming context marred by uncertainties and numerous challenges, it is of critical importance for any farming system to be resilient. To understand farming system resilience, this study conceptualises it as the capacity of the farming system and its units at its different levels, to provide “sufficient food for all, in the face of disturbances, unforeseen and otherwise” (Tendall, et al., 2015: 18).

In the context of global food security and feeding the world's hungry, many governments and initiatives have stepped up to the plate to combat hunger and decrease food insecurity, especially for the poorest people in the world. It has become increasingly important for resilience to be understood and operationalised in people's lives, especially farmers. Resilience in this case, as conceptualised by Tendall et al. (2015), is defined as consisting of reactive actions and preventive actions, when faced with shocks and stresses. Firstly, they observe that a system will build robustness in the face of shocks and stresses, that is, the capacity to withstand the shock or stress, with very minimal effect on the outputs of the food system. Robustness is preventive in nature and builds the profile of the system to the extent that it aims at preventing damage, such as reduced

output, or reduced meals, or reduced nutritious food (Anderies et al., 2013). The capacity or ability of the food system refers to the different constituents of robustness that eventually have an effect on the total resilience of the entire food system. Mijatovic et al. (2012) agree that robustness is an important constituent of resilience, embedded in the whole system and actions at each stage or level of the shock or stress to the system, thus building robustness. Secondly, a farming system is characterised by redundancy as part of the constituents of building resilience, referring to the extent to which components of the system can be replaced, giving a base to its capacity to absorb the effects of the shock and stress, with the aim of avoiding food insecurity. This aspect speaks to the dynamic nature of subsistence food systems – in the face of shocks and stresses, a farmer might opt to replace one aspect of the system with something else that is more workable in as far as it will ensure that food is produced and is available to the farmers' household. In this sense, replacement is not a negative concept, but rather a progressive one, that impacts positively on the whole farming system. Thirdly, they argue that resilience also encompasses the flexibility of the system, especially the rapidity with which a system will change to ensure that food security is not lost. This has a time dimension to it, depending on the occurrence, whether shock or stress and the extent to which it has damaged the farming system. A system that changes with challenges and is accommodative to different actors and actions, enhances its resilience patterns. This is based on the dynamism of a subsistence farming system and the onset of unexpected uncertainties; this requires that a system does not stick to one way of doing things, but instead flows with the changes it faces. Lastly, resilience of a subsistence system is dependent on its resourcefulness and adaptability, which refers to the ability to attract and draw on its own resources and adapt them to the prevailing circumstances.

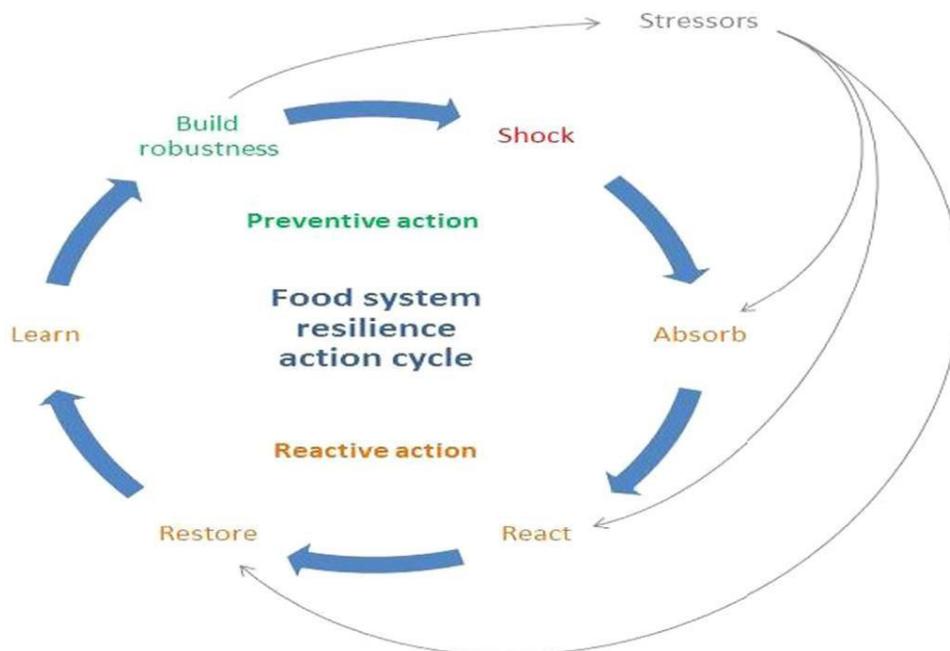


Figure 1: Food system resilience action cycle

Source: Tendall et al. (2015: 19)

As the figure shows, a subsistence farming system is in a continuous resilience action cycle. Shocks and stresses reoccur, making it necessary for the system to transform its structures to fit the prevailing circumstances. There are actions that speak to adaptation and absorption, while others are reactive in order to restore the farming system through learning and transformation (Darnhofer et al., 2015; Jacobi et al., 2018; Urruty et al., 2016). These components all require an understanding of the system, to know what it is composed of, so that in the face of shocks and stresses, it can (a) be adapted; (b) know what aspects inside the system can absorb what shocks without destroying the system components itself; and (c) know what learning has happened, prior to (preventive) the occurrence, during the shock or stress (reactive) and after everything has happened, to build the system for future occurrences.

Methodology

The nature of resilience as explained above, is dynamic, transient and fluid, therefore the methods of data collection were complementary and exploratory – they would capture the lives, experiences and challenges of farmers, told from their perspective. The study involved 100 households of subsistence farmers in Wakiso district, Central Uganda, in Nangabo Sub-county. A survey was conducted among all 100 households, interviewing the head of each household (UBOS, 2014). The survey collected extensive information about (a) the shocks and stresses and their coping mechanisms; (b) constituents of resilience to shocks and stresses; and (c) constituents of adaptability, transformation and learning.

In order to understand the extent of shocks and stresses and how they affected each other, a stressor and shocks-mapping participatory exercise was conducted with 30 subsistence farmers, representing 30 households, sampled from those who participated in the survey. During the mapping exercise a group discussion was conducted with the groups of farmers, with females and males separated, to further understand their experiences. Lastly, an in-depth interview was conducted with 30 farmers, sampled from those who participated in the survey to further understand experiences of individual farmers, when faced with shocks and stresses.

All data collection instruments were pre-tested in another sub-county with characteristics similar to Nangabo and administered by the principal researcher, assisted by three research assistants. Data was analysed by using descriptive statistics and content analysis for the in-depth interviews and data from the discussions. All data was triangulated to find meaning in the stories of the respondents.

Results

Shocks and stresses to a subsistence farming system

The findings revealed that a subsistence farming system is a combination of numerous activities, actors, processes, and outputs, which combine to make a system affected by numerous shocks and stresses to differing magnitude. The farmers' greatest shock was the havoc wreaked by pests on their crops, which occurred at any time during the agricultural calendar and had very devastating

effects on the farming system. Farmers explained that some of their crops like maize and bananas were susceptible to the diseases caused by pests and sometimes it led to the loss of an entire harvest.

The second most common shock, was unreliable rainfall. In some cases, when farmers were expecting rain and planted, they got sunshine instead, thus destabilising the agricultural system for a whole agricultural calendar year, leading to stresses like shortage of food. In addition to the above, farmers also indicated that in some cases, floods destroyed planted crops and led to poor or no yields at all. As already discussed, subsistence agriculture is rain-fed and therefore dependent on natural weather patterns to water crops and make the land suitable for planting, and it is expected that rain or sunshine will come at the right time. However, with climate change and environmental challenges, any system that depends on natural weather patterns tends to be in danger of being crushed by the effects of these systems. The shocks were exacerbated by additional stresses, most notably the loss of soil fertility, which farmers reported as affecting their farming outputs extensively, as well as changes in seasons, lack of markets, and lack of access to extension services.

Farmers in the group discussion and in-depth interviews, revealed that when a piece of land loses soil fertility, it is either left for a while and it rests to regain its fertility, or farmers will keep cultivating on it because they have no access to other land. Most farmers reported that they did not have the luxury of leaving the land for a season or two, because they did not even own the pieces of land where they lived. There were landlords and private companies that owned the land and dictated whatever the tenants were to plant or how to manage the land. In case a landlord wanted their land back, particularly if there was no signed paper agreement, they decided and executed their plans, sometimes cutting the crops down or if one was lucky, allowing a short period for the farmers to harvest what could be harvested and if not, the crops were slashed to the ground.

The presence of shocks and stresses present some similarities to what other scholars have found about subsistence farming systems – their circumstances can change from one day to the next or they can flourish without any effects on the system. On the whole, and from this study, the findings also revealed that the shocks and stresses are not ends in themselves; systems often bounce back faster than anticipated and at other times, they transform in the face of a shock or a stress. There was not a point at which a farmer reported giving up completely, but they indicated that prayer and seeking supernatural intervention at times became a very important survival mechanism. Loss of land and land grabbing also stood out as traumatic experiences that caused a total collapse of the subsistence system, causing farmers to relocate their entire household or their farming system to another piece of land. This demonstrated the integral part that land plays in a subsistence system – as the basis of a particular system – without which a household is unable to access food.

Constituents of absorption and adaptation of a subsistence farming system to shocks and stresses

The findings of this study revealed that the recovery of a subsistence system from shocks and stresses was constituted by various components. The strategies that farmers employed to absorb shocks and stresses were dependent on internal and external factors and actors. Internally, absorption constituents included building on the knowledge skills and resources that were available to the system to survive. Generally, farmers treated crops that were diseased, by accessing drugs to spray pests. Others lived through the situation – they did not give up; they

simply took in all the effects of the shocks. Yet others irrigated the crops that were affected by drought and seasonal changes while other farmers removed affected crops from their gardens. Farmers indicated that adapting to and absorbing stresses required unique responses and therefore the strategies applied differed from those applied to shocks. In absorbing and adapting to stresses, the findings revealed that some farmers borrowed money from their community savings groups or from relatives, while others decided to wait on the next season, even if it was not guaranteed that it would turn out differently. Other farmers planted different crops or sprayed the diseased crops.

As scholars have argued, unless a farming system absorbs and adapts to the changing circumstances, resilience is compromised. Farmers in this study indicated that such actions are taken as part of everyday life (Tendall et al., 2015). The findings from the survey, the discussions with the farmers, and the interviews revealed that one aspect of resilience does not exclude another. Given the multiple shocks and stresses that farmers faced, the strategies in some cases were also applied concurrently. For instance, a farmer fighting pests would also be faced with drought, and hence, has to irrigate and would also be facing loss of land or lack of farming inputs. The nature of subsistence farms is such, that all these challenges happened concurrently and were solved at the same time, to ensure that the crops for the season were not lost, because that implied lack of food for the family. What it also demonstrates, is that for household food security, the subsistence farming system can be supported to provide food, as this is its primary purpose. All efforts targeting subsistence farmers therefore, must primarily support the function of food provision, before anything else. The actions taken by farmers were reactive and preventive in nature, focusing on ensuring that food was available both in the short and long term. Waiting for another season did not mean that a farmer sat and did nothing while waiting – this was applicable to a particular crop. For instance, if maize got diseased in a particular season, the farmer would then wait to plant maize the next season; but planting other crops would sometimes be done on the same piece of land.

From the resilience perspective, the findings demonstrated a redundancy of aspects of the system that characterise the subsistence farming system studied as being resilient. Farmers changed and replaced crops, altered their livelihood activities, changed their farming methods, and used fertilisers, all of which enabled the system to absorb/withstand the shock or stress that they faced. It was the redundancy that enhanced the capacity of the subsistence farming system to live and survive through the shock and stress – an argument advanced by Tendall et al. (2015).

The capacity to adapt subsistence farming systems to changes resulting from shocks and stresses

Learning from and adapting to shocks and stresses have been acknowledged as ranking among the major parameters of understating how resilient a farming system is (Meuwissen et al., 2019). Findings from this study revealed that farmers learned from their hardships and each one took a lesson and acted on it. There was learning that can be characterised as learning to adapt, and learning for the future and for the long term. Most of this learning happened on the farm, with their friends and in their households. Importantly, the farmers had no access to agricultural extension services as a support system. The farmers indicated that when they were faced with stresses and shocks, they learned different things. This translates to learning to absorb, learning to adapt, learning to restore and learning to transform. Farmers learned to absorb the shocks and stress, by resorting to actions such as: irrigating their crops, identifying rentable land, and using

fertilisers. Learning to adapt to prevailing circumstances involved applying measures, including: (a) planting early instead of waiting for the onset of the rains; (b) preparing themselves for the uncertainties in time, by anticipation and prevention, which built the resilience of the farming system; (c) practicing crop rotation; and (d) selling their products within the community. Learning to restore in this case, involved saving regularly, crop rotation and fallowing the land for a season to regain its fertility. Learning to transform involved farmers changing their current practices, for instance, crop rotation, consulting other farmers, renting land, growing marketable crops, and learning to use limited space for their crops. Significantly, learning took place with the transformation process, giving it a short-term and long-term outlook as far as the system resilience was concerned (Darnhofer, 2014).

The learning that happened on and off the farm, and the nature of adaptation strategies show that resilience for a subsistence system is complex, yet simple and diverse. It is complex in the sense that every aspect is interconnected, and simple in that it happens as the shock or stress takes place. It is dynamic, fast and practical, because its impact is felt as soon as there is a stress or shock. While this has been singled out as one of the reasons that the subsistence farming system model is difficult to plan for and to manage, it is the basis of its survival. It increased the buffer capacity and robustness of the system (Tendall et al., 2015) and the lessons learned will also affect the long-term survival of the whole system, as argued by Jacobi et al. (2018; 2019). In these findings, this constituted using methods available to build the strength and resources of the system, to enable it to generate reserves for when the next shock or stress impacts the system. It was this learning process that contributed to the resilience of the whole system by its focus on one aspect of the system.

Conclusion

The future of subsistence farming systems is in enabling them to enhance their capacity for resilience. It is clear that even with the challenges they face, such systems thrive and fulfil their primary purpose of providing food for households, making them a very important actor in the fight against hunger. The findings have shown that the shocks and stresses are multiple and diverse and sometimes strike concurrently. The findings also showed that, instead of viewing shocks and stresses as completely negative occurrences, they often thrust the farming system into a continuous learning cycle or phase, enabling the system to adapt and emerge stronger than it was before the incident. Therefore, the state of being resilient is highly dynamic and fluid, calling for a high level of flexibility and critical engagement. The subsistence farming system therefore needs to be supported by government institutions to build more resilience and increase its primary system output, which is food security.

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