ICTs as Enablers in the Adaptation of PGS: A Participatory System for Socio-Economic Empowerment of Rural Smallholder Farmers in Adamawa

Research-in-Progress

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Abstract

ICTs are presented as enablers in an adaptation of PGS for socio-economic empowerment of rural smallholder farmers in the village of Bura Lamja in Adamawa State, Nigeria. A consensus exists in international development that ICTs can contribute to the development of rural poor provided the targeted communities actively participate in such development efforts. Furthermore, communication, knowledge sharing, and respect for diversity are critical determinants of the success of socio-economic change. Development initiatives targeting the rural poor should create an enabling environment for stakeholder ownership and active participation. The communities must make a meaningful contribution in conceiving and nurturing such initiatives. ICTs are deployed here not as direct solutions to social inequalities but as catalysts supporting communication processes that empower the Bura Lamja community to actively engage change and build the capacity needed to improve their livelihoods in a sustainable way.

Keywords

ICTs, Participatory Guarantee System (PGS), socio-economic empowerment, enablers, participation, smallholder farmers, rural development

Introduction

There are over 500 million Africans and over 65% depend on small-scale farming as their primary livelihood source [ASFG 2013]. There are over 300 million rural poor people in sub-Saharan Africa, with over 62% living in absolute or extreme poverty – i.e. they live on less than $1.25 a day. These are also the people who are the most marginalized. In this paper, poor refers to the same definition of extreme or absolute poverty. It is what Gordon [Gordon 2005] defines as absolute poverty, "a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to services." These poor people lack choices, access to credit, income-generating opportunities, as well as the basic
capacity to participate in society. They, generally, live in relative insecurity, powerlessness, and exclusion. The causes of poverty are diverse and complex [Marker et al. 2002].

Africa has approximately 33 million small farms, representing 80% of all farms in the region, and they produce as much as 90% of the agricultural output in Africa [ASFG 2013]. Yet over 30% of the population in sub-Saharan Africa are undernourished, and live in extreme poverty. The question is how can these small-scale farmers produce enough to feed themselves and to make a living out of farming? International development researchers have, for decades, attempted to answer this question using varying approaches [Bragg et al. 2010].

The Bura Lamja village is a small rural community in Northeastern Nigeria. Based on a review of existing documentation, records, and baseline data collected over several months of direct interactions, extensive interviews, and observations, the primary source of livelihood for this community is farming. However, there is a growing range of other farming-related microenterprises such privately owned cornhusk grinding machines which are limited in scale because of inability to access adequate financing and unable to meet local demand. Through existing collaboration with local educational institutions and researchers, the Bura Lamja people have come to recognize the urgent need to generate greater outputs from farming, establish better access to local and domestic markets, and scale up other farming-related microenterprises to support the growing population and to create employment opportunities for their growing and increasingly more educated but unemployed youth. In addition, there is a surprisingly high diffusion of Information and Communications Technologies (ICTs) such as mobile phones, particularly, amongst the younger population and the more dedicated smallholder farmers (henceforth referred to simply as “smallholders”).

The Bura Lamja smallholders have recognized that they need to collaborate with each other, to pool their resources in order to exploit existing opportunities within and beyond the community. Furthermore, the local research institutions present an opportunity for the local communities to access ICTs that would ordinarily be beyond their reach. Therefore, an important objective was to devise a pragmatic and cost-effective system using ICTs as catalysts to support the sustainable socio-economic development of the Bura Lamja. Such a system must draw upon the existing recognized strengths of the community to be attractive to stakeholders and to lower any barriers to adoption. The approach described in this paper presents ICTs as enabling tools in the socio-economic empowerment of rural smallholders through a farming system adapted from the International Federation of Organic Agriculture Movements’ (IFOAM) Participatory Guarantee System (PGS). The conception of the system was a jointly effort with the smallholders, and is a model that is very attractive to them because it fits with existing cultural structures.

**The Bura Lamja Smallholders**

The State of Adamawa in Northeastern of Nigeria is one of 36 States. It is one of the least developed, with the one of the highest levels of illiteracy and poverty. Bura Lamja is a remote village community near Mayo Belwa, the hometown of the reigning Governor of Adamawa. It has over 6,000 inhabitants the vast majority of whom are smallholders (both men and women). The vast majority of the smallholders are illiterate and do not speak the English language. These smallholders produce cash crops such as corn, maize, groundnuts, and beans. They also rear poultry, sheep, and cattle. There is also a community of Fulani herdsmen, who rear large herds of cattle and, they appear to have a very harmonious and symbiotic relationship with the village. The Fulani herdsmen currently buy large quantities of husk cattle feed from the village, particularly during the dry season. Corn or maize husk feed is agricultural waste that is ground and then processed with fungi into nutritious feedstuff for ruminant animals via solid fermentation [Akinfemi et al. 2009]. The village smallholders already make limited use of organic fertilizer, from cattle manure, to boost their crop yields but each smallholder acts independently. The opportunity exists to collect and consolidate the abundantly available cattle manure from the Fulani herdsmen, local cattle farms, as well as slurries from the abattoir in the neighboring town of Jimeta, to process and create a common pool of liquid fertilizer that is available to the smallholders.

In terms of rural infrastructure, the Bura Lamja smallholders are in a privileged position in that the village is, just recently, been linked by federal trunk road to other neighboring villages such as Mayo Lamja and local markets. However, only limited local transportation is currently available that, carries passengers and farm produce 3 times a week to the various local markets. The village also has a market on
every Monday of the week but because produce volumes have been low the number of buyers have also been dropping. Therefore, the route is not competitive and transportation is relatively expensive because the volume of farm produce available for the local markets has not reached critical mass. There are currently two privately owned cornhusk grinders in the village. Even though the demand for husk-powder based cattle-feed is high the owners' finances are limited and so these machines are often in a state of disrepair. The herdsman and smallholders, therefore, often have to travel to neighboring villages to buy husk-powder cattle-feed.

The stated needs of these smallholders include the usual suspects, in no particular order:

- they lack access to credit for more and better quality farm inputs; to invest in an appropriate husk grinder(s) that can serve the village needs
- they lack fertilizers - organic or inorganic to improve their crop yields;
- they lack pesticides, knowledge and the know-how to prevent diseases that affect their crops;
- they lack adequate transportation to improve access to local markets;
- they lack access to adequate power for lighting and charging mobile phones they use to connect with their customers
- they want to diversify the income-generating opportunities in the village, particularly as there is a good population of young men who are currently untrained, unskilled, and unemployed

Major challenges facing the Smallholders

There are many private and non-governmental organizations, such as the African Small Farmers Group [ASFG 2013], with extensive experience of supporting smallholders in scaling up their participation in local, domestic and international markets. The ASFG, and other organizations also advocate for policy changes to increase the support that smallholders receive from national governments and the international development community. According to the ASFG, the issues that influence smallholders' equitable and sustainable access to markets need to be separated into three categories: 1) the cross-cutting issues which have wider relevance beyond the rural economy; 2) the pillar issues which specifically impact smallholders and; 3) the foundation issues which impact the entire rural population.

In this paper, the focus is on the pillar issues that directly affect the rural smallholders and which the smallholders can start to do something about right away. The paper, only briefly, reviews some of the related foundation issues because they influence smallholders' access to markets. Foundation issues are to do with what national governments are expected to provide: such as rural infrastructure, including feeder roads, energy services, irrigation, storage and warehousing; rural public services such as health, education, water, and sanitation; rural investment climate, and enabling environment for business. The evidence on the ground is that there is little investment by the Nigerian government on rural infrastructure and services. The problem is exacerbated by the fact that the rural population, in general, tend to lack any voice or political visibility, and cannot participate in shaping the policies that impact their livelihoods.

The pillar issues that directly affect the smallholders include access to land and water; access to credit and inputs; access to markets; and access to research and extension services. In Nigeria, the Agricultural Credit Guarantee Scheme Fund (ACGSF) is a policy instrument of the Federal Government of Nigeria on Agricultural Credit [CBN 2007]. The Scheme was established by Decree Number 20 of 1977 but started effectively in 1978. It was established to provide guarantee on loans granted by banks to farmers for agricultural production and agro-allied processing. The ACGSF as well as other credit schemes that were put in place by the Nigerian government to encourage agricultural development but often require a "Personal Guarantee", as security that is offered to the bank as a condition, for a loan that typically amounts to only about $100. The ACGSF and related government credit schemes have encountered other problems as well, including: high loan default rates; lack of cooperation by participating banks because of the high cost of processing these loans and the related high default rates; and poor publicity or awareness resulting in very low farmer turn out in most Nigerian States [Nwosu et al. 2010]. The underlying reasons for the high default rates include poor farm management, low product prices, loan diversion, deliberate refusal to pay and the inability of farmers to assess loan requirements properly leading to inadequate or
excessive loans. What seems clear about these credit schemes is the fact that the targets are individual farmers. However, the rural poor more often than not, do not own the title to the land they cultivate, which could otherwise serve as collateral for the loans. Therefore, those that have tended to benefit from these loans have been the wealthier farmers who are more likely to be aware of the schemes; and that can provide the requisite "Personal Guarantees". Nevertheless, there are also indications that the ACGSF has increased the flow of funds to farmers overall but more has to be done to address the challenges smallholders face. In addition, the lack of adequate government investment in rural infrastructure and feeder roads usually means inadequate access to markets, as transportation can be extremely difficult, irregular, unsafe, and too expensive to deliver fair returns to rural smallholders. Similarly, buyers are also not sufficiently attracted to source from rural smallholders because the returns may not be significant given these obstacles.

Smallholder empowerment

When farmers work together in a group with common goals, they are more able to utilize economies of scale to lower their costs, improve their overall productivity and competitiveness, and to strengthen their bargaining position in the markets. Therefore, working collectively, smallholders can reduce and better manage their risks. As a group, farmers are collectively more attractive to creditors and lenders as they are less likely to default. It is expected that government credit schemes such as the ACGSF and its participating banks are, therefore, more likely to provide loans to cooperative associations or smallholder groups than to individual smallholders. In fact, the Nigerian governments should recognize such smallholder groups, both formal and informal one, and encourage participating banks to make loans more accessible to them. The government can even go further by offering tax incentives to such smallholder producer organizations, thus further economically empowering them.

In Africa, soil is often fragile and degraded, particularly in the areas that are more arid such as in the northern part of Nigeria, which includes the Adamawa State [ASFG 2013]. The Nigerian government and some donor organizations support the use of inorganic and mineral fertilizers to promote crop yields. However, there are questions and concerns about the long-term health impact of using inorganic fertilizers. Therefore, where the opportunity exists to use organic fertilizers, which can be produced from local and naturally available resources, it should be pursued.

The term Participatory Guarantee System (PGS) is relatively new even though these kinds of initiatives have existed since the 1980s and in over 20 countries around the world [IFOAM 2014]. According to IFOAM’s definition, "Participatory Guarantee Systems are locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange". The PGS has been adapted in various countries. There is no data available on the number of PGS initiatives that are operational in Nigeria at this time. Across the whole of Africa, there is 1 in Zimbabwe, with over 850 producers that have already been certified; 2 in South Africa, 1 in Namibia, and 1 in Uganda. Figure 1 below, shows a diagram of a typical PGS [May 2008]. These PGS initiatives are underpinned by some basic elements, which embrace a participatory approach, a shared vision, transparency and trust. IFOAM provides guidelines for the PGS but there is no requirement for an adapted PGS initiative to adopt all elements right from the get go.
The Bura Participatory Guarantee System (BPGS)

The PGS approach [May 2008] was chosen as the best model to be adapted to cater for the needs of the Bura Lamja smallholders, their customers, and other stakeholders. Figure 2, below, illustrates the key elements of the BPGS, adapted from the IFOAM PGS Guidelines [May 2008] with the following clarifications:

- No explicit commitment to organic farming except that all produce shall be naturally grown;
- Reaffirmation of the commitment to promote local shared ownership and participation;
- Commitment to value, generate or develop, and share local content;
- Commitment to locally adapt globally appropriate and/or convergence of technologies
- Commitment to value cultural traditions and to leverage ICTs that support and nurture local communication;
- Commitment to cultivate relationships with local informediaries and information providers to build adaptation skills;
- Commitment to develop local capacities through training opportunities for extension workers and smallholders;

The key elements of the BPGS are described below:

- The key stakeholders include the smallholders of Bura Lamja, the customers from local markets, researchers from the American University of Nigeria, Fulani herdsmen, abattoir, lenders, and others;
- Central facility for processing, storing, and distributing liquid manure and slurries. Cattle manure from the Fulani herdsmen, farmers, and slurries from the abattoir is stored here;
- The Fulani herdsmen provide cattle manure and in return they enjoy discounted husk cattle feed rates;
- Farm produce storage facility, necessary when produce volumes increase (farm produce and cattle feed);
- Husks grinder to process corn husks collected from farms by local collectors;
- Specially customized tricycles for collecting and transporting manure and slurries;
- Locally adapted spreaders or tractors for spraying liquid manure on farms;
- ICTs for critical communication and coordination between stakeholders; improving access to markets, prices, and farm inputs; producing and adapting local content; collecting, analyzing, sharing research data and monitoring; as well as capacity building; for sourcing and securing funding from micro-finance sources.

**Figure 2: The Bura PGS**

**ICTSs as catalysts for empowerment in the Bura PGS**

ICTs can be defined as technologies that facilitate communication and the processing and transmission of information by electronic means [Marker et al. 2002]. This definition encompasses the full range of electronic technologies and media, from radio and television to telephones (fixed and mobile), e-mail, computers, digital cameras, the Internet, and portals. There is a consensus amongst researchers in international development community that ICTs can be decisive tools but not the solution to rural development [Sudan 2010, Bujoreanu 2013, WB 2014, Uphoff 2012, Belden 2012]. What most researchers also agree on is that, for ICTs to be catalysts for the development of rural communities, it is critical that there is community participation in conceiving and operationalizing development initiatives.
According to Alfonso Gumudo-Dagron, there are certain conditions that must be true for ICTs to contribute to the development of poor rural communities [Gillman 2003]:

- Ownership and appropriation of the communication process;
- Development of local content;
- Language and cultural pertinence;
- Convergence and networking;
- Appropriate and sustainable technologies

The BPGS described above ensures that smallholder participation in the Bura Lamja village is nurtured in a structured and proven system. ICTs are identified that act as enablers or catalysts of socio-economic change. The Bura Lamja smallholders currently have a number of challenges that hinder communication and flow of information that is necessary to support the BPGS. These smallholders are mostly illiterate and their primary language is Fulfulde, related to Hausa. However, there is a surprising high level of ICTs diffusion in the community, particularly amongst the rural youth. Almost everyone in village owns a mobile phone, often with more capability than just making a phone call. There is a local community shop with a satellite TV that draws people who are interested in European league football, American wrestling, as well as local news and other local content and entertainment. In general, the community appears to be a position to benefit from an injection of knowledge, training, and skills so that they can adapt a variety of appropriate technologies. These is expected to have a beneficial impact on communication, improve access to local markets, input prices, customers, and also create related income-generating activities that revitalize the local economic environment of the Bura Lamja.

**Access to credit and farm inputs**

A web portal created for the BPGS promotes the smallholders, re-enforcing participation, brings visibility, and highlights the smallholders’ reduced overall risk profile. The BPGS it strengthens the bargaining position of the smallholders; it also ensures greater visibility with the local government and relevant agricultural institutions in Adamawa; and it presents a more attractive candidate for government credit schemes and other micro-finance lenders

**Access to fertilizers**

In most developing countries, the smallholders get fertilizers through government subsidy schemes and extension workers. In the absence of trained extension workers, the smallholders determine the fertilizer usage, often, with the assistance of retailers or input sellers. These farmers do not often use the proper dose and chemical type due to lack of appropriate knowledge. The consequence is higher production costs as well as harm to human health and the environment in the long term. With the assistance of research stakeholders the BPGS can adapt technologies such as the e-Krishok program in Bangladesh [Palmer 2012]. In the Bangladesh program, an online tool called Fertilizer Recommendation Solution (FRS) was used to provide farmers with guidance on fertilizer type and dosage. This kind of tool may be adapted, with the help of the BPGS research stakeholders, for use in the Bura Lamja. The BPGS research stakeholders can also provide support in terms of knowledge and skills, and assist the village to construct an organic fertilizer processing and storage facility that utilizes cattle manure from the farms and Fulani cattle rearers, as well as slurries from the neighboring abattoir in Jimeta. Furthermore, the BPGS can network with other neighboring smallholder groups to exchange knowledge and traditional lessons.

**Access to pesticides and disease prevention**

The BPGS can work with local research stakeholders to identify and adapt innovative ICT solutions, such as what has been implemented by UNICEF’s Technology for Development (T4D) team, the Ureport (www.ureport.ug) [Bujoreanu 2013] and others such as the Ushahidi crowdmap portal [Ushahidi 2014]. UNICEF’s Ureport is a network of 195,000+ volunteers across Uganda who use mobile technology to report on various issues that are of interest to UNICEF and other development partners. The technology behind Ureport also provides the capability to visualize crop disease epidemic and to disseminate critical information to affected communities or beneficiaries in an effective way.
Access to markets and transportation

The BPGS ensures that the smallholders progressively raise the quality of their farm produce, backed with locally derived certification scheme developed in collaboration with customers. This ensures that the farmers can eventually attract better prices for their differentiated and high quality produce. The BPGS ensures production costs progressively decrease as resources are pooled and; ensures that transportation costs drop as the Bura Lamja village market progressively becomes more competitive and local commercial activity flourishes.

Access to adequate power

The Bura Lamja smallholders lack access to adequate power for lighting. The Indigo pay-as-you-go system combines mobile and solar to deliver affordable energy as a service [Azuri Technologies 2014]; it can meet the smallholders’ lighting needs and provide a way to charge their mobile phones and; the rural youth can use it to study longer after dusk.

Diverse income-generation

The BPGS ensures jobs are created for rural unemployed youth, as manure and slurries collectors, husks grinders, and fertilizer operators. In addition, developments and improvements in smallholder productivity can ensure a proliferation of agriculture-related commercial activities and other income-generating opportunities, particularly for the women in the village.

Barriers to communication

ICTs can also be used to tackle another major cross-cutting barrier - the vast majority of the Bura Lamja smallholders speak Fulfulde and very little of the English language. The BPGS can work with stakeholders to train extension workers or rural youth who can operate as human intermediaries, such that information obtained from the Internet can be passed onto the smallholders who are mostly illiterate and do not have access to the Internet.

Conclusions

The adaptation of the BPGS is in progress, through a pilot program, and it is expected to lead to significant benefits, such as the socio-economic empowerment of the Bura Lamja smallholders who should be able to grow the income generated from farming cash crops and rearing cattle. The BPGS is expected to strengthen the smallholders bargaining power in local markets as a result of increased crop yields and improvements in farm produce quality through appropriate local content driven capacity building and skills development. ICTs are identified as critical enablers of vital communication processes and collaboration that support the development of the BPGS. The transportation and production costs should drop over a period of a few years due to increased commercial activity in the Bura Lamja village market. Over time, the smallholders will be able to attract better prices for their produce, because of progressive improvements in produce quality and increased produce differentiation in the local markets.

Finally, it is expected that several skilled jobs will be created because of the BPGS including: collectors who can collect and transport cattle manure and slurries using specially adapted tricycles; husk grinder operators and husk feed sales persons; farm liquid manure spreaders or operators. The BPGS should be able to secure the assignment of dedicated extension workers from the local government as a result of their increased bargaining power and higher visibility within the community.
REFERENCES


