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Tendayi Chapoto, Anthony Q.Q. Aboagye,

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African innovations in harnessing farmer assets as collateral

Tendayi Chapoto and Anthony Q.Q. Aboagye
Department of Finance, University of Ghana Business School, Accra, Ghana

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Abstract

Purpose – The purpose of this paper is to document and appraise two innovations by which nontraditional forms of collateral are being used to make smallholder crop and livestock farmers bankable in Ghana and Zimbabwe.

Design/methodology/approach – The setup and operations of the warehouse receipt system (WRS) in Ghana were evaluated for the extent to which the WRS was meeting crop farmers' expectations and the WRS's own objectives. Owners of the WRS, a certified warehouse operator in a big city, and two operators of certified community warehouses in farming communities were interviewed. Two focus group discussions with crop farmers were also held. Information about the setup and operations of the Tawanda Nyambirai Livestock Trust (TNLT) Private Limited in Zimbabwe (TNLT) and extent of serving the credit needs of livestock farmers was obtained by telephone from the managing director. Data were gathered in April 2014 and were analyzed later.

Findings – Due to low output no smallholder farmer targeted by the WRS had been issued with a tradable certified warehouse receipts to serve as collateral to potential lenders. Grain aggregators (non-farmers) have aggregated enough grains from farmers to be issued warehouse receipts. Grain farmers report substantial reduction in post-harvest losses when they lodge farm proceeds with certified community warehouses. For the TNLT, more than 140 farmers had deposited 700 cattle and had been issued with tradable certificates of deposit within one year of TNLT to obtain revolving credit from one bank. Other benefits and challenges are highlighted.

Originality/value – Both approaches have potential of helping to solve liquidity constraints of farmers.

Keywords Credit, Collateral, Crop and livestock farmers, Warehouse receipt system, Cattle bank

Paper type Research paper

1. Introduction

Smallholder agriculture in Sub-Saharan Africa is seen as key to poverty reduction and achieving food security as more than 70 percent of the population relies on agriculture for their livelihood (IFAD and UNEP, 2013). Despite holding a key position in Africa's agricultural sector, studies have shown that smallholder farmers face major liquidity challenges which curtail their farm production and productivity growth. Without access to credit, many small-scale farmers are not able to access key farm inputs such as seed and fertilizer that are pertinent to have a good harvest. Hence, they fail to adequately meet their family and other basic needs such as food, clothing, children's education and health care.

A number of studies have shown that providing small loans to the poor has positive impact on poverty reduction (Yahaya *et al.*, 2011), but the majority of the poor in Africa do not possess collateral acceptable to commercial banks to access loans. For example, rural farmers cannot use their farmland as collateral because they only have user rights of the land, rights which are not tradable (Endres, 2012). One area that has not received a lot of attention is how banks and other financial institutions can harness the less recognized types of collateral possessed by smallholder farmers, a subject motivating this paper.

Miller (2013) summarized the reasons for inadequate access to finance for farmers. They include the fact that agricultural production (crops and livestock) generally has a slower turnover than other microenterprise ventures traditionally funded by microfinance institutions. Also, agricultural credit requires longer loan terms. Thus, investing in agriculture entails higher risk to lenders. Furthermore, agricultural loans are much more sensitive to interest rate changes. Most of Africa's agriculture is rain-fed so farmers face risks which are beyond their control. Smallholder farmers' incomes are seasonal and

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coupled with weather risks which make them a very risky group to lend to. In addition, the land which the farmers use is not theirs, so they cannot use it as collateral. Finally, movable assets such as livestock are also considered high risk due to the absence of title or insurance to cover crops and livestock.

Against this backdrop, this study examines microfinance innovations that have been aimed at making smallholder farmers bankable. These innovations are intended to address collateral issues and allow the rural folk to benefit from the assets that they possess. This study investigates and reports on two microfinance innovations that are being implemented in two African countries to help farmers access their credit using some of the assets they possess. One is aimed at crop farmers in Ghana (a crops warehouse receipts system) run by the Ghana Grains Council (GGC), and the other is aimed at a livestock collateral system in Zimbabwe.

The study investigates the set up and operations of the warehouse receipt system (WRS) in Ghana for the extent to which the WRS was meeting crop farmers' expectations and the WRS's own objectives. The same was done to the livestock collateral system operated by Tawanda Nyambirai Livestock Trust (TNLT) Private Limited in Zimbabwe (TNLT).

The remainder of this paper is organized as follows. The next section reviews the literature on the use of WRSs, livestock and land use rights, and attempts to use these as collateral in Africa. It is followed by the methodology adopted for the study. Findings are reported, first for the Ghana WRS, then the Zimbabwean TNLT followed by discussion and recommendations.

2. Theoretical and empirical literature review

When banks make loans, they expect that repayments due on them would be made in full and on schedule. To increase the chances that these expectations would be met, banks undertake credit analysis of loan applicants to assess their credit worthiness and reduce the risks that banks face. One way of banks to reduce the credit risk they face is to require potential borrowers to post-assets against performance of their obligation, called collateral.

Credit analysis has many dimensions. One dimension is assessing collateral posted. Banks accept many forms of collateral. These include debtors, stocks, marketable securities, natural resources, real property and equipment, guarantees, personal property, etc. Of particular interest in this study is banks' concern about the ease of perfecting the bank's claim against the collateral. Issues of concern to banks when considering assets pledged as collateral include: standardization to remove ambiguity, durability (withstand wear and tear), ease of identification, marketability, stability of value, among others. On this score, the harvest of crops or head of animals owned by small-scale farmers often come up short against these yardsticks. Attempts and innovations to develop programs to make the multitude of smallholder farmers in Africa bankable (overcome shortfalls of their generic collateral) are discussed here.

2.1 WRSs

Various forms of WRSs are being used in Africa as a way of using farmers' crop output as collateral for loans. A number of countries including Malawi, Kenya, Zambia, Uganda, Ghana and Ethiopia have been implementing different forms of the WRSs. Generally, the farmer, for a fee, deposits grain into a certified warehouse and receives a receipt verifying the tonnage and grade. The warehouse then guarantees to maintain the grain's quality and quantity until it is transferred to whosoever buys the receipt from the depositor, or until the depositor asks to withdraw their grain. Farmers then can borrow against their grain in the warehouse as collateral (Onumah, 2010).

WRSs have been implemented successfully in the USA, Latin America and Asia (UNCTAD, 2009). Giovannucci *et al.* (2000) have documented a number of benefits that they confer. Some of the benefits include: enhancing ability to mobilize credit for agriculture by rendering farmers collateral secure; smoothing market prices by facilitating sales

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throughout the year rather than just after harvest; reducing risk in the agricultural markets; and improving food security and credit access in rural areas; helping to upgrade the standards and transparency of the storage industry by introducing better regulation and inspection; helping to create commodity markets to enhance competition, market information and international trade; contributing to lower post-harvest losses due to better storage conditions at the certified warehouse; and lowering transaction costs by guaranteeing quantity and quality.

In fact, worldwide, WRSs have been prerequisites for the development of future markets in agricultural commodities.

UNCTAD (2009) carried out a review of the WRSs and credit inventory systems in Eastern and Southern Africa (Tanzania, Kenya, Uganda, Madagascar, Zambia and Malawi). The review concluded that a number of critical factors need to be in place if establishment of a WRS is to be successful. These include: support services such as research, extension, financial and insurance services. Also, government output and price support programs run outside the system tend to work against the programs as private investment into storage and storage functions are curtailed. Another important requirement for the success of the WRS is an effective regulatory system and non-interference in the grain market by governments. Also, to be sustainable, WRS in Africa should not rely heavily on donor funding because if the system is run as projects then they are likely to die off when funds from donors stop flowing in.

Implementation of WRSs in Sub-Saharan Africa has faced many problems. Challenges faced in Malawi have been documented by Onumah (2010) and Nordier (2013) and for Tanzania, Kenya and Ethiopia by Salami *et al.* (2010). These challenges include: inadequate investment in suitable storage infrastructure to avoid post-harvest losses; absence or weak legal and regulatory issues; variability in quality of warehouse and storage management skills; and inadequate volumes to meet the minimum requirements for the warehouses to breakeven, and hence requiring continued support from donors.

2.2 Cattle banking system

There is not much literature about the use of cattle banking among smallholder farmers in Sub-Saharan Africa. Studies available refer to the use of livestock as collateral in the developed countries. Two notable ones are Aslam and Azmat (2012). They report that while there is great potential for livestock to be collateralized for microfinance loans, implementation has potential problems. One of the key problems has to do with the borrowers claiming non-existent animals as collateral. Another issue is theft of cattle, which has led to the need for biometric identification of the cattle. Traditional animal identification methods such as hot iron branding, tattooing, and tagging with various metal or plastic tags, as well as more modern electronic and digital methodologies including radio-frequency identification tags, rumen boluses, and implantable microchips are not considered conclusive enough to meet the high level of security needed for evidentiary proof of animal identity (Optibrand, 2014). These markers are reported to be susceptible to tampering, loss and human error, hence the need for biometric identifier such as the retinal vascular pattern which has the evidentiary power to ensure priority position and protection of a creditor in a claim against a debtor. Unfortunately, these are expensive and so cost acts as a hindrance to using livestock as collateral.

To be successful, the use of technological controls to minimize/reduce theft cannot be ignored. Also, prevention of diseases and mortality would require active involvement of animal scientists who are knowledgeable about caring for animals.

2.3 Land use rights and credit

Byamugisha (2014), for example, reports discussions on the possibility of using land use rights as acceptable collateral, it having been documented that in Sub-Saharan Africa,

the majority of smallholder farmers have only user rights to the land they farm because the land is held in trust for them by the state or by the traditional leaders. Therefore, the millions of smallholder farmers making a living out of land cannot use it as collateral.

However, Ethiopia has become a pioneer in issuing land guarantee certificates to poor land owners in Sub-Saharan Africa. The Ethiopian system recognizes that the legal and regulatory environment is inadequate to enable the full use of land as collateral. Nevertheless, there is emerging evidence that farmers with land use certificates fairly better than those without (Hagos and Holden, 2014).

In an exploratory survey, Smith (2001) interviewed 270 small farmers in Zambia. The results of the survey showed a widespread desire for having title to their land mostly to avoid risk of dispossession. However, USAID (2014) argues that it is unlikely for land titling alone to increase credit access in the vast majority of places where United States Agency for International Development (USAID) is engaged in development efforts. It concluded that there was a universal agreement among experts that while formal documentation of land rights does matter in the broad scheme of financial sector development, it is not sufficient to bring about more immediate access to credit, especially for the rural poor.

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3. Methodology

In order to gather the data during this study, a number of methods were employed. First, a desk review was done to gather information about the Ghana WRS. Next, interviews were conducted with WRS implementers/managers and farmers in order to solicit information about how the programs are run, challenges being faced, how these are being dealt with, and their visions for the future.

The Zimbabwean TNLT is a new entity which could not share contact information about the farmers they work with, with researchers based in Ghana due to privacy issues. However, the managing director of the Trust gladly accepted our request to interview him extensively about the initiative over the telephone. He shared with us the details of the workings of the program, growth rates of business, success and challenges and their vision for the future.

The second phase involved drawing up interview guides for both GGC and TNLT as well as designing a card for the participatory appraisal (PA) with farmers to rate the current WRS operations and rank in order of importance their expectations from the WRS. The PA approach makes for easier communication between researchers and their interpreters on one side and farmers on the other, given language differences. An interview with the Accra GGC outreach manager was done in April, 2014 before a field visit to a grain growing area in May, 2014. GGC field staff helped set up meetings with two groups of farmers, one in Diare and the other in Tamalagu, both just outside the regional capital, Tamale. In Diare, 27 farmers including 14 females participated in the focus group discussion after which we used the PA card to interact with farmers in order for them to rate the WRS. In Tamalagu, 24 farmers including 12 women participated in the focus group discussion.

The responses from this exercise and other responses from the focus group discussions were used to cross-check the supposed benefits and challenges on the ground and those provided by the GGC managers. This approach was chosen in order to gain a more complete view of the program.

4. Findings

4.1 The WRS in Ghana

The WRS in Ghana was started in 2012 by the GGC with the technical and financial assistance from USAID. GGC's main goal in establishing the WRS is to improve the livelihoods of smallholder farmers in Ghana through the provision of better and more organized storage

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facilities that would enable the farmers to store their grains for longer periods in anticipation of better market prices. The WRS would also assist the farmers with grading of produce and facilitate the use of the warehouse receipts to access loans using the receipts as collateral thereby helping alleviate liquidity problems facing the smallholder farmers in Ghana.

4.1.1 Operations of the Ghana WRS. At the time of this study the Ghana system had operated for two years. More than 80 percent of GGC's funding comes from donors who helped to establish the system. The rest of the funds come from membership fees. GGC management admitted that the progress to date toward achieving the basic function of WRS has been very slow because since the launch of the system, none of the smallholder farmers participating in the program had been issued with a receipt by the GGC Warehouse in the city so that they could potentially benefit from inventory credit. The reason is that, to date, none of the farmers have been able to meet GGC minimum quantity of ten metric tons to qualify to be issued with a warehouse receipt.

What the GGC has done is to arrange for aggregators (dealers in substantial quantities) to buy grain from the small-scale farmers at market prices. Farmers use mobile phone short message service to help them know the grain prices in different markets and then decide when and in which market to sell.

Currently, the benefits to smallholder farmers have mainly been through access to better storage provided by GGC Certified Community Warehouse (different from GGC Warehouse in the city) built within farming communities by matching grants from Alliance for Green Revolution in Africa and USAID. Smallholder farmers store their grain in the Community Warehouse for a fee of US$0.17 per 100 kg per month until they can sell the grain or withdraw some for home consumption. Moisture content test is done before the farmer's grain is accepted into the community warehouse (with a capacity of holding about 800 100 kilogram bags of grain).

GGC managers in the field reported that grain aggregators are finding the Community Warehouses useful because the aggregators can store their grain during the buying season until they amass enough quantities to move the grain to the bigger GGC Warehouse in the nearby city, Tamale, where the grain is further cleaned and graded. After the grain is transferred to the GGC warehouse, the warehouse operator in the city generates a receipt to the aggregator for the grain in the warehouse for the aggregator to use as collateral to access credit from the participating financial institutions if the aggregator so wishes.

To make its presence useful, GGC is training farmers in modern grain production and marketing. Further, at the time of the field visit, GGC had just embarked on a farmer training program intended to educate farmers about the benefits of group marketing. In addition to having a bigger bargaining voice, GGC wants farmers to realize the importance of group marketing and maybe one day a warehouse receipt can be issued to the group for them to access credit.

Further discussions with GGC revealed a major benefit to smallholder farmers, namely, reduction in post-harvest losses. Thanks to better storage facilities provided by the certified community warehouse. The GGC official further believes that smallholder farmers are realizing better prices for their harvest now that they have the option to use the community certified warehouses to store their grain.

4.1.2 Report on farmers' focus groups report. In order to check whether the benefits stated by the GGC team tallies with what the farmers perceived as the benefits of the WRS in their area, farmers were asked to rate the services they receive from the WRS in terms of access to credit, higher market prices and reduction in post-harvest losses, etc. Since none of the farmers participating in the WRS had received a receipt to use as collateral, it was not surprising that 96.3 percent of the farmers who participated in the focus group discussions disagreed when they were asked whether they agreed with the statement "Since the launch

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of WRS, I now have better access to credit." However, it is important to note that not everyone strongly disagreed with the statement suggesting that there may be other credit options that may have come up in their communities because of the organized storage system of farm produce. In fact, some farmers reported that some grain aggregators do pre-finance grain production.

At the focus group meetings, 85 percent of farmers disagreed with the assessment by GGC management that grain prices have improved since the inception of WRS. The problem is that at the moment farmers are not able to produce enough volumes to store and sell anytime between the current harvest and the next harvest (so as to receive higher prices during the lean season). Most farmers withdraw their grain too soon to gain the price advantages that accrue to utilizing the warehouses.

All farmers who took part in the focus groups agreed with the assessment of GGC that the WRS has helped farmers reduce post-harvest losses due to better storage. These results suggest that investment in good community storage facilities may go a long way to help farmers manage their produce better. According to Coulter and Onumah (2002), post-harvest losses due to poor storage in Ghana can be very high ranging between 6 and 8 percent for storage periods of four to seven months.

Next, the farmers were asked to rank the importance to them of the benefits they realised from the WRS. Results from both focus groups indicate that access to better storage was ranked number one (43 percent), followed by access to credit (33 percent). The least important on their priority list was receiving higher market prices (24 percent).

4.1.3 Challenges faced by farmers. The main reason for low production volumes was that farmers lacked resources to expand their production. As a result, they deposit their grain in the community warehouse and in less than two months they withdraw their grain in order to sell so they can take care of their pressing daily needs such as paying school fees for their children, putting food on the table, buying farm inputs, etc.

In addition, farmers indicated that high transportation costs were a hindrance to them taking their grain to the warehouse. Unless, a farmer has large quantities to attract the warehouse operators or traders, they would have to meet their own transport costs to the community warehouse.

Further, due to limited financial resources, many are not able to afford grain sacks. However, aggregators do bring sacks to the community for use by farmers who would sell their grain to these aggregators.

4.1.4 GGC and certified warehouse operator. In discussions with the GGC Warehouse operator in the city, Tamale, he indicated that certified warehouse operators like him qualified to be issued with a GGC Warehouse Receipts because he could meet the minimum GGC requirement of ten tons. He indicated that he was also a grain trader and all the grain in the warehouse belonged to him so he qualified to receive a GGC Warehouse Receipt in order to benefit from inventory credit. To ensure the credibility of the system, GGC uses a private collateral management firm to help monitor the operations of the GGC Warehouse and ensure that the quality and quantity stated on the receipt are not tempered with.

4.1.5 Challenges facing the WRS. Probing at GGC revealed that funds from participating banks (banks which had signed up to consider accepting warehouse receipts as collateral) were being channeled through the Commodity Clearing House (CCH) Financial Holdings Limited. Warehouse operators with receipts were being encouraged to access funds from CCH, which was itself a member of GGC. However, the operator indicated that interest rates charged by CCH were too high. Short-term credit costs 35 percent p.a. for up to three months, whereas prevailing bank rates were about 32 percent p.a. This was a disincentive to using the WRS.

A second challenge is that warehouse facilities in Ghana under the WRS are being managed by the owners of the facilities who were themselves interested in obtaining

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receipts to be presented as collateral for loans from participating financial institutions. GGC finds the dual roles of the warehouse owners to present a conflict of interest situation for they could in one way or the other falsify the quantity and/or quality of grains indicated on the receipt. Efforts to train collateral managers and officials from GGC to manage the warehouses should be speeded up. These officials would be at the warehouse premise and give daily reports on the movement (in and out) of the grains.

Yet another challenge is the distance between the location of existing warehouses (700 kilometers to Wa and 600 kilometers to Tamale) and the national offices of GGC (Accra) where the quality of the grains are tested and standardized. The distance is inconvenient to farmers, and creates anxiety and suspicion. Testing and standardization should take place at the premises of the warehouses.

Finally, as currently operated, the WRS is only semi-electronic. Steps need to be taken to remove or reduce the manual and human involvement to reduce subjectivity and speed up operations.

These challenges need to be addressed since the ultimate aim of the WRS is to provide the basis for establishment of a Grains Auction and Commodity Exchange (GACE) for Ghana. Establishment of GACE is likely to increase farmers' chances of gaining access to financing to enhance their activities.

4.2 TNLT

This section presents information gathered during a telephone conversation with the managing director of TNLT. Being based in Ghana, it was not possible for the researchers to speak to any of the farmers who patronize TNLT. The telephone conversation took place in April 2014.

4.2.1 TN livestock trust model. TNLT is into beef production and also owns fast food outlets across Zimbabwe to which it provides beef. By establishing the livestock trust, TNLT has just grown vertically upstream. The Trust slaughters the aging cattle for beef and replaces the slaughtered cattle with more productive cattle.

The desire to help solve the credit problems faced by Zimbabwean small farmers was the driving force behind the TNLT proprietors (private entities). Having studied the lifestyles and occupations of the people of this region, the proprietors settled on the idea of letting the farmers utilize their cattle as collateral. TNLT did not want to design a charity program but to establish a business venture that would help solve liquidity constraints in the cattle rich communal areas of Zimbabwe. They decided to set up a trust that could profitably empower the farmers by simply taking cattle as deposits and issuing receipts acceptable to the bank that has signed up to the system.

Under the Trust's model, farmers deposit their cattle at TNLT farms where the livestock would be under the care of veterinary experts employed by the TNLT. In return, the farmer gets a tradable TNLT certificate of deposit which they can use as collateral to access funds from a bank to meet any of their needs.

TNLT raises awareness about the services they offer in the communal areas and identifies those farmers interested in depositing their cattle for receipts. Once a farmer has signed up, TNLT picks up the cattle. An independent official from the Ministry of Agriculture carries out an initial assessment of the cattle at the pickup point. An agreement is reached in the presence of the farmer as to the sex, age, weight and overall health assessment of the animal.

To guarantee the integrity of the system, ensure transparency and reduce the hustle faced by farmers, officials from the Ministry of Agriculture are the ones responsible for determining the value for the cattle. Upon delivery at the TNLT farm, the animals are vetted for diseases and quarantined for at least two weeks before being released to join other cattle

on the farm. The farmers are then issued with a negotiable TNLT certificate of deposit showing the deposit, breed, sex, age, weight and value of the cattle. Currently, the farmer is able to access up to 65 percent of the value of the deposited cattle. The farmer retains the option to withdraw cattle of equivalent weight, sex and value.

TNLT does not itself provide credit to farmers. Rather, TNLT has partnered with the People's Own Savings Bank (POSB) to provide credit to farmers at prevailing interest rates and according to the banks terms and conditions. TNLT only guarantees that the Certificate of Deposit by the farmer is authentic and in case of loan default the bank will inform TNLT to liquidate the farmer's livestock up to the loan amount. In the event that a farmer dies without paying off the debt, a close member of the family can take over repayment of the loan and ultimately get the cattle back. Since the farmers are required at the minimum to sign a two-year deal with TNLT, this also means that the farmers have revolving credit for that period as long as they pay back their original credit.

4.2.2 Benefits of cattle banking. Some farmers find it difficult to look after the cattle because of lack of grazing land especially in the dry season when pastures are dry. The animals roam more in search of green pastures and in the process they get lost or stolen. As a result, farmers are now motivated to deposit their cattle with TNLT where their animals are under the watchful eye of qualified animal experts.

The need for young boys to stay home and herd cattle is now being replaced by TNLT. So these young boys can now attend school and be able to have a chance to chase their own dreams. Another benefit of depositing cattle with TNLT is the improvement of the farmer's herd through use of pedigree bulls or artificial insemination. If the farmer decides to withdraw after the two-year agreement they get improved cattle breeds.

TNLT started operations in March of 2013 with 38 cattle and within four months the herd had grown to 250 cattle. Currently, the herd is just over 700. With an average deposit of at least five cattle per client, TNLT had taken cattle from about 140 farmers in less than a year. TNLT started with one 250 hectare farm and currently has two farms. They had anticipated to have three farms in different locations by year end of 2013 but could not reach this target. However, the managing director is upbeat about the prospects of growth for TNLT.

All in all, TNLT has made it possible for the smallholder farmers to benefit from the assets they own without necessarily selling the assets.

4.2.3 Challenges. According to the managing director, TNLT has some challenges that it is working hard to solve. These include: raising awareness about TNLT's products which has been very costly and slow; lack of land tenure security making it difficult for TNLT to pitch its cattle banks at many locations; land owners granting only short-term leases so TNLT is challenged to make required long term investments.

By the time of this interview in April 2014, TNLT had only managed to establish two out of the three cattle banks it had planned for. Other challenges include: cattle depositors often asking for guarantees that the project will not close down due to farm takeovers; and other than POSB, other banks have been reluctant to recognize the TNLT certificate of deposit.

When asked to enumerate some of the problems faced by the farmers, the TNLT executive said the major problem revolved around trust. As a new concept, farmers were not yet confident about the product being offered by TNLT and many fear they could be swindled out of their cattle.

Also, since supplemental cost of feeding the cattle in the cattle bank is very high, TNLT plans to diversify and become a grain aggregator to supply their farms rather than buy grain at retail prices. This will involve setting up a warehouse and buying grain from farmers. TNLT hopes to reduce its costs and at the same time provide a sure market for the farmers.

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4.3 Overall discussion

The WRS model run by GGC has the potential of helping to solve farmers' credit constraints using inventory credit even though farmers are not yet in a position to produce enough volumes given their current technology and level of resources. To solve the challenge of small-scale farmers not producing enough grains to meet the minimum requirement to get the warehouse receipts individually, the GGC encourages the farmers to form cooperatives. That way, collectively, they would be able to meet the minimum requirement and obtain the receipts that could be used as collateral. After the loan has been secured, the lead farmer or nucleus farmer would then divide the loan among the small-scale farmers based on their grains in the warehouse. This approach is recommended.

Legislation to compel financial institutions to recognize the warehouse receipts as marketable securities has been proposed by TNLT. This study is unwillingly to wholeheartedly support such a move on the grounds that market forces should be allowed to operate. Risk perceived by financial institutions cannot be wished away by legislation.

Unlike TNLT that is wholly funded by private resources, sustainability of the GGC WRS is highly uncertain. With more than 80 percent of the GGC's funding coming from donors who helped establish the system initially, and the remainder coming from membership fees, the high percentage is likely to threaten the continuity of the program. GGC needs to quickly find alternative funding sources. There is no doubt that establishing a vibrant system will take time, and membership needs to grow to be able to sustain the system via membership fees.

5. Conclusion and recommendations

It would appear that both WRS and TNLT have similar design characteristics. If implemented well they have the potential of helping to address the liquidity challenges faced by most smallholder farmers. GGC has not met its primary objective of helping farmers access acceptable warehouse receipts as collateral, but some indirect benefits have accrued to smallholder farmers. These include: improved storage facilities, linkages to the market and improved grades and standards which hopefully can benefit farmers who endeavor to produce high-quality grain. Based on information provided by the managing director of TNLT, one is tempted to conclude that the business model is potentially sustainable as it is built as a private business with farmers borrowing from the market.

These authors did not have an opportunity to visit with the participating farmers, the credit granting bank and other stakeholders associated with the project, one is not in a position to make any useful recommendations other than to advocate first hand visit to the cattle farmers who deal with TNLT.

Micro-credit provision linked to smallholder farmers' inventory in the Community Warehouse should probably be left to private entrepreneurs and/or aggregators who can better design credit products suitable to farmers' needs. GGC should find a way to make these private sector players part of the set up that is promoting the WRS. Minimum required quantities can be reduced tremendously if the system is left to develop at that level.

Since both innovations studied, the WRS and TNLT are in their infancy, there is need do a follow up study to examine the progress of both programs a few years down the road.

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Corresponding author
Anthony Q.Q. Aboagye can be contacted at: aaboagye@ug.edu.gh

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