Pathways to Resilience in the Karamoja Cluster
A regional conference on recent research and policy options

21-23 May 2019, Moroto, Karamoja, Uganda

WORKING PAPER

The Role of Disaster Risk Financing in Building Resilience of Poor Communities in Karamoja Region of Uganda: Evidence from an Experimental Study

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Abstract

The occurrence of natural disasters continues to ravage communities from all around the world, and the impacts are far reaching for underdeveloped regions. Karamoja region in the north-east of Uganda has endured severe droughts for decades, causing deaths, underdevelopment and rampant poverty. Disaster risk financing (DRF) as a proactive approach to disaster risk reduction was piloted in Karamoja in 2016. The approach involved early detection of disaster risks and making financial resources available to take care of the needs of the affected communities during and after drought disasters. The initiative offered paid labor-intensive work on public projects to engender disaster risk resilience by preventing consumption from dropping and protecting people's livelihoods and assets. This paper focuses on how DRF contributed towards household productive assets and food consumption, comparing the periods before and after the intervention. This paper uses data from a sample of the same households selected scientifically across three districts of Karamoja region. A mixed method approach, involving both qualitative and quantitative methods was used. Both wealth index and household food consumption scores were used to assess the impact of DRF on consumption and household wealth. A number of significant findings were made and several scholarly and policy recommendations have been generated.

Introduction

Disaster risk financing is a proactive approach to disaster risk reduction which involves early detection of disaster risks and making financial resources available to take care of the needs of the affected communities during and after the disaster to smoothen consumption and engender resilience. Governments use several instruments such as accumulated reserves and precautionary savings, contingent credit, and post-disaster borrowing. These instruments are used to finance resilience infrastructure and to support people's livelihoods to cope with and recover quickly from disasters. Examples of these include cash transfers in Kenya; household reinsurance pools in Peru; disaster insurance in the Pacific Island countries; and Catastrophe Deferred Drawdown Option in the Philippines, all supported by the World Bank (Clarke & Wren-Lewis, 2016). The purpose of these financing initiatives is to help governments avoid becoming emergency borrowers, allowing them to protect their fiscal balance and maintain the welfare of their citizens.

In Uganda, DRF was piloted on poor households in Karamoja region in 2016 under the third Northern Uganda Social Action Fund Project. The aim was to develop a mechanism for scaling up assistance to poor and vulnerable households immediately following disaster events and a system to cover the costs of this expansion. The scale up was in form of offering paid labor-intensive work on projects such as construction of community access roads, water dams, tree planting, and opening up of block farms among others. The understanding was that if such community assets were in good shape, and functioning properly, they could help people either to sustain or recover from natural disasters (Masten & Obradović, 2008). In part, DRF was meant to help build a more resilient society during and after climatic disasters, helping to avoid loss of any gains made prior to climatic disasters. Decisions to trigger labor intensive works were reached automatically using objective, pre-agreed, quantitative indicators for which reliable, satellite time series data existed.

Whereas disaster risk financing is portrayed by many as innovative and better than relief and emergency support, its contribution to disaster resilience of impoverished communities is yet to receive consistent scholarly investigation. There is scanty scholarly evidence linking disaster risk financing to disaster resilience. Indeed, it has been noted that there is a need for better evidence to enhance, guide and support disaster risk financing programmes (Teh, 2015). This paper is an attempt to provide evidence on the contribution of disaster risk financing towards household disaster resilience. This is important because in Uganda DRF was implemented as a pilot, in part to gather evidence that the approach can deliver better results before it is adopted at a national level. The approach of utilizing disaster risk finances to facilitate labour intensive public works in poor, remote drought prone communities is yet to receive scholarly attention. In particular, evidence linking household food consumption and livelihood assets to DRF is yet to be generated from a developing country perspective. Even where related studies have been conducted, a focus on individual disaster resilience has hardly been made (Masten & Obradović, 2008). As such, this study contributes to these scholarly gaps by focusing on how DRF contributes towards access to productive assets and food consumption in a community suffering from drought disaster. Moreover, Cutter, et al (2008) call for further inquiry to provide guidance for implementing more sustainable practices that empower local communities to take their risks seriously, and at the same time provide guidance on policy changes needed to enhance community disaster resilience.

Research Design and Methods
A multi-method research approach was used to carry out the study. The study utilized quantitative and qualitative methodologies of data collection and analysis of both primary and secondary data. The two methodologies (used concurrently) revolved around extensive consultations, active participation of the key stakeholders, and extensive document review to facilitate triangulation. The study was conducted at three-time intervals, time 1 (before the DRF intervention), time 2 (after the first DRF trigger) and time 3

(after the second DRF trigger). The same cohort respondents participated in the study. These respondents were selected scientifically using a formula developed by Krejcie & Morgan (1970) were allocated to the districts proportionately. A total of 591 households were generated at time 1, representing a response rate of 89.5% and this was considered adequate (Richardson, 2005; Sekaran, 2005). The same respondents were sought at time 2 and 3. With this method, it would be possible to measure achieved change, and test whether the change was significant or not. A stratified three-stage cluster sampling design was used in the study from the district to watershed and household. The HHs in the watersheds were selected using a systematic random sampling method from the available sampling frame. From each selected HH, all women (above 18 years), men (above 18 years) were eligible to participate in the study, although only one was selected per household to represent the rest of the household members.

In addition to respondents who provided quantitative findings, the study also covered respondents who provided qualitative data. The qualitative survey took an embedded case approach, where, data were collected at several levels in each district. The embedded approach was useful because it involved triangulation, which reduces bias. It also provided a wider perspective on the activities and processes of DRF. So, in each of the districts, there were interviews at the Technical level, Operational level, and beneficiary level.

Socio-demographic characteristics of the respondents were measured by gender, age, education levels, and marital status. Access to productive assets was measured by ownership of livestock and basic household effects. Food consumption was measured by meal frequency and food consumption patterns (World Food Programme, 2011).

Quantitative data was collected and captured electronically using Computer Assisted Personal Interviews (CAPI) devices. Data was converted and exported to SPSS 24 for further checks and quality assurance as well as for generation of statistical tables. The data in SPSS was tested for consistency and all possible errors were removed before conducting the analysis. The analysis was done using mainly descriptive statistics. Comparative analyses were done on data from respondents who had participated at time 1. These analyses included Analysis of Variance (ANOVA), Student t-tests, and cross-tabulations. Qualitative data analysis was guided by the recommendations by Miles and Huberman (1994), Pope *et al.* (2000), Creswell (2006) and Bazeley (2007). First, a scheme representing the various study variables was developed from extant literature with an objective of determining operational definitions to facilitate the coding process. The predetermined categories were then coded into tree nodes. In the second round of coding, all transcripts were carefully reviewed, categorizing text sentences into emergent themes. The emergent themes formed the subcategory codes within each of the major categories. Using selective coding, the components of each subcategory were specified. This involved grouping quotations from the transcripts that represented each subcategory to enable the researchers to use the participants' own words as much as possible.

Results

Demographic profile of respondents
The socio-demographic characteristics offer an insight of who the DRF beneficiaries are, thus shedding light on whether the right beneficiaries were selected. The majority of the beneficiaries were female (59.7%). The median age was 34 years and the oldest respondent was 90. These elderly people benefitted from the project as special interest groups who were needy but did not have energy to participate in the labour intensive activities[1]. The predominance of young people was expected since the project required

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[1] Nonetheless, in situations where the elderly could participate in non-labour intensive activities such as child care or on-site cooking for the able-bodied workers, it was considered as participating in DRF activities.

people with energy to work. Up to 84.3% of the respondents were married, with more than 43% of these in polygamous marriages, a proportion that is way above the national average of 7.7% of polygamous relationships (UBOS, 2016).

Most respondents (majority women) never went to school (77%) and could neither read nor write (81.4%). According to the Uganda population and housing census, the Ugandan population in this category was only 18.9% in 2014 (UBOS, 2016) suggesting that Karamoja region suffered from significantly low levels of education. Such a level of education among DRF beneficiaries implies that skills could have been low among these people to qualify for paid employment, even if it was to be available. The entire region has only 273 primary schools, 23 secondary and 6 tertiary institutions, taking care of over 1.2 million people. Such a level of education among DRF beneficiaries implies that skills could have been low among these people to qualify for paid employment, even if it was to be available. It could therefore be argued that the choice of DRF as an intervention could have been appropriate as the nature of work did not require specialized skills

The median number of people in a household was 7 and the mean was 7.8. This is a relatively large number, as it is above the national average of 4.7 members per household (UBOS, 2016). These figures could imply that there will be less tenacity during disaster. This could even be exacerbated if some of the household members are not productive. Up to 61.8% of the respondents were household heads, and about 64.5% of these were male. However, to have more than one third of the household heads as female (35.5%) reflects the burden that these women carried since most of their households had children with absentee husbands. Considering the fact that they were in polygamous relationships and were without formal education, such women were bound to carry a big burden of looking after the household members.

Given the patriarchal nature of Karamoja society, these women develop coping mechanisms and become creative in how they manage their household finances in order to beat all odds to survive. Many of these women were identified to be beneficiaries of NUSAF3 by community members because they were considered to be extremely poor in an already impoverished community. Indeed, their abject poverty qualified them to be a part of DRF interventions.

Food Consumption and Food Security
How often a person eats in a day depicts availability of food and what they eat reflects the nutritional diversity. While households without a single meal a day had fallen from 11.3% at T1 to 2.2% at T2, the proportion had increased to 10.4% at T3. These results suggest that one in every ten households did not have food to eat and missed meals on certain days of the week. Missing a meal has important repercussions especially for children's development because it retards cognitive and physical development. Indeed, the Uganda Nutrition Action Plan (UNAP, 2011), shows that meal infrequency is a key cause of malnutrition, which leads to deaths, reduced agricultural productivity and poverty among other atrocities. Missing food by households was directly related to lack of food due to poor harvest.

However, households having one meal a day improved from 43.5% at T1 to 28.9% at T3. It is noteworthy that having close to one third of households having one meal a day is not indicative of improving resilience capacity. Majority of households had children and some of the households had lactating mothers, thus eating once every 24 hours may not be sufficient. At the time of the T3 study, households with two meals a day were slightly more than half of the entire sample and this was a significant improvement from the 42.1% recorded at T1. There was a small portion of beneficiaries that had three meals a day (5.1%), registering a slight improvement from the baseline position (3%). Generally, DRF beneficiaries eat very few times a day but there was improvement in the volume of meal intake as reflected in the words of one of the NDOs:

> *Initially the people used to eat once a day and now they are able to afford at least*

two meals as compared to having one meal in the evening only (NDO Kaabong).

The above statement is indicative of the progress made towards meal frequency. It is a sign that life is improving. For individuals living in severely impoverished settings like Karamoja where majority of the population previously would spend days without a meal, being able to afford two meals a day is significant progress and a step in the right direction.

Insert Table 2

It should be noted that having a meal was important but the type of meal was also equally important to assess. The latter would help in determining the dietary diversity the household members enjoyed. For instance in the district of Kaabong specifically, focus group discussions with the youth revealed that in many households the second meal was local brew made out of sorghum. It was believed by many of the beneficiaries that the local brew was both nutritious and filling and its affordability in times of food scarcity made it popular among many households. An example of these beliefs is illustrated below:

> *We are used to eating one meal a day because of the long droughts. And it is normal*
> *for us because our stomachs are used to it. We do not need a lot of food so instead*
> *we supplement our meals with kwete (Local Brew), and we are satisfied. Kwete can*
> *fill your stomach and you don't fill hungry the whole day until the next morning*
> *(Youth FGD Kaabong).*

Indeed for many households in Kaabong and Napak district this local brew was part of their daily diet and was not exclusive to adults but rather was given even to children as young as 5 years old. The results in table 3 further provide some insight into the dietary composition of the food consumed. Consumption of fish, eggs, and meat was low, generally below 20%. A vast majority of households fed on cereals, and the proportion was high from T1 (86.6%) up to the T3 (77.4%). This is unsurprising because cereals were the most grown food stuffs in the region. On a more positive note, consumption of milk and milk products significantly improved from 18.1% at T1 to 45.3% at T3. Milk is known as a rich source of proteins and if added to cereals, household members would have an improved diet. Consumption of eggs also improved from 5.6% to 9.1% just as sugar intake improved from 26% to over 45% per household. However, fruit consumption, tubers and root crops and fish significantly declined. While people had fewer meals per day, it is evident that their meal composition was varied. It could be argued that consumption of eggs, and milk improved largely because of investment in livestock. The investment in livestock albeit small, is well documented in the subsequent section.

Insert Table 3

As explained above, food consumption was linked to a number of factors. These factors include the type of food grown, the amount harvested, amount stored and sold off as well as the technology used. The main crops grown by households were sorghum, maize and beans. The proportion of households growing maize increased from 60.6% at T1 to about 78.8% at T3 and this increase was **statistically significant.** Furthermore, the proportion of households growing sorghum increased from 49.1% to 54.3% over the same timeframe. There was also a significant increase in the proportion of households growing beans from 27.9% to 45.1%. These changes in number of households growing more food crops could be explained by access to seedlings with the money earned from DRF activities. More households were able to use their earnings to purchase seedlings, something that was difficult at T1. There was even effort to grow other crop varieties (millet, ground nuts and beans). However, the adoption rate was low with only a handful of households venturing into these varieties. Generally, households grew crops that they were accustomed to, or staple foods of the regions. For instance, households in Amudat grew maize while those of Napak grew Sorghum and Kaabong grew both maize and sunflower.

Insert table 4

The overall implication of having more households growing the traditional food crops is that food availability was going to improve. As expected, apart from simsim, vegetables and ground nuts there was **a significant increase** in the yield of all the crops grown from T1 to T3. These positive results could be attributed to increased land acreage, better seedlings, better weather and some improvement in farming tools. The yield of maize significantly increased from 2.9kg at T1 to 66.1kg at T3. The households sold only 8.9% of this yield, also a fall from the 14.7% observed at T1. This implies that households were able to keep over 60kg of maize for home consumption. However, while there was a significant increase in the maize yield, the proportion of yield relative to acreage utilized was significantly poor. It is anticipated that one acre should produce 2500 kg of maize but in Karamoja the reported average acreage size of 5.5 acres produced only 66kgs. This under achievement is reflective of poor methods of farming, poor seedlings, susceptibility to vagaries. This could also partly explain why people still ate fewer meals. They knew that current food stocks were not sufficient and so limited their consumption rates.

There were significantly better yields of sorghum at T3 (76.5kg) compared to T1 (3.2kg). As with maize, more land was allocated to sorghum growing but the yields sharply declined since T3. The low yields of sorghum were attributed to excessive rains which destroyed the sorghum while in the gardens, and pests and diseases. The households could not harvest their sorghum in time because of the rain (nowhere to sun dry it from) and thus most of it got spoilt from the gardens. It emerged that in the year 2018 the region started to have a lot of unusual rain which caused flooding. A more positive yield was observed in beans. While the allocated acreage decreased from T1 and T3, the quantity **produced increased significantly**. At T1, a household produced only 0.6kg of beans but the quantity increased to 39.4kg at T3. Beans are an important source of protein for families and thus increasing their consumption would have better nutritional benefits to household members. However, compared to maize and sorghum, quite a number of households were not growing beans. The major reason was unpredictable weather which could easily destroy the seedlings, further depriving people of what they could have eaten.

It is evident that Napak had the lowest quantity of maize stored, at 0.33kg per household. Kaabong boasted the highest quantities at 80kg per household. While Amudat has traditionally been a maize growing area, the quantity of maize stored was very small (12kg) reflective of the impact of flooding and armyworms in this district. With regard to sorghum and beans, Napak still had the least stock than Kaabong and Amudat and these differences were **statistically significant**. For instance, while households in Napak kept an average of 0.32kg of sorghum per household, in Kaabong the average was 73kg and zero in Amudat. With regard to beans, the average for Napak was 0.16kg but Kaabong had 26kg and Amudat 11.3kg. On all types of food, Napak and Amudat generally had nothing in stock. This means that the quantities harvested were consumed and there was nothing left. Part of the explanation is that while a lot of land was tilled (more acreage at T3), the harvest was small and could not allow households to store anything. Indeed, most granaries visited were empty, suggesting an impending food problem in the region. Even Kaabong that had some food in the granaries had small quantities – 58kg of maize for 8 people in a home may not sustain the family for a month unless they miss some meals and eat once a day.

Access to productive assets
Overall, about one third (28.4%) of households had productive assets. Most of these assets were in form of livestock, particularly poultry (39.7%), goats (47%), cows (39%) and sheep (26.2%). These results indicate that generally households had some assets to rely on during times of disaster as all the livestock assets could either be converted into cash to help with food consumption or to support other household needs. These findings are in tandem with the findings of World Food Programme (2015) which showed that nearly half of households in Karamoja owned livestock and they mostly owned goats, cows and poultry. The proportion of households with these assets increased from 25.6% at T1 to 31.4% at T3, suggesting better resilience capacity of households than at the start of the project. It should however be

noted that there was no observed increase in non-livestock assets, particularly ox-ploughs (from 6.8% to 6.1%) and bicycles (from 11% to 5.9%).

Insert table 6

The observed changes in livestock assets may not have happened as a result of organic growth through live births. Households purchased more livestock than they sold. This is perhaps the channel through which there was an increase in livestock. For instance, while at T2 only 15.4% of households purchased cows, at T3 the proportion had doubled to 31.1%. Moreover, during the same period the cows sold were fewer at 12.5% at T1 and 20.4% at T3 (below the 31.1% sold). These changes suggest that households acquired more cows during the DRF intervention period. Furthermore, while 19.4% of households bought goats at T2, by T3 the proportion had changed to 36.5%, and this change was **statistically significant**. As with the cows, fewer households sold goats whereby at T2 only 11% had sold goats and the proportion had changed slightly to 14.8% by T3.

A significant increase in purchase of livestock occurred in relation to poultry where the proportion changed from 17% to 33% by T3. Only 16.8% of households sold poultry by T3. These changes clearly imply that households were able to retain livestock, and other studies (e.g. WFP, 2015) suggest that such households are able to improve their food consumption. Households with livestock were few, just a fraction of the overall sample. Therefore, the key message is that the households which resorted to livestock keeping often retained their livestock.

Wealth index

The wealth index is a composite measure of a household's cumulative living standard and is computed using data on household's ownership of selected assets. This index is important because wealth is a household characteristic that often has a large effect on the living standard of a household. The results in table 7 show that generally there was significant progress in the wealth of households since T1 (($X^2(8) = 687.051$, $p < .05$). It is seen that the proportion of the poorest households fell from 19.4% at T1 to 18.6% at T3. More importantly, households deemed better with regard to ownership of assets increased from 17.6% at T1 to 26.2% at T3. These results indicate that overall, households were better than they were at T1.

Insert Table 7

Nonetheless, in-depth interviews with beneficiaries revealed that their standard of living has improved as described below:

> *In my community where I work people who had no money can now access money. Someone has bought a goat and household items they have bought mattresses, plates, basically they have changed in their lives in some way. Most people especially ladies have improved their lives. The ladies are now involved in buying sugar and selling (CF Amudat).*

> *NUSAF has really helped us. We can buy and sell a goat. When the baby is sick we can take them to hospital. This region is dry and the food is not enough so that money has helped us. There are some people who have bought even some goods (Women FGD Amudat).*

Discussion and conclusions

This study has demonstrated that DRF is able to improve food consumption, food production and household productive assets. Improvement in consumption is core to resilience building because during

disaster, food consumption is important for the very existence of the affected populations. Thus, ability to eat more meals a day gives people ability to cope with drought. This argument underscores that very notion of disaster resilience which posits that resilience is about ability to deal with adverse shocks (Béné, Wood, Newsham, & Davies, 2012) at household level (Carpenter, Walker, Anderies, & Abel, 2001; Gunderson & Folke, 2005). Indeed, the results have shown that the people of Karamoja were able to grow more food and accumulate more productive assets which in the long run would help them to absorb disturbance brought about by drought (Klein et al., 2003; Folke, 2006). The productive assets can help people recover from drought by converting these into cash or relying on them to increase production at household level. The focus of DRF on providing income for work can therefore be expected to gradually change people's attitude towards productivity. A cash economy is being introduced and for the poor to earn money, they will eventually appreciate its value as a key tool for solving household needs during difficult times. This change in attitude from relief support towards paid work is reflective of the adaptation that has been advocated for by Brooks et al, (2005). Such adaptation is important in situations where the climate change and increasing drought conditions are gradual. A key aspect that DRF may have to pay attention to is learning as this helps people to adapt fast. If communities can be helped to understand why block farms are there, why access roads are funded and why the project utilizes the approach it adopted, they will start to question their own behaviours and thus learn to adapt to approaches that can enable them cope with disasters (Manyena, 2006). This view implies that households and whole communities will need to view resilience as a process rather than as an outcome. This is because climate change ensures that such poor communities have to learn what works for them, which practices are better and should learn to take decisions that help them mitigate the effects of drought on their assets.

Furthermore, it has been revealed that even when people could afford three meals a day, they chose to have one. Others complemented an actual meal with local brew that was readily available and affordable but less harmful to human body. Other households refused to sell their produce while some bought more livestock and sold less of it. All of these practices are indicative resilience building. Such behaviors fit well with the argument of several scholars (e.g. (Berke and Campanella, 2006; Gaillard, 2007; Manyena, 2009) that resilient communities should be able to learn and adapt to what works and what does not work so that they are able to survive and cope with disasters with minimal impact and damage. Such arguments imply that communities have to be learning communities and often take carefully considered and transformative choices after disasters. At the core of this proposition is the concept of relationships which have been found vital in the learning process and coping strategies (Luthar, 2006). Thus while a community suffers as a whole from disasters, members of the community will often need to work together on interventions that build resilience at both household and community levels, and learning from each other is important. This is what DRF is doing by bringing people to work together to address their needs and this is key because working together helps communities to emerge out of disasters stronger and better (Manyena, Bernard, O'Brien, Geoff, O'Keefe, Rose, Joanne, 2011). Indeed, local leaders, governments and other stakeholders ought to work together to make informed choices and build appropriate capacities before, during and after disasters. The implementation structure of DRF just demonstrates this assertion.

The contribution from this study is that DRF is a good approach to improving food consumption and access to productive assets at household level. These two are key pillars of resilience building. The DRF approach allows for attitude change and learning which are necessary for resilience to take place. Whereas this paper makes important contributions to the understanding of how DRF can help in building resilient households, it should be noted that the scope of reliance was limited to a few indicators – food consumption and access to productive assets. A more robust assessment of all the indicators, and analysis of the contribution of DRF on each indicator would offer further insight.

References