

Research Application Summary

Effective implementation of climate variability adaptation programs: Lessons from Katulu social innovation in Kenya

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Abstract

Many initiatives have been undertaken by the Kenyan Government and Non-Governmental Organisations (NGOs) to help residents of Semi-arid lands (ASALs) cope with the effects of climate variability with mixed results. A study to map climate variability adaptation programs in the larger Kitui County - Kenya was done in 2015. The study addressed itself to programs' efficaciousness at improving the climate resilience of affected households. Data sources included household questionnaires, key informant interviews and focus group discussions. This paper draws on an analysis of one such program called Protracted Relief and Recovery Operation Program (PRRO) locally known as Katulu. A locally driven social innovation, Katulu brings together various actors including the local community, the Government, the Catholic Church and a host of donors in Kitui County. Results indicate that Katulu has been instrumental in providing support to its members cushioning them against effects of drought. Under Katulu, members have been sharing various technologies aimed at conserving moisture and fertility in their farms which in turn is expected to boost output. The study recommends that stakeholders involved in climate adaptation should integrate people driven initiatives such as Katulu in their long term plans to ensure sustainability of such programs in the ASALs.

Key words: Climate resilience, climate programs, development, Katulu, Kenya, social innovation, governance

Résumé

De nombreuses initiatives ont été entreprises par le gouvernement kenyan et des organisations non gouvernementales (ONG) pour aider les habitants des terres semi-arides (TASA) à faire face aux effets de la variabilité climatique avec des résultats mitigés. Une étude visant à cartographier les programmes d'adaptation à la variabilité climatique dans le grand comté de Kitui - Kenya a été réalisée en 2015. L'étude s'est penchée sur l'efficacité des programmes à améliorer la résilience climatique des ménages touchés. Les sources de données comprenaient des questionnaires destinés aux ménages, des entretiens avec des informateurs clés et des discussions de groupe. Cet article s'appuie sur une analyse d'un tel programme appelé Programme d'opérations prolongées de secours et de redressement (OPSR) connu localement sous le nom de Katulu. Innovation sociale menée localement, Katulu rassemble divers acteurs, dont la communauté locale, le gouvernement, l'Eglise catholique et une multitude de donateurs dans le comté de Kitui. Les résultats indiquent que Katulu a contribué à fournir un soutien à ses membres en les protégeant contre les effets de la sécheresse. Sous Katulu, les membres ont partagé diverses technologies visant à conserver

l'humidité et la fertilité dans leurs fermes, ce qui devrait à son tour augmenter la production. L'étude recommande que les parties prenantes impliquées dans l'adaptation au climat intègrent des initiatives axées sur les personnes telles que Katulu dans leurs plans à long terme pour assurer la durabilité de ces programmes dans les TASA.

Mots clés : Résilience climatique, programmes climatiques, développement, Katulu, Kenya, innovation sociale, gouvernance

Introduction

Climate change has become a global reality and is now being regarded as one of the world's top challenges while its impact is being felt in all countries around the globe, though with different impacts and on different scales. Extremes of climate are expected to affect billions of people; especially those residing in arid and semi-arid lands (ASALs) (IPCC, 2014). For instance, patterns of warming temperatures, changes in precipitation, and sea level rise are likely to affect water supply and quality (IPCC, 2014). Other effects include concomitant shocks such as malnutrition, pests and diseases, conflict and death. It's often believed that people with resilient livelihoods are often those who are able to respond to climate change (Adger *et al.*, 2007; Abdulla *et al.*, 2009). On the other hand, it is expected that the poorest and most marginalized groups are being adversely affected by the impact of climate change (Adger *et al.*, 2007; Abdulla *et al.*, 2009).

Adaptation and resilience are considered Africa's priority response to climate change. The 15th African Ministerial Conference on the Environment (AMCEN) in the build-up to the Paris Agreement called for "a global goal for adaptation which takes into account adaptation needs and associated costs, including support for developing countries, while recognizing the need to increase adaptation investments in developing nations".

In the 21st century, there is an increasing realization that poverty is closely linked to development and environment (McGray *et al.*, 2007). The poverty- environment -development discourse has been instrumental in changing global focus exclusively on mitigation to a more balanced approach that recognizes adaptation especially as it regards developing countries. However, adaptation is situated within existing poverty levels and income inequalities among communities that experience adverse effects of climate change. Communities that have been generally marginalized in terms of access to resources are considered to be more vulnerable to effects of climate change (Adger *et al.*, 2007; Abdulla *et al.*, 2009). Majority of these people reside in urban slums and ASALs. Being unable to respond to different shocks might act as an obstacle for communities in ASALs to address climate change adaptation today and in the future.

In Kenya, about 10 million people live in semi-arid lands which cover 80% of the country's land mass. Over 60% of these people live below the poverty line. These households usually have scant savings and few other sources of income to cushion them from external shocks. Moreover, the effect of climate change and global warming is posing great danger to agricultural productivity.

Climate variability is common in Kenya and it is increasingly limiting the growth and development in agriculture which is considered the main livelihood source for the people in semi-arid lands. Extremes of rainfall are the most damaging aspect of climate variability and the semi-arid lands

(ASALs) of Kenya frequently suffer the devastating impacts of floods and drought. Lives, property, and infrastructure are lost during these events and the financial costs are far beyond the means of the locals, meaning that they are neither prepared for such events nor able to afford to repair the damage caused.

As part of her commitment to the global agreements to climate change, Kenya developed a National Climate Change Response Strategy (NCCRS) in 2010 and a National Climate Change Action Plan (NCCAP 2013-2017) in 2013. In 2016, the country launched the national adaptation plan (NAP) as the basis for the adaptation component of Kenya's Intended Nationally Determined Contribution (INDC). Kenya's NAP covers main sectors of the economy such as agriculture, tourism and energy albeit on a macro scale. The NAP also places emphasis on vulnerable and marginalized groups. However, the main challenge anticipated in achieving the NAP objectives is the question of financing and capacity building.

Prior to the NAP, the Government of Kenya was already implementing projects and programs for coping with climate variability especially in ASALs. Nongovernmental organisations have also over time pitched tent in ASALs of Kenya with several climate variability adaptation projects. However, such efforts have not been evaluated especially to find out whether they have had impacts on livelihoods improvement. This paper adds up to existing knowledge and works on climate change adaptation in Kenya (such as Mongare and Chege, 2011; Below *et al.*, 2012; Amwata, 2013) by focusing on the effectiveness of resilience programs on livelihoods of ASAL residents.

Resilience is understood as being able to recover from idiosyncratic shocks (i.e. household-level shocks, such as death, injury or unemployment) or covariate shocks (i.e. community shocks, such as natural disasters or epidemics). It has been argued that households that are vulnerable to idiosyncratic shocks are also expected to be vulnerable to covariate shocks. As such, a generally resilient household (or community) is also thought to be climate change impacts resilient. Thus, long term programs that are meant to socially protect households do not only improve livelihoods but also reduce vulnerability of groups to climate change eventualities. Such resilience programs must be aimed at strengthening the assets defined in the sustainable livelihoods (SL) framework: financial, natural, physical, human, social and political capitals (Frankenberger *et al.*, 2012).

Being located in an arid and semi-arid region in Kenya, Kitui County has a long history of negative effects of droughts. Some droughts have led to loss of lives due to famine. To respond to this, there are numerous government and Nongovernmental initiatives aimed at helping the populace adapt to the effects of climate variability. However, many of these initiatives have not been evaluated in terms of their impacts on livelihoods improvement. This paper draws on an evaluation of one such social program locally known as (Katulu). The paper discusses how Katulu as a social innovation helps the vulnerable population in Kitui to build resilience against the effects of climate variability. This work draws inspiration from the emerging theory of social innovation.

The rest of the paper is organised as follows: the next section expounds on the theory of social innovation before discussing in detail the study's methodology. This is followed by a presentation of results and a discussion of the same. The final section concludes.

Theory of Social innovation. In the recent decades, there has been an increase in the innovative forms of organizing across traditional boundaries of geography, cultures and politics to address long standing global problems such as famine, paucity, conflict, pollution, economic injustice, and environmental degradation (Cooperrider and Pasmore, 1991). These innovative forms of organization represent an emerging type of social behaviour. These organizations are christened social innovation. Social Innovation (SI) has been defined as innovation aimed at meeting social needs of communities that ensures social inclusion (Murray *et al.*, 2010). A social innovation is a novel solution to a social problem that is more effectual, efficient, and sustainable than present solutions and for which the value created accrues primarily to society as a whole rather than private individuals (Phills *et al.*, 2008). The drivers of contemporary social innovation are characterized by; exchanges of ideas and values, shifts in roles and relationships and the integration of private capital with public and philanthropic support (Mulgan, 2006).

The conceptual basis of Social Innovation is drawn from the recognition that conventional service delivery such as market fundamentalism, neo-liberalism or techno-economic innovation had failed to tackle problems of poverty and social exclusion (Moulaert *et al.*, 2013). These macro-economic paradigms have been characterized by high levels of unemployment, welfare dependency, poverty and general deprivation. Social innovation therefore seeks to advance new ways of development, supported by social relations and experiences of those in need (Moulaert, 2013). Some have considered social innovation as commodification of socio-cultural wellbeing. Neo-liberalism strategies like ‘new governance’ or ‘soft or caring liberalism’ are considered as forms of social innovation (Peck *et al.*, 2013).

Epistemologically, social innovation is seen as part of a scientific paradigm shift. It favours co-construction of knowledge involving a collaborative effort of researchers and actors taking into account local and global factors in a holistic and sustainable perspective. Ethically speaking, social innovations provide a platform to enhance the capabilities of the most vulnerable people to better their living conditions. At the strategic level, social innovation drives an inclusive project in which resources are harnessed and shared. There is consideration of networking of political, economic and environmental as well as social actors collectively. In a nutshell, social innovation vouches for an integration of diverse spheres of human activity, i.e., the public, private and social spheres.

Several works on social innovation centre on social enterprises and third sector economy include (Klein and Knight, 2005; Defourney and Nyssens, 2010; Calzada, 2013; Fraisse, 2013). To add to this growing knowledge, this study focuses on climate adaptation. The paper focuses on social relations that underlie the intervention in question. This in turn addresses a policy need which calls for an understanding of better adaptation frameworks to address not only basic societal needs but also the demands of society’s most vulnerable groups.

Methodology

The study site. Kitui County (Figure 1) is located in the lower Eastern parts of Kenya (about 150 kilometres east of Nairobi city) and covers approximately 24,385.1 km² (9,415.1 sq. mi). The County’s elevation is between 400m and 1800m above sea level. The County is characterised by

varying topography with the highest areas being Kitui Central, Mutitu Hills and Yatta plateau. These also form the most productive areas of the county since they receive high rainfall compared with other regions. However, generally speaking the county is one of the semi-arid regions in Kenya receiving roughly 71 cm (28 inches) of rainfall. The general rainfall pattern in Kitui County is bi-modal with long rains occurring in the months of March-April- May (MAM) and short rains falling in the months of October –November- December (OND). MAM rains are usually very erratic and unreliable while OND rains are a bit reliable. Thus farmers prefer to grow their crops during the short rains season.

Temperatures within the County are generally high throughout the year, and ranges between 140C and 340C. The climatic conditions have therefore contributed to the semi-arid vegetation as a dominant land cover of Kitui County (Figure 1). Therefore the land use type is predominantly bush land with some areas having woodlands. Sparse agriculture is however practiced in the central and northern highlands within the county. Due to its climatic conditions, Kitui County

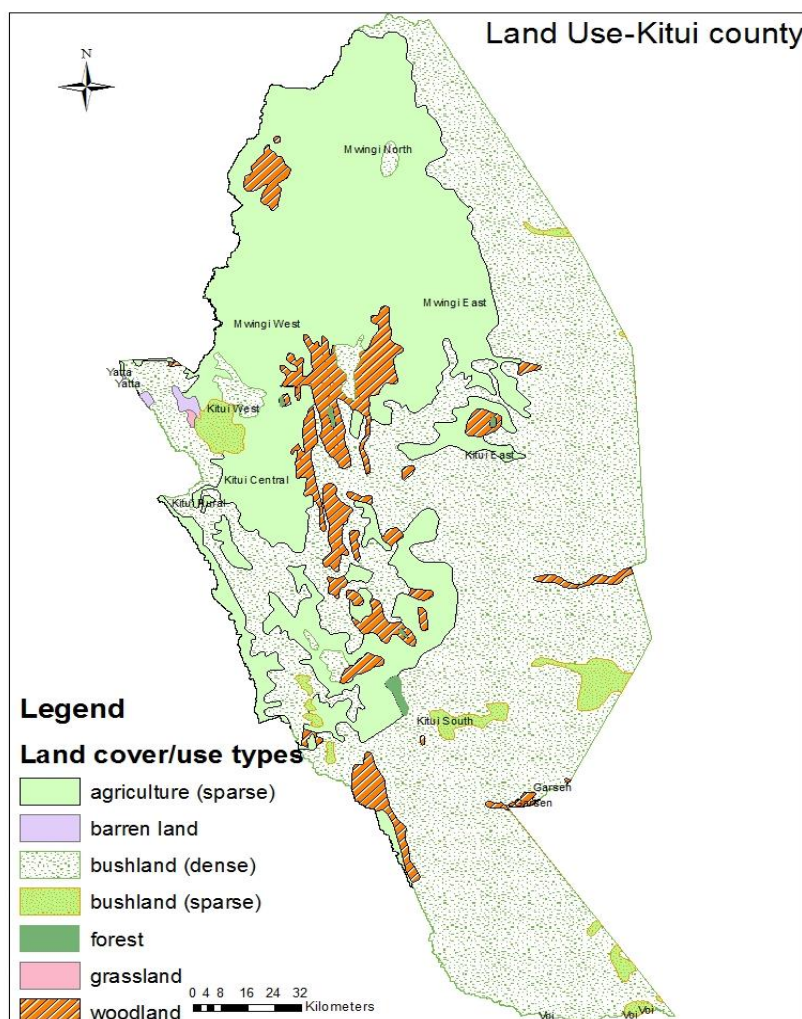


Figure 1. Land cover/land use types in Kitui County

does not favour many rain-fed crops and thus the main crop grown commercially in the region is cotton. A cotton ginnery is situated in Kitui town where cotton farmers from around the County can deliver their harvest. The ginnery was set up in 1935 and is the only major industry in the County.

During the 2009 national population and household census, the County's population stood at 1,012,709 which composed of 531,427 females and 481,282 males (GoK, 2010). The average household of Kitui County size is 6.6 persons (Eriksen *et al.*, 2005). The population growth rate of the county stood at 2.1% which is slightly lower than the national rate of 2.6 % (Kenya National Bureau of Statistics, 2013). The poverty rate indicates the percentage of the total population living below the poverty line. Poverty line has been set at household living for USD 1 per day in Kitui County stands at 63.1% against the national average of 45.9% (KIPPRA, 2013). The local residents of Kitui County are from the Kamba community who were traditionally known to be agricultural as well as long distance traders (Okoth, 2006).

Materials and Methods

The project employed a mixed methods strategy, where both quantitative and qualitative data sets were generated. Quantitative data was generated from questionnaires administered during household surveys while qualitative data was collected through Key Informant Interviews (KIIs) and focus group discussions (FGDs) involving community members. The choice of respondents for a household survey was by stratified random sampling. The rationale was to ensure that both the moderately dry and extremely dry districts within Kitui County were included in the survey. Thus, the study area was subdivided into district administrative units and four districts purposely selected for data collection. Households were then randomly selected from these units. Equal number of households was chosen in each district (that is 50 households totalling to 200 respondents). A questionnaire was administered to the households. The questionnaire was intended to capture socio-economic characteristics of the households including sources of income and household assets among others. The survey also collected data on the various projects and strategies aimed at mitigating climate variability. Qualitative data was obtained through key informant interviews and four focus group discussions (one FGD in each sampled district). A Key Informant Interview guide and an FGD guide were used to capture the stories of community members as well as rural development practitioners as a way of triangulating data that had been collected through the household surveys. During FGDs, participants were asked to perform a strengths weaknesses opportunities and threats (SWOT) analysis on the various programs. SWOT analysis (Dyson, 2004) is one of the tools used in evaluating interventions. The data also helped to explain the survey findings. The study also utilized secondary sources of data. Such data included analysis of bulletins and institutional annual reports on projects in Kitui County in print media as well as websites.

Data collection commenced in September 2014 with the survey. Key informant interviews followed in October 2014. The exercise concluded with focus group discussions which ended in January 2015. Key informants were drawn from the following institutions: government – Ministry of Devolution and Planning – National Drought Management Authority (NDMA) field officer based in Kitui; Catholic Diocese of Kitui – Caritas Kitui; World Vision field officers based in Kitui; and the Kenya Forestry Research Institute (KEFRI) officers in Kitui. The FGD participants were

drawn from the local population who had not participated in the survey phase. Data collection was followed by data analysis. Quantitative data was analysed through descriptive statistics in the statistical package for social sciences (SPSS version 11) using frequencies and percentages. Qualitative data was analysed through open coding and themes generation. This entailed probing the data and grouping information under categories of emerging themes.

Results and discussion

Livelihood Impact of Climate Adaptation Projects. Results from the household survey indicated that the community members have been affected by drought events in the past which characterizes food and water shortages. The most severe droughts in the recent past occurred in the years 1997 and 2008/9. During the drought the residents received various forms support from different. Water supply was the highest rated support reported by about 65% of the respondents (Figure 2). The food/cash for work (Katulu) program and child support tied at position two cited by 12.5% of respondents. The rest of programs reached about 2.5% of the households including bee keeping, orphan's education, goats rearing and health provision projects.

Though the water supply recorded the highest ranking of the programs, it is important to note that this was a short term measure. Furthermore, the water was supplied to all residents of the county as a response to the biting effects of drought. The beneficiaries were therefore not profiled in terms of income. On the other hand, the rest of projects were long term and their lifespan transcended climate variability events of drought and floods. These projects also targeted the poorest of the poor in the community. Out of these six long term projects, child support and food/cash (Katulu) for work programs reached at least 12.5% of the total population.

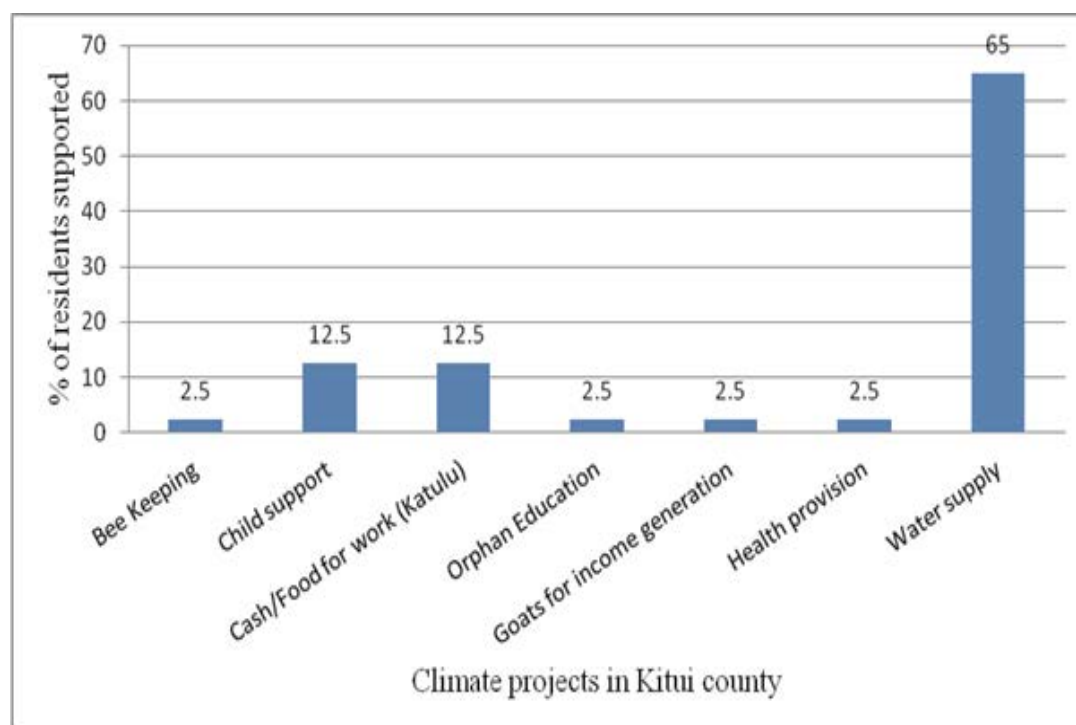


Figure 2. The scope of climate programs in Kitui County, Kenya (N=200. Source: Fieldwork, 2015)

As part of the household survey, respondents were also asked to rank the sufficiency of various projects. The results are shown in Table 1 below:

Table 1. Climate projects in Kitui County (figures are in percentages)

Program/ percentage Rating	Child support	Katulu-food/ cash for work	Water supply (short term)	Others
Sufficient	48.1	55	51.6	25
Not sufficient	51.9	45	37.6	75
Not applicable	0	0	10.8	0
Percentage	100			
	100	100	100	100

Source: Fieldwork, 2014

From Table 1 it emerges that the Katulu program received the highest rating of respondents who indicated that the support was sufficient (55%) followed by water supply initiatives (51.6%). For rest of the projects, sufficiency of the programs was ranked at about 25%. Based on these results, the following section presents an analysis of the Katulu social innovation drawing experiences from qualitative data collected across the county.

Katulu program- a social innovation to climate adaptation. According to the key informants from the National Drought Management Authority (NDMA) in Kitui County, one of the most successful projects that the authority was involved in implementation was the Protracted Relief and Recovery Operations program (P.R.R.O) locally referred to as Katulu. The authority implemented this program in partnership with the World Food Program (WFP) and non-governmental organizations including the Catholic Church (Caritas Kitui); World Vision; and Action Aid among others. The program uses local Self Help Groups as a channel of reaching out to the poorest members of the community. The P.R.R.O was started around 2007/2008 and represents a shift from the conventional approach to drought response which involved provision of relief food (Mwolyo) to the poorest members of the community during severe droughts. Following pleas from community members for long term livelihoods support so that they did not just depend on Mwolyo which was a short term measure, the various organizations responded by starting long term programs that could empower the community to be resilient to general shocks. This was reported during a key informant interview as follows;

‘.....to help us tackle the protracted problem of famine, we set out, six years ago, to enrol 14,000 households into the (Katulu) program. This is a 15 year program before we can review its impact on vulnerability of the community to climate change....’
(World Vision, Kitui town, October, 2014)

The participants of the self-help groups identified for enrolment by the local leaders such as the chief and include poorest members of the community. The local Kamba community dubbed the program ‘Katulu’ as was reported by one respondent in an FGD,

‘.....Katulu is the local name for squirrel. A squirrel has to dig/scratch from the soil so as to get food. This program entails digging terraces, planting pits, earth dams and water ponds

for food production...for you to participate in the program you must be willing to work on the earth.....'

(FGD Excerpt, Mutomo District, Kitui County, January, 2015)

According to NDMA, the program's key objective is to build resilience of the community by increasing and diversifying food production through planting of drought tolerant crops and digging of water conservation dams. At the household level, those participating improve water access by digging farm ponds. The project also promotes drip and furrow irrigation; kitchen gardening for vegetable production; conservation of wastelands; planting trees; fodder production for the livestock; construction of roads to improve access to social amenities. Other activities include making terraces on farms for production of pigeon peas (*Cajanus cajan*), creating water pans, and digging of maize planting pits called Zai pits.

During the FGDs, members performed a SWOT analysis of the Katulu program in which they categorized the program as an agricultural enhancement project capable of improving food production and access in the county (Table 2).

Members noted that Katulu was instrumental in providing labour on their farms helping to increase productivity through timely and efficient land management. Members said the program represented a change in climate governance in the County as the local members were involved in the day to day running of the projects making it a community driven innovation. The community was also allowed to determine who qualifies beneficiaries of the program. This represents a bottom up approach to climate governance that draws heavily on the principle of participation.

However, respondents reported that one major threat to the project was the fact that long term water supply to the region was still a challenge. This hindered agricultural production in the region as residents had to wait for the rainy seasons for them to plough. With the fluctuating rainy seasons, farmers were unable to plan their crop calendar with precision. But the respondents were still optimistic that they still had other alternatives to ensure that food production in the region was enhanced. As the area is a semi-arid zone, participants reckoned that Katulu could be more effective in enhancing food production by incorporating drought resistant indigenous species. In the Kitui traditional society the drought resistant crops commonly grown included Sorghum (*Sorghum bicolor* (L.) Moench), finger millet (*Eleusine coracana* (L.) Gaertn), cowpeas (*Vigna*

Table 2. SWOT analysis of the Katulu project in Kitui County

Support/coping strategy	Strengths (positive impacts)	Weaknesses/Threats	Opportunities (areas of improvement)
Agricultural support (provision of seed and labour)- <i>Katulu</i>	Food for work (<i>Katulu</i>) has been instrumental in provision of labour on farms. <i>Katulu</i> takes care of community interests	Water for crops still a challenge and a hindrance to agricultural production	Inclusion of indigenous crops in agricultural systems

Source: Fieldwork, 2015

sinensis (L.) Savi), cassava (*Manihot esculenta* Crantz), sweet potatoes (*Ipomoea batatas* (L.) Lam), green grams (*Vigna radiata* (L.) R. Wilczek var. *radiata*), and pigeon peas *Cajanus cajan* (L.) Millsp. (van der Maesen).

The cereal crops have a low rate of evapotranspiration and hence are able to manage moisture efficiently compared to other crops such as corn (*Zea mays* L.). Cassava and sweet potatoes are also able to manage the moisture using root tubers that are buried in the soil. The respondents during FGDs explained that whereas cassava and sweet potatoes can be found in some parts of Kitui County, one can hardly come across fields with indigenous cereals save for the pigeon peas. They further decried the abandonment of the traditional grains to changes in lifestyle whereby corn is preferred to sorghum and finger millet. However, some of the respondents were of the opinion that the sorghum and finger millet were abandoned because of they are hard to manage in the field (that is weeding, keeping away the birds, harvesting and storage).

Katulu acts as Grassroot Social Protection. Katulu has been credited for supporting members' ability to cope with unexpected shocks in novel ways. By providing cash to members, Katulu ensures that basic consumption needs are met. This ensures that the beneficiary households are protected. The cash transfers also are likely to prevent a drop in living standards in times of drought. By paying members to work on their farms ensures that labour as a factor in production is promoted. By targeting the neediest and marginalized in the community, Katulu initiative is likely to contribute to transformation of the society by changing discriminatory practices that result in unequal access to social and economic resources. Thus, Katulu social innovation activities have a striking alignment with four social-protection objectives of protection, prevention, promotion and transformation as propounded by Devereux and Sabates-Wheeler (2004). Devereux and Sabates-Wheeler (2004) argue that social protection is not only a state-led policy instrument but also a gamut of activities that can be undertaken informally to reduce vulnerability of the poor and marginalised. During the field study, respondents explained how Katulu helped households to better cope with risk and vulnerability through protective and preventive social-protection actions.

Building Resilience through Natural Capital. Natural capital is a fundamental element of resilience, especially for households whose livelihoods depend directly on the natural environment. Natural capital comprise of resources such as fertile soil, water, forests and biodiversity. In the case of Kenyan ASALs, farmers have to grapple with considerable stresses on natural capital as a result of changing environment, including erosion, poor soils and water scarcity. Natural capital has been described as setting the 'ecological limits for socio-economic systems' (EEA, 2015). Katulu members appeared to be operating at these limits, particularly in terms of access to water and conservation agriculture intended to improve soil productivity. Generally, the program has helped the rural households to meet their water and agricultural needs as espoused by the following responses;

'...Water pans have helped us to improve our access to water in this region ...'
(KII Excerpt, Mutomo District, Kitui County, November, 2014)

'...They (Katulu) dig terraces, pits for planting of crops such as maize. Terraces help in preventing soil erosion and help in improving crop farming in the area....'
(FGD Excerpt, Kitui Rural District, Kitui County, January, 2015)

The FGD participants acknowledged that Katulu program had helped the participants to practice climate smart agriculture through soil and water conservation. As a way of preserving soil moisture in their farms, they employed technologies such as digging of trenches, terraces and pits within which water was trapped for a long period of time compared to the surrounding land. Cereals such as pigeon peas would then be planted on the terraces while vegetables were planted within the trenches and pits. To improve on soil fertility, organic manure from the plant and animal remains were also applied to the crop fields.

Furthermore, under the Katulu program, members were encouraged to practice agro forestry technologies. On farm tree planting was reported by a few individuals as part of their drought coping strategies during climate variability. The residents reckoned that the trees have moderated the micro-climates of their homesteads especially during the dry season. Some of the preferred tree species include the croton tree (*Melia volkensii*) locally referred to as 'Mukau'. Mukau tree species is adapted to dry conditions. During the field study, the researchers observed that the Kenya Forestry Research Institute (KEFRI) had initiated various Mukau projects in the study area. The tree had been tried in the neighbouring county of Makueni in Kibwezi district and proved to be a viable plant that could earn farmers income from such products as timber, firewood, and animal fodder.

Residents also reported that these technologies were as a result of knowledge co-production between the organizations and local community. One of the contributions of the community to knowledge production was through dry planting. Dry planting (as opposed to onset planting) is whereby farmers plant the seed a few days before the rains start. In dry planting seeds are placed in the soil, with a very thin layer of soil covering the tops of the seeds. The strategy is aimed at ensuring that the seed are exposed to the soil surface and atmospheric conditions and subsequently get 'watered up'. Other strategies employed included what residents called 'the Katulu technology' a practice of planting five corn seeds in one pit instead of the conventional methods gave much more yields.

Alongside natural capital, the program is also credited for enhancing resilience through supporting the financial and physical assets of members. Key informants from the community reported that in Katulu, participants in the program are paid to work and create assets within their farms. Payments were made to the accounts of the participants at the end of the month. The World Food Program (WFP) and the other actors involved in the Katulu program have teamed with two local banks to ensure this. The banks are Kenya Cooperative Bank and Equity Bank. The beneficiaries, majority of who are women, open accounts with these two banks through which they start receiving their monthly payments.

Opening of banks accounts has had positive unintended consequences. At the social level, it has been very transformative. The lowly beneficiaries who were the poorest of the poor were suddenly transformed into bank account holders receiving real cash at the end of each month. This boosted their standing in the community improving their self-confidence. Opening an account also entailed having an identification card. This is a very important document which many poor people do not have and as a result are locked out of very many government services. As many Katulu beneficiaries were prompted to acquire identification cards to facilitate bank accounts' opening, they now enjoy these services including voting.

Conclusion

This study has demonstrated that there is continuing departure from traditional relief (e.g. food aid 'mwolyo') approaches to tackling climate related shocks to new ways that are more inclusive of the community members and more responsive to the needs of chronically vulnerable in the society. This is in line with Frankenberger *et al.* (2012) assertion that resilience in protracted crises, such as drought should focus on addressing the needs of the most vulnerable populations. Such populations (the poorest of the poor) are always facing difficulties to cope and make advances in their normal life while experiencing either idiosyncratic or covariate shocks. Thus, any resilience interventions for this category of the society aim at strengthening people's asset or capital base to generally insure them against impacts of the unexpected. Although resilience interventions may comprise a gamut of activities, this study has demonstrated that in cases where hazards are clearly defined, resilience programmes can support resilience of a specific type of covariate shocks.

The Katulu social innovation aims to enhance resilience against drought induced food shortages both at the household and community level through empowerment from the bottom up. Building on the analysis of experiences in Kitui county of Kenya, this paper has demonstrated that by empowerment of the community through financial, physical and natural assets; Katulu contributes to the adaptive capacities and can enhance resilience thus improving food security in times of increasing climate stress. This initiative is similar to approaches such as Self Help Groups (SHGs) and Merry Go Rounds which have been reported to efficiently assist in building resilience among communities that are vulnerable to climate change impacts.

Lastly, Katulu program espouses the best tenets of governance such as participation and partnership. As the program is grassroots centred, the local citizenry actively participate in decision making and are supported by different organizations to meet their objectives. Thus, it is envisaged that should various initiatives working within marginalized areas integrate these two tenets of engaging the local community and different partners then residents of these areas will be more economically empowered and become generally resilient. General resilience for these communities will mean that whenever natural hazards such as flooding and, droughts strike, the communities will be able to adapt as they will no longer be referred to as vulnerable.

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