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Addressing challenges of water resilience: a study of water security risk in pastoralist households in Kenya

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Pastoralist communities in Northern Kenya face increasing water security risks attributable to disruptions in their hydro-climatic and socio-ecological environments. Sedentary pastoralists, women and children are most vulnerable to spatial-temporal variations in water availability. This vulnerability is exacerbated by embedded power relations within existing socio-cultural and water governance systems. A preliminary study carried out in 2015/16 examined pastoralist women's disempowerment in relation to the domestic water security constraints they face. The research found subjective evidence that women with diversified livelihoods and social capital are more resilient to water stress. The follow on study being carried out in 2018 builds on these findings and is aiming to provide empirical evidence on factors behind water security and factors that enhance resilience for vulnerable pastoralist communities. The study is being carried out in both urban and rural communities in Samburu County and is applying a mixed methods research methodology incorporating both quantitative and innovative, qualitative research approaches.

Background and rationale for the study

Increasing climate variability in arid and semi-arid lands (ASALs) of Northern Kenya has led to variability in rainfall, shorter drought return periods (Njoka et al., 2016; Kirkbride, M., & Grahn, R., 2008), pressure on grazing areas and water resource depletion (Kirkbride, M., & Grahn, R., 2008; Ouma, C., Obando, J., & Koech, M., 2012). This has contributed to changing demographics patterns as evidenced by increasing sedentarisation and rapid growth of small urban centres in pastoralist areas due to loss of livestock-based livelihoods and increasing insecurity due to conflict over resources (Fratkin, 2004; X. Sung, 2009; Galvin, K.A. 2009; Reid, R.S. et al., 2014; Njoka et al., 2016). Water insecurity is a feature of life for both sedentarised and nomadic pastoral societies with women and children bearing the biggest burden of fetching water. Among Samburu pastoralists of Wamba and Weso locations in Northern Kenya, women are responsible for both domestic water supply and watering of livestock which requires them to travel long distances and spend a considerable part of their day fetching water (Boruru, E.O. et al., 2011). Routine monitoring by the Drought Management Authority showed that at the height of the drought in 2017 women in some areas were travelling up to 15km a day to find water, leaving them with little or no time for other chores including child care and feeding the family (see Photo 1). Where investments in improved water supplies have been made in the ASALs the impact on water security is often reduced by poor functionality. The pluralist institutional arrangements governing rural water supplies lead to poor governance where allocation is influenced more by power dynamics and social networks than policy and regulations (Kemerink, J., Munyao, S., Schwartz, K., Ahlers, R., & van der Zaag, P., 2016; McCord, P., et al., 2016).

Centre for Humanitarian Change is working with other local actors (Rural Focus Ltd and Northern Rangelands Trust) in a four year programme to improve resilience of pastoralist communities through strengthening water resource management. Despite a widespread understanding that poor water resilience contributes to the stress pastoralist communities face during drought periods there are outstanding questions about socio-political drivers of water security in these communities in arid and semi-arid areas, and whether an understanding of these determinants can help us to predict which households will be water insecure and

need more support in times of stress. There is an indication that for pastoralist households these factors can be defined and used as a relative measure of water security within a community and hence improve targeted intervention to improve water security and household resilience to drought. In an earlier, qualitative study into “**Understanding empowerment and water security among pastoralist women in Kenya**” CHC explored the role of women’s empowerment in determining household water security in two different ASAL counties in Kenya. The findings confirmed that water related tasks are highly gendered within pastoralists households (Balfour, N. et al., 2017). Indeed, women and girl children are responsible for most of the tasks within the household (including watering small and sick animals), whereas men are only responsible for watering livestock. However, community water governance is dominated by men, and women have very little control over water management decisions. The study contradicted the hypothesis behind the research, and a common assumption in water development, that women who have more time available because they do not have to spend all day collecting water, will use their time for income generating activities. In the communities that we studied the work load of the women is so overwhelming, especially in the dry season, that any time they save fetching water is used to get the other chores done, look after the children or take a well-earned rest. However, there are clearly circumstances in which women who are more empowered are able to mobilise resources to reduce water insecurity. One clear example is where women in women’s groups were able to buy storage tanks and pay for transport to collect water.

The qualitative study identified some patterns of water insecurity related to women’s empowerment and work load but it also suggested several other factors that influence household water security and which required further research. Specifically the role of diversified livelihoods, social capital and water governance. A mixed methods study into “Gendered Dimensions of Water Security Risk in the Context of Climate Variability, Sedentarization and Institutional Pluralism for Pastoralist Households in Northern Kenya” was therefore launched in 2017 to examine these factors in more detail and, specifically to test a scale for measuring household water insecurity. Furthermore, the study aims to compare water security in both urban and rural communities in the arid and semi-arid lands (ASALs) of Kenya.

Objectives

The study aims to address the following objectives:

1. to explore the gender-related occurrence of water security risk among vulnerable semi-urbanized pastoralist communities in Arid and semi-arid lands (ASALs) rural areas and small towns (STs),
2. to assess the extent to which livelihoods diversification by households and women in rural and semi-urbanized pastoralist communities contributes to reduction in water security risk,
3. to assess the extent to which access by households and women in rural and semi-urbanized pastoralist communities to various forms of capital contributes to reduction in water security risk
4. assess the extent to which differing water governance structures (institutions) within rural and semi-urbanized pastoralist communities contributes to water security risk at community/ HH level,
5. to derive a water security risk analysis framework suited to pastoralist contexts of rural and small towns of ASALs in Northern Kenya.

Methodology

The study is applying a mixed methods research methodology incorporating both quantitative and qualitative research approaches. In addition, water quality testing is being conducted at household level for domestic water supply.

Sampling

Multistage random sampling strategy was used to identify a statistically representative sample for the household survey. Purposive sampling techniques was used for the identification of key informants and participants to the focus group discussions. Sample sites for water quality testing were also purposively selected to cover the range of all water sources. A random sample of 300 urban households in Maralal Town and 293 rural households in Samburu East was used for the study.

Data collection

Quantitative data collection is being done through a household Computer-Assisted Personal Interviewing (CAPI) survey developed on Survey CTO technology. The survey is being carried out by Samburu speaking field enumerators equipped with tablets. Qualitative data collection uses semi-structured interviews with key informants, focus group discussions, participatory mapping techniques and seasonal calendars. Interviews

are also audio-recorded for later transcription. The research team are also trialling the use of personal diaries as a technique for examining the extent of water related tasks at a household level. Data is being collected from both dry (January – February) and wet (March – May) seasons.

Water quality tests are being carried out on samples obtained from households for both microbial and physicochemical parameters using a portable Water laboratory.

Data analysis

Quantitative Data Analysis: Raw data is being downloaded from SurveyCTO, coded and entered into MS Excel 2016 and imported into STATA 14 for analysis. Data is being analysed for simple descriptive statistics and regression; bivariate and multivariate methods are being used to test for relationships between variables of interest. Exploratory Factor Analysis methods are being used to develop a composite variable for Household Water Security.

Qualitative Data Analysis: Qualitative interviews are audio-recorded during data collection, transcribed and entered into MS Excel 2016 and imported into NVIVO 11 for coding and subsequent analysis. Social Network Analysis (SNA) methods are being applied for analysis of household social capital.

Mixed Methods Analysis: Qualitative data from the 2016 study findings was used during this study exploratory phase to help refine variables for design of the quantitative survey. In addition, a qualitative formative study was conducted in Maralal to inform design of the study tools. After the quantitative data analysis, the qualitative findings will be used to provide additional explanatory information to the quantitative analysis.

Study area

The study is being conducted in rural and semi-urbanized communities within Samburu County in the ASALs of Northern Kenya. The study population comprising rural pastoralist communities is located within Meibae conservancyⁱ which formed part of the study area under the 2016 research; Urban communities were identified from homogeneous sedentarised pastoralist communities located in the study town of Maralal, the county headquarters and a key town serving communities in Samburu county.

Testing a Water Security Measurement Scale

One of the challenges for the study was to have a clear definition of water security against which to measure other variables. Following the literature review the researchers decided to develop and test a scale to measure household water security. Items for the scale have been adapted from recent work carried out in Western Kenya by (Boateng et al., 2017). A set of 26 questions in water insecurity has been adopted for the study with formative qualitative work carried out in 2016 (for rural communities in Wamba) and early 2018 (for urban communities in Maralal) used to inform the scale questions. The scale is being administered as part of the household survey with the responses ranked on a 5-item scale. The validity of the scale will be checked by testing its relationship with other variables obtained from the survey (and which have been shown in theory to affect household water security) such as time taken to fetch water, quality of household water, type of water source. The scale will also be regressed against other variables of interest such as a household's sedentarization status, household livelihood activity, responsibility for fetching water and household size among others.

Preliminary findingsⁱⁱ

Preliminary findings have been analysed from the qualitative, formative study in urban households in Maralal and the results of the first round of quantitative surveys in rural households in Wamba and urban households in Maralal.

Experiences of pastoralist women in urban households

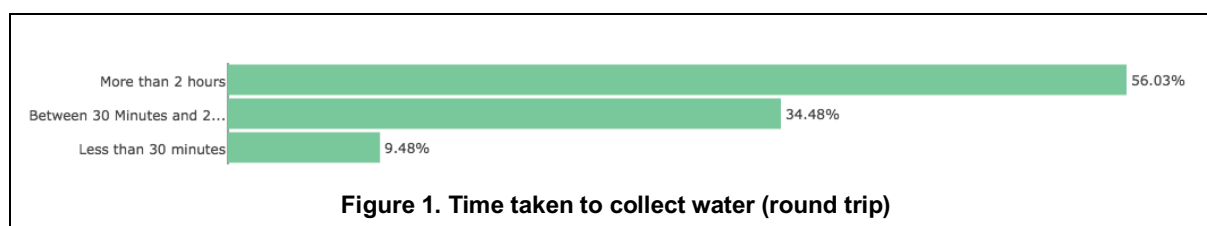
The first point to note from the study is that women and men consider themselves as 'pastoralists' even after they have sold or lost all their livestock and moved to town. Their livelihoods are still connected to livestock keeping through the extended family. Women reported that the lack of water created stress, frustrations, uncertainty and hindered them from engaging in any other activities. In certain situations, lack of water in a household led to violence against the woman if the spouse asked for water and there was none. Similarly water sources away from town are considered not safe since they are in deserted and bushy areas which make it risky for women and children. Once they reach the remote water sources they may experience

conflict with other women over the limited water available. But it is considered the duty of the woman to ensure that there is water in the homestead so at sometimes they are forced to take these risks. Water in town was reported to be costly and some families lacked money to purchase water. Overall the women reported that water related tasks take a lot of time in their dayⁱⁱⁱ; time taken to cover the long distances to the water points, time taken in purifying the water and time spent while waiting at the water point. Lack of water in the area means women cannot complete their other daily businesses/chores, even attendance to social events suffers. A common coping method reported by women is borrowing and loaning water between each other in times of need. The women reported that children did not go to school if there was no water since they feel they cannot allow them to go when they are dirty or when they have not had enough water to make tea/food for them in the morning. When there is no water hygiene in the household suffers. Personal hygiene for the women is also affected especially at critical times such as during their periods or after child-birth.

While it is a common assumption that rural, pastoralist households have more difficulty in fetching water from sources far from their homestead, the women in sedentarised semi-urban communities felt that they experienced more difficulties in obtaining water because they depend on limited sources and if these are not available then they have no options. This was contrasted to women in nomadic communities who are able to move between alternative water sources when need arises.

Early results from surveys in rural households

Nearly 70% of the households in the study area rely on surface water. This can be from a pan (a shallow depression that collects rainwater) or a sand river which retains water below the surface in the dry season. More than 60% also reported that they had to resort to an alternative source, further away, when their primary source dried up in the dry season. The majority of women surveyed reported spending more than 2 hours a day collecting water (Figure 1).



The early study had shown that within the household adult women have the primary responsibility for collecting domestic water, while adult men are responsible for livestock. In addition to domestic water 98% of women surveyed also reported having responsibility for fetching water for young animals left at the homestead. On water governance only 11% of women said they were involved in any way in management of the community's water source. In most cases their involvement was as a member of a committee. Very few households have a toilet and more than 95% reported practicing open defecation.

Discussion of findings

These are very early findings and the data collection will be completed in April so more comprehensive analysis will be available later in the year. However, the results so far support the findings of the earlier study (2016) that women bear the primary responsibility for provision of water in the household and that water insecurity has major impacts on them and their children.

Some of the unexpected findings emerging are the perception, amongst urban women, that rural, pastoralist women are less water insecure because they have options on where to fetch water. Women in these peri-urban households are clearly spending time going outside of town to collect water from unprotected sources rather than relying on the piped water supplies near their homesteads. The reasons for this will be further explored during the ongoing survey. The proportion of women spending more than 2 hours a day fetching water in Wamba sub-county is also higher than reported in other assessments and the distance to water could be expected to rise as the dry season continues. This burden on women and children affects every aspect of their lives, particularly their health, nutrition and education.



Photograph 1. Woman in Wamba Sub-County collecting water from a pan

Source: Mutuku, 2016

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Notes

- ⁱ A community conservancy is a community-based organisation, created to support the management of community-owned land, for the benefit of household livelihoods and for the conservation and protection of natural resources.
- ⁱⁱ The study is ongoing at the time of drafting this paper but will be complete by the time of the 41st conference and more findings will be available for presentation.
- ⁱⁱⁱ The proportion of the day spent on water related tasks will be explored using personal diaries later in the study
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