



Variability in perceptions of household livelihood resilience and drought at the intersection of gender and ethnicity

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Abstract

Over the past decade, there has been a growing focus on resilience-building work by international humanitarian and development organizations; however, development policies have historically given less attention to the different perceptions and experiences of women and various ethnic groups. Drawing on empirical evidence from Isiolo County, Kenya, the objective of this paper is to highlight how resilience-building work should pay more attention to differing perceptions of livelihood resilience between genders and members of different ethnic groups, specifically through an intersectional lens. A total of 338 quantitative household surveys were conducted: 152 in Kinna and 187 in Burat. Perceptions of livelihood resilience were measured using the Household Livelihood Resilience Approach (HLRA). Results found that perceptions of livelihood resilience were lower for females and did vary between the four ethnic groups involved in the study. An intersectional analysis of gender and ethnicity found more nuanced results than looking at gender or ethnicity alone. Further, while perceptions of changes in drought severity and frequency were not significantly different between genders, they did vary by ethnic group and major livelihood practice. Overall, research results demonstrate how perceptions of household livelihood resilience, and the impacts of climate change, vary based on the intersectionality of demographic characteristics. Integrating a diversity of perceptions into resilience-building work can lead to more successful outcomes for a greater number of individuals, achieving overall poverty reduction.

1 Introduction

Over the past decade, there has been a growing focus on resilience-building work by international humanitarian and development organizations (Keating et al. 2016). However,

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while improving, development policies and practices have historically left out women (Kanji et al. 2007), as well as minority groups (Bedasso 2017). While many organizations do work to include women and minority groups, unfortunately, they are still sometimes left out of work that aims to build resilience to the impacts of climate change (Lebel et al. 2017). For example, women's perceptions and needs are often given less attention, and culture, an important element of ethnicity, is regularly not considered (Lebel et al. 2017). As illustrated by Lebel et al. (2017), there is a need to expand resilience work to include a more nuanced analysis of the processes and perceptions that impact people's ability to adapt to the impacts of climate change. Previous work has shown that the impacts of climate change can worsen already-existing social inequalities, and therefore an understanding of these inequalities is critical (Ngigi et al. 2017). Further, most recent studies analyzing the impacts of climate change on gender are predicated on the construction of gender as a binary: men versus women (Carr and Thompson 2014). This approach runs contrary to the current literature on gender and identity, which treats gender as one social grouping that takes meaning from its intersection with other identities (Carr and Thompson 2014).

Addressing the oversights outlined by Lebel et al. (2017), the objective of this paper is to highlight the importance to resilience-building projects of understanding varying perceptions of livelihood resilience through an intersectional analysis of gender and ethnicity. The resilience of an individual can be contingent on their perceptions, knowledge, culture, and attitudes (Bene et al. 2016), and this paper aims to explore an individual's assessment of their own resilience. It is generally at the household scale that assets are accumulated and utilized, and at an individual level that perceptions are formed. In order to conceptualize livelihood resilience, this paper draws on five types of livelihood capital assets as outlined in the Sustainable Livelihoods Framework (Chambers and Conway 1992; Carney 1998). Recent work within the development sector illustrates the effectiveness of this approach to study perceptions of livelihood resilience (Constas et al. 2014; Kristjanson et al. 2017; Quandt 2018). Lastly, drawing on empirical evidence from Isiolo County, Kenya, this research provides an example of how perceptions of household livelihood resilience, and drought, can vary between genders and members of different ethnic groups.

1.1 Theoretical frame: livelihood resilience

The concept of resilience has evolved from the field of ecology and is now being applied in a diversity of academic fields related to social-ecological systems (See Walker and Salt 2006 for context). However, resilience thinking has been critiqued for not paying enough attention to the social or political side of social-ecological systems (Brown 2014). One response to this criticism has been the development of a livelihood perspective in resilience thinking. Tanner et al. (2015; 23) define livelihood resilience as “the capacity of all people across generations to sustain and improve their livelihood opportunities and well-being despite environmental, economic, social, and political disturbances.” Focusing on livelihood resilience places people in the center of analysis and highlights the role of human agency, rights, and capacity to prepare for and cope with shocks (Tanner et al. 2015). Further, one important question that needs to be asked in any resilience-building project or intervention is “resilience for whom?” (Brown 2014).

This paper is framed around the concept of livelihood resilience because of the current prominence of livelihood resilience in both development projects and academic research. Recent work has highlighted resilience capacity as a way to look at measurable resources

and assets that may help individuals, households, or communities prepare for and respond to shocks (Constas et al. 2014). Other work has looked specifically at “subjective resilience” which uses people’s own perceptions to quantify household resilience (Jones and Tanner 2015), and this paper draws from this idea.

1.2 Intersectionality of gender and ethnicity

Gender can be defined as the social, cultural, and psychological characteristics linked to males and females in particular social contexts (Van Dijk and Bose 2016; Ngigi et al. 2017). Gender is one of the major factors that influences how an individual experiences and perceives the world. Since the 1970s, development studies have recognized the importance of gender in explaining if a development intervention succeeds or fails (Carr and Thompson 2014). This is often related to gendered rights and responsibilities, which can be divided into control of resources, access to resources, use of resources, and gendered responsibilities (Rocheleau et al. 1996). Access to resources and land is often marked by significant gender inequalities (Kanji et al. 2007; Carr and Thompson 2014; Van Dijk and Bose 2016). For example, across sub-Saharan Africa, men have been found to produce between 4 and 25% more crops per hectare than women (Kristjanson et al. 2017). Gender is also an important factor that determines an individual’s ability to adapt to climate change (Kanji et al. 2007). For example, in a study of 9 countries in East and West Africa, Perez et al. (2015) found that women, in contrast to men, often adapt to changing conditions through their membership in social groups.

However, as stated by Warner and Kydd (1997;144), “the identification of gender roles does not usually do justice to the actual complexity which characterizes the social and economic lives of rural people in Africa.” Gender relations are dynamic, socially constructed, and therefore vary across ethnic groups (Aregu et al. 2016). Members of the same ethnic group often share ancestry, language, culture, or religion. However, ethnicity is not a static term and cultural norms for different ethnic groups are constantly shifting and changing, as are the boundaries of ethnic groups themselves. Ethnicity is an important factor that also determines an individual’s perceptions of the impacts of climate change, as well as necessary measures to build resilience to such impacts. Perception of climate change hazards can vary between members of different ethnic groups due to different perceptions or world views (Soetanto et al. 2016). In Kenya, ethnicity not only influences the normal range of livelihood activities for an individual (pastoralist, agriculturalist, etc.), but is politically and socially salient. Additionally, trust is much higher within an ethnic group than between ethnic groups in Kenya (Burbidge and Cheeseman 2017). This largely arises from a long history of interethnic suspicion and divisions beginning in the colonial era. Ajulu (2002) goes as far as to argue that the uneven economic development in Kenya has further engendered ethnic inequalities.

Contemporary feminist research has shown that gender categories gain meaning with reference to a number of other individual characteristics (Carr and Thompson 2014). Simply, all men (or women) will not experience an event or process in the same manner because their roles, responsibilities, and perceptions are shaped by more than just gender (Carr and Thompson 2014). This paper thus takes an intersectional approach in order to gain a more nuanced understanding of an individual’s identity, perceptions, and actions. It treats ethnicity and gender as an individual characteristic because of the way that other characteristics intersect with ethnicity and gender.

While the interaction between gender and climate change has received considerable attention in recent years (Ngigi et al. 2017), less attention has been given to the

intersectionality of gender and these other characteristics (Tschakert and Machado 2012). This intersectionality is important, as illustrated by Nielsen and Reenberg (2010) in Burkina Faso. They found that different gender expectations within various ethnic groups can lead to different adaptive capacities in similar agricultural settings.

1.3 Perceptions of drought

Drought is considered the most complex natural hazard, and, if measured by total number of people impacted, drought ranks first among all natural hazards globally (Wilhite 2000; Mishra and Singh 2010). Drought is particularly threatening as it can have significant impacts on ecosystems, livelihoods, and the overall development of a country (Singh and Chudasama 2017). Spurred on by the projections that most drylands will face increased frequency and severity of drought (IPCC 2014), the impact of drought on livelihoods has undergone extensive research (Linstädter et al. 2016). While this research has focused on soil, vegetation, and social system resilience (Linstädter et al. 2016), efforts to integrate gendered or ethnic perspectives into building resilience to drought have been much less studied. Importantly, men and women experience climate change differently, even if they live in the same household (Kristjanson et al. 2017). Differences in perceptions of climate change are related to different exposures to shocks, roles within the household, and perceptions of the same climate signal (Kristjanson et al. 2017). This is also true of individuals practicing different natural resource-dependent livelihood activities. For example, a pastoralist and agriculturalist will feel different impacts (for example, lower crop yields versus walking further distances to water livestock) and thus have different perceptions of the same climate signal (Quandt et al. 2017).

Understanding perception of drought is important for resilience-building work because it has been well documented that people act on their perceptions (Enns and Bersaglio 2015; Tanner et al. 2015). An individual's perceptions may affect their ability to adapt and decisions about how to build livelihood resilience (Enns and Bersaglio 2015; Bene et al. 2016). As stated by Singh and Chudasama (2017), incorporating a variety of perceptions could help policy makers establish long-term strategies for drought-resilient livelihoods.

2 Methods

This research took place in the communities of Burat and Kinna, in Isiolo County, Kenya, between July 2014 and July 2015. A total of 338 quantitative household surveys were conducted: 152 in Kinna and 187 in Burat. These communities were selected because of their ethnic, biophysical, and livelihood diversity.

2.1 Study area and ethnic groups

Burat is located outside Isiolo Town and is ethnically mixed with Turkana, Meru, Borana, and Somali, as well as other minor ethnic groups. Agriculture takes place between the Isiolo and Aye Nakore Rivers, which are used for irrigation. Agriculture began in earnest in the 1960s when Meru began moving into the area and claiming land for farming (it was previously being used as rangeland) (Boye and Kaarhus 2011). Alternatively, Kinna is largely comprised of Borana, with some Meru working as agricultural casual laborers. Farmers in Kinna depend upon a spring canal and two small rivers for irrigation.

The ethnic groups in this research include the Borana, Turkana, Somali, and Meru. Borana are the most populous ethnic group in Isiolo County and the majority holders of local administrative and political positions (Boye and Kaarhus 2011). Borana are traditionally pastoralist; however, many have invested in trade and agriculture. Turkana are traditionally a pastoral group; however, many have taken up agriculture in Burat. The Somali are another traditionally pastoral group, and Isiolo County has one of the largest Somali populations in Kenya outside Nairobi. Lastly, Meru are a traditionally agricultural group. Meru began moving to Isiolo from the highlands near Mt. Kenya because there was not enough inheritable land to continue farming there (Boye and Kaarhus 2011). Much of the agricultural adoption that has taken place in Isiolo County is attributed to the influence of Meru. Isiolo County is prone to ethnic conflict, and the four ethnic groups all claim some type of ownership of the land and/or use rights of natural resources in Isiolo (Boye and Kaarhus 2011).

2.2 Data collection

Measuring resilience is a difficult task, and most efforts utilize indicators of resilience (Jones and Tanner 2015). For this research, indicators of resilience are organized using the Sustainable Livelihoods Framework's five types of livelihood capital assets: financial, human, social, physical, and natural capital (Chambers and Conway 1992; Carney 1998). The five capital assets constitute a stock of capital that can be stored, accumulated, exchanged, or allocated to activities in order to generate an income or means of living (Babulo et al. 2008). This approach to measuring livelihood resilience is called the Household Livelihood Resilience Approach (HLRA) and has been empirically tested in Isiolo, Kenya (Quandt 2018; Quandt et al. 2018; Quandt et al. 2017). The HLRA is beneficial because it moves beyond just a monetary assessment of livelihoods (Rakodi 1999). As stated by Campbell et al. (2001), "the capital assets approach to livelihoods may be an appropriate organizing principal for the selection of indicators of system performance." Ultimately, resilience is a component of sustainable livelihoods and vice versa (Thulstrup 2015). This approach is gender-neutral and aims to not prioritize or favor any specific gender or other social group. Further, the focus on livelihoods in the HLRA is important when analyzing perceptions of livelihood resilience.

Household surveys were conducted, representing a statistically representative sample size of agricultural households in Kinna and Burat with a 95% confidence level. The household survey is provided in the Electronic [Supplemental Material](#). In Kinna, 152 of 246 households were sampled, and in Burat 187 of 349 households. The aim of the sampling strategy was not to survey an even number of respondents of each gender, or of members from the four ethnic groups. Instead, by selecting households in various locations within a geographic area, the method aimed to capture a diversity of households in the communities with differing types and levels of livelihood capital assets. Surveys were conducted in Swahili or Borana by enumerators who surveyed every other household along the transect for that day, surveying either the male or female household head depending on who was willing and able. It is important to distinguish that while the female or male household heads were surveyed, this does not mean that the household was ultimately a female- or male-headed household. In reality, most households have a male and female household head, typically the husband and wife of the family, where the different genders lead the gender-specific household activities. The household survey aimed to collect information about the perceptions of a variety of indicators of household resilience, as organized in Table 1. Indicators were selected based on a literature review and previous experience conducting livelihood research in Isiolo County, Kenya

(Quandt and Kimathi 2016, 2017). Each indicator was then converted into a question for the survey. Size of farm and ownership of livestock were included in both natural and financial capital as the five types of livelihood capital can and do overlap. Further, the survey included questions about perceived changes in drought severity and frequency compared to 10 years ago. Ethnicity and gender were self-reported by the respondents.

2.3 Data analysis

In order to analyze the results, the responses of the indicator questions on the survey were used and HLRA process was followed (Quandt 2018). First, results for each indicator question were converted so that the answer choices were on a scale of 0 to 1. The results were given a 1 to represent the most favorable response, and a 0 to represent the least favorable. Questions with multiple answer choices (such as Likert scale–type questions) were assigned values within the range of 0 to 1 (for example, 0, 0.33, 0.66, and 1). Next, the results to all the indicator questions were averaged for each of the livelihood capital asset categories. For example, the results for all the indicators under natural capital were averaged to create an overall natural capital score for each respondent. Then the scores for each of the five types of livelihood capital assets were averaged to create the overall livelihood capital score for each respondent. It was assumed that higher scores for the livelihood assets are related to higher levels of

Table 1 Household survey livelihood resilience indicators

Asset	Quantitative indicator (independent variables)
Financial capital	<ul style="list-style-type: none"> • Salaried job (yes or no) • Access to a bank account (yes or no) • Remittances (yes or no) • Household belongings (no. of belongings; 5 total response variables) • Livestock (no. of livestock; 6 response variables) • Size of farmland (no. of acres) • Ownership of farm equipment own, rent, borrow pieces of equipment; 3 response variables)
Human capital	<ul style="list-style-type: none"> • Labor availability (no. of household members between 18 and 55) • Education (level of education of respondent; 8 response variables) • General health of family (scale of poor to good; 5 response variables) • Health problems impact on ability to practice livelihoods (scale of no to very much; 4 response variables)
Social capital	<ul style="list-style-type: none"> • Family living nearby (yes/no, distance; 4 response variables) • Political influence or power (scale of none to a lot; 4 response variables) • Participation in groups (no. of groups; 12 response variables) • Participation in agriculture or tree planting group (yes or no) • Strength of relationship with neighbors (no. of activities done with neighbors; 10 total response variables)
Physical capital	<ul style="list-style-type: none"> • Normal and rainy season road conditions (scale of good to bad; 5 response variables) • Presence of facilities (schools, hospitals, etc.) within 3 km from home (11 response variables total) • Access to irrigation schemes (yes or no) • Ownership of farming equipment (own, rent, borrow pieces of equipment; 3 response variables)
Natural capital	<ul style="list-style-type: none"> • Size of farmland (no. of acres) • Own farmland (yes or no) • Diversity of farm crops (no. of different crops planted) • Livestock (no. of livestock; 6 response variables) • Soil erosion (rank of severity of soil erosion on farm; 4 response variables)

livelihood resilience, as suggested in the literature (Thulstrup 2015; Bene et al. 2016). It is important to note that indicator questions were not weighted. While in reality the importance of all the indicators is not equal, weighting them without extensive involvement of the research participants was not possible or appropriate. The division of indicators into the five livelihood capitals does disaggregate livelihood resilience to some extent, which helps to show different perceptions at a finer scale than just overall perceptions of livelihood resilience. Further, this disaggregation does partially address the issue of not weighting the indicators by providing detail and nuance.

The process described above made it simple to compare livelihood capital asset scores between different types of respondents. Thus, scores were compared between men and women, members of different ethnic groups, and at the intersectionality of gender and ethnicity. To determine significance and correlations, statistical tests such as one-way ANOVA were conducted. Due to smaller sample sizes, a more sophisticated multi-variate analysis was not conducted.

3 Results

3.1 Livelihood resilience and gender

Female respondents' perceptions of their household's livelihood resilience, particularly human and natural capital assets, as well as overall livelihood capital, were significantly lower than male respondents (Fig. 1). Under human capital, male respondents, on average, perceived themselves to be more educated ($\chi^2 = 26.37$, $p = 0.001$), while 47% of females (compared to 35% of males) reported that health issues impact their ability to work. As for natural capital, female respondents were more likely to report a smaller farm size than males ($\chi^2 = 11.05$, $p = 0.026$) and males reported a greater crop diversity on their farms than females ($\chi^2 = 13.7$, $p = 0.033$). The primary livelihood activity reported by respondents was not significantly correlated with gender.

3.2 Livelihood resilience and the intersectionality of gender and ethnicity

Perceptions of livelihood resilience also varied between ethnic groups (Fig. 2). Financial, social, physical, and natural capital assets were statistically different between the four ethnic groups. Borana had the highest financial and physical capital scores, and Turkana the lowest. Having relatives that live nearby was significantly correlated with ethnicity ($\chi^2 = 46.58$, $p = 0.000$), with 65% of Borana, 68% of Turkana, and 75% of Somali reported living near to family, while only 23% of Meru have family nearby. Further, Turkana described participating in the most number of different social groups ($\chi^2 = 82.09$, $p = 0.000$). Meru respondents did have the highest natural capital scores, and the greatest diversity of crops ($\chi^2 = 166.8$, $p = 0.000$).

Primary livelihood activity did vary significantly between ethnic groups ($\chi^2 = 124.1$, $p = 0.000$). For Borana, the major livelihoods were farming (41.51%), livestock keeping (22.64%), and salaried employment (10.06%). For Turkana, the major livelihood was farming (41.41%), casual labor (32.32%), and charcoal production (13.13%). For Meru, the only livelihood listed for all respondents was agriculture. Lastly, for Somali, the major livelihood was casual labor

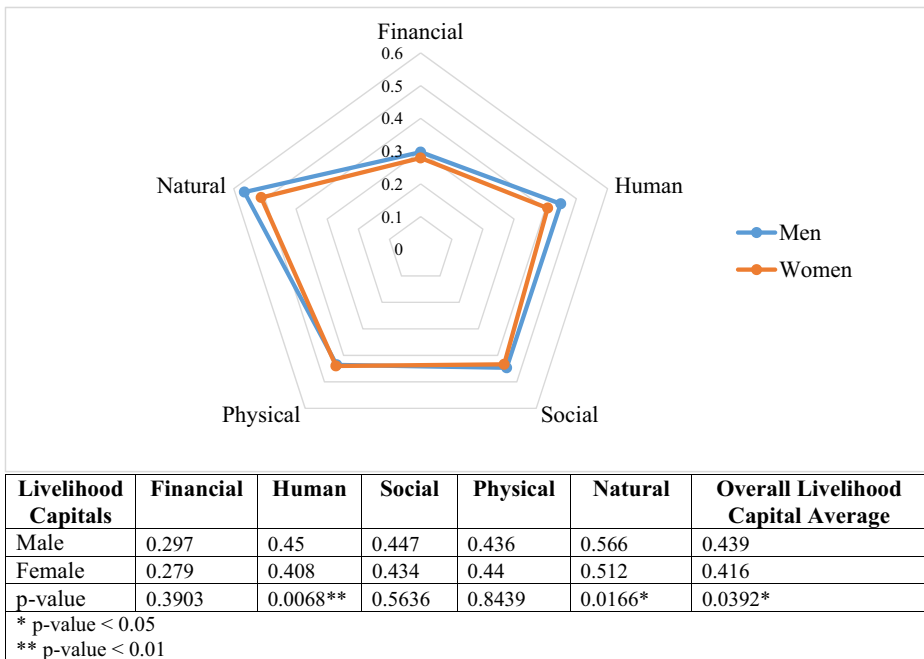


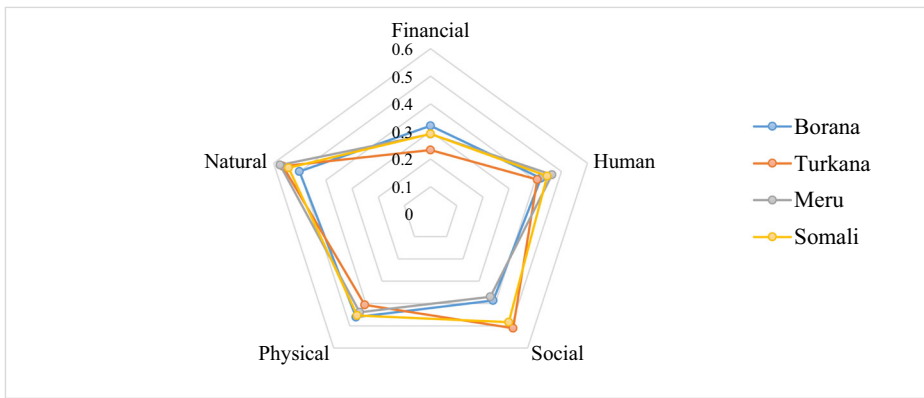
Fig. 1 Gender and livelihood capitals. The spider web chart compares the five livelihood capital asset scores between male and female survey respondents. The table below it provides the average livelihood capital scores for both male and females for each capital (financial, human, social, physical, natural) and the overall livelihood capital average for all five capitals for each gender. The p values were determined with one-way ANOVA tests. In the household survey, 125 males and 211 females were surveyed

(36.36%), crop farming (22.73%), and livestock keeping (22.73%). Livestock ownership was correlated with ethnicity ($\chi^2 = 60.51$, $p = 0.0000$).

Exploring the intersectionality of gender and ethnicity, perceptions of livelihood resilience were significantly higher for male Turkana and human capital, and male Borana and natural capital. However, for Meru, women had significantly higher perceptions of their social capital than men. Meru females were more likely than men to report that they take part in groups ($\chi^2 = 14.07$, $p = 0.029$). Turkana was the only ethnic group where overall livelihood capital scores were significantly different between genders.

3.3 Perceptions of drought vary by gender and ethnic group

While perceptions of changes in drought did not significantly vary between men and women, they were significantly correlated with ethnic group (Fig. 3a and d). Perceptions of drought frequency ($\chi^2 = 31.83$, $p = 0.023$) and severity ($\chi^2 = 36.0$, $p = 0.007$) were also significantly correlated with major livelihood activity. For example, 42.86% of respondents whose major livelihood is livestock keeping reported that drought is more severe, while 54.1% of households whose major livelihood is agriculture said that drought is less severe than 10 years ago. Further, Fig. 3b and d shows perceptions of drought frequency and severity at the intersection of gender and ethnicity and highlight the greater nuance attained than just examining gender or ethnicity alone.



Livelihood Capitals	Financial	Human	Social	Physical	Natural	Overall Livelihood Capital Average
Borana	0.321	0.422	0.387	0.461	0.501	0.417
men	0.332	0.436	0.400	0.437	0.546*	0.428
women	0.313	0.412	0.384	0.472	0.478*	0.411
Turkana	0.233	0.407	0.511	0.407	0.565	0.427
men	0.245	0.445*	0.528	0.430	0.572	0.451*
women	0.225	0.385*	0.498	0.393	0.558	0.412*
Meru	0.291	0.464	0.370	0.439	0.576	0.427
men	0.322	0.453	0.305*	0.415	0.539	0.402
women	0.224	0.491	0.493*	0.494	0.643	0.475
Somali	0.291	0.446	0.483	0.454	0.543	0.442
men	0.223	0.485	0.636	0.481	0.58	0.469
women	0.305	0.437	0.459	0.448	0.534	0.437
Ethnicity p-value	0.0031**	0.2180	0.0000**	0.0423*	0.0205*	0.6305

* p-value < 0.05
 ** p-value < 0.01
 The p-values were determined with one-way ANOVA tests.

Fig. 2 Livelihood capital scores at the intersectionality of ethnicity and gender. This figure presents both graphically, and in table form, how the livelihood capital asset scores vary between members of different ethnic groups. The table also highlights how the livelihood capital scores vary between genders within each ethnic group. Sample sizes varied between ethnic groups with Borana = 160, Turkana = 110, Meru = 26, and Somali = 24

4 Discussion

4.1 Resilience and the intersectionality of gender and ethnicity

Perceptions of household livelihood resilience did vary between genders. Women reported themselves to be less educated, less healthy, and having smaller, less-diverse farms, leading to lower livelihood capital asset scores. Gender is an important characteristic in regard to determining an individual’s access, control, and use of natural resources and these inequalities likely undermine a female’s perceived resilience to the impacts of climate change (Rocheleau et al. 1996; Le Masson 2016). This study supports work by Ngigi et al. (2017) which highlights the importance of gendered perceptions of livelihood resilience within the same household, when most studies to date have instead focused on male-headed and female-headed households. Because women often have less power and fewer assets and other resources, it is



Fig. 3 Perceptions of drought frequency and severity by gender and ethnicity. Numbers are in percentages. **a** How perception of drought *frequency* is significantly correlated with ethnicity ($\chi^2 = 24.93, p = 0.000$). **c** How perceptions of drought *severity* is significantly correlated with ethnicity ($\chi^2 = 25.35, p = 0.000$). **b, d** The intersectional analysis results between gender and ethnicity. Tests of significance were not conducted due to small sample sizes

expected that they will also have different perceptions, needs, and priorities for building livelihood resilience (Kristjanson et al. 2017). Agricultural development efforts that do not address existing gender inequalities will miss opportunities for greater impact (Kristjanson et al. 2017).

Further, perceived levels of household livelihood resilience varied between the four major ethnic groups in Isiolo County. Members of the same ethnic group often share language, culture, and ancestral heritage, and this can impact an individual’s perceptions, livelihood, and world views (Ajulu 2002). The results presented here are similar to Mullins and Soetanto (2013), who found a correlation between perceived levels of resilience and ethnic group.

Historical disparities can explain some of this divide, as the Borana have had control of the local government, and thus more political power, while the Turkana have been discriminated against and marginalized since colonial times (Boye and Kaarhus 2011). Livelihood activities can also explain some of this divide. The various ethnic groups in Isiolo County, Kenya, have developed their livelihood strategies based on their specific, and historical, ecological, and social-economic contexts (Boye and Kaarhus 2011). However, it is important to note that livelihood strategies can and do change to adapt to changing socio-environmental conditions. This paper supports previous work by Burbidge and Cheeseman (2017) who highlight the salience of ethnicity at the individual level.

Resilience analysis that looks at gender or ethnicity alone will not capture some of the nuances that are captured in the intersectional approach. Addressing the first objective of this paper, the empirical data from Isiolo County, Kenya, highlights how the intersectionality of gender and ethnicity can impact a respondent's perception of the level of livelihood resilience of their household. This work shows why moving beyond gender as a binary is important in future work (Carr and Thompson 2014). For example, overall social capital scores were low for Meru, but for Meru women the scores were significantly higher than those for men. This suggests that perceived resilience and coping strategies vary, as well as how men and women of the same ethnic group may utilize different strategies to adapt to changing environmental conditions. This supports work conducted by Perez et al. (2015) that found that women are more likely than men to adapt to change through their social groups and networks. It also supports work by Nielsen and Reenberg (2010) in Burkina Faso by also demonstrating that differing gender expectations and roles associated with different ethnic groups can produce different adaptive capacities in similar settings. However, the same results were not seen for ethnic groups other than Meru, highlighting the importance of looking at gender and ethnicity together.

4.2 Perceptions of drought

Results from Isiolo County, Kenya, also highlight how perceptions of drought can and do vary between genders and members of different ethnic groups. Individuals often act on their perceptions, and these perceptions may affect their ability to build livelihood resilience (Tanner et al. 2015). Further, perceptions of drought can be influenced by local biophysical, social, cultural, economic, and political conditions (Slegers 2008). Quandt et al. (2018) found that perceptions of drought are also dependent on how drought is defined by an individual. Interestingly, this research found that perceptions of drought varied significantly by ethnicity, but not gender. However, an intersectional analysis does provide more nuanced results. For example, the majority of Turkana females stated that drought is less severe than 10 years ago, while the opposite was true for Turkana males.

Livelihood activities can also play a role in shaping an individual's perception of drought. For example, Meru were more likely than members of other ethnic groups to report that drought is less frequent and less severe than 10 years ago. Meru are also the only traditionally agricultural group, and survey results found that agricultural households were more likely to report that drought was less severe and frequent than respondents whose dominant livelihood was livestock keeping. This supports work by Kristjanson et al. (2017), which states that differences in perceptions of climate change relate to differential exposure to climate shocks, which can change based on an individual's livelihood activities.

4.3 Limitations and recommendations

While the results are useful, this research does have limitations. First, this paper was based on a quantitative survey. Thus, this research largely focuses on the “what,” while complementary qualitative research is needed to better understand the “why.” Second, a larger survey would be needed in order to conduct more complex data analysis. Third, the indicators of livelihood resilience may not have captured certain important variables, such as traditional knowledge. Further, the equal weighting of all indicators is an assumption made in this paper. In future research, it may be more effective to understand the importance of the various indicators by involving research participants in the weighting of indicators. Lastly, while using the HLRA to measure livelihood resilience is supported by the literature, it is important to note that an assumption of this approach is the link between livelihood capital assets and livelihood resilience.

Characteristics such as ethnicity and gender are important aspects of culture, perceptions, and access to resources (Aregu et al. 2016; Van Dijk and Bose 2016). Based on a review of the literature and empirical evidence from Isiolo County, Kenya, I make two recommendations for institutions and organizations engaging in resilience-building work:

1. Perceptions of household livelihood resilience may vary based on the intersectionality of demographic characteristics and this needs to be accounted for in designing, implementing, and monitoring interventions aimed at building livelihood resilience. Understanding how access and control of assets vary based on gender and ethnicity can help shape resilience-building interventions to address existing inequalities. Further, targeting women and other vulnerable groups with resilience-building interventions may help increase the likelihood of achieving overall poverty reduction and increasing sustainability (Kristjanson et al. 2017).
2. Perceptions of the impacts of climate change also vary based on the intersectionality of demographic characteristics, and this should shape resilience-building interventions and strategies. Interventions may not be successful if they do not take into account the varying perceptions of how climate change is impacting lives and livelihoods. Instead, integrating the diversity of perceptions of the impacts of climate change, as well as feasible adaptation strategies, can lead to more successful outcomes for a greater number of individuals.

5 Conclusion

This paper demonstrates how perceptions of household livelihood resilience, as well as drought severity and frequency, can and do vary between genders and members of various ethnic groups. The results support the importance of resilience-building projects integrating various perspectives, particularly to avoid worsening the existing social inequalities that can be exacerbated by climate change (Ngigi et al. 2017). Further, the paper highlights an intersectional approach to analyzing perceptions of livelihood resilience by treating gender as a social characteristic that only takes on meaning from its intersection with other identities, such as ethnicity (Carr and Thompson 2014). In doing so, the paper supports the idea that the resilience of an individual is tied to their perceptions, knowledge, culture, and attitudes (Bene et al. 2016). Drawing on the HLRA method for measuring livelihood resilience, this paper uses empirical evidence from Isiolo County, Kenya, to provide specific examples of how

perceptions of household livelihood resilience and perceptions of drought can and do vary. Going forward, resilience-building projects should shift from considering women and minority ethnic groups as victims to working with them as equal agents of change for building resilience (Le Masson 2016). Further, integrating varying perceptions into resilience-building projects helps address the important question of “resilience for whom?” and tailor projects to groups most in need (Brown 2014).

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Compliance with ethical standards

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