Socio Demographic Determinants and Community Engagement in Livelihood Coping Mechanisms during Drought: A Case Study of Daynile District, Somalia.

Abstract

Introduction: Globally livelihoods and survival of humanity is significantly affected by natural disasters such as drought. It is projected that the nature and severity of drought is going to be on an increasing trajectory due to climate change. As a result, households adopt either negative or positive coping mechanisms as a response to the disaster. Thus this study aimed to assess factors influencing the adoption of livelihood coping mechanisms for drought risk reduction among local communities in Daynile district, Somalia.

Methods: The study employed a descriptive cross sectional study design to assess the influence of community engagement and socio demographic factors on adoption of livelihood coping mechanisms. Stratified random sampling was used to identify a sample size of 250 respondents in Daynile district. The sample size was proportionately distributed in all the sub districts i.e. Darasalam, Isse Abdi, Barwaaqo, Odwayne, Kurdamac and Halgan. Data was collected using ODKcollect and analyzed using SPSS version 25. All ethical considerations were adhered to during the study.

Results: The study revealed that a majority (73.9) of the respondents adopted positive livelihood coping mechanisms. Community engagement had a significant association with the livelihood coping mechanisms whereby a majority of respondnets who had positive livelihood coping mechanisms were actively engaged by DRR programs ($\chi 2= 68.809$, $p<0.001$). Gender and level of education had a significant association with livelihood coping mechanisms whereby a majority of respondents who had positive livelihood coping mechanisms were females (80.3%) and respondents with no formal education (66.3%) respectively. Additionally monthly income has an influence on livelihood coping mechanism whereby respondents who adopted positive livelihood coping mechanisms had a higher monthly income (74.83USD) as compared to those who had negative livelihood coping mechanisms (64.05 USD).

Conclusion: The study findings suggest the need for integrated, community-driven initiatives, in combination with targeted socio-economic support to enhance drought resilience in the Daynile District.

Keywords: Community engagement, coping mechanisms, drought, livelihood

Introduction

Globally an estimated 55 million people are affected by drought annually and it's the most serious climate hazard to livestock and crops (WHO, 2024). Further according to a report by the European Commission Joint Research Centre and United Nations Convention to Combat Desertification (UNCCD) drought is increasingly affecting every continent with projections showing that by 2050 three quarters of the world's population could experience the effects of drought which includes food insecurity, forced migration and conflict over scarce resources (United Nations, 2024). In Southern Africa millions of people are currently going hungry due to a severe drought which is projected to worsen upto the next harvest which is expected in March 2025. Countries such as Malawi, Lesotho, Namibia, Zambia and Zimbabwe have actually declared drought a national disaster (Aljazeera, 2024).

In Somalia drought has been identified as one of the major disasters with a large part of the country being drought prone (Gure, 2021). Drought shocks are usually devastating since they involve loss of livelihoods, life, long recovery periods for communities and migration of populations. Drought further leads to conflict for scarce resources hence insecurity problems. Climate hazards as well as insecurity contributes significantly to high morbidity and mortality rates and considerable suffering among populations. For instance In Somalia drought, floods and insecurity issues in 2024 resulted to an estimated 6.9 million people in need of humanitarian support (Humanitarian Programme Cycle, 2024).

Many low and middle income countries such as Somalia have weak systems to mitigate risks and inadequate disaster response which results to disasters such as drought to have a prolonged effect on communities (del Ninno, Dorosh, & Subbarao, 2007). It is worth noting that drought is one of the most complex natural hazard and its impacts vary across communities (Quandt, 2019; Quandt, Neufeldt, & McCabe, 2017). Just as the impacts vary across communities the coping strategies adopted vary as well. Rural communities in these countries normally deploys a set of complex disaster mitigation measures as well as adopt diverse coping strategies (Nyahunda, 2025). Some of these coping strategies may include migration, social safety nets, changes in dietary choices as well as negative responses such as prostitution, joining of non-state armed groups, stealing, begging, child labor among others (Di Falco & Bulte, 2013). The choice of coping strategy is usually situation specific and they vary from household to households (Quandt, 2021). It is also worth noting that some of the coping strategies are usually very costly to households and individuals wellbeing in the long run (Di Falco & Bulte, 2013).

A majority of studies have focused on the effects of drought mitigation interventions however, there is limited information on coping strategies adopted by unique communities such as those living in Daynile district whereby there are host communities and IDP camps (Twongyirwe et al., 2019). Therefore, this

study aimed at examining the socio demographic factors and the role of community engagement in the adoption of livelihood coping mechanisms in Daynile district.

Methods

Study site

The study shall be conducted in Daynile district Somalia. Daynile District is the largest district in the Southeastern Banaadir region of Somalia (Wikipedia, 2022). The district includes the northern outskirts of the national capital Mogadishu. Daynile district is comprised of inghabitants as well as a significant number of internally displaced persons (IDPs) who are displaced from Qoryooley, Kurtuunwaarey, Afgooye among other district (REACH/CCCM, 2018).

Study design

The study employed a descriptive cross-sectional study design. The study design allowed for a comprehensive snapview of influence of early warning systems, community engagement and socio demographic factors on adoption of coping mechanisms among local communities in Daynile district at a single point in time. Many similar studies have used cross-sectional study design. For instance, a study assessing adaptive responses and determinants of adaptation decision to climate change in Ethiopia adopted cross-sectional study design (Bedo, Mekuriaw, & Bantider, 2024).

Experimental procedure

A sample size of 250 households was computed using fisher's formula. The study employed stratified random sampling whereby Daynile district was stratified into six sub districts i.e. Darasalam, Isse Abdi, Barwaaqo, Odwayne, Kurdamac and Halgan. The sample was proportionately distributed in the six stratas and simple random sampling was then used to idenfity households that meet the inclusion criteria. Data was collected using standard and unstandardized questionnaires whereby UNHCR Joint Analytical Framework questionnaire was used to assess livelihood coping mechanisms while a standard Likert scale was used to assess community engagement. The research tool was pretested in Merka District. Validity was ensured by randomization during sampling and expert validation of the research tool by a disaster risk reduction expert. Data was analyzed using SPSS version 25. Data was subjected to descriptive analysis to determine livelihood coping mechanisms used by households and levels of CE. Further data was subjected to chi square test to assess the association between CE and socio demographic characteristics with livelihood coping mechanisms. Ethical clearance for the study was sought from the Ethical Review Committee of University of Peace. Permission to conduct the study was sought from the Ministry of Interior and National Security and the District Commissioner of Daynile District. Verbal informed consent was obtained from each participant after full and detailed information on the research objectives.

Results

Socio-demographic characteristics of the respondents

Most respondents (77.2%) were female, while 22.8% were male. Slightly above half (53.1%) of the respondents were married, 21.2 were divorced, while the rest were separated. A majority of the respondents had a household size of 4-6 members, 25.3% had a household size of 1-3 members, while the least had a household size of over 9. Most (84.1%) of the respondents were residing in IDP camps, while 15.9% were residing in host communities. Most respondents (71.8%) had no formal education, 21.2% had primary education, and the least had tertiary education. A high number (43.6%) of the respondents were business casual laborers, 29.9% were unemployed, while 0.8% were employed in either the public or private sector. The mean age and monthly income were 34.51 years and 72.01 USD monthly.

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency	Percentage
Gender		
Male	55	22.8
Female	186	77.2
Marital status		
Single	19	7.9
Married	128	53.1
Divorced	51	21.2
Separated	15	6.2
Widowed	28	11.6
Household size		
1-3 members	61	25.3
4-6 members	97	40.2
7-9 members	54	22.4
< 9 members	29	12.0
Residence		
IDP camps	201	84.1
Host Community	38	15.9
Highest level of education		
No formal education	173	71.8
Primary	51	21.2
Secondary	13	5.4
Tertiary	4	1.7
Occupation		
Unemployed	72	29.9
Business	42	17.4
Farmer	20	8.3
Employed(private/public sector)	2	.8
Casual labourer	105	43.6
Age (years)		

34.51 ± 11.38

Monthly income (USD)

72.01 ± 32.44

Livelihood coping mechanisms

A majority of the respondents adopted positive livelihood coping mechanisms, while 26.1% adopted negative livelihood coping mechanisms.

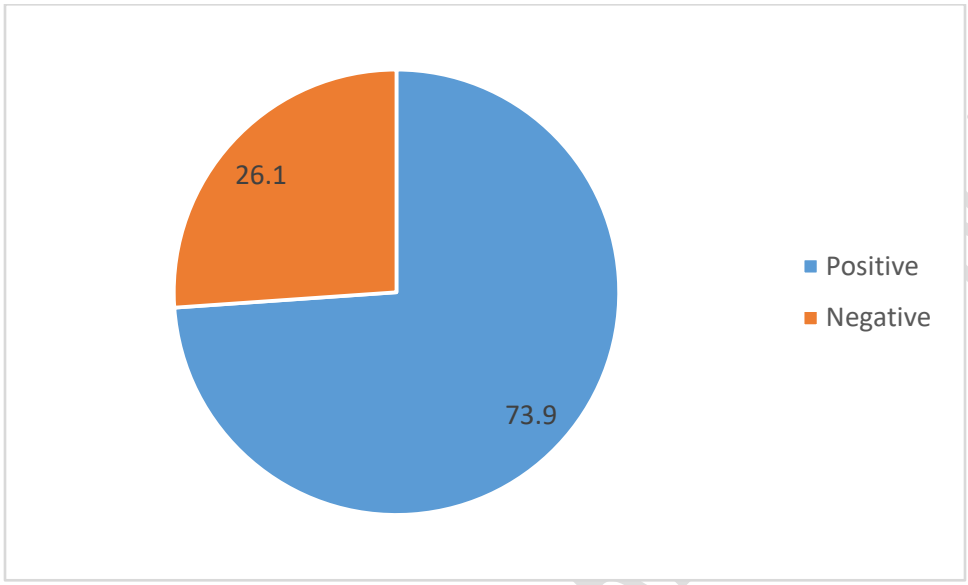

Figure 1: Livelihood coping mechanisms

Community engagement

A majority of the respondents were actively engaged in drought risk reduction programs; 26.1% were engaged at the leadership level, while 13.7% were passively engaged.

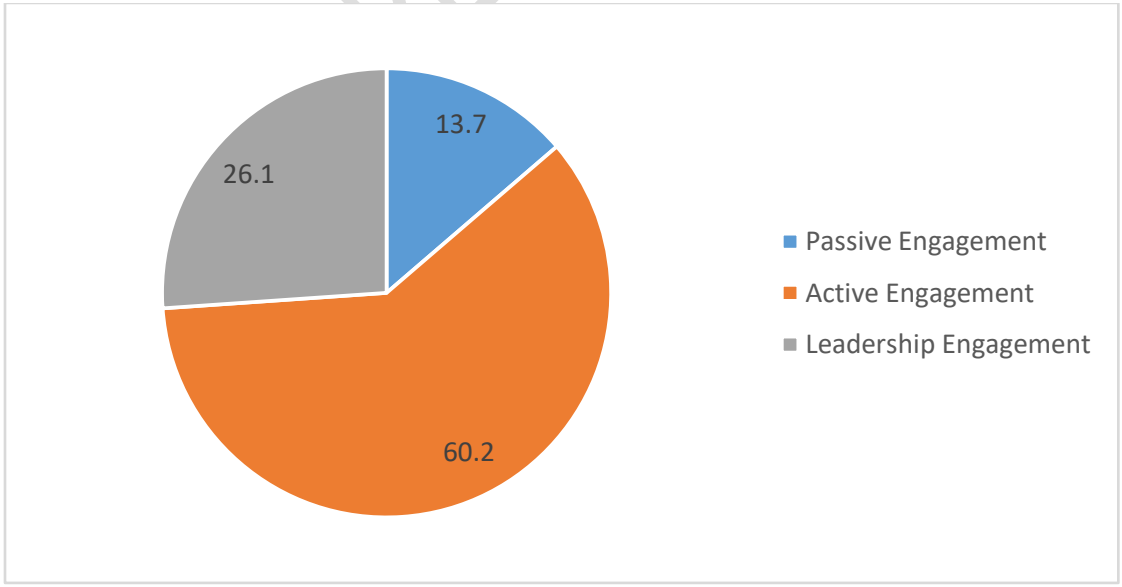

Figure 2: Levels of community engagement

Association between community engagement in drought risk reduction (DDR) initiatives and livelihood coping mechanisms

There was a significant association between community engagement and livelihood coping mechanisms ($\chi2$= 68.809, p<0.001). A majority of respondents (69.7%) who adopted positive livelihood coping mechanisms were actively engaged by DDR programs, followed by those.

Table 2: Association between community engagement in drought risk reduction initiatives and livelihood coping mechanisms

	Livelihood coping mechanism			
	Positive f(%)	Negative f(%)	$\chi2$	P value
Levels of community engagement				
Passive	32(18.0)	1(1.6)	68.809	<0.001
Active	124(69.7)	41(65.1)		
Leadership	22(12.4)	21(14.5)		

Socio-demographic factors associated with livelihood coping mechanisms

Gender was significantly associated with livelihood coping mechanisms ($\chi2$= 3.857, p< 0.049). A majority of the respondents who had positive livelihood coping mechanisms were female. Further levels of education and occupation had a significant association with livelihood coping mechanisms. A majority of the respondents who had positive livelihood coping mechanisms were those with no formal education (66.3%) and casual laborers (38.2%), respectively.

Table 3: Socio-demographic factors associated with livelihood coping mechanisms

	Livelihood coping mechanism			
Variables	Positive f(%)	Negative f(%)	$\chi2$	P value
Gender				
Male	35(19.7)	20(31.7)	3.857	0.049
Female	143(80.3)	43(68.3)		
Marital status				
Single	11(6.2)	8(12.7)	4.987	0.289
Married	92(51.7)	36(57.1)		
Divorced	42(23.6)	9(14.3)		
Separated	12(6.7)	3(4.8)		
Widowed	21(11.8)	7(11.1)		
Household size				
1-3 members	43(24.2)	18(28.6)	0.687	0.876
4-6 members	74(41.6)	23(36.5)		
7-9 members	40(22.5)	14(22.2)		
< 9 members	21(11.8)	8(12.7)		
Residence				

IDP camps	145(81.9)	56(90.3)	2.424	0.119
Host Community	32(18.1)	6(9.7)		
Level of education				
No formal education	118(66.3)	55(87.3)	10.615	0.014
Primary	45(25.3)	6(9.5)		
Secondary	12(6.7)	1(1.6)		
Tertiary	3(1.7)	1(1.6)		
Occupation				
Unemployed	59(33.1)	13(20.6)	19.064	0.001
Business	39(21.9)	3(4.8)		
Farmer	11(6.2)	9(14.3)		
Employed(private/public)	1(0.6)	1(1.6)		
Casual laborer	68(38.2)	37(58.7)		

Influence of age and monthly income on livelihood coping mechanisms

Monthly income had a significant influence on the adoption of livelihood coping mechanisms (t= 2.286, p= 0.023). Respondents who adopted positive coping mechanisms had a higher monthly income as compared to those who adopted negative livelihood coping mechanisms. Additionally, age had no significant effect on the adoption of livelihood coping mechanisms.

Table **Error! No text of specified style in document.**: Effect of age and monthly income on livelihood coping mechanisms

	Livelihood coping mechanisms			
	Positive	Negative	T statistic	P value
Age (years)	33.73 ± 11.00	36.73 ± 12.31	-1.807	0.072
Monthly income (USD)	74.83 ± 31.34	64.05 ± 34.41	2.286	0.023

Discussion

Livelihood Coping Mechanisms

The findings reveal that a large proportion of the respondents (73.9%) adopted positive livelihood mechanisms, such as diversifying income sources, engaging in small-scale trade, implementing water conservation techniques, and utilizing community-based support mechanisms. On the other hand, only 26.1% of the respondents adopted negative coping strategies like selling household assets, reducing food consumption, and engaging in high-risk jobs.

The above findings are in line with existing studies. According to Makoti and Waswa, (2015), the incidence of food shortages in drought-prone areas of Kenya was reduced by diversifying income through casual labor, small businesses, or migration. Likewise, Ward et al., (2020) attested to the substantial role that water conservation and sustainable farming practices play in increasing resilience to drought shocks.

Nevertheless, negative coping mechanisms show a continuity of low-income household vulnerabilities. For instance, in Uganda, families without sufficient financial capital were more likely to sell their

productive assets, resulting in long-term economic instability (Akwango, Obaa, Turyahabwe, Baguma, & Egeru, 2017). This implies that though a few households in the Daynile District have adopted sustainable coping mechanisms, others are hugely vulnerable because of financial constraints and lack of opportunities for livelihood diversification.

The situation is further compounded by the fact that the people of the district are living as internally displaced persons (IDPs). The findings by the study that 84.1% of the respondents resided in IDP camps is an indication of restricted access to stable sources of income. Evidence suggests that IDPs in Somalia have a greater level of food insecurity and depend on humanitarian aid (OCHA, 2022). They cannot adjust long-term positive coping mechanisms and are more likely to resort to short-term high-risk survival strategies.

Association Between Community Engagement in Drought Risk Reduction Initiatives and Coping Mechanisms Adopted

The results of the study showed a strong and statistically significant association of the community's involvement in the drought risk reduction (DRR) programs with the adoption of the positive coping mechanisms ($\chi 2=68.809$, $p<0.001$). 69.7% of respondents who adopted positive coping mechanisms were engaged in DRR programs. The study findings are in line with research relevant to the community-driven approach to disaster risk reduction. Olawuyi and Mushunje, (2024) assert that the communities that participate in the decision-making processes are more likely to opt for sustainable coping strategies. Similarly, a Kenyan study reported that pastoralist communities that more actively participated in the protection of resources had more success in managing drought stress (Pandey & Humnath, 2009).

Various levels of engagement appeared throughout the research study. Participants classified as passively engaged totaled 13.7% since they only received information without taking part in decisions. The category of active engagement accounted for 69.7% of the respondents who participated in meetings and training events while putting DRR measures into practice. Those in leadership roles (26.1%) created program guidance strategies and oversaw resource management systems. The research findings show that passive engagement fails to develop positive coping strategies, but active engagement strongly supports resilience development. The work of Taylor, Ryan and Kim, (2020) supports that disaster preparedness programs demonstrate their best outcomes through complete community participation in both decision processes and implementation stages. The active participation of communities enables them to effectively manage shared resources together as an essential practice in regions affected by drought. The Borana region of Ethiopia benefited through resource sustainability when local communities established their agreements to share water and manage grazing areas (Andersson et al., 2020).

Influence of Socio-Demographic Characteristics on Coping Mechanisms

To begin with, the study revealed a strong association between gender and coping mechanisms ($\chi 2$= 3.857, p= 0.049), with women adopting positive coping mechanisms than men. This is consistent with a Nigerian study which reported that in the event of a drought, women take charge of managing household resources and food security (Ekele, Sennuga, Bamidele, Alabuja, & Osho-Lagunju, 2023). But women continue to be resilient despite their structural barriers, including limited access to land, credit, and decision-making opportunities. Liu et al., (2024) stress that more efforts are needed to enhance women's role in drought adaptation via financial inclusion and capacity-building initiatives aimed at eliminating gender disparities.

Coping strategies also featured significant association with education level and occupation. The study found that individuals with no formal education (66.3%) and casual laborers (38.2%) were more likely to adopt positive coping mechanisms. Such a finding implies that, even without education in the form of attendance at schools, there is practical experience and traditional knowledge involved in their survival strategies. Nevertheless, unemployed respondents (29.9%) were more inclined to employ negative coping mechanisms. This emphasizes the requirement for vocational training programs, microfinance initiatives, and employment opportunities to bring down precarious survival strategies (Vasanthi, Sahana, & Sudheendra, 2018).

Finally, the coping strategies were statistically significantly associated with income levels (t = (2.286; p= 0.023), but not with age (p= 0.072). Households with considerably higher monthly incomes embraced positive coping mechanisms, reinforcing the relationship between economic stability and climate resilience (Deressa, Ringler, & Hassan, 2010). This reinforces the need for financial empowerment programs like cash transfers, savings cooperatives, and small business support initiatives to boost the economic resilience of vulnerable populations.

Conclusion

The present study aimed at examining factors influencing the adoption of livelihood coping mechanisms for drought risk reduction among local communities in the Daynile District, Somalia, by focusing on community engagement and socio-demographic characteristics. Positive coping strategies were strongly associated with community engagement in support of the importance of active participation in drought risk reduction initiatives. Coping mechanisms were heavily influenced by socio-demographic factors, namely gender, level of education, occupation and monthly income whereby women, casual laborers, and low-income groups respectively showed distinct adaptation patterns. These findings suggest the need for integrated, community-driven, in combination with targeted socio-economic support to enhance drought resilience in the Daynile District.

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Conflict of Interest

The authors declare no conflict of interest.

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