

# Riparian Communities Response to Livelihood Shocks and Stresses in Murang'a County, Kenya

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**Abstract:** Riparian communities livelihood vulnerability to shocks and stresses appears to have increased in the last decades due to climate change. In the humanitarian assistance circle, the contemporary debate is focusing on how to make resilience a core aim of external assistance when responding to disasters and other related stresses. The approach has ignored capability and the ability of Riparian Communities to respond, withstand and recover from such shocks and stresses. It is on this background that this study investigated riparian communities' vulnerability and response to shocks and stresses in Murang'a County, Kenya. The study was conducted in four purposively selected Sub-Counties - Kiharu, Kangema, Mathioya, and Maragua, due to their richness in wetlands. Data was collected using household's survey questionnaires, key informant interviews, and focus group discussion. Questionnaire were administered to a randomly selected sample of 404 respondents from the riparian community in the four sub-counties. Data was analyzed using SPSS software version 26.0. Chi-squared test was used to test for association between vulnerability and response to shocks and stresses. Rejection value for statistical tests was set at  $P < 0.05$ . Results showed proness to shocks and stresses rate of 60.4%. It is concluded that livelihood strategies of riparian communities were not sustainable due to a high rate of vulnerability to shocks and stresses, which sometimes are beyond their vulnerability level of control in responsive, adoptive, and transformative leading to reduction in resilience level. Hence the study recommends technological natural resource information early warning system, natural resource information system, balancing ecology in the lens of response to shocks and stresses for sustained livelihood through empowerment, capacity building and stakeholders' active participation.

**Keywords:** Shocks, Riparian, Stresses, Community, Livelihoods, Wetlands.

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## 1. INTRODUCTION

Livelihood strategy concept is about scientific investigation into change process and adaptation techniques which are capable to mitigate and enhance the recovery process. The terms stress and shocks are sometimes used interchangeable but generally they mean different concepts altogether. Stress are those livelihood calamities within our normal control level while shocks are beyond our vulnerability level of control and at times force us to call for external assistance. The debate is still not very clear about what should be categorized as a stress and what is actually a shock, comparatively, a stress to one given community, may be a shock to a neighborhood community (MEA, 2005).

Zselezcky, and Yosef, (2014), conducted a study on the frequency, scope, severity and the impacts of shocks on food resilience and security. The study showed that shocks are external deviations from effective long-term trends which causes negative substantial impacts on the people's present state of well-being. The notion is supported by Constas, Frenkenberger, and Hoddinot (2014), who stretches our imagination that shocks are man-made and includes human conflict, market base, and technological base. They also hold that in contrast, some shocks occur naturally such as floods,

epidemics, droughts, cyclones or famine. These shocks are economic in nature as they affect labor demand, consumption patterns, market functioning, public transfers, commodity and food prices which again have an impact on household's wellbeing (Constas et al. 2014).

Researchers as well as academicians have tried to examine the role of the riparian community's in response to shocks and stresses which either contributes to their resilience or vulnerability. However, many studies had revealed that the riparian's role in food production, environmental stewardship as well as response to shocks and stresses, have been underappreciated by the general public (Myer, 2008). However, the USAID resilience report (2016), depict that people who are considered vulnerable to shocks and stresses are the chronically poor farmers, rural poor women and children who depends on fishing and agricultural activity for livelihoods (Tango, 2016).

Millennium Ecosystem Assessment (MEA) done in 2014 on Climate change, view stressors as those long-term pressures such as inter-community conflicts, election violence, unstable markets. In addition, there are seasonal demand for agricultural products, uncontrolled credit terms and conditions and misguided government policies. It further observes that stress and shocks propagate to community's vulnerability to food security. The notion is supported by Department for International Development (DFID) (2011), as it views resilience as the ability of Nations, communities and households to effectively manage change through transforming or maintaining living standards in the face of shocks and stresses such as drought, floods, earthquakes, pandemics, or conflicts without compromising their long-term prospects.

The government of Kenya through its constitution 2010, mandated different governmental and non-governmental actors to mitigate, manage, conserve natural resources and respond to shocks and stresses should they occur. However, among them there is lack of a well-coordinated framework of action to respond shocks and stresses occurring as a result to climate change (Kenyan Constitution, 2010).

Reflection on poverty and unsustainable livelihood in Murang'a County, involves inability to satisfy human basic wants/needs, inadequate skills and lack of education. It involves malnutrition, poor health, lack of basic shelter, lack of control over resources. On the other pole, it further involves inadequate access to Water and sanitation, vulnerability to shocks and stresses, lack of political voice, prone to crime and violence (World Bank, 2001). It is on this background that the study was carried out to unpack riparian communities' response to shocks and stresses in Murang'a County, Kenya.

## II. METHODOLOGY

This study used a descriptive survey design and adopted mixed method approach, to investigate riparian communities' response to shocks and stresses in Murang'a County, Kenya. According to Leavy (2017), descriptive survey design is appropriate because it provides a clear picture of a phenomenon the way it naturally occurs and the way they are related. Further, Creswell (2014), observes that descriptive survey design is more important as it helps in cross-sectional studies of interviews and questionnaires in field data collection among the respondents. The study targeted 144,376 riparian households which were living and drawing their livelihoods from wetlands in Murang'a County. Records obtained from County Natural Environmental Office showed that Four Sub-Counties: Kiharu, Kangema, Mathioya and Maragua, had the highest number of wetlands and were therefore purposely selected for the study. Simple random sampling was used to arrive at household sample of 143 (35.4%) in Kiharu, 64 (15.9%) in Kangema, 69 (17%) in Mathioya and 127 (31.5%) in Maragua respectively. Thus, a total of 404 households participated in the study.

Primary data was collected using several methods: structured and semi structured questionnaires, key informants' interviews, observation check list and focus group discussion. Household survey was carried on 404 households in the County to determine household size, history of settlement, nature of households, wetlands resource utilization and socioeconomic status. Structured and unstructured questionnaires were administered to each household. The oldest member of the family was given adequate time to fill the questionnaires. Those who did not know how to read and write were assisted by appropriately trained research assistants. Positive statements in Likert scale was used to determine their level of either agreeing or disagreeing with statement in questions that seeks their individual's perceptions, knowledge, and attitudes.

Key informants including NEMA, WARUA'S WARMA, TARDA, County Assistant Commissioners, KWS officers, Sub-County agricultural officers, Head teachers, Chiefs, Assistant Chiefs and Nyumba Kumi leaders were visited in their offices for one to one interview with prior appointments. During the visit, an interview guide was used to determine their awareness on shocks and stresses affecting their livelihoods. Additionally, key informants also gave their views on their

response to shocks and stresses in community level. Further, some of the key informants such as NEMA and TARDA also provided secondary data in form of office records on public awareness, campaign and collaboration with other stakeholders on responsive, adoptive, and transformative leading to resilience level on shocks and stresses. Data was analyzed using SPSS software version 26.0. for the accuracy of the results.

### III. LITERATURE REVIEW

Department for International Development (DFID) (2011), views resilience as the ability of Nations, communities and households to effectively manage change through transforming or maintaining living standards in the face of shocks and stresses such as drought, floods, earthquakes, pandemics, or conflicts without compromising their long-term prospects. Based on Hyogo Framework for Action 2005-2015, resilient of riparian and any given community to shocks and stresses can be measured through five pillars (Table 3.1).

**Table 3.1: Pillars for measuring communities' resilience to shocks and stresses**

Process	Outcome
Capacity strengthening through training	Hyogo Framework For Action
Assessment of vulnerability and capacities	Risk governance
Preparedness and action plans	Risk assessment
Community awareness	Knowledge and education
Mitigation activities	Risk management and vulnerability reduction
Community early warning system	Disaster/Shocks/stresses preparedness

**Source:** Hyogo Framework for Action (2015).

Measuring communities' resilience help in building livelihood capabilities which is coupled with effective coping mechanisms to minimize the impact of uncertainties. Bird and Shephard, (2003), observes that every given community, have their own ways of dealing with change which is either permanent or temporary. Some communities migrate from the area for a strategic period of time, or sort to other alternative livelihood strategy (Bird et al. 2003).

Capacity to cope and recover from shocks and stress involves investment decision making which are effectively responsive, adoptive, absorptive and transformative, a resilient community should have a good idea to respond to stresses and shocks which causes diverse effects on people's wellbeing (Bird, et al. 2003).

Riparian communities' resilience level, focuses on food security, universal basic health care, education, capacity building, rehabilitation and protection of wetlands. Other measures may be boundary realignment and title deed acquisition, compliance and enforcement, effective policies, legislations and regulations, stakeholder's participation, diseases management, optimum operational market, money borrowing, political stability among others (Bird, 2003). This notion is supported by Juma, (2009) who conducted a study on Turkana livelihood strategies and adaptation to drought in Kenya, he observed that when a community is faced with a shock such as drought, they respond to it through the adaptation of other alternative livelihoods (Juma, 2009). However, Start and Johnson (2004), gives a warning signal that desperate strategies are dangerous and costly and normally leads to unsustainable and negatively impact on well-being of the community (Start, et al. 2004).

Food crisis in the Sub-Saharan region has led to development of different strategies in the fight against hunger and under-nutrition as well as response to shocks and stresses. However, it should be borne in mind that each country is different from one another in terms of geographical distribution and climate change. As a result, "there is no one size fits it all solution", to vulnerability to shocks and stresses as well as response to food insecurity in the region (FAO, 2006).

Strategic plans to improve riparian's resilience levels, may be based on addressing the root causes of stresses and shocks but not just mere symptoms and integration of contingency into risk management schemes. Siddika (2008), conducted a study on women livelihood resilience and options for adaptation to climate change and found that when shocks and stresses strike due to climate change, urgent adaptation measures are required to reduce women and children vulnerability. According to Devise, Guenther, Leavy and Mitchell (2009), households faced with shocks and stresses leading to food crisis intend to respond differently by collecting the famine food, borrowing grain food from their kin, migration, engage

in dry season farming, sale of part of their livestock, borrowing money from shylocks/ merchants, domestic sale of assets, lease/pledge of portion of farm land or permanently migrate from the area (Devies et al. 2009).

In Kenya and due to devolution, shocks and stresses response budget allocations by both the national and county governments are always insufficient and at times subjected to misappropriation and corruption. The institutions mandated by checks and balancing role are also affected by the vise too. The NGOs have played a critical role in making funds available for shocks and stresses information dissemination and awareness to boost the riparian's community's resilience level. However, they are too having their own challenges in terms of monitoring and evaluation their projects (GoK 2014).

Due to change in climate, the weather pattern in Murang'a County is uneven and varies with season, during dry seasons, wetlands are subjected to degrading human livelihood strategies and during the rainy season when they are supposed to recover from such shocks they are again faced with floods and this make it difficult to strike a balance between the two shocks (Choularton, Frankenberger, Kurtz and Nelson, 2015).

#### IV. RESULTS AND DISCUSSION

*Bio-Data of the respondents:* A total of 404 households were included in the study, out of which 198 were males and 206 were females (Table 4.1). Questionnaires were provided and returned on site, and hence, a return rate of 100% was achieved. However, despite the 100% return rate, only 350 (86.6%) questionnaires were fully responded to and included in the analysis. These included 170 (42.1%) males and 180 (44.5 %) females' participants.

**Table 4.1: Response rate by gender**

Respondents	Sampled Response	Response	Response Rate (%)
Male	198	170	42.1
Female	206	180	44.5
<b>Total</b>	<b>404</b>	<b>350</b>	<b>86.6</b>

In this study, a response rate of 86.6% was achieved, which was acceptable for analysis since, the whole point of conducting a survey is to obtain useful, reliable, and valid data in a format that makes it possible to analyze and draw significant conclusions about the target population. Babbie (2007), asserts that a response rate of 60% is good and 70% is very good. The dominance of women in the study is consistent with the national gender distribution in which females are approximately 51% of the national population (KNBS, 2019).

*Age Distribution:* Out of the 404 respondents, over 87% were aged between 31 and 80 years (Table 4.2). The majority constituting about 25% were aged between 51-60 years and 24% between 24-50 years. A very small proportion of about 11% were above 71 years and 5.1% below 24 years.

**Table 4.2: Age distribution of the respondents**

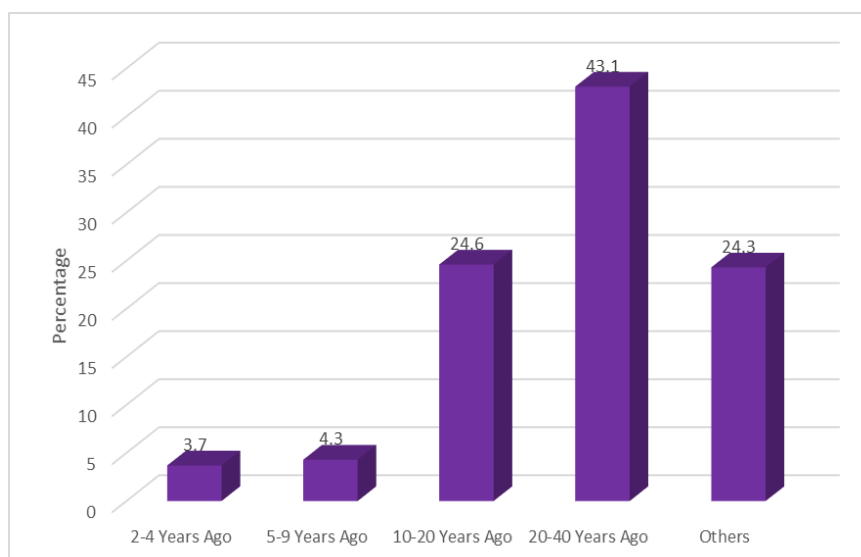
	Frequency	Percentage
18-24 Years	18	5.1
25-30 Years	23	6.6
31-40 Years	47	13.4
41-50 Years	84	24
51-60 Years	87	24.9
61-70 Years	48	13.7

*Marital Status:* Marital status is associated with how an individual contributes to community livelihood activities and the life quality. Study assessed the marital status of the respondents and the findings (Table 4.3), shows that 52.3% are married, 27.7% are single, 7.4 % are widowed, 5.7% are divorced, 3.1% are separated, 2.9% are widower while 0.9% indicated others.

**Table 4.3: Marital Status**

	Frequency	Percentage
Married	183	52.3
Single	97	27.7
Divorced	20	5.7
Separated	11	3.1
Widowed	26	7.4
Widower	10	2.9
Others	3	0.9
<b>Total</b>	<b>350</b>	<b>100</b>

*Settlement in the Area:* The respondents were asked to indicate how long they had settled in the area and the study findings (Figure 4.1), 43.1% settled in the area 21-40 years ago, 24.6% settled 10-20 years ago, 4.3% settled 5-9 years ago and 3.7% settled 2-4 years ago while 24.3% indicated others and could not ascertain the exact year they settled in the area. From the study findings, majority (67.7%) of the respondents settled in the area between 10-40 years ago, while a significant number (24.3%) were not sure of the years.

**Figure 4.1: Settlement in the Area, n = 350.**

*Common Shocks and Stresses in the Community:* The respondents were asked indicate the common shocks and stresses they have encountered in the community and the multiple response findings (Table 4.4), shows that 86.9% experienced insecurity, 84% experienced unusual high level of livestock disease, 78% experienced unusual high level of crop disease, 70.9% experienced unusual human diseases among other shocks and stresses in the community.

**Table 4.4: Common Shocks and Stresses in the Community, n = 350**

	Frequency	Percentage
Insecurity	304	86.9
Households Members/Breadwinners Diseases	169	48.3
Household Member/Breadwinners Death	137	39.1
Unusual High Level of Crop Pest Disease	273	78
Unusual High Level of Livestock Disease	294	84
Unusual Drought Pattern	169	48.3
Unusual Flood Pattern	143	40.9
Unusual Human Disease	248	70.9
Civil Strive	74	21.1
Acute Labour Shortage	96	27.4
Post-Election Violence (2007/2008)	61	17.4
Others	9	2.6

Tango International (2013), gives a very unique perspective of shocks and stresses as the study observes that some shocks and stresses such as drought and livestock diseases might have been so common to a particular area that the community no longer consider them as shocks and stresses, but as part and parcel of their lives. According to Weely and Leakens (2004), unusual or rear disease affects one person out of approximately 2000 or less and most unusual diseases are genetics. Unusual diseases cause a burden to community as a result of lack of knowledge in the diagnosis stage, high cost of treatment and unlimited therapy or medical care. In an FGD stakeholders were conversant with insecurity issues, unusual human diseases such as tuberculosis, sickle cell anemia, cancer and the most recent one Covid-19.

*Response to livelihood Shocks and Stresses in the Community:* Community capacity building generally focuses on vulnerability reduction, effective preparedness, enhanced long term recovery, access to social services and risk awareness creation. The respondents were further asked to indicate how they responded to the common shocks and stresses in the community and the findings (4.11), shows that 50.9% seek external veterinary services, 14% purchase hay, and 7.4% sell at low price, 7.1% purchase water tank, and 6% resort to traditional animal treatment approaches among others.

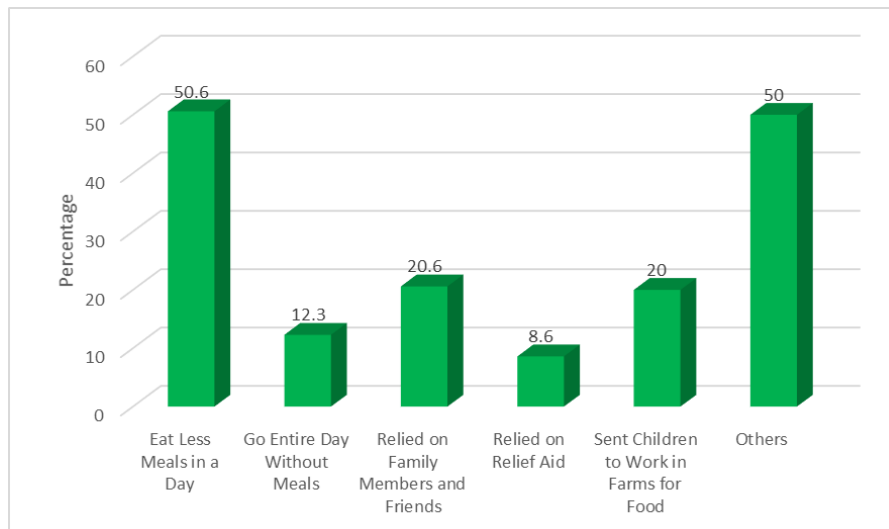
**Table 4.5: Response to common livelihood Shocks and Stresses in the Community, n = 350**

	Frequency	Percentage
Zero Grazing	11	3.1
Bore hole	7	2
Vigilantes	10	2.9
Seeking External Veterinary Services	178	50.9
Traditional Animal Treatment Approaches	21	6
Use of Wetland Water to Solve Water Problems	10	2.9
Purchase of Hay	49	14
Employing Guards	9	2.6
Purchase More Land	4	1.2
Purchase of Water Tank	25	7.1
Sell at Low Price	26	7.4
<b>Total</b>	<b>350</b>	<b>100</b>

Riparian's were aware that their livelihoods depended more on agricultural productivity and they were more knowledgeable about shocks and stresses that were affecting their livelihood strategies. They were also conversant with the role of both the National and County government on effective service delivery such as veterinary service, enhanced infrastructure, market provision and as well as modern technology development and transfer.

The above notion is supported FAO (2016), as it observes that economic impact of livestock diseases can be assessed in different perspectives such as reduction to national income, threat to livelihoods of the community, an increase in source of revenue from vaccines and drugs, and a disruption to food security. Frankenberger, Langworthy, Spragler and Nelson (2012), gives a unifying opinion that resilience of a community to shocks and stresses involves livelihood strategies diversification through long term access to public infrastructures, such as markets, roads, education health care, veterinary services, natural resource management and strengthening of governance institutions for a sustained livelihood.

*Coping with Food Shortage:* Whenever small-scale farmers are faced with external/internal shocks/stresses, they often adopt to negative coping strategies and any effort towards raising their living standards should be geared towards alleviating extreme hunger. The respondents were asked to indicate how they cope with food shortage in their locality and the multiple responses presented in Figure 4.2, shows that 50.6% eat less meals in a day, 20.6% relied on family members and friends, 20% children to work in farms for food, 12.3% go entire day without meals and 50% indicated others. The study finding shows that over 50% cope by having less meals in a day.



**Figure 4.2: Coping with Food Shortage,  $n = 350$ .**

The findings were further corroborated with FAO (2015), that over 800 million households in the World, suffers hunger. A participant in a FGD who was a public health nutritionist in Kangema indicated that food access, availability and utilization is complex and dynamic as it involves quality diet, nutrition knowledge, cooking methods, healthy practices, clean water, and sanitation. She supported the concept that the community only produce food during a given period in a year, and even if they have good harvest, storage facilities was a problem leading them to selling the products at a prevailing price in the market leading to high demand during off peak season thus hindering their access to food throughout the year.

*Social Safety Nets and Solidarities:* In the contemporary societal set up, social safety nets and solidarities recognize that when government insurance policies are ineffective in the management of risks involved during calamities, then different households turn to informal intervention strategies. The respondents were asked if they rely on external support from families or relatives in case of calamities and the findings (Table 4.6), shows that 78.6% rely on families and relatives for external support during calamities while 21.4% do not. The findings imply majority of the respondents rely on relatives and families for support during calamities.

**Table 4.6: Social Safety Nets and Solidarities**

	Frequency	Percentage
Yes	275	78.6
No	75	21.4
<b>Total</b>	<b>350</b>	<b>100</b>

According to Devereux, Sabates and Guenther (2008), social safety nets form part of social protection programs with a broad objective of building resilience of the community poor and vulnerable against livelihood risks, maintaining of adequate level of food consumption and improvement of food security. In a participatory group discussion, it was observed that riparian communities in both the Sub-Counties of the study, were conversant with formal social safety nets such as health and risk-based insurance policies for the non-poor in the area where they get medical insurance cover as well as insuring their properties against risks and pay premium and hence getting compensated in the event of predefined occurrence/risk.

## V. CONCLUSION

Based on the findings, the study concluded that Riparian's livelihood strategies are prone to shocks and stresses which sometimes are beyond their control in terms of responsive, adoptive and transformative strategies. leading to a reduction in resilience level. Hence, the study established that livelihood strategies of riparian communities in Murang'a County were not sustainable. the study recommends technological natural resource information early warning system, natural resource information system, balancing ecology in the lens of response to shocks and stresses for sustained livelihood through empowerment, capacity building and stakeholders' active participation.

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