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Psychological Perspectives on the Impact of Climate Change in Kenya: A Revisit of Solai Dam Tragedy

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Corresponding Author:**George Manono Areri**Assistant Lecturer,
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Climate Change is a global phenomenon with impacts that have been well documented. Governments through the Intergovernmental Panel on Climate change (IPCC) have developed policies and strategic plans to mitigate the impacts of climate change. Kenya has developed a National Climate Change Response Strategy (NCCRS) that has clearly outlined the impacts of Climate change and measures to mitigate them. While the areas of impact focused on are the biophysical, socio-economic and to some extent physical health effects of climate change, there is little or no significant mention of the psychosocial impacts of climate change in Kenya. This paper endeavors to highlight the psychological dimension of the impact of climate change by analyzing the Solai Dam tragedy - an extreme weather occurrence associated with climate change. It provides a critical analysis of psychological reactions to the tragedy by individuals and communities against existing related literature on psychological dimensions of climate change in Kenya. This was a descriptive study that used archival research method which relies on existing records. The survivors' and dam owners' narration of their experiences was analyzed for underlying thoughts, feelings and behaviors. These were identified and categorized into psychological reactions and related to existing literature on psychological reactions to disasters and the environment. The emerging psychological reactions of the survivors' and the dam owners included loss, grief, anxiety, identification with the environment, guilt, Post Traumatic Stress Disorders, and breakdown of social support. Psychological adaptation of the survivors was related to their perception of the internal and external resources available to them.

Key Words: Climate change, Impacts, Psychological dimensions, Psychological perspectives, Psychological reactions

Introduction

Climate Change is defined by the Intergovernmental Panel on climate change (Intergovernmental Panel on Climate Change [IPCC], 2007b) as "any change in *climate* over time, whether due to natural variability or as a result of human activity." Changes in climate refer to changes in means and variability of, for instance, temperature, precipitation, and wind over the course of months to millions of years. More broadly, climate refers to changes in atmosphere (gaseous envelope surrounding the earth), hydrosphere (water on the surface of the earth), cryosphere (snow, ice, and permafrost on and beneath the surface of the earth and ocean), land surface, and biosphere (ecosystems and organisms living in the atmosphere, land, and oceans). While global climate change is fundamentally a biophysical phenomenon, it is acknowledged that the recent and accelerating warming of the earth's climate is largely attributable to human activity, and its impacts are mediated by psychological and social processes and can be limited primarily by human activity (Swim et.al 2009).

Psychology, like other intellectual disciplines, can help better understand the causes and consequences of climate change and contribute to humanity's response to the continuing process of global climate change. Psychologists possess relevant skills for understanding why and how humans act in ways that contribute to climate change; the psychosocial impacts of climate change; and ways to assist society in responding to current and anticipated impacts of climate change via both adaptation strategies to lessen impacts and actions to reduce greenhouse gas emissions (Clayton & Brook, 2005; & Swim et.al 2009,). Psychological perspectives focus on perceptions and conceptions of global climate change, human activities that drive climate change, the psycho-social impacts of climate change, barriers to responding to climate change, and human responses to climate change in relation to adaptation and mitigation .(Swim et.al 2009).

Although there is plenty of literature on the impacts of climate change in Kenya, the focus of such literature mostly gravitates towards the biophysical, infrastructure, socio-economic and to some extent physical health effects of climate change. However there is hardly any mention of the impacts of climate change on psychosocial spheres of life in Kenya. The World Health Organization recognizes the adverse effects of climate change on health and specifically its impact on mental health (WHO, 2009). On May 9, 2018, Kenya

experienced the worst dam disaster¹ recorded in its history in which 48 lives were lost in a single weather related incident. Many residents of Solai farm area were injured and there was massive destruction of property. According to media reports, besides the loss of lives, two villages were destroyed along with livelihoods of the survivors. The owners of the dam, the Patel family as well as the agencies entrusted with overseeing the construction and maintenance of such structures have come under close scrutiny. Legal processes have been instituted to provide justice for the victims of this tragedy.

The Solai² Dam tragedy occurred in the background of unprecedented rains that pounded the country and the region during the long rains season of March to May 2018. Many parts of the country have time and again experienced floods leading to some rivers such as the Tana bursting their banks. This has been leading to the displacement of residents in nearly the entire county of Tana River. Masinga and Kamburu dams were full after a long time and the excess water had to be released downstream. Extreme weather conditions in Kenya have been associated with climate change (IPCC 2007).

This paper seeks to highlight three important aspects in relation to climate change; first, the psychological dimensions of climate change, secondly the psychological effects on individuals and communities that experience extreme weather events and disasters, and thirdly the psychological adaptation strategies that individuals and communities apply to mitigate effects of climate change.

Review of Related Literature

The Psychological Dimensions of Climate Change

Climate Change is defined by the Intergovernmental Panel on Climate Change (IPCC, 2007b) as “any change in *climate* over time, whether due to natural variability or as a result of human activity.” Changes in climate refer to changes in means and variability of, for instance, temperature, precipitation, and wind over the course of months to millions of years. According to the National Climate Change Response Strategy (NCCRS) the evidence of climate change in Kenya is unmistakable. Temperatures have risen throughout the country. Rainfalls have become irregular and unpredictable, and when it rains, downpour is more intense. Serious droughts, diseases such as cholera, Rift Valley Fever and Typhoid, and Population displacement and migration from climate disaster-prone areas are on the increase NCCRS (2010). Psychology can provide insights into the meanings of climate change to individuals and societies (Swim et.al. 2009). People’s experience of climate change can be through information gotten through the media or educational sources.

People are likely to be influenced by these sources to interpret given events and phenomena that they experience for example, floods, hurricanes or drought as resulting from climate change. According to Swim et.al (2009) generally, people’s understandings of climate change underlie their willingness to act, and to support public policies, in response to it. Considering that there are human dimensions of climate change, psychology can contribute to climate change analyses and discussions. The human behavioral contributions to climate change happen through the use of goods and services that directly influence the environment for example environmental consumption, which is linked to economic consumption, thus expenditures on goods and services.

The impacts of climate change may include individual and social perceptions of the risks, psycho-social well-being, aggression, intergroup outcomes, and community building. Individuals and communities vary in their vulnerability to climate change and capacity to adapt. Adaptation includes a range of coping actions that individuals and communities can take, as well as psychological processes such as appraisals and affective responses that precede and follow behavioral responses (Swim et.al. 2009). Measures to mitigate climate change can both decrease the human contribution to climate change and improve individual’s psychological well-being. However, it is important to note that mitigation policies can also meet resistance. Institutional, cultural, and individual practices can influence patterns and amount of consumption, the impacts of climate change on individuals and societies, adaptation processes, and attempts at mitigation.

Materials and methods

Methodology

This was a descriptive study that used archival research method. Bordens and Abbott (2011) note that archival research is purely descriptive and relies on existing records. Data from such records can be overwhelming and is not stored in a particular order and it is the researcher who outlines from the outset the themes they will be seeking to unravel from the information (Bordens and Abbott, 2011). This study set out to identify and categorize thoughts, feelings and behaviors related to psychological reactions to disasters and the environment.

In this research secondary data was extracted from excerpts of interviews of the survivors and dam owners of the Solai dam tragedy, in Nakuru county, in Kenya. The interviews were conducted by the major media outlets and recorded in both electronic and print form. Video recordings viewed and critically analyzed were from Citizen TV and Nation Television (NTV) networks. Newspaper reports

¹ Dam disasters majorly occur due to sub-standard construction materials and or techniques, spillway design error or geological instability caused by changes to water levels during filling or poor surveying. In the case of the Solai Dam tragedy in Kenya, it looks like the combination of all these factors were at play.

² Solai is a town in Nakuru County, Kenya. It is located about thirty (30) kilometers north of the county capital, Nakuru. Lake Solai lies to its north.

used were drawn from *The Standard* and *Daily Nation*. The survivors' and dam owners' narration of their experiences was analyzed for underlying thoughts, feelings and behaviors. These were identified, categorized and collated to existing literature on psychological reactions to disasters and the environment. The emerging psychological reactions of the survivors' and the dam owners were categorized and discussed in relation to existing literature.

Results and Discussion

The Psychological Reactions after Solai Dam Tragedy

Based on media reports carried in the main media houses such as Citizen TV³, KTN⁴, KBC⁵ and NTV as well as newspaper reports, it was clear that many of the survivors underwent harrowing experiences. A variety of psychological reactions were observed and expressed by survivors of the tragedy that occurred on May 9th 2018.

Loss and grief; media reports and police records indicated 48 people had lost their lives including children. Loss affected entire families, women, children and the elderly. George Wanjala, 25 years, a survivor of the tragedy interviewed by the *Daily Nation* said: "I have no idea of the whereabouts of my wife and children". He could not hold back his tears as he gave his story, an experience that was shared by many families affected by the incident.

Panic and helplessness; A number of survivors that were interviewed by media reported that people were running without knowing what they were running away from, they were running for their lives. Trauma and vulnerability to mental disorders such as Post Trauma Stress Disorder (PTSD); Mbutia, a survivor, said "This will haunt me for a long time". He witnessed the water swallow his shop as it swept all before its path and the retrieval of bodies from coffee plantations', houses, and buildings destroyed overlaid with mud. Anxiety regarding the future; Stephen Ng'ang'a another survivor, expressed concern for safety in the future as two other dams were reported to be leaking.

These reactions are consistent with observation made by researchers studying the psychosocial and mental health implications of climate change. Fritze et.al (2008) notes that direct impacts of climate change such as extreme weather events such as the one that led to the Solai dam tragedy, are likely to immediately affect the prevalence and severity of mental health issues in the affected communities. Individuals that may have been exposed to extreme weather conditions are likely to experience psychological and mental health outcomes associated with loss, disruption and displacement (Few, 2007). Fritze et.al (2008) point out that these outcomes may include acute and post-traumatic stress disorder, complicated grief, depression, anxiety disorders, somatoform disorders, drug and alcohol abuse, suicide attempts and completions, high risk of child abuse and increased vulnerability of those with pre-existing severe mental health issues.

Disruption of the Community and Social support Networks

Many survivors of the Solai dam disaster lost family members and friends. This definitely has led to the disruption of the community and social support networks. This is likely to prolong the process of recovery as the systems they depended on for emotional support are no longer in place. It is imperative that the survivors of this tragedy be assisted to develop alternative social support systems that may help in the process of recovery and healing. Organized Survivor groups, extended family members or faith based groups may prove to be important in providing emotional supports to the survivors over time.

Vulnerability of communities

Having shelter, a livelihood, an education and social support systems are considered determinants that help promote mental health (Swim et.al, 2009). The destruction of social, economic and environmental determinants that promote mental health in general creates vulnerability. Vulnerability is here defined as a lack of capacity within the individuals and communities to respond to external stresses placed on their livelihoods and well-being (Brklacich et.al 2007). The destruction of homes, livelihoods, schools and social amenities in the Solai dam tragedy, especially the destruction of energy sources at the village by the raging waters not only left the survivors destitute, but also significantly increased their vulnerability to mental health problems.

Sense of Guilt

There has been manifestation of a sense of guilt by the owners of the Solai Dam, the Patels, who expressed regret regarding the event and have since made payments to the survivors for the loss of life and property. While this is not equivalent to an admission of responsibility for the tragedy, it can nevertheless be viewed as an emotional response that indicates that the individual is motivated to make amends or feels a moral responsibility to behave differently (Moser, 2007). Eco-guilt has received coverage in the popular media (Foderaro, 2008). It is observed that attempts to shame individuals to adopt pro-environmental behaviors can be ineffective in

³Citizen Television Network is a private owned media company in Kenya which also runs Radio Citizen that broadcasts in virtually every vernacular language in Kenya.

⁴ KTN stands for Kenya Television Network. It also runs Radio Maisha and *The Standard*, which is one of the leading mainstream newspaper together with *Nation* which is published by Nation Media Group. Nation Media Group also owns NTV and *Mwananchi* in Tanzania and *The Monitor* in Uganda

⁵Kenya Broadcasting Corporation (KBC) is a public broadcaster funded by the Kenya Government.

changing behaviours. This is so when these attempts to rationalizations of behavior and rejection, resentment and annoyance at such perceived manipulations (Moser 2007a).

Environmental Identity

Environmental identity is a sense of connection to some part of the non-human natural environment that affects the way individuals perceive and act towards the world. It is a belief that the environment is important to us and important part of who we are (Clayton, 2003). The natural environment is associated with strong emotional and social experiences such as satisfying the need to belong (Clayton, 2003). It contributes to self-understanding as well as a sense of autonomy (Korpela et.al 2001, Ryan & Deci 2003). Environmental identity is associated with positive meaning can contribute to self-esteem (Fraser, Clayton, Sickler & Taylor 2009).

When survivors of extreme weather events such as the Solai Dam incident view their destroyed houses and physical environment, there is a sense of a distortion of their identity. One of the Solai Dam tragedy survivors was reported in the media as saying “[...]this place has been my home all these years, I don’t know where to begin.” For this survivor, the attachment and association to the physical environment has been disrupted leading to a disoriented view of themselves and the future. Reconstruction and rehabilitation efforts need to incorporate the survivors’ environmental identity so that the new environment may retain as many features as possible that enhance positive meaning to the survivors. Individuals and communities that associate positive meaning to their natural or built environment are likely to develop pro-environment behaviors that can protect it. Thus activities that are destructive to the environment such as charcoal burning, sand harvesting and deforestation are likely to be minimized.

Provision of Long-term Psychological Intervention

Mental health professionals that were involved in offering assistance in the Solai dam disaster may be well aware that in the immediate aftermath of the disaster, the survivors are likely to benefit from psychological first aid that includes assist individuals attain functional recovery. Survivors need to be assisted to have contact and engagement, stabilize, gather relevant information, be given information on coping and be connected with collaborative services.

However psychological interventions need to be availed for the victims of the Solai Dam disaster not only in the short-term but for the foreseeable future. This may help mitigate the negative impact of the tragedy on individuals and the community. Thus even as measures to provide material assistance are being put in place, psychological support must also be incorporated by the relevant agencies that are involved in working to rehabilitate the survivors of the Solai dam tragedy.

Psychological Strategies to Mitigate effects of Climate change

Psychological Adaptation

The Intergovernmental Panel on Climate Change (IPCC) refers to adaptation as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC, 2007b). On the other hand psychological adaptation refers to adaptation processes that involve for instance, accommodating, assimilating or adjusting to various contexts and new or difficult life circumstances for example work situations(Hulin 1991), new cultures (Rudmin 2003), adoption(Tan, MarfoDedrick 2007) chronic disease (Stanton, Revenson & Tennen 2007).

In Psychology, the use of the term adaptation includes focus on intra-psychic conditions and social processes that influence how individuals and communities respond to challenging circumstances. Adaptation also includes a variety of types of psychological responses such as adaptive responses that include cognitive reappraisals, disengagement and emotional management.

Impacts of climate change initiate stressors that may produce direct, indirect or mediated experiences. Initial responses to impacts of climate change include cognitive responses in the form of appraisals of the impacts relative to resources (threat appraisals), appraisals of possible responses (coping appraisals), attributions for events, affective responses such as fear and hope and the activation of motivational processes such as self-protection motives and uncertainty reduction (Swim et.al., 2009).

These initial responses influence each other as well as the selection of intra-psychic and behavioral responses at both individual and community level, which in turn affect individual and community impacts. For example greater perceived threat can lead to more worry. At intrapsychic response level the two responses together can lead to affect regulation or denial. At behavioral response level the two responses can lead to participation in civic action to encourage their community to develop protection measures against impacts. Many moderators can influence each step in the psychological adaptation process. Moderators include characteristics of the individual, characteristics of the incident and physical environment and characteristics of the community.

For instance in the case of the Solai dam tragedy,in the aftermath of the incident, the survivors appraised the event as threatening given the severity of the damage it caused to life and property. Stephen Ng’ang’a, one of the survivors expressed fear for their safety in the future as two other dams in the area were reported to be leaking.The affective responses to the tragedy included anxiety and a sense of helplessness by the survivors. In regard to their social construction of the situation the survivors of the tragedy still viewed Solai area as their home. A few days after the incident many of the residents were making efforts to resume ‘normal life’ by moving into new residences, opening their businesses and children going to school. These may be interpreted as efforts to disengage from the tragedy and manage their emotions in the light of the traumatic event. Some of the residents attributed the tragedy to ‘an act of God’. Psychological research shows that people’s willingness to restore or prevent damage is driven by their perceptions of the causes of the

damage (Brun, 1992; Slovic et-al, 1986). People are likely to consider if harm is caused by natural or human-made processes. Attribution plays a crucial role in determining considerations of ethical responsibility and accountability. In the Solai incident it is observed that while the residents appear to attribute the cause of the tragedy to natural causes, media representation appears to focus on human made causes that is negligence, corruption and greed. Attributions also influence coping appraisals, for example, whether coping responses should be directed at self or changing the situation.

Many of the survivors of the Solai tragedy appear to have opted to stay in the area. Their perceived threat of the incident is low, probably due to the feeling that they have adequate internal and external resources to deal with such incidents in the future. Motivational processes influence the selection of coping responses individuals undertake. People are likely to select coping responses that serve the functions of safety, security and defense in the face of uncertainty, threat or environmental demands (Swim et.al. 2009). Many survivors of the Solai tragedy have resettled within the area despite the destruction caused by the bursting of the dam. Payments have been made to those that lost loved ones and property. Many of the survivors view the area as their home because it offered them livelihoods in the farms owned by the dam owner. Thus they feel safe and secure in this 'familiar' environment compared to the uncertainty of starting their lives all over again away from the area.

Implications for Achievement of Government's Big Four Agenda of Development

According to Swim et.al (2009) generally, people's understandings of climate change underlie their willingness to act, and to support public policies, in response to it. The human behavioral contributions to climate change happen through the use of goods and services that directly influence the environment for example environmental consumption, which is linked to economic consumption, thus expenditures on goods and services. The government's four agenda of development focuses on achievement of universal healthcare, Food and Nutrition security in Kenya, tapping opportunities for employment creation in the manufacturing sector and providing affordable housing. Negative psychological impacts of climate change will threaten the attainment of universal health. This will in turn have detrimental effects on attainment of food security and manufacturing as a consequence of poor health of individuals that should be engaged in these sectors. Ultimately this will also adversely affect the take up of affordable housing as individuals that suffer poor health may not be productively engaged and lack adequate financial resources.

Individuals and communities vary in their vulnerability to climate change and capacity to adapt. Adaptation includes a range of coping actions that individuals and communities can take, as well as psychological processes such as appraisals and affective responses that precede and follow behavioral responses (Swim et.al. 2009). Thus successful implementation of the government's big four agenda of development requires need to evaluate communities's capacity to adapt to climate change. Strategies to assist individuals and communities to adapt behavior changes that reduce human contribution to climate change need to be entrenched in programmes. Sensitization programmes need to be designed to create awareness in individuals and communities on the psychological effects of climate change.

Conclusion

It is important to understand the psychological dimensions of climate change. This will help identify and explain the contributions of individuals and communities to climate change in Kenya. How people understand climate change influences their willingness to act, and to support public policies, in response to it. Psychosocial impacts of climate change in Kenya are a reality as observed with the reactions of the survivors of the Solai Dam tragedy. There is evidence of an increase in the occurrence diseases as a result of climate change in Kenya (NCCSR, 2010). While more attention appears to be focused on the impacts of climate change on physical health, it is imperative to create awareness and educate the public on the psychosocial impacts of climate change. As part of the national strategy to mitigate the impact of climate change in Kenya, emphasis has been placed on a multi-disciplinary approach. Psychologists should be part and parcel of the multi-disciplinary strategies so that they can offer their skills in efforts to mitigate impacts of climate change in Kenya. This is due to the fact that psychologists can offer insight to the human behavior contributions to climate change as well as how to involve individuals and communities to mitigate impacts of climate change. The government has clearly outlined a big four agenda for the development of the country that includes Universal Healthcare, Food and Nutrition security, Employment creation in the manufacturing sector and providing Affordable Housing. To achieve the agenda set out by the Government of Kenya, all threats and distractors must be minimized including the negative psychological impacts of climate change.

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