African Journal of Clinical Psychology
ISSN: 978-9966-936-05-9: 2025 Vol. 06, Issue 03

School of Applied Human Sciences

Loss of Tangible Resources and Posttraumatic Growth among Survivors of the Solai Dam Disaster, Nakuru County, Kenya

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Abstract

Disasters occur frequently around the world, causing significant socio-economic, infrastructural, physical, and mental health impacts. In Kenya, disasters are a regular occurrence and often lead to severe psychological consequences. Existing literature on the mental health outcomes of disasters in the country has largely focused on negative effects, particularly post-traumatic stress disorder (PTSD). However, there is limited understanding of the potential for psychological growth among disaster survivors. This study investigated the Posttraumatic growth experiences of survivors of a dam disaster at Solai in Nakuru County, Kenya. The objectives of the study were to establish the relationship between demographic characteristics of the survivors and the extent of posttraumatic growth and, assess whether tangible loss of resources would have any effect on the posttraumatic growth of those affected. The study applied a mixed methods approach Quantitative data were collected using standardized psychological tests of Posttraumatic Growth Inventory-Expanded (PTGI-X), and Loss of Resources scale (LOR scale). An interview guide was used to collect qualitative data. Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS), while qualitative data were examined through thematic analysis. Descriptive statistics was used to summarize data while inferential statistics were employed to determine the association between the loss of non-tangible resources and posttraumatic growth. Overall participants reported high scores of posttraumatic growth with the majority (83.8%) indicating having experienced growth to a great extent with qualitative findings also corroborating the quantitative results. A chi-square analysis was done to determine if there was a significant difference in the relationship between the loss of tangible resources and extent of posttraumatic growth. There was a significant association between the extent of tangible resource loss and the extent of Posttraumatic growth ($X^2 = 18.017$; $p = 0.000$). The findings of this study indicate the need for continued provision of mental health services to disaster survivors and highly recommend the development of new strategies to support affected individuals.

Keywords: Disaster, Loss of Resources, Mental Health, Non-Tangible Resources, Posttraumatic Growth, Survivors, Tangible Resources, Trauma,

Introduction and Background

On May 9th, 2018, Kenya experienced one of the worst man-made disasters in history. Solai dam that was built on a commercial farm, known as Patel farm in Rongai sub- County, Nakuru County, Kenya burst its walls, spilling water and killing 48 people with hundreds of people suffering injuries, and families internally displaced, and livelihoods and property worth millions of shillings were destroyed. Interventions to manage the negative consequences of the disaster were implemented through a national multi-agency coordination team both from Nakuru county and national governments. The survivors of the Solai dam disaster were exposed to trauma, including the death of loved ones as well as sustaining serious injuries which affect the continuation of life. One of the determinants of posttraumatic growth is exposure to a shattering life experience such as a traumatic event and how life continues after the experience (Janoff-Bulman, 1992).

Human beings have experienced disasters and crises as long as they have lived (Quarantelli et al., 2007). Disasters have been defined as events that threaten lives, cause people to develop fear and helplessness and have the potential to generate trauma (McFarlane & Norris, 2006**).** Fritz (1961) describes a disaster as a "disruption of the social context" in which individuals and groups tend to operate. Thus, disasters affect individuals and groups in adverse ways. Disasters may be broadly classified into two types: acts of nature and human/man-made disasters. The former are considered to be unintentional acts of nature while the latter are regarded as intentional human acts (Makwana, 2019). Natural disasters include earthquakes, hurricanes, volcanic eruptions, floods and drought. Man-made disasters are technological accidents, wars and terrorist acts. Efforts to explain how disasters affect mental health are fairly recent (Neria et al., 2009).

Disasters give rise to stressors that affect mental health (Norris et al., 2002a). Among such stressors include bereavement, injury to self or significant others, threat to self or others, fear, panic during the disaster event, loss of social networks, destruction of property, financial loss among others. Survivors of traumatic experiences have responded in diverse ways, some have suffered negative effects such as posttraumatic stress disorder (PTSD) and anxiety several years after the event, while others have been reported to have experienced posttraumatic growth (PTG) over the same period. According to Schneider et al, (2019), a positive relationship was observed between PTSD and PTG with survivors that experienced PTSD symptoms being more likely to experience PTG,

thus survivors of disasters are potentially likely to experience both positive and negative psychological outcomes. It is therefore important to attend to both reactions in the aftermath of a disaster or traumatic event

Tedeschi and Calhoun (2004) define posttraumatic growth as a positive psychological change as a result of struggling with highly challenging life experiences. Calhoun and Tedeschi (2006) indicate that a disaster does not only produce psychological distress, but rather, in other instances, it does offer opportunities for growth. Some of the growth experiences include an increased sense of being closer to loved ones than was the case before the disaster or traumatic event. Additionally, some survivors develop a deeper relationship with God in comparison with the relationship prior to the disaster event.

Globally, studies that explain both negative and positive psychological outcomes of disaster events have been conducted, with increased attention being turned to understand positive psychological outcomes following catastrophic events (Wang, 2014). For instance, experiences of posttraumatic growth were reported among survivors of Hurricane Sandy which affected the North Eastern coast of the United States in 2012 (Schneider et.al.,2019), Swedish survivors of the South East Asia Tsunami in 2004 (Michelsen et.al., 2017), survivors of Pohang earthquake in South Korea (Seo & Lee, 2020), survivors of seasonal cyclones in Australia (Pooley et.al., 2013) adult survivors of a terror attack in South Eastern Nigeria (Aliche et.al, 2019), and among Somali refugees resettled in Hungary (Kroo & Nagy, 2011). Notably, few studies have focused on the posttraumatic growth experiences of disaster survivors in Kenya and the present research sought to fill this gap in the literature.

In Kenya, man-made disasters have had devastating consequences and efforts have been made to understand the psychological impact of disasters. Effects on mental health primarily focused on negative psychological experiences (Huho et al., 2016). Some studies have found a prevalence of PTSD among pregnant women following terrorist attacks (Ndetei et al., 2005) and negative psychological functioning of children and experiences of trauma, grief and depression after terrorist attacks (Pfefferbaum et al., 2003; Pfefferbaum et al., 2006). In Kenya, interventions after a disaster often follow a similar pattern as the global one (Korman et al., 2023, Sutini et al., 2022). The Solai dam survivors received psychological first aid to deal with varied psychological

reactions including shock, fear, loss and grief, guilt and feelings of anger towards the owners of the dam, government agencies and anger towards God (Ministry of Interior & Coordination of National Government, 2018).

The loss of resources is one of the major consequences of disasters. Resources are those things that are valued by individuals (Hobfoll, 2001). There are four types of resources: objects, conditions, personal characteristics and energies. Objects include physical items and possessions such as houses, while conditions include non-material things like marriage and job security. Personal characteristics are things like self- esteem, and examples of energies are money and time. Resources have alternatively been categorized as tangible resources - comprising of Hobfoll's objects and energies and non-tangible resources - incorporating Hobfoll's personal characteristics and conditions (Ehrlich et al., 2002). According to Hobfoll (2001) individuals are stressed when they actually lose resources or when they experience the threat of losing resources. At the same time the failure to acquire more resources even after investing in the effort to accumulate resources also contributes to stress in the individual.

A few studies have related loss of resources with posttraumatic growth. For instance, Laing (2020) in a study of the psychological outcomes of Hurricane Matthew in the Caribbean found a positive relationship between loss of resources and posttraumatic growth. However, this association was moderate. Other studies have related loss of tangible resources with posttraumatic growth. A study that directly examined the relationship between loss of tangible resources and posttraumatic growth reported that tangible resource loss was positively associated with posttraumatic growth among university students who were survivors of Hurricane Katrina (Cook et al., 2013). Sattler et al., (2023) found that loss of object and energy resources, both being tangible resources, triggered problem-focused coping, which in turn was associated with posttraumatic growth among survivors of climate change-linked disasters in the Phillipines and Fiji. In sub-Sahara Africa, research that has related loss of resources to psychological outcomes has focused on negative outcomes (Shannonhouse et al., 2019). There is limited literature on positive psychological outcomes among survivors of traumatic events in Kenya, which the research endeavored to bridge.

Disasters elicit various reactions among survivors. Global trends in research into the mental health impacts of disasters have largely focused on negative psychological outcomes such as PTSD and

depression. This exclusive focus on the negative consequences of disasters is understandable given the immediate need to alleviate survivors' distressful symptoms. The practice among mental health practitioners is normally focused on psychological first aid (PFA), which is aimed at preventing survivors from developing Acute Stress Disorder (ASD) and PTSD. There are often a few programs dedicated to enabling survivors to develop PTG. However, the effect of this approach is that unwittingly, practitioners are likely to overlook opportunities for survivors' psychological growth, and this may slow and hinder the process of recovery of survivors.

In recent times there has been increased attention to understanding the positive psychological outcomes among survivors following a disaster. Disaster survivors go through difficult experiences; however, it is observed that various factors may aid recovery. Availability of resources and social support are noted to be critical to the process of recovery from adverse life circumstances. Most times, there is inadequate funding to see the process to completion. For instance, the psychological support offered to Solai dam disasters stopped after two years due to inadequate funding. The inability to provide continued psychological support potentially hampered the full recovery of the survivors.

The following two objectives informed the present study: To determine the relationship between the demographic characteristics and the posttraumatic growth of the survivors of the Solai dam disaster in Nakuru County, Kenya. The second objective was to establish the extent to which the loss of tangible resources is related to the posttraumatic growth of the survivors of the Solai dam disaster in Nakuru County, Kenya

Methodology

This study applied a mixed methods approach to investigate whether loss of tangible resources predicted the degree of posttraumatic growth of survivors of the Solai dam disaster that occurred in 2018 in Nakuru County, Kenya. Both quantitative and qualitative data were collected concurrently. The target population were the adult survivors from the 223 households that were most affected by the Solai dam disaster. This was according to the National coordination committee that was tasked to respond to this disaster. Quantitative data were collected using a standardized questionnaire while qualitative data were collected using an interview guide. The

study purposively recruited a sample of 80 adult survivors who filled a questionnaire that consisted of standardized psychological tests of Posttraumatic Growth Inventory-Expanded (PTGI-Expanded), and Loss of Resources scale (LOR scale). Qualitative data was obtained by interviewing five adult survivors (three females and two males) individually in relation to their experiences of loss of resources, and posttraumatic growth in the aftermath of the Solai dam disaster. Data was analyzed using frequencies, percentages, parametric statistical analysis and thematic analysis.

The research instrument for the collection of quantitative data was a survey questionnaire that had been divided into three parts. Part A had the Participant's demographic information, Part B Loss of Resources scale whereas Part C had Posttraumatic Growth Inventory-Expanded (PTGI-X). The survey questionnaire was an amalgamation of demographic information of the participant; gender, age, marital status, education, employment status and type of house ownership and constructs of posttraumatic growth, Posttraumatic Growth Inventory- Expanded (PTGI-X), and loss of resources, Loss of Resources scale (LOR scale). The instrument for the collection of qualitative data was an Interview Guide that contained semi-structured topical questions. Both instruments were translated into Kiswahili so that they could be localized for those that may not be familiar with English. The following are the details of the subsections of the survey questionnaire.

Posttraumatic Growth Inventory—Expanded (PTGI-X)

The Posttraumatic Growth Inventory measures five areas or domains that include Relating to others, New Possibilities, Personal Strength, Spiritual and Existential Change, and Appreciation of life. The PTGI-X inventory that was used in the present study is a revised version of the Posttraumatic Growth Inventory (Tedeschi et al., 2017). It is an expanded tool which has incorporated more and new items on the spiritual and existential domains. The changes to this domain were necessitated by the need to cover people that are non-religious and in more secular cultures as well as adherents of traditional religious belief systems. Considering that the PTGI-X includes the original 21 PTGI items, it could be used to make direct comparisons to work using the original measure. The PTGI-X consists of five factors (domains) including Factor I- Relating to others, Factor II - New Possibilities, Factor III - Personal Strength, Factor IV - Spiritual and Existential Change, and Factor V - Appreciation of life. Participants indicate the degree of change

that has occurred in their lives as a result of the crisis on a scale of 0 to 5 (0 = no change, 5 = great degree of change).

The scale is scored by averaging all responses with scores ranging from 0, lowest score to 125, highest score. A low score means no growth or a low degree of growth. A high score means a high degree of growth. An average score, 62.5, means moderate degree of growth. Factors are scored by adding responses to items in each sector.

Loss of Resources Scale

The Loss of Resources scale measures two main categories of resources, tangible and non-tangible resources. Tangible resources include things such as food, furniture, residence, insurance, and means of transport such as a motorbike or car. Non-tangible resources on the other hand include aspects such as feeling valuable to other people, involvement in religious activities and retirement security. The Loss of Resources scale (LOR scale) was adapted from a study by Erhlich et al (2010) which involved mothers who had experienced a hurricane disaster. The study categorized resources into tangible and non-tangible resources. Loss of Resources scale was originally used by Benight and Harper (2002) however Ehrlich et al (2010) had the questions divided into tangible and financial factors (tangible LOR), consisting of Hobfoll's original categories of energies and objects, and non-tangible or psychosocial factors (non-tangible LOR), comprising of Hobfoll's original categories of personal characteristics and conditions. LOR, tangible, has 16 factors, while LOR non-tangible has 23 factors.

Participants were to rate the degree to which they had experienced each loss on a scale of 0 - 4 (0 = no loss, 4 = extreme amount of loss). The Loss of Resources scale (LOR) has 39 factors (items), and the scores range from 0 (minimum score) to 156 (maximum score). An average score on this scale is 78. A minimum score means no or few losses of resources while a maximum score means a large amount of loss of resources. An average score of 78 means a moderate loss of resources. The LOR scale is divided into two sub-scales that is, tangible LOR scale and non-tangible LOR scale. Tangible LOR subscale has 16 factors (items), and its scores range from 0 (minimum loss of resources) to 64 (maximum loss of resources). An average score on the subscale is 32.

Results

Post Traumatic Growth Index by Participants' Demographics

Posttraumatic growth was measured along a 6-point continuum of no change, very small, small, moderate, great, and very great responses with respective weightage of 0,1, 2, 3, 4 and 5 points for the change that occurred in one's life as a result of Solai Dam disaster. Based on the distribution of the data obtained, the categories were further reduced to 4 points to check how it was distributed across the respondents' demographics.

Overall, both male and female participants reported high scores of posttraumatic growth with the majority (83.8%) indicating as having experienced growth to a great extent and very great extent. Female participants reported higher scores (89.1%) of posttraumatic growth compared to male participants (76.5%). 66.7% of the participants across the age groups experienced posttraumatic growth to a great extent and very great extent after the Solai dam disaster. 100% of participants aged between 46 and 65 years experienced posttraumatic growth to a great extent and very great extent. Additionally, participants aged between 18 and 45 years (90%) reported posttraumatic growth to a great extent and a very great extent. 83.8% of the participants across the marital status groups reported experiencing posttraumatic growth to a great extent and a very great extent. Married participants (100%) and widowed participants (100%) reported experiencing posttraumatic growth to a great extent and a very great extent. 75.8% of the single participants reported experiencing posttraumatic growth to a great and very great extent, while 72.2% of the separated/divorced participants indicated having experienced posttraumatic growth to a great and very great extent.

The majority of the participants (83.8%) regardless of education level reported posttraumatic growth to a great extent and a very great extent. Participants with college/university level of education (100%) experienced posttraumatic growth to a great extent and very great extent. Similarly, 100% of participants with no formal education reported experiencing posttraumatic growth to a great extent and very great extent. 86.7% of participants with high school level of education reported posttraumatic growth to a great extent and very great extent, while 65.4% of participants with Primary school level of education experienced posttraumatic growth to a great extent and very great extent.

The majority of the participants (83.8%) regardless of employment status reported having experienced Posttraumatic growth to a great extent and very great extent after the disaster. 100% of the employed participants reported having experienced posttraumatic growth to a great extent and very great extent. 85.4% of the non-employed participants reported experiencing posttraumatic growth to a great extent and very great extent. Further, the self-employed participants (78.8%) reported having experienced posttraumatic growth to a great extent and to a very great extent. Table 1 shows the distribution of the extent of posttraumatic growth based on demographic characteristics.

Table 1: Distribution of Post Traumatic Growth Index by Participants' Demographics

		No effect (0)		Small and Moderate extent (0.22-0.69)		Great extent (0.70-0.85)		Very great extent (0.86-1.0)		Total
		N	%	N	%	N	%	N	%	N
Gender	Male	2	5.9%	6	17.6%	10	29.4%	16	47.1%	34
	Female	0	0.0%	5	10.9%	18	39.1%	23	50.0%	46
	Total	2	2.5%	11	13.8%	28	35.0%	39	48.8%	80
Age	18 – 45	0	0.0%	2	10.0%	9	45.0%	9	45.0%	20
	46 – 65	0	0.0%	0	0.0%	12	44.4%	15	55.6%	27
	66+	2	6.1%	9	27.3%	7	21.2%	15	45.5%	33
	Total	2	2.5%	11	13.8%	28	35.0%	39	48.8%	80
Marital status	Single	2	6.1%	6	18.2%	9	27.3%	16	48.5%	33
	Married	0	0.0%	0	0.0%	2	10.0%	18	90.0%	20
	Separated/Divorced	0	0.0%	5	27.8%	8	44.4%	5	27.8%	18
	Widowed	0	0.0%	0	0.0%	9	100.0%	0	0.0%	9
	Total	2	2.5%	11	13.8%	28	35.0%	39	48.8%	80
Education	No Education	0	0.0%	0	0.0%	13	68.4%	6	31.6%	19
	Primary	2	7.7%	7	26.9%	10	38.5%	7	26.9%	26
	High school	0	0.0%	4	13.3%	3	10.0%	23	76.7%	30
	College/University	0	0.0%	0	0.0%	2	40.0%	3	60.0%	5
	Total	2	2.5%	11	13.8%	28	35.0%	39	48.8%	80
Employment status	Employed	0	0.0%	0	0.0%	4	66.7%	2	33.3%	6
	Self employed	2	6.1%	5	15.2%	12	36.4%	14	42.4%	33
	Not Employed	0	0.0%	6	14.6%	12	29.3%	23	56.1%	41
	Total	2	2.5%	11	13.8%	28	35.0%	39	48.8%	80

Overall, both male and female participants reported high scores of posttraumatic growth with majority (83.8%) indicating as having experienced growth to a great extent and very great extent. Female participants reported higher scores (89.1%) of posttraumatic growth compared to male participants (76.5%). 5.9% of the male participants reported experiencing no posttraumatic growth while 17.6% reported posttraumatic growth of small to moderate extents.

The majority of the participants across the age groups (66.7%) reported great extent to very great extent posttraumatic growth after the Solai dam disaster. All the participants aged between 46 and 65 years (100%) reported having experienced posttraumatic growth to a great extent and very great extent. Moreover, participants aged between 18 and 45 years (90%) reported posttraumatic growth to a great extent and very great extent. On the other hand, elderly participants aged 66 years and above reported no posttraumatic growth (6.1%), and posttraumatic growth of small to moderate extent (27.3%). 66.7% of participants of this age group reported posttraumatic growth to great and very great extents.

Majority of the participants (83.8%) across the marital status groups reported experiencing posttraumatic growth to a great extent and very great extent. Married participants (100%) and widowed participants (100%) reported experiencing posttraumatic growth to a great extent and very great extent. A huge number (75.8%) of the single participants reported experiencing posttraumatic growth to a great and very great extent, while 72.2% of the separated/divorced participants indicated as having experienced posttraumatic growth to a great and very great extent. However, 6.1% of the single participants reported experiencing no posttraumatic growth with another 18.2% indicating a small to moderate extent of posttraumatic growth. A few of them (27.8%) of the separated/divorced participants reported posttraumatic growth to a small and moderate extent.

The majority of the participants (83.8%) regardless of education level reported posttraumatic growth to a great extent and very great extent. Participants with college/university level of education (100%) indicated as having experienced posttraumatic growth to a great extent and very great extent. Similarly, 100% of participants with no formal education reported experiencing posttraumatic growth to a great extent and very great extent. A high percentage of participants (86.7%) with high school level of education reported posttraumatic growth to a great extent and

very great extent, while 65.4% of participants with primary school level of education reported as having experienced posttraumatic growth to a great extent and very great extent. Among participants with primary school level of education, 7.7% reported no posttraumatic growth, and a further 26.9% indicated as having experienced posttraumatic growth to a small extent and moderate extent. A few participants (13.3%) with a high school level of education reported experiencing posttraumatic growth to a small extent and moderate extent.

The majority of the participants (83.8%) regardless of employment status reported having experienced Posttraumatic growth to a great extent and very great extent after the disaster. 100% of the employed participants reported having experienced posttraumatic growth to a great extent and very great extent. A high percentage (85.4%) of the non-employed participants reported experiencing posttraumatic growth to a great extent and very great extent. In the category of the self-employed, 78.8% reported having experienced posttraumatic growth to a great extent and very great extent. At the same time, 6.1% of the self-employed participants reported no posttraumatic growth while 15.2% of the participants in this group indicated having experienced posttraumatic growth to a small extent and moderate extent. 14.6% of non-employed participants reported experiencing posttraumatic growth to a small extent and moderate extent.

Thus, survivors of the Solai dam disaster who experienced posttraumatic growth to a great extent and very great extent were female, middle-aged, married, widowed, having no formal education, having a college/university education, and employed. Survivors who experienced no posttraumatic growth were male, elderly, single, having primary school education, and self-employed.

Relationship between Loss of Tangible Resources and Posttraumatic Growth

The relationship between the loss of tangible resources and the extent of posttraumatic growth among participants is presented in Table 2.

Table 2: Relationship between Loss of Resources-Tangible and Posttraumatic Growth

		PTG						
		Small & Moderate extent		Great extent		Very great extent		
		N	%	N	%	N	%	X^2
Tangible LOR Index	Small extent(n= 18)	8	44.4%	5	27.8%	5	27.8%	18.017 (0.000)
	Moderate extent (n=60)	3	5.0%	23	38.3%	34	56.7%	

Majority of the participants (77%) experienced a moderate extent of loss of tangible resources. Out of these, 56% experienced posttraumatic growth (PTG) to a very great extent, 38.3% experienced PTG to a great extent, while 5.7% experienced PTG to a small and moderate extent.

A few of the participants, (23%) experienced loss of tangible resources to a small extent. Of these, 44.4% reported experiencing posttraumatic growth to a small and moderate extent, 27.8% reported experiencing PTG to a great extent while another 27.8% reported experiencing PTG to a very great extent.

Qualitative data findings indicated that participants experienced loss of tangible resources such as household items, death of significant others, destruction of means to generate income, and the loss of valuable documents. At the same time, participants reported experiencing a great appreciation for life, having a strong connection with God, becoming aware of personal strengths and having new opportunities and possibilities in life.

Discussion

Demographic Characteristics and the Posttraumatic Growth of Survivors

The extent of posttraumatic growth across the demographic characteristics of the participants is presented in Table 1. Overall participants reported high scores of posttraumatic growth with the

majority (83.8%) indicating having experienced growth to a great extent and very great extent. Based on their demographic characteristics participants who experienced posttraumatic growth to a great extent and very great extent were female (89.1%), middle aged 46-65 (100%), married (100%), widowed (100%), having no formal education (100%), having a college/university education (100%) and employed (100%). Participants who experienced no posttraumatic growth were male (5.9%), elderly 66 years and above (6.1%), single (6.1%), having Primary school education (7.7%) and self-employed (6.1%). Tedeschi and Calhoun (2004) coined the term posttraumatic growth to describe a phenomenon in which positive psychological changes occur in the process of an individual struggling to come to terms with highly challenging life experiences. This growth occurs in the midst of suffering and not in its absence. Janoff-Bulman (1992) asserts that traumatic events challenge the individual's assumptions about the world. Psychological chaos may be the result of this conflict in the individual's views of the world before and after the traumatic events.

One of the ways to resolve this conflict is to reorganize the assumptive world of survivors in a new meaningful way that may result in psychological growth. Concerning the relationship between gender and posttraumatic growth, Helgeson et al (2006) observed that females have a greater probability to experience growth. The finding that females experience a greater degree of growth concurs with previous literature. However, the finding that middle-aged participants experienced the highest degree of PTG compared to other age groups contradicts results from a previous study (Helgeson et al., 2006) that found younger people to show a greater probability of posttraumatic growth. The participants' high scores in posttraumatic growth seem to confirm previous observations in the literature.

Relationship between Loss of Tangible Resources and Posttraumatic Growth

There were two main categories of responses that emerged in relation to loss of tangible resources, thus loss of tangible resources to a small extent and loss of tangible resources to a moderate extent. On the other hand, responses to posttraumatic growth were categorized into three, Small to moderate extent of growth, Great extent of growth, and a very great extent of growth. The categories for loss of tangible resources were related to the categories for Posttraumatic growth to determine the association between the two constructs.

Small Extent of Loss of Tangible Resources and Degree of Posttraumatic Growth

Participants who experienced the loss of tangible resources to a small extent were 23%. Out of these, a majority of the participants (44.4%) experienced posttraumatic growth to a degree ranging from small extent to moderate extent. 27.8% reported experiencing posttraumatic growth to a great extent while another 27.8% reported experiencing posttraumatic growth to a very great extent. The participants who experienced loss of tangible resources to a small degree also experienced posttraumatic growth to small and moderate extents. However, it was observed that there were participants that experienced posttraumatic growth to great and very great extents despite reporting loss of tangible resources to a small extent. This finding supports the theory of Conservation of Resources which argues that a threat to or actual loss of resources can lead to stress (Hobfoll, 2001). At the same time the Posttraumatic growth theory contends that stress that results from loss triggers the process of growth because the individual's assumptions of the world get to be challenged (Calhoun et al., 2010). The individual whose assumptions are challenged may reevaluate them leading to reconstruction of new meanings. The new meanings may contribute to the growth of the individual as they seek to come to terms with the adverse experiences in their lives. This was a notable finding considering that a small extent of loss of tangible resources constitutes a low level of severity of a traumatic event.

Traumatic events that are of a low level of severity are unlikely to trigger posttraumatic growth of individuals (Kliem & Ehlers, 2009; Levine et al., 2008). Janoff-Bulman (1992) argued that a traumatic event must have a considerable impact for it to shatter the individual's assumptions of the world as a fair and safe place. Perhaps the fact that the Solai dam disaster affected a large area and people known to the survivors may have contributed to a sense of shattered assumptions for these participants who lost tangible resources to a small extent.

Moderate Extent of Loss of Tangible Resources and Extent of Posttraumatic Growth

Participants who experienced loss of tangible resources to a moderate extent formed 77%. Of this percentage more than half (56%)of the participants reported experiencing posttraumatic growth to a very great extent. 38.3% of the participants experienced posttraumatic growth to a great extent and 5.7% of them reported experiencing posttraumatic growth to small and moderate extents. The survivors who experienced moderate extent of loss of tangible resources were more likely to

experience posttraumatic growth to great and very great extents. This finding is consistent with previous studies that found that a traumatic event of moderate severity is more likely to contribute to posttraumatic growth among survivors (Kliems & Ehlers, 2009; Levine et al., 2008). This kind of outcome may be explained in that loss of resources to a moderate extent may sufficiently alter an individual's beliefs about their lives as being predictable and secure (Janoff-Bulman, 1992). The individual whose sense of control over their life is shaken will start to reexamine their assumptions of the world. This may cause them to develop a changed outlook to life and posttraumatic growth may be the result.

Qualitative data findings indicated that participants experienced loss of tangible resources such as household items, death of significant others, destruction of means to generate income and loss of valuable documents. At the same time participants reported experiencing a great appreciation of life, having a strong connection with God, becoming aware of personal strengths and having new opportunities and possibilities in life. This corroborates the findings of quantitative data that indicated that loss of tangible resources predicted posttraumatic growth of the participants. For instance, Respondent 1 experienced loss of all her household items and yet appreciates the fact that her life was saved by saying:

> […]All the items in the house were destroyed, everything… Even if you were to salvage the belongings, where would you have taken them when the house was destroyed? It was rather we saved our lives.

Respondent 2 explained the loss of her two farms, her main source of livelihood, as follows:

> […]Let me say when that water burst out of the dam, you know we've gone through difficult things, and accordingly we had farms that we were cultivating and I had two fields, this and the other one below it, now you see how the water came sweeping everything and sweeping the fence, sweeping everything like it is maize, food and even now I can't farm well because that water deposited stones all over the farms [...]

Despite the experience of the tangible loss of resources for respondent 2, she was still able to express appreciation to God and to her husband for his support. She says the following during the interview:

> Let's say that it is God because he has helped us. God's love because there is no other help except my husband who is a long distance lorry driver who we are depending on. I don't know what we would have done if it were not for him,[…] it would have been difficult.

Respondent 3 lost farm produce and the farm is no longer productive after it was destroyed by the flooding from the dam. At the same time, he experienced a closer connection with God despite his struggles post-disaster;

> In my case I lost a lot. I had one acre of land so the farm was bearing maize (corn) and beans and when the water came with so much force from high on the hill it swept everything away, including the top soil from the farm. All the crops that I had planted on the farm were destroyed, I remained with zero. It was what I depended on for my upkeep and school fees for the children. I am left with no livelihood leaving me so stressed….I live only by faith, eeh […], by the grace of God but not that things have changed.

Respondent 4 lost her husband, grandchild and property. However, she expressed her appreciation of life and her strong connection with God post-disaster. She described her experience in the following way;

> We lost many things. You know even at this time one can't remember everything. To start with we had a nice, big house, bigger than this one, I had two houses for my sons with outdoor toilets which we lost, in addition to many other things we lost, even spoons and needles. We lost all that. Actually, our house was demolished while we were inside and the water carried us with the house, we kept crying "*wuuhi*", we had no idea where the water was carrying us to eeh, and together with my children, my husband and grandchildren. My husband and grandchild died that day….I always say that, actually there is a song in our language that says, "I'm in a deep hole and God took me out". So, while I was in a deep hole God took me out. I was not rescued by my father, by my mother or neighbors but God saved me. Even at this time God has helped me a lot, that is why I fully depend on him.

Respondent 5 lost the spouse, house and everything inside it and his investments. He too experienced a strong connection with God despite the challenges faced after the disaster:

> During the disaster the first thing I lost was my wife, and I also lost my permanent house and all my possessions. I lost all my possessions that I had before at that time when the water struck. In fact, I

> lost everything, even investments I had… I have persisted with spiritual things because God exists. The reason is that He saved me from this tragedy. It is evident He is alive.

Thus, loss of tangible resources was a predictor of Posttraumatic growth among survivors of the Solai dam disaster. The moderate loss of tangible resources was associated with posttraumatic growth to a very great extent while a small extent of loss of tangible resources was related to posttraumatic growth to a small and moderate extent. A chi-square analysis was done to determine if there was a significant difference in the relationship between the loss of tangible resources and extent of posttraumatic growth. Findings of the study indicated that there was a significant association between the extent of tangible resource loss and the extent of Posttraumatic growth ($X^2 = 18.017$; $p = 0.000$). This result is consistent with a previous study that found a positive association between loss of tangible resources and posttraumatic growth among university students that were survivors of Hurricane Katrina (Cook et al, 2013). However, another study found a negative correlation between loss of tangible resources and posttraumatic growth among black young mothers that were survivors of Hurricane Katrina (Preston, 2023).

To enhance mental health interventions, particularly for individuals from marginalized areas or those with limited financial resources, an introduction of accessible digital solutions is highly recommended. Such innovations could include mobile applications, online support networks, and tele - therapy services specifically tailored for people facing economic constraints. By leveraging digital tools, we can create virtual spaces where individuals dealing with post-traumatic stress disorder (PTSD) can connect with supportive networks, including mental health professionals, peers, and mentors who offer guidance and resources. Additionally, these platforms can support users in setting and achieving personal goals, boosting entrepreneurial ideas, and enhancing skills that contribute to self-sufficiency. These digital interventions would in the long run foster recovery, growth, and empowerment, helping individuals from all socioeconomic backgrounds to rebuild their lives and pursue sustainable paths forward.

Conclusion

The study established the relationship between the demographic characteristics of the Solai Dam disaster survivors and posttraumatic growth. Further, the study confirmed that even though most studies tend to focus on PTSD, it evidenced that there may be positive psychological outcomes

following a traumatic event. The findings of this study demonstrated that the loss of tangible resources predicted the degree of posttraumatic growth among survivors of the Solai dam disaster. The greater the extent of loss of tangible resources, the greater the degree of posttraumatic growth among the survivors. Additionally, the study established that the Solai Dam disaster received initial psychological support which ceased after two years following the disaster. The study therefore recommends implementing a vibrant strategy that leverages to enable survivors to access independently access mental health information and to empower them with entrepreneurial skills.

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