NATURAL HAZARD MITIGATION STRATEGIES REVIEW: ACTOR NETWORK THEORY AND THE ECO BASED APPROACH UNDERSTANDING IN ZIMBABWE.

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1.0 Introduction

The purpose of this paper is to critically review theoretical hazard mitigation evolutions, concepts and approaches. The review is contextualised to fit a global perspective, highlighting the African experiences in semi-arid zones (Alesch 2004; Joakim 2008). For instance, developing countries experience a higher loss of lives, while developed countries experience more economic losses (Mileti 1999; Joakim 2008). However, similar concerns exist around the impacts, experiences, actors involved and their response/s using available natural resources. In the course of this review, an overview of the structural and non-structural hazard mitigation approaches will be discussed (Mileti 1999). Followed by a summary of the role of *Ziziphus mauritiana*, and the Actor Networks Theory's potential to enhance the understanding of hazard mitigation options. The review guides into an argument of recent unique understandings of the role of both human and non-human actors in any process. The ANT is explored from an ecological service perspective, arguing that in order for hazard mitigation to be effective, it must be considered together with other actors in the discourse.

1.1 METHODOLOGY

Systematic review was done between 2015 and 2016. A selection criterion was developed. Elimination of scholarly work was done on work outside eco-based natural hazard mitigation. Google scholar and science direct search helped to achieve the elimination process using key words like natural hazards mitigation, structural and non-structural mitigation, Actor Network Theory and Commodity Chain Analysis.

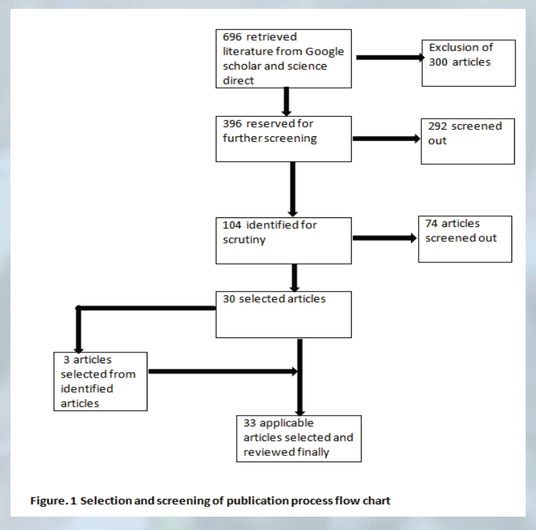

Figure. 1 Selection and screening of publication process flow chart

1.2 Approaches to Hazard Mitigation

The earliest social scientific insight into hazard mitigation comes from a study by Rousseau, who explains that the shock of the 1755 Lisbon earthquake would have been moderate if the city had been sparsely inhabited and if people had evacuated promptly in reaction to the early tremors (Dynes 2000). The ideas of hazard mitigation have evolved and have been developed over the most recent half-century. Hazard mitigation studies were championed by renowned academic Gilbert Fowler White in 1945, who studied floodplain management as a way of reducing flood loss rather than dependence on structural flood mitigation. This approach has subsequently been supported by a number of key researchers (De Silva 1981; Tennakoon 1986; Mileti 1999; Ernstson 2008; Neisser 2014; Kenny and Phibbs 2015).

Gilbert White's work is seminal in the critical study of hazard mitigation methods (Mileti 1999). White's research has led to 'noteworthy' hazard policy changes in places such as Bangladesh, Japan, Sri lanka, Sweden and the United States. (Adger 2009; Neisser 2014). In the search for suitable approaches to hazards, recent studies are promoting a shift in emphasis from rescue to proactive methods in order to mitigate the effects of natural hazards (Neisser 2014; Manyanye 2015). Conventionally preferred hazard mitigation strategies are those that could lessen the harsh and disrupting effects and accordingly reduce the scale of a hazard (Adger 2009; Neisser 2014). Hazard mitigation strategies have been defined in an array of ways. The most used are the structural and non-structural hazard mitigation (IISD 2003; Lindell et al., 2006).

1.3

Structural hazard mitigation versus Non-Structural approaches (Gilbert White's work)

A B

Non Structural Approach

1.Open system approach
2.Multivariate Model approach
3.Political approach
4.Adaptive capacity or resilience approaches

- Although rural communities in Muzarabani are often more vulnerable to hazards they are not just helpless victims as often represented. They resort to the available natural resources to mitigate and adapt to extreme weather conditions e.g *Ziziphus mauritiana*.

Ziziphus mauritiana (or 'Musawu

HAZARD MITIGATION OPTIONS HAVE FAILED

DROUGHT

FLOODS

How can we enhance the understanding of natural hazard mitigation and adaptation options?

ANT AND ZIZIPHUS MAURITIANA

- **In the view above, this paper explored the use of ANT as theoretical approach that might examines multiple considerations in enhancement of hazard mitigation and adaptation.**

Actor Network Theory (ANT)

- **ACTOR**
- NETWORK
- **SCALE**
- **POWER**
- **CRITICISM OF ACTOR NET WORK THEORY**

Research Gaps and Justification

- **Limited empirical researches on hazard mitigation approaches that place Actor Network Theory into perspective**
- **The structural and non structural hazard mitigation initiatives in most cases have failed to yield intended results.**
- **Lack of information to comprehend complexities and the actor networks that can stabilise hazard mitigation options.**
- **Failed policies and limited research on hazard mitigation options .**

The paucity or complete lack of climate change policy, and poor implementation of existing hazard mitigation policies are some of the handicaps to research capacity in Zimbabwe.

In light of the knowledge gaps identified above:

- **Use of the Actor Network Theory as an innovative approach.**
- **Recognition and promotion of non-human actors like *Ziziphus mauritiana* in terms of use and hazard mitigation .**
- **Improvement of the social networking in hazard mitigation.**
- **Facilitation of the formulation of policies approaches.**