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Original Research

Indigenous knowledge for disaster risk reduction

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Abstract

Indigenous knowledge is valuable knowledge that has helped from the interaction between members of the community and knowledge, its documentation in the area of disaster risk reduction has not been well-recognised in the disaster risk reduction field. Colonialism and lack of proper documentation of indigenous understanding adaptive strategies of the local people has led to not adapt for generations, before the arrival of Western education. Literature used in this article, obtained from the books, papers, change, indigenous knowledge and adaptation, highlight the country context. This would lead to better strategies which are Africa.

Indigenous knowledge: Relevant knowledge?

Indigenous knowledge has been receiving a lot of attention since climate change (Hiwasaki *et al.* **2014** (#CIT0019_272)). Disasters using scientific knowledge, while ignoring the value of indigenous (#CIT0046_272). Indigenous knowledge is usually underappreciated (**2010** (#CIT0034_272)). However, there have been calls for indigenous knowledge for generations to mitigate hazards and reduce disasters in Africa (#CIT0059_272).

The importance of indigenous knowledge in the field of disaster risk reduction potential for improving disaster risk reduction policies has been highlighted in the region, with reference to the Hyogo Framework for Action – the role of indigenous knowledge (Hilhorst *et al.* **2015** (#CIT0018_272)). The role indigenous knowledge plays in empowering local communities through mixed cropping which sustains soil and leads to yield of various crops (Mwaura **2008** (#CIT0037_272)). Such activity makes it possible through which this knowledge is spread in communities could be (#CIT0049_272). In Africa, indigenous knowledge has been used for management for natural resources (Domfeh **2007** (#CIT001_272)) environment for long periods of time – this has improved knowledge

coping mechanisms, methods of conservation, studying the African countries are faced with various types of hazards and obtained from their indigenous knowledge (Nyong, Adesina &

Indigenous knowledge

Indigenous knowledge has been passed down generations, g visions (Agrawal **1995 (#CIT0003_272)**). In various contex the same thing (Kelman, Mercer & Gaillard **2012 (#CIT0022 community development (Mutasa **2015 (#CIT0036_272)**) a implementation of local knowledge (Nyong *et al.* **2007 (#CI problems and helps in their developmental processes. The kr (Jabulani **2007 (#CIT0020_272)**). Indigenous knowledge fc a long period of time. This knowledge has been harnessed fr valuable information with regards to the local environment a empowerment is attained through the use of indigenous kno participation and educating individuals on disaster risk reduc particular community and is stable for such a community as (Dekens **2007 (#CIT0010_272)**).****

Indigenous knowledge in agriculture

Local cultivation of crops and rearing of livestock in Africa ar enhances food security through methods that pose low risks derivatives were used by local people for insect control in crc many cause no harm to mammals. Some of these derivative (Rahman & Talukder **2006 (#CIT0044_272)**). Plants derivat from developing resistance to them (Domfeh **2007 (#CIT00 Indigenous knowledge literature has shown that local crops ; & Campbell **2000 (#CIT0048_272)**). To keep livestock heal immunity in their local herds during rinderpest outbreaks aff smear it on the nostrils of their own herd. Animals that survi (Mwaura **2008 (#CIT0037_272)**). Such local remedies high**

Indigenous knowledge in medicine

Melchias (**2001 (#CIT0033_272)**) wrote that indigenous m Medicinal plant species used in the Central African region ha outbreaks and the World Health Organization recognises this manufacturing companies even invest billions of dollars in bc to research indigenous plants and harness knowledge (Eyon

Indigenous knowledge in land and soil management

To manage the lands on which these important crops are pla ensure availability of food, and minimal tillage which keeps t African people (Domfeh **2007 (#CIT0011_272)** ; Mwaura **20 crops in a particular portion of land – for example, planting r fixation and helps control weeds. It is also important to note may result from the failure of one particular kind of crop due consumption (Mwaura **2008 (#CIT0037_272)**).**

Indigenous knowledge in natural resource management

Conservation of natural resources to ensure sustainability is management techniques help with forest conservation. The c Local hunters in Africa use indigenous knowledge to preserv hunting for animals that are considered a delicacy in their di (**#CIT0013_272**). Forests that are recognised as 'sacred' b disturbance from humans who revere such forests, these spe need continued biodiversity to survive. The forests are terme and animal species that make up such forests are indirectly j are also a safe haven for indigenous flora and fauna (Eyong, for water conservation. Wells are dug using traditional techn farming. These wells can reach a depth of 50 feet in some in needed water supply (El Sammani & Dabloub **1996 (#CIT00**

Indigenous knowledge in disaster risk management

Local people in Nigeria have used indigenous plants to tackle the Delta region of Nigeria, which led to the knowledge that riverbank vegetation prevented the washing away of soil which causes bank erosion. Apart from their effectiveness in preventing erosion and preventing landslides, due to their fibrous roots. In Swaziland, the presence of specific birds' species on trees causes how high birds build their nests from river surfaces (Domfeh

'Hard' or 'soft' technology for indigenous knowledge?

Indigenous knowledge provides a wealthy store of knowledge. It is a vast system of knowledge that includes local technical knowledge. This knowledge has been shown to evolve with time and can grow. This knowledge empowers local communities for their development contexts (Tharakan 2015 (#CIT0057_272)). The debate on indigenous knowledge is not new (1991 (#CIT0047_272)) but generally it could range from rural to urban local communities (Tharakan 2015 (#CIT0057_272)). The modern technologies, which usually profit-based, have threatened to eliminate this grass. However, if it is continued to enable local communities to provide themselves with services, it can be used for health purposes and the aforementioned Maasai. Modern advanced procedures such as acupuncture (Tharakan 2015)

For the purpose of this article, appropriate technology can be defined as the application of local methods to solve local problems in the context of community-led disaster risk reduction (DRR) approaches, as defined by (2007 (#CIT0011_272)). It involves the use of local laws and customs within a society. It may not be presentable in a physical form, but we can apply the application of knowledge derived from natural science that can be used in a physical form (#CIT0063_272). In other words, hard technology takes its form from (2005 (#CIT0007_272)); Zhouying 2005 (#CIT0063_272) written about here, from the use of plant derivatives for use in Western medicine (Eyong 2007) indigenous knowledge as a source of appropriate technology. It ranges from the most basic practices to the more sophisticated ones, obtained from

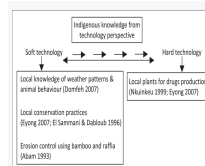


FIGURE 1: Examples of indigenous knowledge from a technology perspective.

(<https://jamba.org.za/index.php/jamba/article/viewFile/2>)

Community-led DRR approaches save lives. When the tsunami hit, their knowledge of the environment while tourists, who did not predict the onset of the disaster through the unusual patterns of the communities that had been passed down generations (Arunc coastal communities to an ever-present hazard. There is a need for communities would continue to live in hazard-prone areas – on the slopes of a volcano, due to their cultural beliefs and life patterns. They live next to Mount Elgon, which is a basaltic volcano (Knapel communities and make them constantly vulnerable (Kulatun) to ever-present hazards.

Mitigation and adaptation strategies for disaster risk reduction

There is a link between adaptation due to a changing environment and the changing climate. Changes in weather patterns and environmental conditions (2010 (#CIT0008_272)). The impacts are reduced by the capacity to cope (Shaw, Pulhin & Pereira 2010 (#CIT0050_272)). The effects of climate hazards are low (Laukkonen *et al.* 2009 (#CIT0009_272)). Therefore, there is a need to invest in adaptation strategies to

necessary in the management of hazards and disasters which strategies help individuals manage, cope and adjust their lives. Mitigation strategies aim to reduce the likelihood of disasters occurring (Kane **2000 (#CIT0021_272)** ; Prabhakar, Srinivasan & Sha

Mitigation and adaptation had always been viewed as separate outcomes for DRR (Nyong *et al.* **2007 (#CIT0039_272)**). The capacity at the community level hinders successful integration **2001 (#CIT0035_272)**). Despite these challenges, communities have survived for generations. Therefore, a necessary entry communities have used indigenous knowledge to cushion the **2007 (#CIT0039_272)**).

Pastoral farmers in Africa store away fodder as a part of their weather conditions. When drought occurs, local farmers rely on other products by feeding them fodder. Through this practice. On the other hand, mitigation strategies have helped in reducing ensuring biodiversity, mitigation strategies are usually employed species to be used for breeding in the future. However, there are Situations such as these highlight the need for development for farmers who usually practice adaptation strategies, to ensure plans for development, as this knowledge has helped local communities Warren **1991 (#CIT0060_272)**).

Focusing on the importance of adaptation strategies towards disaster at this stage, it is important to highlight some examples of local employ mitigation strategies in their work on disaster risk reduction. During 06–15 March 2015, it caused a lot of devastation and disaster. However, they realised that the number of fatalities in the member of the community formed a group comprising of local houses affected by the cyclone to this day. Another resident water supply to prevent them being killed by the cyclone. Even uprooted by the cyclone. Instead of allowing the bananas to be eaten by people in the community (Barthow **2015 (#CIT0005_272)**) in disaster risk reduction and sustainability. Going over the history the importance of indigenous early warning strategies that are However, in Africa, they mentioned various programs – W.M. They say these programs are undertaken with a combination managed by developed countries (Red Cross/Red Crescent Commission disaster risk reduction come from initiatives from developed knowledge that had helped the forefathers of Africa survive (

Inclusion of indigenous knowledge in disaster risk reduction

Local communities have not always been helpless in the face of their own approaches towards disaster risk reduction using traditional knowledge had been widely ignored in preference to scientific a result of politics as well as ignorance and particular ideological theories and assumptions which have been 'received' from the context because they had attained credibility over the years. A tendency to alienate other important questions which should be the 'wood fuel crisis' theory which suggests that cutting of trees for fuel in Africa are obtained from land clearing for agricultural **(#CIT0029_272)**). It is important to mention that some of the when the idea of 'conserving the environment' was proposed in Europe. This approach came to be known as colonial science. These ideas had little evidence to support their arguments, these ideas (Beinart **1984 (#CIT0006_272)** ; Leach & Mearns **1996 (#CIT0007_272)**) failed to recognise the relevance of indigenous knowledge by African locals as agents of environmental change in a negative

In the 70s and 80s, famines occurred in the Sahel region as a result due to hunger (Adepoju **2009 (#CIT0002_272)** :3). The West plantations. The foreign observers were quick to point out the lack of harvest. This idea of laying the blame on the local people can be neglecting their natural resources. To ensure that they manage

2007 (#CIT0032_272)). Colonialism altered the African cor affecting the cultural heritage and development of the Africa important to note that this form of education was not rooted knowledge'. Colonial education, which has graduated to what and technological systems. Locals abandoned their traditional pursuit of the Western knowledge (Ocheni & Nwankwo **2012** wider scale in Africa, as the advent of 'Western knowledge' in

There is also the problem of documentation of indigenous kn usually passed down generations through stories told to the interested in learning this knowledge as they are interested i believe indigenous knowledge is 'knowledge of the poor' (De African indigenous knowledge has not been well documentec handed to the younger generations, this knowledge also face breakdown in traditional communication channels and socio-global influence limit interaction with the older people in cor (Langill **1999 (#CIT0026_272)**). This leads to greater diffic for global development initiatives. Lack of funds, technologic knowledge also lead to this decline in indigenous knowledge area such as DRR would pose risks for development and disa from the locals for development policies. This is why DRR po experts and even governments believe documented, tested ; usually obtained from different parts of the world and they n (**#CIT0056_272**)).

Conclusion

People are increasingly vulnerable to climate-related hazards countries such as Africa and Asia suffer more human losses. also a product of long-term issues of underdevelopment (Yoc of mitigation approaches to help in reducing vulnerability of i by the top-class within the economy and have led to failures these hazards. Now, people are beginning to advocate for th indigenous knowledge in developing DRR initiatives applicabl (**#CIT0061_272**)). Mitigation strategies used by governmen local community dynamics work. The community-led DRR ad that enable engagement of like minds with shared values an the same knowledge that is indigenous to their culture. This been shown that projects that create effective participation f (**#CIT0039_272**) ; Yodmani **2001 (#CIT0061_272)**).

Local communities should be given the chance to determine Marzano **2008 (#CIT0053_272)**). Local households had alw However, the focus of government on Western knowledge for adaptation strategies that had worked for them on a larger s implemented in the most basic form of community (the hous environment. It has been shown that the constant interactio these people relate with the environment (Sillitoe **1998 (#C** Such adaptation has sustained day-to-day life in Africa. Rele starting point in DRR policies especially at the local level. Th contexts, which helps in understanding how things work at t Provisions for documentation of indigenous knowledge shoul such knowledge.

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Competing interests

The author declares that he has no financial or personal relai

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