

Title: **Strategies to ensure protection of culture and improvement of mental health and development of Minority race of Northern Nigeria from the occurrence of Drought**

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Introduction

Drought has been common and widespread in the United States, with perhaps the most notable occurrence being the 1930s drought in the Great Plains, often referred to as the Dust Bowl (Andreadis, 2005). This was the US's most intense drought period to date, with several high-severity droughts occurring in rapid succession such that affected regions could not recover between episodes (NDMCDD 2015). The 1930s drought led to widespread agricultural devastation and exacerbated the economic burden of the Great Depression. In the 1950s the Great Plains and southwestern US suffered through another devastating drought, leading to federal drought disaster declarations in 244 of 245 Texas counties. In the late 1980s, the northwestern US and northern Great Plains suffered a significant drought that became the most expensive disaster of any kind to affect the country up to that point, including agricultural damages and damages from wildfires throughout Yellowstone National Park (NPSHWY, 2015). More recently at the peak of the historical drought of 2012, 61.8% of the contiguous US experienced moderate to extreme drought conditions (NOAA, 2015). Continuing into 2015,

several West Coast, Southwest, and Southern Great Plains states experienced moderate to severe droughts that led to declared states of emergency, record low lake levels, road-closing dust storms, and wildfires (Dewey, 2015). Conditions were particularly dire in California, where the governor issued an executive order mandating substantial water reductions in response .

Owing to climate change and land degradation due to drought and desertification in the Northern Nigeria, the grazing land where pastoralist can take their herds to have been reduced forcing them to move to South. Also there is poor quality of water and soil for farming resulting to little or no yield. There may also be culturally-influenced ways of interpreting or expressing distress that account for the vulnerability of minority groups

Causes of Drought

Precipitation deficiency

Mechanisms of producing precipitation include [convective](#), [stratiform](#), and [orographic](#) rainfall. Convective processes involve strong vertical motions that can cause the overturning of the atmosphere in that location within an hour and cause heavy precipitation, while stratiform processes involve weaker upward motions and less intense precipitation over a longer duration. Precipitation can be divided into three categories, based on whether it falls as liquid water, liquid water that freezes on contact with the surface, or ice. Droughts occur mainly in areas where normal levels of rainfall are, in themselves, low. If these factors do not support precipitation volumes sufficient to reach the surface over a sufficient time, the result is a drought. Drought can be triggered by a high level of reflected sunlight and above average prevalence of high [pressure systems](#), [winds](#) carrying continental,

rather than oceanic air masses, and ridges of [high pressure areas](#) aloft can prevent or restrict the developing of thunderstorm activity or rainfall over one certain region. Once a region is within drought, feedback mechanisms such as local arid air hot conditions which can promote warm core ridging and minimal evapotranspiration can worsen drought conditions.

Dry season

Within the tropics, distinct, [wet](#) and dry [seasons](#) emerge due to the movement of the [Intertropical Convergence Zone](#) or [Monsoon trough](#). The dry season greatly increases drought occurrence and is characterized by its low humidity, with watering holes and rivers drying up. Because of the lack of these watering holes, many grazing animals are forced to migrate due to the lack of water and feed to more fertile spots. Examples of such animals are [zebras](#), [elephants](#), and [wildebeest](#). Because of the lack of water in the plants, bushfires are common. Since water vapor becomes more energetic with increasing temperature, more water vapor is required to increase relative humidity values to 100% at higher temperatures (or to get the temperature to fall to the dew point).^[16] Periods of warmth quicken the pace of fruit and vegetable production, increase evaporation and transpiration from plants, and worsen drought conditions.

El Niño

Drier and hotter weather occurs in parts of the [Amazon River](#) Basin, [Colombia](#), and [Central America](#) during El Niño events. Winters during the El Niño are warmer and drier than average conditions in the Northwest, northern Midwest, and northern Mideast United States, so those regions experience reduced snowfalls. Conditions are also drier than normal from December to February in south-central Africa, mainly in [Zambia](#), [Zimbabwe](#), [Mozambique](#), and [Botswana](#). Direct effects of El Niño resulting in drier conditions occur in parts of [Southeast Asia](#) and [Northern Australia](#), increasing [bush fires](#), worsening [haze](#), and decreasing air quality

dramatically. Drier-than-normal conditions are also in general observed in [Queensland](#), inland [Victoria](#), inland [New South Wales](#), and eastern [Tasmania](#) from June to August. As warm water spreads from the west Pacific and the [Indian Ocean](#) to the east Pacific, it causes extensive drought in the western Pacific. Singapore experienced the driest February in 2014 since records began in 1869, with only 6.3 mm of rain falling in the month and temperatures hitting as high as 35 °C on 26 February. The years 1968 and 2005 had the next driest Februaries, when 8.4 mm of rain fell.^[20]

Erosion and human activities

Human activity can directly trigger exacerbating factors such as over farming, excessive [irrigation](#), [deforestation](#), and [erosion](#) adversely impact the ability of the land to capture and hold water. In arid climates, the main source of erosion is wind. Erosion can be the result of material movement by the wind. The wind can cause small particles to be lifted and therefore moved to another region (deflation). Suspended particles within the wind may impact on solid objects causing erosion by abrasion (ecological succession). Wind erosion generally occurs in areas with little or no vegetation, often in areas where there is insufficient rainfall to support vegetation.

[Loess](#) is a homogeneous, typically non stratified, porous, [friable](#), slightly coherent, often calcareous, fine-grained, [silty](#), pale yellow or buff, windblown ([Aeolian](#)) [sediment](#). It generally occurs as a widespread blanket deposit that covers areas of hundreds of square kilometers and tens of meters thick. Loess often stands in either steep or vertical faces. Loess tends to develop into highly rich soils. Under appropriate climatic conditions, areas with loess are among the most agriculturally productive in the world. Loess deposits are geologically unstable by nature, and will erode very readily. Therefore, windbreaks (such as big trees and bushes) are often planted by

farmers to reduce the wind erosion of loess. Wind erosion is much more severe in arid areas and during times of drought. For example, in the [Great Plains](#), it is estimated that soil loss due to wind erosion can be as much as 6100 times greater in drought years than in wet years.

Climate change

Activities resulting in global [climate change](#) are expected to trigger droughts with a [substantial impact on agriculture](#) throughout the world, and especially in [developing nations](#). Overall, global warming will result in increased world rainfall. Along with drought in some areas, flooding and erosion will increase in others. Paradoxically, some proposed [solutions to global warming](#) that focus on more active techniques, [solar radiation management](#) through the use of a [space sunshade](#) for one, may also carry with them increased chances of drought edit

As a drought persists, the conditions surrounding it gradually worsen and its impact on the local population gradually increases. People tend to define droughts in three main ways:

1. [Meteorological](#) drought is brought about when there is a prolonged time with less than average precipitation. Meteorological drought usually precedes the other kinds of drought.^[37]
2. [Agricultural](#) droughts affect crop production or the ecology of the [range](#). This condition can also arise independently from any change in precipitation levels when [soil](#) conditions and erosion triggered by poorly planned agricultural endeavors cause a shortfall in water available to the crops. However, in a traditional drought, it is caused by an extended period of below average precipitation.
3. [Hydrological](#) drought is brought about when the water reserves available in sources such as [aquifers](#), [lakes](#) and [reservoirs](#) fall below the [statistical average](#). Hydrological drought tends to

show up more slowly because it involves stored water that is used but not replenished. Like an agricultural drought, this can be triggered by more than just a loss of rainfall. For instance, around 2007 [Kazakhstan](#) was awarded a large amount of money by the [World Bank](#) to restore water that had been diverted to other nations from the [Aral Sea](#) under [Soviet](#) rule. Similar circumstances also place their largest lake, [Balkhash](#), at risk of completely drying out.

Effects of Drought

Effects vary according to vulnerability. For example, subsistence farmers are more likely to migrate during drought because they do not have alternative food-sources. Areas with populations that depend on water sources as a major food-source are more vulnerable to famine.

- In the case of environmental effects: lower surface and subterranean water-levels, lower flow-levels (with a decrease below the minimum leading to direct danger for amphibian life), increased pollution of surface water, the drying out of wetlands, more and larger fires, higher deflation intensity, loss of biodiversity, worse health of trees and the appearance of pests and dendroid diseases.
- Economic losses include lower agricultural, forests, game and fishing output, higher food-production costs, lower energy-production levels in hydro plants, losses caused by depleted water tourism and transport revenue, problems with water supply for the energy sector and for technological processes in metallurgy, mining, the chemical, paper, wood, foodstuff industries etc., disruption of water supplies for municipal economies.
- Social costs include the negative effect on the health of people directly exposed to this phenomenon (excessive heat waves), possible limitation of water supplies, increased

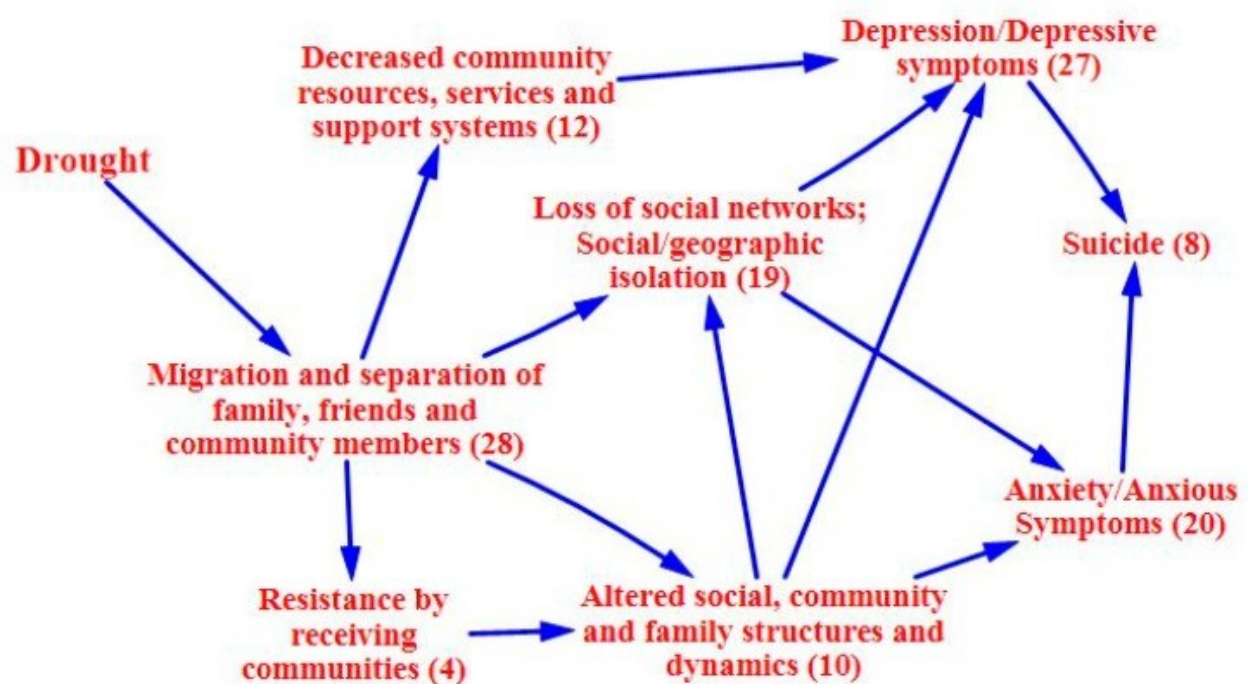
pollution levels, high food-costs, stress caused by failed harvests, etc. This explains why droughts and fresh water shortages operate as a factor which increases the gap between developed and developing countries.^[41]

Drought Health Effects

Droughts have been characterized as slow-moving disasters. Like other disasters, droughts often have significant health effects, typically mediated through complex environmental, economic and social pathways. (Thomas et al 2009). Observed adverse impacts on livelihoods, economic activities, infrastructure, and access to services in North American urban and rural settlements over the past few decades have been at least partially attributed to droughts (Romero-lankaro et al 2014). Furthermore, given the projections of persistent drought conditions described in both the Fifth Assessment Report of the IPCC and the US National Climate Assessment, there is concern that adverse health outcomes may become more prevalent (Melilo et al 2014, Vaughai et al 2013).

The catalogue of harmful health effects associated with drought is still being assembled and is an area of active study. Several distinct health outcomes have been identified and multiple causal pathways proposed. For example, increased amounts of airborne dust and particulate air pollution can exacerbate asthma, respiratory allergies, and airway disease . Drought conditions can reduce the availability of fresh water, increasing the risk for diseases associated with poor hygiene . Drought can also compromise agricultural production, decreasing food security and threatening livelihoods . From an economic perspective, slow-onset disasters like drought have been found to have a more extensive and destructive impact in the long term than fast-onset disasters . For example, the 2012 drought and heat wave in the US is estimated to have cost

approximately \$31 billion—one of the country’s most expensive weather disasters. Despite the magnitude of these impacts, the literature on drought health impacts remains relatively thin, particularly in the category of mental health.



Mental health effects of Drought

Source: Holly,2005

Strategies for Psychological Interventions for Victims to ensure protection of culture and improvement of mental health and development

1. Prevention Planning

The diagram can be used by public health practitioners or extension workers in order to look for upstream warning signs of mental health issues associated with drought. This could be particularly relevant in the case of feedback loops, where there is interplay between drought-related stressors, coping or adaptation strategies, and downstream impacts. For example, in the current California drought, farmers have taken to pumping groundwater to cope with surface water losses. As groundwater levels deplete, pumping costs will increase and may be subject to limits. This could further threaten agricultural production and amplify drought-related stressors. The causal diagram can help identify strategies that anticipate such feedbacks and thereby promote adaptive strategies over short-term coping efforts.

2. Public Health Programming

The diagram offers a useful approach to examining interactions among stressors and impacts, which could be valuable when developing programs or interventions for communities. The literature review revealed that several mental health initiatives related to drought have already

been implemented across the globe with varying degrees of success. Adapting successful interventions using the causal process diagram could be another practical use of this research.

3. Vulnerability and Risk Assessment

Public health has often used environmental risk assessment to estimate human exposure to harmful or toxic substances; these methods have been expanded over recent years to estimate adverse effects of climate change, as seen in the methods used by the Intergovernmental Panel on Climate Change. This concept of analyzing possible impact from an environmental change can be applied to causal process between drought and health. The diagram and complementary table highlight areas of exposure and characteristics that make individuals particularly vulnerable to drought. This information can be used to inform vulnerability and risk assessments, allowing for the characterization of risk to the exposed populations.

4. Community awareness programs : Initially developing and increasing an awareness of risks , hazards and vulnerabilities (Awareness programmes/Various methods, use of the media) .This helps to:

- recognize hindering factors, like denial, fatalism etc
- empower community members with relevant skills to cope with the event (Skills training)
- give support and information on resources that can be activated, so that the person evaluates his/her resources relative to the threats posed by the event, as sufficient to deal with them.
- facilitate self responsibility for managing threat, thus give ownership to citizens, non-governmental organizations etc..

- Sustainability

Conclusion

Given the current drought situation affecting parts of the minority Northern Nigeria and increasing concern over the association between climate change and drought, the linkages between drought and mental health are increasingly important.

Most of these relationships are mediated through environmental or economic pathways, and the outcomes mostly mood disorders and, to a lesser degree, intimate partner violence and suicide. It is therefore important to develop psychological intervention and strategies in order to protect the mental health development of the indigenous people in the area.

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