

## Application of a PAR Model for Assessing Vulnerability to Drought Hazard in Kondoa District

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### Abstract

The Tanzania Disaster Management act of 2015 defines Vulnerability as the extent to which a community, structure, services, or geographical areas is prone to a particular hazard. The objective of this paper to document the extent of which Kondoa District is vulnerable to drought. The district is located along the border of two regions, namely Manyara and Arusha. The paper employed secondary data as main sources of data. These data were obtained from the district files, profile, documents report and research report written about the district. The study was based on the Pressure and Release Model (PAR) which developed by author Blaikie, et al. and modified by Wisner, et al. The finding reveals that the population is vulnerable to drought because of land degradation, low production, poor transportation and infrastructure, low price of commodities, poor market and a poor method of cultivation and a weather-related problem such as shortage of rainfall. No significant measures were taken by authorities to address the matter.

**Keywords:** Vulnerability; Drought hazards; Pressure and release model

### Introduction

The vulnerability is a recent word which becomes population in the middle of 1970's of which social scientist start using it along the line of Risk management. Vulnerability refers to the extent to which the population, communities, country, regions systems or structures are prone/susceptible to damage or injury from hazards. The term originated from the Latin Word "Vulnerabilities" which meant "a wound", but currently has more meaning than the originating one. The term has been defined by different scholars as; Coppola defined the term as a measure of the propensity of an object, area, individual, group, community, country, or other entity to incur the consequences of a hazard [1]. Susman describes vulnerability as the degree to which different classes of society are different at risk [2]. Blaikie et al, define vulnerability as characteristics of a person or group in terms of their capacity or ability to anticipate, cope with resist and recover from the impacts of a hazard [3]. Wisner et al., the vulnerability has been defined as the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the Impact of a natural hazard [3]. According to Watts and Bohle, Vulnerability is a multi-layered and multi-dimensional social space defined by the political, economic, and institutional capabilities of people in specific places [4]. Tanzania Disaster Management department, defined vulnerability as social and Material conditions derived from characteristics of Individuals and groups that make them susceptible to harm and loss from environmental hazards and that constrain their ability to cope with the adversities of disasters [5]. According to Hamisi Vulnerability referred as characteristics of a person or group and their situations that influence their ability to cope, resist and recapture from the impacts of natural or man-made hazards [6].

Vulnerability is a multi-dimensional term, used differently in different set up, in that view vulnerability differ from community to community, country to country, continent to continent, person to person, group to group, religion to religion, system to system, economy to economy, hazards to hazards and time to time. In that context vulnerability is classified differently for example; Twigg classify vulnerability into three categories namely; Physical/material vulnerability and capacity (it focus on the most visible areas of vulnerability such as land, climate, environment, health, skills and labor), Social/organizational vulnerability and capacity (how society is organized and vulnerability is less visible and less understood in the community) and motivational/attitudinal vulnerability and capacity (it point on how people in a society view themselves and their ability to affect their environment) [7].

Vulnerability may also be classified into tangible (easy to see) and intangible (difficulty to determine). Coppola classifies vulnerabilities into four classes namely [1]; physical vulnerability (what in the built environment is physically at risk of being affected), Social Vulnerability measures the individual, societal, political, and cultural factors that increases or decrease a populations propensity to incur damage as results of a hazard), economic vulnerability (the financial means of individuals, town, cities, communities, or whole countries to protect themselves from the effects of hazards) and environmental vulnerability (health and welfare of the natural environment whether either increases or reduces their proneness over hazards).

Tanzania Disaster Management Department classified hazards into two broad categories namely Natural hazards (Flood, Drought, Cyclone, Earthquakes, lightning, landslides, Tsunami, Strong winds, Beach erosion, Epidemics, HIV, animal disease and pest infection), Manmade/technological hazards (Fire outbreak, Road accidents, Power failure, proliferation of unplanned settlement, environmental degradation, marine accidents, collapse of buildings, Oil Spill, Civil disorder, Aircraft accidents, Hazardous Material,

Industrial disasters, war and Terrorism) [5]. Coppola, classifies hazards into three class namely; Natural hazards (tectonic Hazards, Mass-movement hazards, Hydrologic hazards and Meteorological hazards), Biological /health related hazards (Epidemic hazards, pests infection and animal diseases) and technological hazards (Transportation hazards, Infrastructure hazards, structural Fires and failures, intentional, civil, and political hazards) [1]. The paper shall address the hydrologic hazards a specially drought. Coppola defined a drought as an unusual shortage of usable water meets the plant's requirement in a particular area [1]. The drought cannot be measured globally, but by the capacity of the affected area to accommodate the changes brought about by the changes in available water. According to Coppola drought are classified into four categories listed below [1];

- Meteorological drought: A measure of the difference between observed levels of precipitation and the normal range of values for precipitation in the same area.
- Agricultural Drought: A situation in which the quantity of moisture presents in the soil no longer meets the need of a particular crop.
- Hydrological drought: Occur when surface and subsurface water supplies fall below normal levels.
- Socioeconomic drought: Refer to the situations that occur when physical water shortages begin to affect people. This type of drought is caused more by socioeconomic factors (such as restrictive governments, poor farming practices, the breakdown of infrastructure, or failed economy, a culture of not valuing water etc.)

Taking into account the nature of the rural economy, drought is a serious hazard hunting the rural dwellers than any other hazards. According to Coppola in a Sahelian drought that began 1968 was responsible for the deaths of 100000 to 250000 people and 12 million cattle, the disruption of millions of lives, and the collapse of the agricultural bases of five countries. Wisner et al. argued that 86.9% of a global death of 1900-1999 was caused by Drought and hunger hazard and not other types of hazards as presented [3] (Table 1).

Hazards types in Rank Order	Percentage of deaths	Hazards types in Rank order	Percentage of deaths
Famine-Drought	86.9	Volcanic Eruptions	0.1
Floods	9.2	Landslides	Less than 1
Earthquakes and Tsunami	2.2	Avalanche	Negligible
Storms	1.5	Wildfire	Negligible

Source: Wisner et al. [3]

**Table 1:** Hazard types and their contribution to death, 1900-1999.

In this context drought is a big threat in our lives especially rural life. Why, because according to the National Bureau of statistics of Tanzania 80 percent of Tanzanian is living in rural and the major source of earning is crop cultivation [8]. Taking into account problem of land degradation, climate changes, low crop production, population growth and drought, rural dwellers are on edge of vulnerability. The drought undermines the effort put forward by the government, community and civic organization to improve the rural life. The drought turns a whole country into crisis. The rural population is a

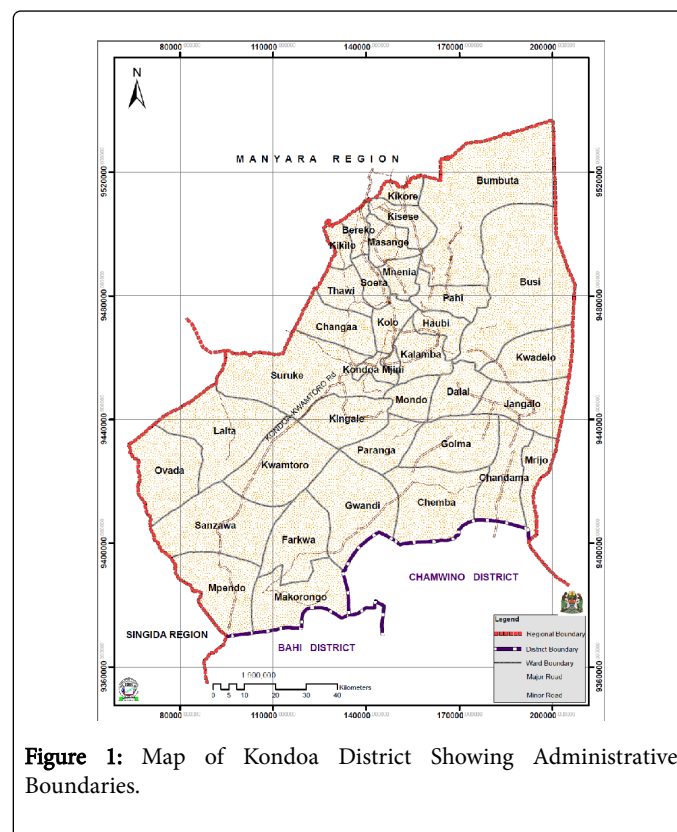
major producer of food and raw material to our industries. If they fail to produce enough food because of whichever reason, it affects the whole population in the Country. As a reference point, Kondoa is one the district located in a semi-arid climate of which rainfall is mostly unpredictable putting the entire population into vulnerabilities situations.

## Aim and Methodology

The paper objectively needs to present and document the vulnerability of the community against drought facing the residents of the district.

## Geographical location of Kondoa district

Kondoa District is located in the Northern part of Dodoma Region, and it is one of the six districts forming Dodoma region, 160 km from Dodoma town. The district has a total area of 13,210 square kilometers. It lies between latitude 40 12' to 50 38' south and Longitude 350 6' to 360 2' East. Kondoa District shares borders with Babati in the North, Kiteto District in the East, Manyoni District in the South West, Singida District in the West and Hanang District in the North West [6], see the map below (Figure 1);



**Figure 1:** Map of Kondoa District Showing Administrative Boundaries.

## Climatic characteristics of the districts

The climate of Kondoa District is wet savannah characterized by a long dry season between late April to December and a short wet season between early December and April. The average rainfall ranges between 400mm in the plateau and up to 1000 mm in the highlands. About 85% of the annual rainfall, falls between early November and March with a long dry spell of approximately 30 days in February. The

rainfall in the district is unevenly distributed; a condition that imposes a pattern of risk evasion in traditional agriculture, especially in low land areas with fewer rains [6].

The Temperatures and rainfall vary with altitude, where high altitude between 915-1,200 meters above sea level fall under mountainous zone with temperature ranging between 15-20°C and rainfall varies from 900-1,200 mm per annual. Areas of low altitude, including the rift valley zone experience high temperatures of 21-30°C with unreliable rainfall normally ranging between 600-700 mm per annual.

### Population size

Administratively, the Kondoa District has 4 divisions, namely Bereko, Pahi, Kondoa Mjini and Kolo. There are 28 wards and 108 villages in the district. The district has a total population of 269,704 people, whereby 136,518 (51% of the district population) are females and 133,186 (49% of the district population) are males, projected from 2002 census at an average growth rate of 1.7% per annum. The average household size is 5-6 people living in the 103,346 households [9]. This statistic of the district does not include the current known Chemba district of which was part of Kondoa District. Thus, the population of the district by 2002 is greater than the population in 2012.

### Population distribution

Population distribution in the district is almost unevenly distributed because, out of a total population of 269,704 of an entire district, 242,321 people live in rural and is equivalent to 90 percent and remaining 10 percent of the population is living in urban areas of the District. So long large section of the population lives in rural areas, the determinants of population distribution are; land fertile, trade and transportation. The others determinants are the availability of social services such as schools, health centers, water and land for grazing animals Ibid.

### Population density

Since the district has a total area of 5,792.26 square km, population density is 46.6 in per/km square by 2012. This is high density because, the majority of the population in the district is mixed peasants, and they produce crops and at the same time keep animals. Since animal keeping needs huge areas for pastures, the district has been facing serious environmental degradation which caused by livestock keeping and population growth.

### Economic Activities

The economy of the district depends mainly on agro-pastoralist, where 56.3 percent of the population is involved in farming while 35.3 percent is involved in both farming and livestock keeping (agro-pastoralists). The district has the total arable land of about 1,362,648 hectares, of which only 66% of this area is suitable for agricultural production. However, only 30% of this area (398,637 hectares) that is in actual agricultural production. Generally, the main crops that are cultivated include maize, millet, sorghum, and sunflower. The district has a total annual income of 91.7 billion. The per capita income of Kondoa District is estimated 340,000 Tanzanian shillings (Tsh) [9].

### The context

The Kondoa District is threatened by a drought, as main hazard that impact the normal life of most of the people and increase the district vulnerability to other related hazards. The essence of these hazards is determined through the risks that they pose to the entire population in the district. The main economic activity for the district dwellers is agro-pastoralist, accounting to more than 90% population. Since the drought has been identified as the major hazard affecting the district, it follows that the agricultural sector is highly vulnerable with its associated aspects. This set up create more complexities on rural economy and ultimately on rural economic vulnerabilities. The district had total arable land of about 1,362,648 hectares, of which only 66% of this area is suitable for agricultural production. However, its only 30% of this area (398,637 hectares) that is an actual agricultural production. The study was framed on the line of PAR model developed by Blaikie et al. and modifies by Wisner et al. [3] (Figure 2).

### The progression of vulnerability

The PAR model depicts a disaster as a product of physical exposure on one side and socio-economic pressure on the other side. The disaster is a collision of the hazard and Vulnerability. The model has three components, generating vulnerability in the social side, namely root causes, dynamic pressure, and unsafe conditions; meanwhile the other side part includes the hazards. The root causes include economic, demographic and political processes, which affect the way resources are located and distributed among the social group of people. Dynamic Pressure refers to those drivers which translate root causes into a local context. Unsafe conditions are the specific situations in which people now live in an endpoint of the root cause, dynamic pressure on time and space.

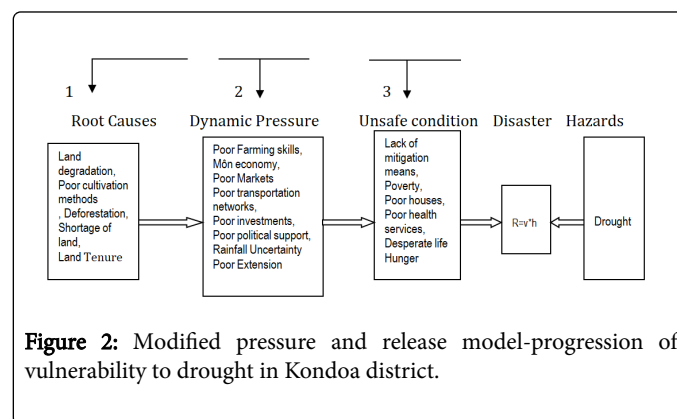


Figure 2: Modified pressure and release model-progression of vulnerability to drought in Kondoa district.

### Results and Discussion

#### Root causes of vulnerability

The root causes seem distanced from the process of generating vulnerability. The root causes making the populations vulnerable to drought are; land degradation, poor methods of cultivation, deforestation, loss of soil nutrient, shortage of fertile land, use of tradition seed, land tenure and low government support and Climatic changes.

**Land degradation:** According to World Bank (technical paper number 270 of 1997, pp: 17), soil degradation it has been a growing concern since the late 1920's when evidence of soil erosion, such as

gullies, was first observed in many parts of central Tanzania. The land is a vital resource on the earth; any activities of human being are done either on or in the land, production food depends largely on the quality of land you have. The other key function host by land includes; balancing ecosystems, conserving biodiversity, regulating hydrological regime, cycling of soil nutrients, storing carbon, and producing oxygen to a human being. In view, the land is one of the most significant resources in rural communities. The rural communities take land as a main asserts for their sustainable livelihood. With infertile land, or eroded land you understand how hard situation is especially in rural areas. Population growth, unsustainable land use, climatic change, and urbanization have been putting pressure on land. As the population growth, competition on the uses of land increases due to growing demand for food, fodder, land for feeding livestock and raw materials. Agriculture is responsible for 80% of deforestation on the earth [10].

According to the UN general assembly (2012), from the 1970s to the early 2000s, the percentage of the Earth's land area afflicted by serious drought has more than doubled. While the world's dry lands continue to be the most vulnerable and threatened by desertification, land degradation and drought (DLDD), land degradation is a global phenomenon with 78% of total degraded land located in terrestrial ecosystems other than dry lands [11].

The total land area that is already degraded or being degraded has increased from 15% in 1991 to 24% in 2008: with more than 20% of all cultivated areas, 30% of natural forests, and 25% of grasslands undergoing some level of degradation [11]. Each year an estimated 24 billion tons of fertile soil is lost due to erosion in the world's croplands. Land degradation directly affects 1.5 billion people around the world (by 2008 estimate) and has a disproportionate impact on women and children [11].

Kondoa district is seriously affected by a drought caused by land degradation. The community engages in crops and animal husbandry, making an area vulnerable to land degradation and ultimately drought. The drought affects the trend of productions in the district caused mostly by changing the rainfall pattern, and lastly is escalating poverty and unsustainable life. The drivers to land degradation have been; improper cultivation practices, deforestation, and overgrazing in Kondoa district. These drivers inculcate not only the process of turning the productive land into less production but change the rainfall pattern on the other hand.

**Poor methods of cultivation:** Taking into account the practices of the agro-pastoralist community, two processes may have taken place; one overgrazing of which entail grazing many animals in one pasture place, making the soil very loose and prone to wind or flood. This process ends up sweeping all topsoil which is useful in a production and ultimately shall gradually become less and less productive or turning the areas into semi-arid kind of weather. The vegetation covers are also affected by overgrazing. Kondoa district is one of the areas heavily affected by overgrazing caused by increasing population and demand of land for people's settlement and for grazing. Second, over-cultivation of which a piece of land has been intensively used for farming for a long time, the soil may become so infertile the extent of not supporting the growth of any vegetation. The land becomes less fertile than before and can easily wash out by moving wind and water. The end point of over-cultivation is poor yield, and community becomes so vulnerable to a drought. Taking into context, some villages in Kondoa district were formed during the programme of Ujamaa Village, where people were forced to form a new village and given only two-acre for cultivation, as the population grows and demand of more

pasture increase, the land become victim to meet the growing demand. The land in Kondoa is victimized by being intensively used.

**Deforestation:** Vegetation cover plays a key pivot in the water cycle, they reduce evaporation rate, retain soil moisture, store water and provide moisture to the atmosphere through transpiration. Deforestation process escalates more evaporation of which makes land lesser retain water and facilitate a desertification process to occur. Forest had a direct relation to climate, rainforest store moisture, once evaporate aid in forming a cloud which is a source of rainfall. Forests collect moisture from its leaves, trunks, and branches. It's estimated that 30% reduction in evaporation from a savannah compare to a forest, with a reduction in rainfall. The long dry spell the reduced water storage in some areas in Kondoa district. As results, the situation changes the rainfall pattern as well. This leaves the Kondoa community is susceptible to drought.

**Shortage of fertile land:** The district has a total area 5792.26 square kilometer (1362648 hectares) and population density of 46.6 per square kilometer by 2012. Out of these hectors only 66% is suitable for production and animals, keeping which is equivalent to 899347.68 hectors [6]. With annual population growth of 1.7%, the population of the district is estimated to reach 298,666 people by the end of 2018 (Exponential Projection  $P_t = P_o e^{rt}$ ). Taking carrying capacity of 3 hectares per person as reported by NBS, the total land required for agriculture has only been 895997.2 hectors; the difference of land required and land available is 3350.48 hectares. The district had cattle amounting to 302,000 which are 25 percent of the total cattle in Dodoma region (1185501) and has 1.1 annual growth rates. It has been estimated that in average 1 cow requires 3 acres of land to feed per annuals. It needs 36664.52 hectares land to meet the pasture requirement in the District. Taking land required to feed 30200 cattle which 36664.52 hectors and available land 3350.48 hectares, the district had a shortage of 33314.04 hectors of land to meet cattle pasture requirements per annual. The deficit does not take into account other animals .The district has a shortage of fertile land to produce enough yields. It has been estimated that 63 percent of people in Dodoma region had experienced food shortages. Some land which has been used for feeding animals, now are used for cultivation in Salare, Bumbuta, Kisasi, Itaswi, Mahongo and Hurui. In that context the district land is used intensively over and over of which ultimately soil erosion persists, flood and decline of soil productivity, hence the community become vulnerable to drought in the long run.

**Land tenure:** Land tenure of Tanzania is clear, the land is owned by the state, in view, the government had only had the authority of how shall be used. According to Hamisi [6], the most fertile land serving more than 80 percent of district population has now banned not to be used by the people for agriculture purposes. The areas are called Nkurutwi only fertile left and are used by the people from three regions, Dodoma, Manyara, and Arusha. The land is close to the Tarangire national park, but the community has used it since 1980's to 2005 of which ban was announced by the government. Taking into account, shortage of fertile land existing in the district, this land ban adds another crisis to the production; sustainability and community continue intensively using the land available and not the land they require.



## Dynamic Pressures

### Poor farming skill

The peasants lack farming skills to handle the production uncertainty. Taking into account the infertile of soils, inadequate land, and land degradation, speed the havoc nature of rural life. The peasants produce using the traditional ways of production. It has been noted, peasants still using an old fashion to produce, using traditional tools (Hand hoe), traditional seed and traditional storage. It proves that a modern skill to produce is missing. Furthermore, only a small number of peasants receive training on production. It has been noted also, peasants mission is hand to mouth economy and attitude have not been changed yet. The essence of producing excess food doesn't exist of which increases vulnerability to the population in a district.

### Mono economy

Peasantry in a very desperate set depends entirely on crops to earn a living. Although conditions of an area determine the nature, process, and types of production; peasants are dominant depends on agricultural production to earn a living. The peasantry in Kondo district keeps some animals such as; cattle's, goats, sheep's and hens. These keeping supplement the income for households. It has been pointed that rural peasants entire depends on crop production. If the production fails, the prices of animals fall as well. Taking into regards the rural situation of insignificance investments, none of the other income sources exist and peasants' entirely susceptible to drought than the urban population. Therefore peasants in the District are living in a highly prone condition to drought.

### Crop Markets

It has been revealed that none market exists for rural producers. It's clear that the market is the determinant production, it may encourage the production or discourage production, but also dictate whether producers benefit or not. According to Hamisi [6], 97.3 percent of the rural areas have no reliable market for selling their harvest the percentage can be compared to that of the Agricultural census of 2012, which show that 60 percent of rural dwellers have no reliable market, while only 2.7 percent of the rural population had a reliable market. Even 2.7 percent referred to the monthly rotating market is the main market for livestock and not for crops. Hamisi reported the rural producers have two options; the first option is to send the harvest to urban markets like Arusha and Dodoma, which is much cost full in terms of time and transport charges and reduce profits. The second option is to sell to retailer visiting the rural areas at a very low price compared to urban markets and producers don't benefit at all with what they produce. This situation increases the vulnerability level to rural peasants in Kondo district.

### Poor extension services

It has come to be known that each ward in Tanzania has an extension officer. The key function of the officer is to provide the technical guide to the peasants on modern methods of doing agriculture. The officers are responsible to train, skill and guide the peasants on how to produce, how to use inputs and connecting them with authority on agriculture. It has been noted that the outcomes of the extension were not noticed yet. The peasants are still producing using the same traditional means of production, whatever argument may be brought forward; these officers have played an insignificant

role to the peasants so far. The peasant continues using poor skills and methods in production and ultimately having low productions. In fact, these escalate the peasants to have the vulnerable kind of life.

### Poor transportation networks

Tanzania has a surface area of 945,000 square kilometers and a total road network of approximately 87,581 km [12]. The Table 2 shows the broad categories, 8.7 percent of the roads in Tanzania are paved, while 91.3 percent of the road is unpaved in Tanzania. The most paved roads are those of the Trunk and regional road making a total of 6630 kilometers, which is equivalent to 87.1 percent of total paved roads, meanwhile, the district road makes a total of 981 kilometers which is equivalent to 12.9 percent. These statistics prove that only a small percent of paved ways are found in rural area, The facts speak on the opposite side of which total kilometers of unpaved road (to regional and trunk roads) are 28370 kilometers, equivalent to 35.5 percent of total unpaved road while 51600 (District Roads and urban feeder road) kilometers which equal to 64.5 percent of total unpaved road in Tanzania. In the view above, 91.3 percent of the roads in Tanzania are seasonal and very poor during the rainy season.

According to Temu et al. in Tanzania rural roads is predominantly impassable during the rainy season. Road density of unpaved roads ranges across regions from 0.01 km per sq in Lindi to 0.07 km per sq in Mwanza, while paved road density is below 0.011 km per sq km for most regions [13]. The Majority of rural population produces and lives far away from major roads, markets and so, faces high transaction costs, including high transportation costs that raise price of inputs and impair further access to information and markets. This condition of roads affects the production process of which peasant cannot send easily their harvest to the market on time and increases costs of transportation, in turn, reduces profit to the peasant. This dynamism pushes peasants to more havoc nature of life and more vulnerability to hazard especially drought.

Category	Paved (km)	Unpaved (km)	Total (km)
Trunk Roads	5755	7031	12786
Regional Roads	875	21339	22214
District Roads, Urban Feeder roads	981	51600	52581
Total	7611	79970	87581

Source: Tanroads and Pmoralg 2013

Table 2: The broad categories, paved and unpaved roads in Tanzania.

### Poor investment

It has been pointed out that, in rural none of the significant investment has been made such as; electricity project and provision, financial services such Bank, access to loans and other development projects. It suggests the peasants engage only in mono-economy and not multiple economies. Taking this into account the peasants are prone to drought or any other natural hazard, but also their capacity to resilience hazards is very limited. All financial institutions are located in urban areas, even the agricultural banks are located in urban while in rural none of these banks exist. The peasants face low money circulation and high rate of rural to urban migration because of poor investment in rural and everything being located in urban.

### Low support from the government (inputs)

It has been pointed out that 78.8 percent of the rural population does not get any kind of assistance from the government; meanwhile, 21.1 percent of the rural population had indirect assistance from the central government [6]. The peasants feel being deserted by the politician's policy. They receive support from the government through extension officer, but because of the inefficient plan and willingness to address rural problems. The peasants receive inputs from extension officers either through a loan or cash buying, this is taken as key support from the government. In view, the support from the central government is not direct and cannot easily grasp by the rural producers. But also the support from the central government is through facilitating production using various agencies which mostly operate in urban centers, thus is very hard to be known by rural producers.

### Rainfall uncertainty

It has been acknowledged that the district is located in wet savannah areas. The rainfall pattern change and are unstable. The average rainfall ranges between 400mm in the plateau and up to 1000 mm in the highlands. About 85% of the annual rainfall, falls between early November and March with a long dry spell of approximately 30 days in February. The rainfall in the district is unevenly distributed; a condition that imposes a pattern of risk evasion in traditional agriculture, especially in lowland areas with fewer rains [6]. Naturally, the district's rain pattern is unstable, adding the land degradation and deforestation fuel the problem. Ultimately, meteorological droughts occur more often in the district. The rainfall pattern speed and push population to live in more vulnerable condition.

### Unsafe Conditions

#### Poorhouses

It has been proved; a large portion of rural houses is of poor standards. There are various houses built without, cement floor, iron roof, and good wall, some are located in a physically vulnerable location as houses along the mountain foot, floodplain and at the top of the Hill. What drive them to this level of unsafe conditions of having poor houses are the combinations of dynamic pressure factors which amplify the root causes into unsafe conditions. It has been revealed that, 53 percent of the population in the district has poor quality roofing and 16 percent of the homes have poor wall. The district has low access to electricity in which only 24 percent of the households have obtained electricity [6]. The Kondoa district population has been experiencing low harvest, market uncertainty, poor transportation means and poor extension services, of which exaggerate the vulnerability to a drought.

#### Poverty

Poverty has been part of peasant's life. The trend has not been changed significantly with all political campaign since independence. The peasant's wellbeing is still of poor houses, poor health services, poor water services and low income. Only a small percent of peasant live above 1\$ dollar per day. The worse part of it, peasants have no idea on exactly how earning accrues per annual. It has been revealed also, the costs of production are unknown to them. The extent of rural poverty is self-explanatory and spread across each aspect of rural life. The number of people living below the poverty line in the district is 21

percent and in each square kilometer, 7 percent of people were classified as poor by 2000/2001 [14]. Poverty cripples the rural population of not forming a social and economic protection mean against hazards, especially drought.

#### Lack of mitigation strategies

It has been proved; peasants in Kondoa district had none of the strategies established to handle the hazards. None of the strategies are put in place to mitigate flood, drought, landslide, famine, an earthquake [15]. Taking into account peasants' lives in deep poverty mitigation is almost impossible; entirely depend on remittance from a close friend living in urban areas. Peasants are producers of food and raw materials within the country; unfortunately, the peasant is more likely to die if droughts occur than consumers who just live in urban areas. It should be noted also, rural areas have none of the serious financial services are found; quite rely on what is generated from the farm to earn a living. In the view above it is an evidence of how hard to peasants on the process of mitigating the hazards around them, especially drought which is commonly found in the central part of Tanzania.

#### Poor health service

Rural live in the district are characterized by having limited health facilities. As a matter of facts, poor health services jeopardize the efforts of peasants to get rid of poverty. The peasant's productions mostly need physic to handle the process. The physical strength cannot be attained if peoples are ill and health services are nowhere found. The health services may be available, but with poor families living in deep poverty, health services are not accessible to them [16]. The District has an average of 0.004 health facilities per each kilometer square, marking a very low health facility [6]. The rural family experiences this kind of life, putting them vulnerable to drought, hunger, and other hazards commonly found in the district.

#### Living desperate life

It has been noted; peasants don't like rural life at all and believe urban life is good and standard. However, whether the assumption is right or wrong, but it makes sense taking the nature of rural life [17]. All good investments, project, big hospitals, Universities, better transportation means, government offices and financial services are located in urban centers. As a result, peasants feel being marginalized and live a desperate kind of life. This kind of perception not only disturbs the mental stability, but put more stress and emotional pain in their practical life. The peasants ultimately produce at the level of subsistence and mainly hand to mouth economy, making them less and less resilience to drought [18].

#### Conclusion

In view of the discussion, the district is vulnerable not only to drought but also to another form of natural hazards such as flood, shortage of food and famine fueling the risks to the population. The root causes of district vulnerability are; Land degradation, poor cultivation methods, deforestation, shortage of fertile land and land tenure. Dynamic pressure factors include; Poor farming skills, Mono economy, poor markets, poor extension services, low support from the government and rainfall uncertainty. Unsafe condition entails poor house, poverty, lack of mitigation, poor health and living in a desperate state.

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## References

1. Blaikie P, Cannon T, Davis I, Wisner B (2014) *At risk: natural hazards, people's vulnerability and disasters*. Routledge.
2. Coppola DP (2011) *The management of disasters. Introduction to International Disaster Management* 1-35.
3. Susman P, O'Keefe P, Wisner B (1983) Global disasters, a radical interpretation. *Interpretations of Calamity*, pp: 263-283.
4. Watts MJ, Bohle HG (1993) The space of vulnerability: the causal structure of hunger and famine. *Progress in Human Geography*, 17: 43-67.
5. United Republic of Tanzania (2012) National sample census of agriculture 2007/2018. Regional report: Dodoma region.
6. Hamisi S (2016) *Appraisal Mitigation Measures to Combat Rural Economic Vulnerability in Tanzania*, Tanzania University (Ph.D. thesis) Lambert and German.
7. Twigg J (2001) *Sustainable livelihoods and vulnerability to disasters*.
8. National Bureau of Statistics (2007) General report, Dar.
9. Prime Minister's Office (2012) *Kondoa District emergency Preparedness and Response plan Report (DEPRP)*.
10. Kissinger GM, Herold M, De Sy V (2012) *Drivers of deforestation and forest degradation: a synthesis report for REDD + policymakers*. Lexeme Consulting.
11. UN General Assembly (2012) High-level meeting on addressing desertification, land degradation and drought in the context of sustainable development and poverty eradication. A/65/861.
12. United Republic of Tanzania (2015) *Road Network Length and classification - Tanzania Mainland 2013/2014*.
13. Temu AE, Nyange D, Mattee AZ, Kashasha LK (2005) *Assessing rural services, infrastructure and their impact on agricultural production, marketing and food security in Tanzania*. Final donor report of a research project funded under IFPRI Eastern African, 2020.
14. PHDR (2005) *Tanzania Poverty and Human Development Report*. Mkuki na Nyota Publishers, Dares Salaam.
15. <http://daily.jstor.org/daily-author/james-macdonald/>
16. Cannon T (1994) Vulnerability analysis and the explanation of 'natural' disasters. *Disasters, Development and Environment* 1: 13-30.
17. [https://cldup.com/Mpx7MBpNet.pdf?download=STRAT-Tanzani%20Emergency%20Preparedness%20and%20Response%20Plan%20%2C%202012%20\(1\).pdf](https://cldup.com/Mpx7MBpNet.pdf?download=STRAT-Tanzani%20Emergency%20Preparedness%20and%20Response%20Plan%20%2C%202012%20(1).pdf)
18. United Republic of Tanzania (2015) *disaster Management Act of 2015*.