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The Relationship of the Cameroon Volcanic Line (CVL) and the Associated Disasters in the Recent Years.

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ABSTRACT:

The Cameroon Volcanic Line is a subsurface geologic feature expressed externally as 1600km SW - NE trending chains of Volcanoes stretching from the Atlantic Island of Pagalu through the Gulf of Guinea and the massifs of Mount Cameroon, Manengouba, Bamboutus, Bamenda, into the outcrops of Benoue, the Kapsiki and beyond the Chad basin. Mount Cameroon is the only active volcano along the CVL, and within the last century it erupted seven times viz, 1909, 1922, 1954, 1959, 1982, (Dumort J.C. 1986) and with the most recent eruptions occurring in March 1999 and 2000, averaging a quiescent period of 18 years.

In the late last century of early this century the country has recorded a series of natural disasters that are identified to be located within and around the corridors of the CVL. Around the corridors of this CVL are scattered Lakes found in craters of long extinct Volcanoes. Amongst these are Lakes, Manengouba, Barombikang, Wum, Oku, Bambuliwi, Nyos and Monoun.

Apart from the eruptions and gas releases from Lakes, are also landslides, floods, and other natural disasters occurring within this regional corridor of the CVL. These disasters in series include; The Lake Monoun (1984) toxic gas in which 37 people were killed, The Lake Nyos toxic gas which claimed some seventeen hundred to approximately two thousand (1700 - 2000) lives, The Bafaka Balue (1995) landslide with 3 lives lost, The Mount Cameroon Volcanic eruptions (1999) where lava consumed an enormous amount of forest (about 800 hectares) with its rich bio-diversity and cut-off 83m of tarred road disrupting economic activities. The most recent of such disasters are; The March 2000 Volcanic eruption which collapsed prominent buildings and rendered many people homeless, The June 26,2001 landslides and floods in Limbe which claimed 24 lives and damaged several buildings and roads.

Each event of the Mount Cameroon Volcanic eruption results in movements which generate waves within the body of the Earth, causing tremors that provoke landslides and floods. Volcanic gases as well are also released into Lakes.

In the event of Lake Nyos accumulation of carbon dioxide gas in the Lake starts when CO₂ - rich gas of magmatic origin rises towards the Earth's surface and contacts groundwater. Oxygen and Hydrogen Isotope data, plus relative proportions of solutes in springs surrounding Lake Nyos suggest a common origin for ground and Lake water.

Several hypothesis have been presented as to the cause of the emission of the gas at Lakes Nyos and Monoun. Lakes Nyos and Monoun are among a series of Lakes that lie along a rift zone that is the site of intermittent volcanic activities. Carbondioxide being a common volcanic gas is believed starts accumulating in the lake when CO₂ rich gas of magmatic origin rises towards the Earth's surface and contacts groundwater. The United State scientific team (Clarke and Others, 1987) forwarded a cause arising from a slow build-up of CO₂ gas which dissolved in Lake waters through groundwaters. The charged groundwater is then released into the bottom of the Lakes in springs. Oxygen and Hydrogen isotope data plus the relative proportions of solutes in springs surrounding the lakes suggest a common origin for ground and lake water. This common origin is consistent with the hypothesis of groundwater transfer of dissolved CO₂ into the lake. With the frequent volcanic activity, it is believed that if the water is disturbed, by a storm, eruption or landslide for example, this water may rise to the surface and the gas displaced out of solution. The British team Freeth, Kay Baxter whilst essentially accepting a similar mechanism suggested that a pulse of cold CO₂ could have been the trigger which caused the lake to overturn and release the already dissolved gas. The precise mechanism responsible for the release from the lake is unknown but has been the subject of much speculation (Freeth and Others 1987, Freeth and Kay 1987), However, concluded that further volcanic activity could be expected. (Tazieff 1987) the occurrence of the second event on December 30, 1986 reported by Chevrier 1987 added possible support to this hypothesis. Scientists currently working on the project say they know of no specific trigger mechanism.

If the partial pressures of CO₂ levels were near saturation prior to the event, almost any physical processes common in lakes could have moved water enough to cause local over saturation and this initiate the release.

Once released the heavy gas then pours over the lip of the Crater Lake and moves at speeds approaching 50mph down the valleys suffocating all animal in its path. Pockets of the gas can linger in hollows and overwhelm those who accidentally stumble into them. Concentrations of just 10% are lethal.

A similar eruption of gas two years ago before Nyos, took place in 1984 at Lake Monoun, where 37 people died. It is also clear that as with the case of Lake Monoun, the bottom waters were saturated with carbon dioxide derived from mantle source. The eruption of Lake Monoun (1984) took place in August, and scientists suspect that climatic conditions in that month may be at least partly responsible for triggering eruptions. Some fear that the next time it happens the lip on the north side Nyos could give way, releasing water that could carry the devastation much further; even reaching the borders of neighbouring Nigeria 50 miles away.

This work redresses some mitigation practices proposed to the Government in order to harness these threats to the human population; an assessment of governments role in managing such disasters reveals a number of inadequacies.

* No planning contingency means have been put in place towards preparedness and mitigation of disasters. The management even of such disasters is usually fraught with corruptions and swing ling of funds.

* Has the government assumed responsibility for avoiding natural disasters through advanced actions rather than only providing post disaster aid to victims?

Are there any ways the government could reform the present inadequate system of the country's laws, policies and programmes that deal with hazards assuming that such disasters are inevitable acts of God?