

**FLOODING AND GULLY EROSION IN AMOKWU-AFFA, UDI L.G.A OF**

**ENUGU STATE; NIGERIA:**

**PUBLIC AND PRIVATE PARTICIPATION AS A WAY FORWARD.**

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**Abstract**

Much have been said and done about climate change and its attendant environmental deterioration, but unfortunately not much have been achieved. Flooding and formation of gullies is one of the greatest environmental mishaps in southeastern Nigeria as a whole and particularly in the study area (Amokwu-Affa). Not much have been discussed on the adoption of low-technology approach through private and public participation to control the environmental scourge. However, to work towards this direction, relevant literatures were reviewed, key stakeholders interviewed, informal discussions were held with key experts in the study area and critical gully erosion sites were also observed and photographs taken. The results revealed that the causes of floodings and erosion can be traced to various human activities. Hence, the conclusion is that human –based approach in form of private and public participation through workshops and other preventive measures can go a long way in reducing the environmental hazard.

**Key words:** Environment, erosion, gully, flooding sustainability, technology, climate change.

**Introduction:**

It has been discovered that the ecological problems of floods, soil and gully erosions and land slides in the south eastern part of Nigeria requires huge amount of fund. It is very unfortunate that despite all the hues and cries made by people of south east (precisely inhabitant of Amokwu-Affa in Udi L.G.A) about the ecological problems to the successive state governments over the years, seems to have not yielded the required response. The state governments had not been regarding the ecological problems in the study area an urgent matter that require major funding and action. Erosion menace which is a major threat to life, is one of the negative impacts of human activities to the environment.

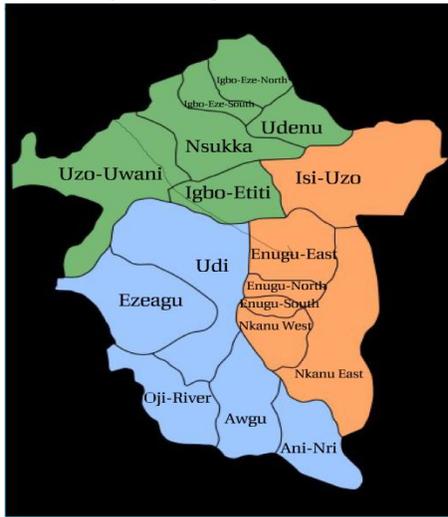
As Stephen M. Wolf, (chairman and chief executive officer of united Airlines), once said in an editorial; that the effect of climate change threatens the existence of all species including mankind, (Awake, Jan 22 1993). The same officer continues and I quote, "We did not weave the web of life, we are merely a strand in it. Whatever we do to the web, we do to ourselves." He also said in the editorial, "We are the cause and we are the only solution"., (Wolf S.M, in Awake 1993). Our environment is regarded as a web that is naturally in equilibrium (i.e ecological system or natural balance among plants and animals), where any alteration by man in terms of developmental changes, would definitely have negative effect on the natural ecosystem. This study was actually informed by the perspective of those affected by flooding and gully erosion in the study area and further examined the human dimension of the problem. The solution adopted is anchored on low-cost and community-based approaches. The scope of this write-up is to examine the study area in respect of flooding and gully erosion problems, the casues of the menace especially the various human activities that generate erosion, the remedial solutions so far adopted by the people and finally recommendations of more responsive solutions.

**The Study Area**

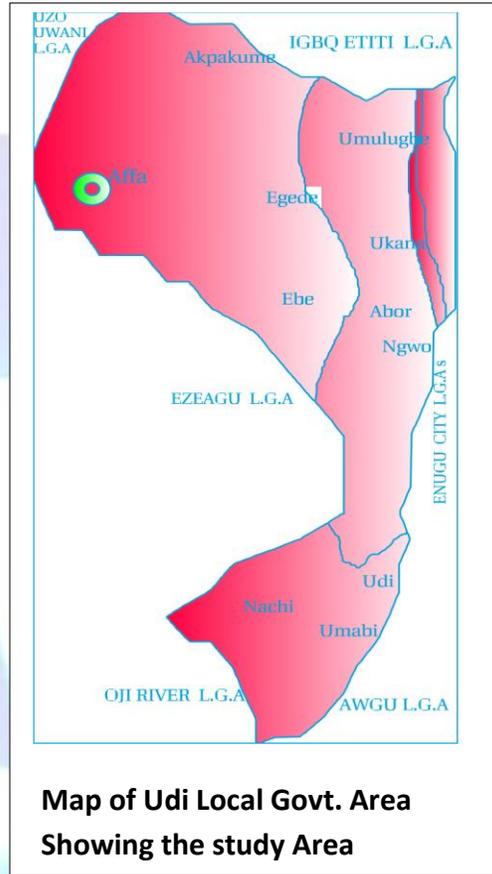
Amokwu is a community in Affa town which is located in Udi Local Government of Enugu state in the south east of Nigeria. Affa is one of the three towns that make up Ugwunye clan comprising Nike (in Enugu East L.G.A), Egede and Affa in order of seniority. Amokwu is one of the seven villages that make up Affa, namely, Amokwu, Amozalla, Amofia, Inonyi, Ikeno Ogor and Umukoloma.

The geographical location of Affa is 6<sup>0</sup> 35' 0" North 7<sup>0</sup> 20' 0" East. (Wikipedia Free encyclopedia). The neighbouring towns are Egede, Umulumgbe, Umuoka, Akpakwume and Ochima. The official population figure of Affa is three hundred and forty seven thousand and fifty (347,050) as at the 2006 census. There are controversies concerning the credibility of 2006 census figure all over the country, but however, the people of Affa represents great percentage of the population count of Udi local goernment. In Udi local government, Affa is one of the most populated towns next to Amokwe.

**Map of Nigeria highlighting  
Map of Enugu State**



**Map of Enugu State  
Showing Udi Local Government**



**Map of Udi Local Govt. Area  
Showing the study Area**

### Methods

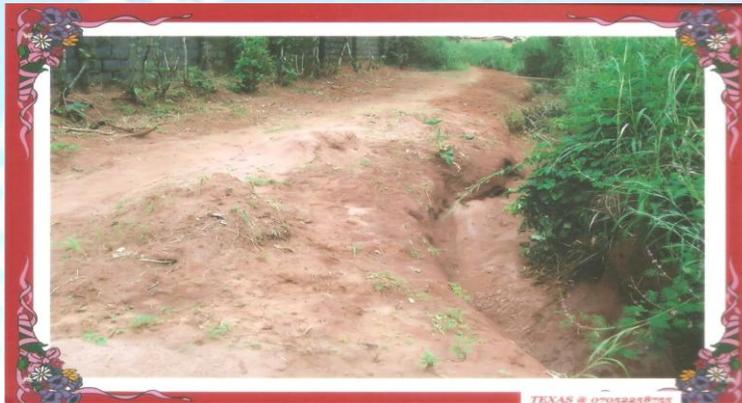
Like it was mentioned earlier, this study relied on the sources of evidence which includes; direct observations, informal interviews with key stakeholders and then documentations. Also used in the study is literature review of academic articles, News articles and publicly available documents. The people interviewed include community heads, village-based experienced artisans, farmers, photographers and surveyors. The interview was designed in most loosely semi-structured format under very informal situation. Questions were focused mainly on ways to prevent flooding and controlling erosion.

### Results

The interviews and opinions sampled showed that flooding and gully erosion in the study area increased in recent times due mainly to human activities in terms of construction of modern buildings, roads and also increased agricultural activities to care for the growing population. According to American Magazine, ..... "The entire march of human progress has occurred against a backdrop of landscapes

transformed from their natural state to suit the needs of agriculture and industry". (Linden E. 2000). The various human activities that led to environmental degradation can be managed and controlled through proper land use, forest vegetation etc (Gobin et al 1999 in Ezezika O.C. and Adetona O. 2011).

Some gully erosion sites as observed started initially on a small scale about 15 years ago, but have now developed into deep gullies. Examples of such gullies are the one along Umuoka – Amokwu road and the one at Obodo Amokwu village square. The ones at the village square are so deep and devastating that the square is no more being effectively used for traditional ceremonies by the community.



**Plate 1: Amokwu-Umuoka Road Flash part taken in 2015**



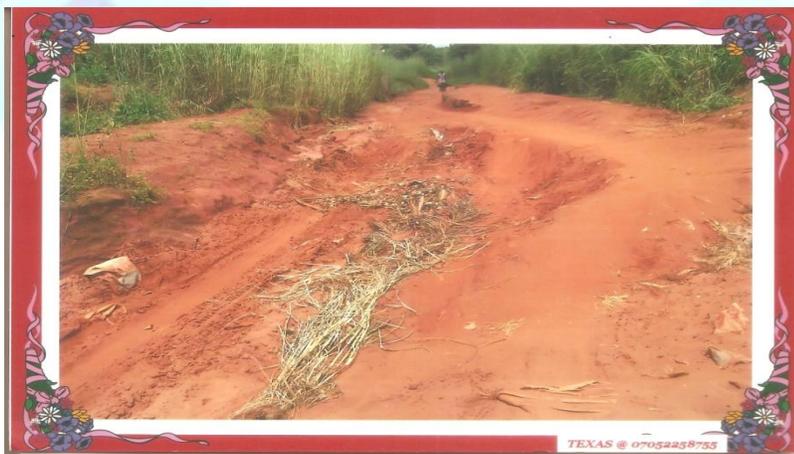
**Plate 2: Amokwu-Umuoka Road Flash part taken in 2015**



**Plate 3: Amokwu – Umuoka Road Flash part taken in 2015**



**Plate 4: Amokwu Village Square being devastated by erosion**



**Plate 5: Amokwu Village Square being devastated by gully erosion**

Also from the interviews conducted, there have been a drastic increase in houses without proper drainage systems, causing increased surface runoff and flooding especially during the rainy season. For instance the ground surface of many residential compounds are paved with rainwater flowing into the surrounding areas. To add more harm, the vegetation around these residential areas which could retain surface runoff and also retard the velocity of water flow are either non existence or in a minimal quantity due to paved surfaces and other construction activities. Hence, the inability or the failure of many households to employ proper drainage systems is one of the major causes of flooding and gully erosion.

### **The various human activities that cause flooding and gully erosion**

Man in his giant stride to respond to the various competitive life challenges, has modified and remodified the natural environment and this sometimes threaten the existence of man on earth. Initially the negative effects of man's developmental strides were not so obvious probably because of the love to preserve the natural environment. Actually the concept of preservation emphasizes on protecting the environment in its natural state either for moral, esthetics, economic or recreational purposes, (C.N. Johnson et al, 2005 in Ogbodo G.S. 2010).

Many scientists and Critics are of the common opinion that human activities are having a dangerous impact on the environment. An American scientist and politician Al. Gore, in his book "Earth in the Balance – Ecology and the human spirit" believes that the impact of man's activity on the environment represents an imminent threat to his survival (Awake, Jan 8 1993). Al Gore stressed that as we continue to expand into every conceivable environmental niche, the fragility of our own civilization becomes more apparent.

Erosion menace started being an issue in most parts of Nigeria around early 70s when construction of modern buildings, roads, drainages, dams and other infrastructural developments picked up. The initial high rate of the developmental changes were mainly as a result of the then oil boom, unchecked population increase, modernization and globalization.

Furthermore in the opinion of many scientists, human induced changes in earth's atmosphere and oceans have made our planet a dangerous place by contributing to more frequent and more severe natural disasters, (Awake, 2005). The assertion strengthens the negative effect of human activities to the environment which eventually bounces back to humans. Some of the related human activities that

in one way or the other affect the frequency and severity of natural disasters especially flooding, gully erosion, global warming etc, are:

- i. Unguided construction and cultivation that cause flooding.
- ii. Indiscriminate channeling of flood water on sloped terrain especially in loose soil structure area like Affa (study area).
- iii. Emission of greenhouse gases and ozone layer depleting gases and burning of fossil fuel, hazardous dumping of household waste etc. These factors contribute to climate change which ultimately cause torrential rainfall that result in flooding which displaces many families.

### Unguided Construction and Cultivation

The concept of development and the environment have changed in focus from the pre-colonial period till date. During the pre-colonial and early post-colonial period, developmental objectives were essentially materialistic and relatively limited to subsistence level. Consequently the impact of man's activities on the environment were quite limited and almost insignificant.

However, from the post-colonial period, this situation and scenario changed especially in most part of Nigeria probably because of increase in population and the economic boom between 1970 to early 80s. In other words, environmental impact or degradation is caused by the combination of an increasing human population (P), continually increasing economic growth or per capita affluence (A) and application of resource depleting and polluting technology (T), (Wikipedia accessed 10th August 2014), =

$$I = PAT$$

Where

I = Environmental impact

P = Population

A = Economic growth or per capita affluence

T = applied technology.

Relating these concepts and events to the study area, between 1960s and early 70s, the construction development that were in existence in Affa were mainly:

- i. traditional building with mud wall, thatched roof and unpaved compound or surf
- ii. Link roads that connect most communities like Amokwu, Inonyi, Amazalla, Ogor, Amofia etc.

These roads were only graded but however, were probably maintained by members of staff of public works department (PWD) of the then Eastern Region. Beyond 1970, population of Affa began to increase and then of course economic activities not only increased but also diversified in both type and complexity. As an environmentalists put it; that if human disturb the environment (eg pollute it), they will disturb the natural equilibrium (eg changing weather pattern) a pattern that is only too evident these days, (Emmitt S, 2002). In Amokwu Community and Affa Town as a whole, the replacement of the old traditional thatched houses accelerated as from 1973, which coincided with the country's period of economic boom.

The modern zinked high pitch roofs produce uncontrollable surface water run-off. Then the surface water produces flood which eventually cause gully erosion on the sandy soil of the community. Flooding and gully erosion have affected negatively the lives of the people of Amokwu Affa in such a way that their residential houses and farm lands are threatened by flooding and gully erosion as depicted in snaps on some flash points shown below.



**Plate 6: Farm Land being destroyed by gully erosion**

#### **Measures to reduce flooding and gully erosion in Amokwu-Affa- Udi L.G.A of Enugu State.**

Practical experience has shown that most natural disasters like flooding and gully erosion are caused by various human activities. Therefore, the interim and permanent solutions to those disasters are mainly community-based which can be in form of:

- i. Reduction of surface run-off from source: The devastating affect of surface run-off is caused by the volume and velocity of water and these two factors can be controlled from various residential and public built-up areas. Each compound should harvest the roof water into either plastic tanks or underground reservoirs for re-use. This could go a long way into

- solving the problems of water scarcity during the dry season in the study area. Secondly, each compound should be leveled as much possible in addition to having about 50s-20% of exposed areas as greenery to help absorb the remaining water run-off.
- ii. Channelling of the surface run-off at different intervals to avoid its accumulation into high volume which could be destructive. If this is done at regular intervals to open farm lands, it could serve as source of replenishing manure for such farm lands instead of being hazardous. At some of these diversion, catchment pit should be used to harvest the water for future purposes.
  - iii. Design and planning solutions still remains in the hands of architects, planners and other professionals in the building industry. The architect should ensure that the roof hieghts do not be excessively too high so that the initial velocity of the surface run-off is moderate. Also the landscape for each compound should be such as to encourage the retention of the surface run-off within its locality or primary source.

### Conclusion and Recommendation

Flooding and gully erosion is one of the natural disasters that had been threatening lives and properties of the people of Amokwu –Affa, and as a matter of fact, the negative effect of this menace had been made worse by climate change which cause inconsequential and torrential rainfall. The study has shown that proper planning, design and landscaping can control the aggregate volume and velocity of surface run-off. Most of the control measures stated above are mainly community-based. But however, the local government authorities should be sending their health environmental officers on regular basis to the communities to ensure compilance to environmental control measures and programmes.

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