# An Analysis of Human Survival Strategies in Difficult Environments: A Case Study of the Kom Highlands in Cameroon


## Abstract

Mountainous regions and other difficult terrains, the world over, present significant challenges to communities as they strive to carry out their daily activities. In spite of these difficulties, strategies have been employed by communities to cope with such difficulties, yielding diverse outcomes. The extent and outcomes of survival strategies employed by communities, still beg for scientific and policy edification, in the context of the Western Highlands of Cameroon. This paper contributes to bridge the knowledge gap, by examining the survival strategies employed by locals in the Kom Highlands to confront the challenges presented by the harsh physical environment. 10 key informant interviews were conducted accompanied by a representative survey of 60 farming household heads, drawn from 5 villages in Fundong. The data were analyzed using both descriptive and inferential statistical tools, including the Chi-square analysis. The results reveal that Kom displays a plethora of harsh physical environmental characteristics, prominent among them are the hilly and difficult terrain, the poor soil quality and the generally cold weather conditions witnessed here. Faced with these challenges, the population has employed a number of survival strategies in the agricultural sector, housing and transport. These strategies are unfortunately inadequate and such inadequacy is accounted for by their low level of technology, poverty, ignorance and other cultural factors, among others. The study therefore recommends the need to improve and modernize agriculture through the provision of fertilizers at subsidized rates to the farming population, the encouragement of effective slope stabilization and terracing and also for rigorous government intervention in terms of road and fly over constructions.



**Key words**: Difficult environments, Farmers, Livelihood, Kom, Survival,


## Introduction

The complex aggregation of land, water, air and all other natural elements comprises the physical environment which is the home of man. Its composition is so complex and varied that scholars sometimes argue about the non-existence of an ideal environment for the uttermost thriving of

man [1]. A harsh physical environment refers to the difficult aspects/attributes of the environment that threaten human survival. Better still, it refers to those aspects of climate, relief, vegetation as well as soils which make life very uncomfortable, miserable and/or challenging to human beings. It is important to mention that the nature of the challenge imposed by the physical environment differs from community to community. In the same vein, the level of adaptation to such harsh environments is dictated among other things, by culture, history and the level of technological advancement of societies [2, 3].

Generally, in the world today, many areas portray aspects of harsh physical conditions like droughts, floods, earthquakes, hurricanes, coastal erosion, landslides and the presence of chains of highlands and mountains which give the area a difficult nature [3]. In fact, an estimated 12% of the world's population lives in mountainous areas which are essentially areas of difficult topography (Price, 2008). Despite the difficult nature of mountainous landscapes, they still have something to offer as half of humanity depend on mountain resources especially water for energy, irrigation and for consumption [4].

Two major themes come to the forefront in the man-land and development discussions. The first emphasizes the role of the physical environment in structuring human activities. The second emphasizes the role of culture in structuring the physical environment. Under these headings, there are literatures of varying degrees of methodological sophistication and theoretical penetration [2, 3]. Both themes, however, rely on a rather stark, and in some ways, indefensible separation of the natural from the human, of the physical environment from culture.

Laos for example, is a landlocked country dominated by a dense jungle and rugged mountains, with a vast drainage basin at the center and alluvial plains in the West along the Mekong River. The inhabitants of Laos have devised survival strategies which they use to cope with these harsh conditions, (www.mountainpeople.org). In addition, there are other inhabited areas of the world which are physically very harsh such as the permafrost zones which is inhabited by eskimos; who live in the permanently frozen areas. These people have devised heat trapping strategies to keep their body cells functioning in the midst of the very chilly weather conditions. Desert settlers (such as in the Sahara which is the largest in the world) have also devised survival

strategies in their dressing, feeding and other human activities. Many states in the Middle East are aware of their very dry conditions and they rely on irrigation for their agricultural activities to flourish. People also live in very mountainous regions of the world like the Alps and the Jura Mountains found mostly in Switzerland which serves as a constrain to human activities and hinders development. Despite the mountainous nature of these regions, people continue to live there because they have derived methods of adapting themselves to the situation like organizing mountain races, snow skiing races, setting touristic sites that attract lots of tourists into the area, thereby making their economy viable.

In Cameroon, there are certain parts of the country where the physical characteristics restrain the population and narrows down their range of human activities. Examples of some of such areas include some parts of the Northern Region of Cameroon which is not only mountainous but possesses a rocky landscape, poor skeletal soils and aspects of desertification or drought, owing to the fact that it is located close to the world's largest desert. The effects of such physical constraints are further enhanced by rising poverty in Cameroon, where an estimated 24% of the population live below the poverty line of 1.9 US dollars per day[1]. This deepening poverty is significant in rural Cameroon where the head-count ratio of the poor is 54%, which is above the average of sub-Saharan Africa [5, 6, 7].

The Kom highlands in the North West Region of Cameroon, exhibits a good example of harsh physical and environmental conditions, which is evident in its poor soils, cold and harsh climate and a difficult relief and topographic landscape. Again, this region is witnessing significant population growth in. Geometrically, it almost entirely lies straddled along the precipitously steep slopes of the high lands that rise from the Menchum Valley at about 900m above sea level in the South, to the Oku Uplands at about 1500m above sea level. Human settlements colonize every bit of hill top and spur and perch along the steep slopes as many stream banks here are steep, narrow and rocky.

All these harsh physical conditions that dominate the area, culminate in making life in the Kom Highlands difficult, particularly in the domain of; construction of houses, farming to raise

[1] Based on estimates between 2014 and 2016 by the UNDP. For details, see: http://hdr.undp.org/en/countries/profiles/CMR

sufficient food crop to satisfy the basic local needs and surpluses for sale, the construction of motorable roads, the frequent or rampant illnesses like cold and fever which result in high death rates, an adaptive peculiar dressing style, are typical of the Kom people.

Since the extent and outcomes of survival strategies employed by communities in harsh physical environments, still seek scientific and policy edification, there is a need to contribute to illuminate this aspect using the case of the Kom Highlands of Cameroon. The objectives of this paper therefore are to (i) identify and categorize the survival strategies employed by farmers in the Kom highlands of Cameroon, and (ii) analyse the extent and outcomes of these survival strategies employed by Kom farming communities. Addressing these objectives is relevant in the field of Mountain Geography, and provides an opportunity to further revisit existing theoretical debates on human adaptation in mountainous environments. The results equally demonstrate potentials to contribute to update theoretical frameworks on environmental determinism and possibilism.

## Research Methodology

### Study area

The Kom Highlands is found between latitude $6^{o}4'$ and $6^{o}20'$ north and between longitude $10^{o}11'$ and $10^{o}30'$ East. It is predominantly a highland area with slopes of peaks like of up to 2500m. However, altitudinal variations are common on the Njinikom plateau. Temperature ranges from 15°C to 38° C with average temperature of 24.5 to 29.7°C. Average annual rainfall stands at 2400mm per annum and humidity of 82% with two seasons [8]. Fundong is the head quarter of Boyo Division (the Kom Highlands). The area forms part of the Western Highlands of Cameroon [9, 10, 11] and occupies the central portion of the North West Region of Cameroon and it is located some 65km away from Bamenda, with a total surface area of about 37000$km^2$ [12]. It is bounded to the west by Wum Sub-division and Bafut Sub-divisions, to the east by Noni and Belo Sub-divisions, Fungom and Bum Sub-divisions share its boundary at the north and to the south, it shares boundaries with Belo and Njinikom Sub-divisions.

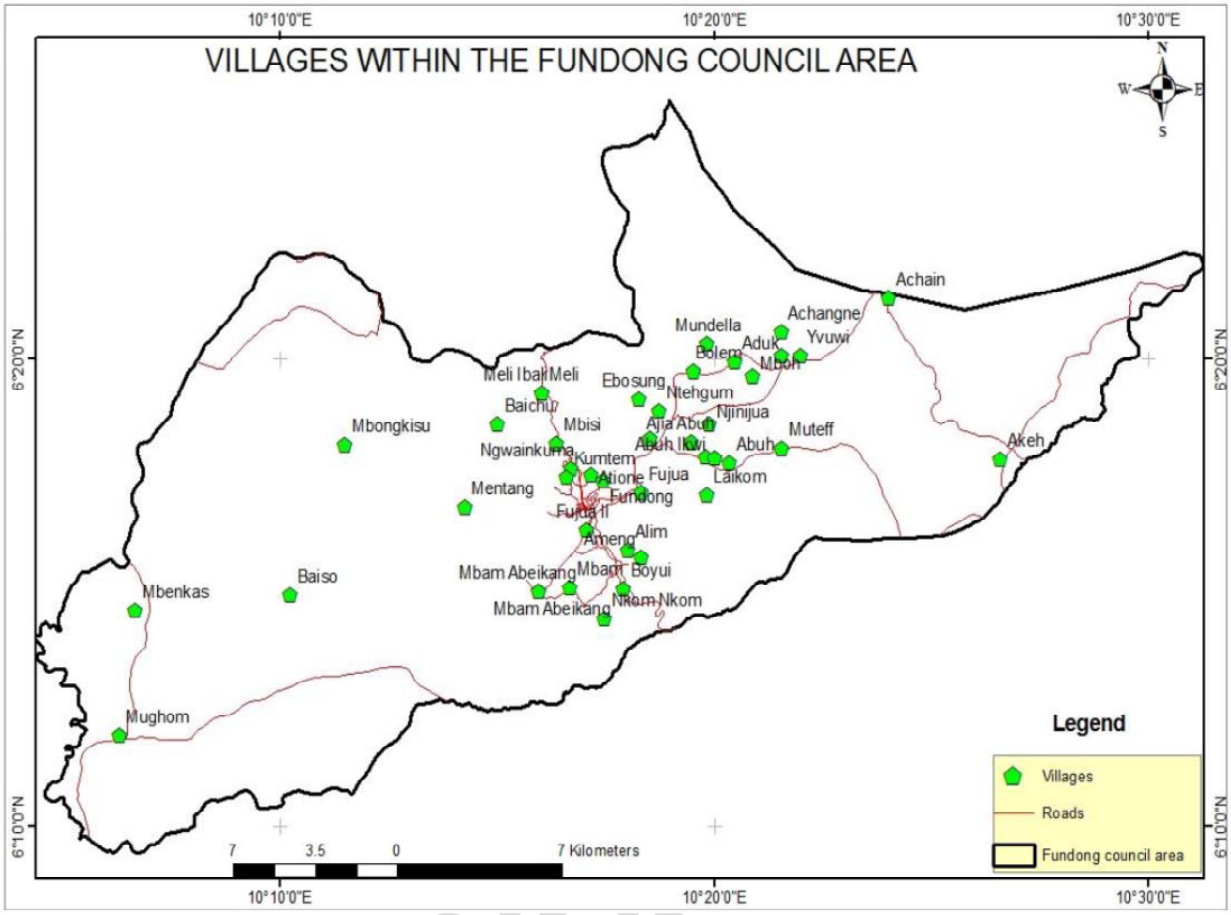


**Figure 1**: The Layout of Fundong Sub-division Source; Fundong Council Development Plan, 2012

## Data Collection and Analysis

The study made use of primary and secondary sources of data. Primary sources include field observation, accompanied by interviews and the administration of questionnaires. Within the Kom Highlands, Fundong Municipality, the most populated, was chosen as the study site. The Municipality has an estimated population of 45831; 60% (27499) constitute the rural (target population). From this number, an estimated 80% (22000) are engaged in agriculture [13]. This represents the target population. A 5% sample (100 farmers) was drawn from this target population to constitute the sample. 10 key informants were interviewed and a total of 100 copies of questionnaires were used to sample the population of Fundong using a random sampling technique and 59 were successfully collected. Interviews were conducted to some traditional and council authorities, as well as to some elites of the population on their suggestions for improving their coping strategies. In addition, some photographs were used to portray certain aspects of the harsh or difficult physical environment.

Secondary data was obtained through the consultation of reports from the Fundong Council, the Delegations of Agriculture and Rural Development, Tourism and Environment and Nature Protection. Also, population data and reports from other related institutions were consulted.

The data obtained has been presented in the form of tables, maps and charts which involve some qualitative representation. Quantitative data analysis was done using the chi-square analysis in which the stated hypothesis (*adequate survival strategies are employed by the population to cope with the harsh physical environment of the Kom highlands*). The chi square test ($X^2$) in statistics, tests whether the observed frequencies of a given phenomenon differ from the frequencies which might be expected according to some assumed hypothesis. The general formula for the chi square test is given as thus:

$$x^2 = \sum d/e = \sum (o - e)/E$$

where;

$x^2$= chi square symbol

$d$ = the difference between the **observed** and **expected** frequency for each category (survival strategies; anti-slope wise cultivation, terracing, use of special oil, thick clothing).

$e$ = expected frequency for each category.

The degree of freedom (df), is given thus;

df = (number of columns – 1)(number of rows – 1)

The formula was used to analyse the (in) adequacy of survival strategies to the harsh physical conditions in Kom.

# Results and Discussion

### Socio-demographic characteristics of respondents

Table 1 presents the socio-demographic characteristics of respondents. Based on age, a majority of the respondents (60%) fall within the age group of 31-49. On the whole, more than 80% of the respondents are above 31 years. Regarding gender, 68% of the respondents were men, as against women who constitute 32%. The household size of most of the respondents (61%) ranges from 4 to 6 members, while a majority of the respondents (44%) are primary school leavers. Seventy-two percent of the respondents have average monthly incomes of less than or equal to 50,000FCFA (86,04 USD).

Table 1: Socio-demographic characteristics of respondents

| Variables | Variable definition | Frequency | Percentage of sample |
|---|---|---|---|
| Age of respondents | 1 = 16 - 30 | 11 | 18 |
| | 2 = 31-49 | 35 | 60 |
| | 3 = 50+ years | 13 | 22 |
| Gender | Male | 40 | 68 |
| | Female | 19 | 32 |
| Family size | 1 = 1-3 members | 16 | 27 |
| | 2 = 4-6 members | 36 | 61 |
| | 3 = 6+ members | 7 | 12 |
| Level of education | 1 = Primary | 26 | 44 |
| | 2 = Secondary | 9 | 16 |
| | 3= University | 2 | 3 |
| | 4=non formal education | 10 | 17 |
| | No formal education | 12 | 20 |
| Average monthly income (FCFA) | 1 = less than 30,000 | 24 | 40 |
| | 2= 31,000- 50, 000 | 19 | 32 |
| | 3 = 51,000 – 75,000 | 11 | 18 |
| | 4 = 75,000+ | 6 | 10 |

Source: Own data. Note: N=59

## Survival Strategies

Over the years, other studies [8, 14] have shown that although environmental conditions have an influence on human and cultural development, people have varied possibilities in their decision to live and survive within a given environment. This idea gained grounds with the advent of technological advancements which seemed to have "tamed" the harsh physical environment and made it conducive for human habitation and survival. Until recently, it has been observed that there are limits to which man can control his physical environment and the environment at one point in time will frustrate human efforts and present harsh environmental repercussions [14].

The above harsh physical conditions in Fundong Sub-division have led to the derivation of some survival strategies. The strategies that have been derived so far are both at individual and general levels. This means that in as much as the individuals are seeking or deriving strategies to facilitate their daily activities, the local authorities and the government as well, is also trying their best to make life comfortable for inhabitants of Fundong. This is viewed in the agricultural, settlement and road construction sectors, among others.

## Survival Strategies in the Agricultural Sector

The presence of poor soils in this region has led to the utilization of very harsh and crude farming practices like burning or the "Ankara" system, a system of farming where the soil is being burnt to enrich it. By so doing, burrowing animals and organisms which help in softening or loosening the soil compactness are destroyed. After burning, the soil actually gains some considerable degree of fertility, but this does not last for years. This farming method has also led to rampant and common bush fires especially during the dry season and this has led to the loss of habitat of some organisms as well as species extinction.

Bush fallowing is also a very common practice here as a result of poor soils. This is a farming practice where by a piece of cultivated land is allowed for some years to fallow or regain its fertility. Hence, poor soils have led to the use of traditional methods of farming or agriculture. The use of farming practices like bush fallowing and shifting cultivation is facilitated by the presence of vast and unoccupied land. Also, terraces are being made to ease agriculture and

reduce the rate of soil erosion. Though terracing is not very common for agricultural practices, there are some evidences of it in Fundong Sub-division.

As another method to deal with soil erosion, farming is being done across the slopes rather than along the slopes as was the case in the yesteryears. This method of farming (across the slope), has greatly helped in remedying the problem of soil erosion. This method is still not 100% successful because on very steep slopes, running water forces its way, cutting across the already constructed ridges, carrying away or eroding the soil and damaging crops as well. Figure 2 shows a situation of contour-ploughing in the Kom Highlands.

Figure 2. Contour-ploughing along slopes of the Kom Highlands (March 2016)

The problem of soil infertility is being dealt with in so many ways by different people; depending on their various perceptions on what method is the best. Some people prefer to use the "Ankara" system. The method is highly discouraged by agriculturalists but the population is still very adamant to change.

Other farmers make use of fertilizers, both artificial and natural as well as domestic waste. Most schools and institutions make use of compost manure. When all these fertilizers and manure are applied in their correct proportions, it improves on soil fertility and agricultural yields. Though

the use of fertilizers and manure is highly encouraged by agricultural technicians, it is not a 100% effective method because some farmers complain that these fertilizers burn and destroy their crops. But this is due to poor methods of application. Another survival strategy in the agricultural sector that is adopted is the fact that most farmers cultivate their farmlands twice in a year to meet up with the increase in demand for food crops by the growing population. Figure 3 shows the frequency of survival strategies in the agricultural sector.

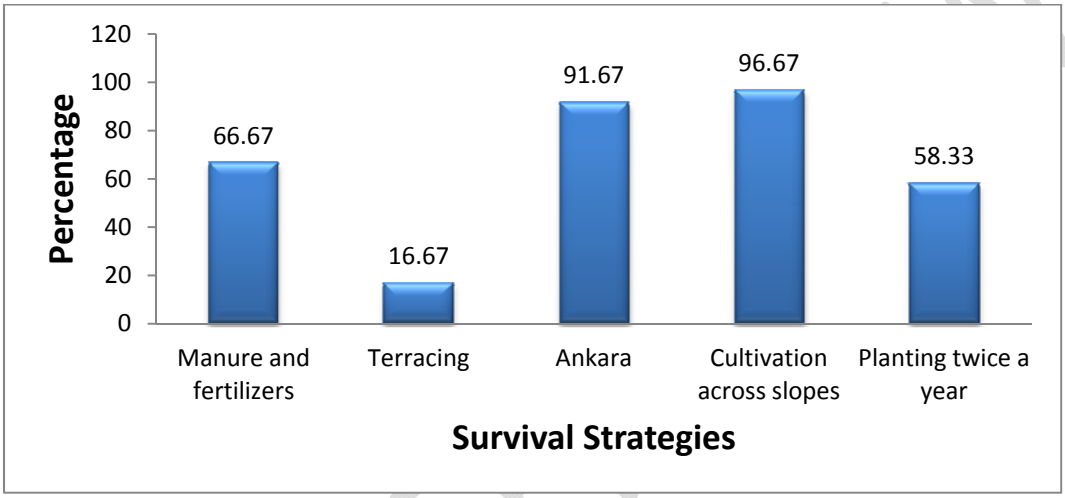


**Figure 3: Percentage of survival strategies in the agricultural sector**

As shown on Figure 3, most cost free methods are the widely used methods. For example, almost all of the respondents indicated that they adopt the anti-slope wise cultivation method because they are aware of the fact that it reduces the effect of erosion since some soil nutrients are not eroded.

The Ankara system is also widely used because it is less costly and its short term effects are very promising, unlike the use of fertilizers and manure which is rather costly because farmers have to purchase fertilizers. Poverty is the number one constrain to this method though most people acknowledge the fact that it is a good method.

**Survival Strategies in Housing Construction**

For the construction of houses, the population makes attempts to terrace or level hill spots to create flat surfaces for houses to be constructed. The foundations for these houses are dug deep into the ground to ensure that the house is well established. This is the most common method of

adaptation and it is a very effective survival strategy, though it has its own constraints. Also, the population locally builds up embankments along path ways and houses by pilling up stones to stabilize slopes. This action is too short-lived.

Some other people prefer to plant trees as a source of support to these houses, to prevent them from eventually falling or breaking off. This method is not the best because some of these trees grow too big so much so that their roots end up instead helping to destroy the foundation of the house. Figure 4 shows the frequencies and percentages of responses on survival strategies in the housing sector.

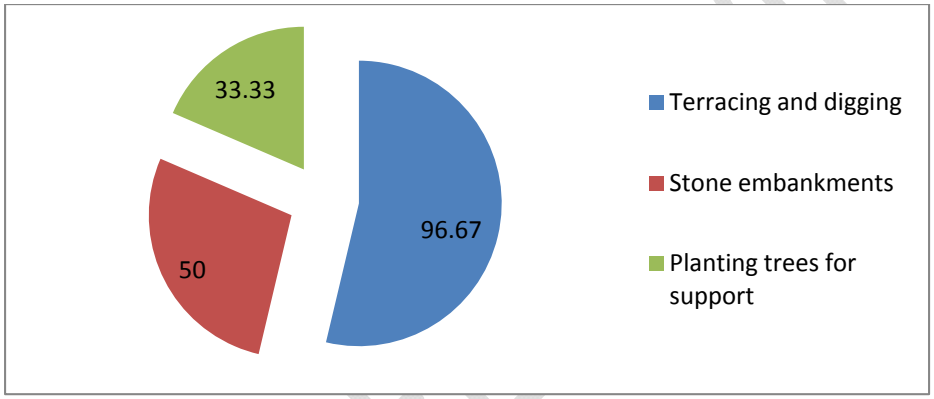


**Figure 4: Percentage of Survival Strategies in the Housing Sector**

Most inhabitants of Fundong recognize the fact that these above listed survival strategies are important but due to the fact that they are constrained by poverty, they make a scale of preference, choosing that which is most necessary to them. According to the analysis above, terracing and the digging of a hill is the most important and preferred strategy. Besides this strategy, the implementation of other strategies would reflect ones financial backings.

**Survival Strategies in Road Construction**

Just as in the case of housing, hills are dug or scabbed to ensure or enable the passage of roads. These roads are dug in such a manner that will minimize cost, the reason why the roads wind and bend. However, due to the absence of heavy machinery, effective terracing is not done and so these areas in the long run still suffer from slope failure problems. Given the nature of roads, accidents are very likely to occur and rampantly too. As a means of trying to reduce these frequent rates of accidents, several speed breaks have been built on the roads to control the

movement and speed of cars. This method has so far met with some success in these winding roads because the rate of occurrence of accidents has greatly reduced. Figure 5 shows the frequency of responses on survival strategies in road construction.

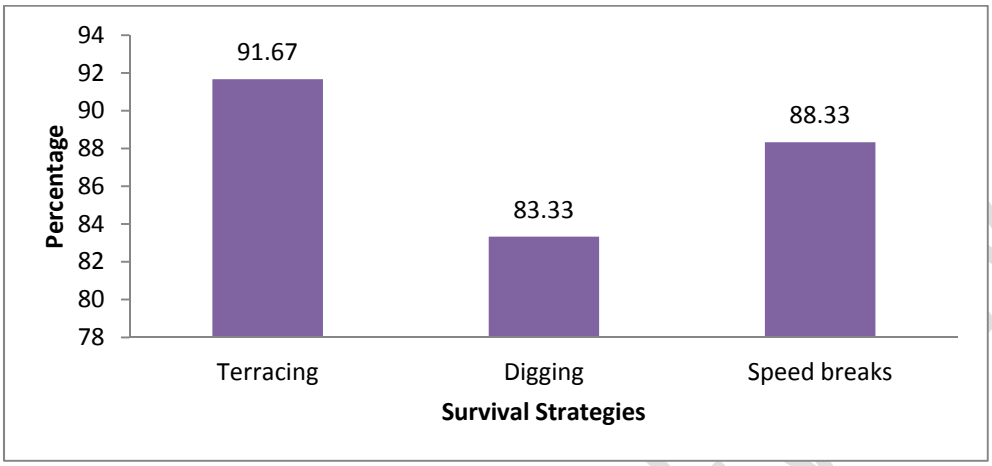


**Figure 5: Survival Strategies in Road Construction**

The above table shows that the three mentioned survival strategies are highly competitive, with frequencies ranging from 50 to 55. Given the nature of the terrain, in creating or constructing roads, these three strategies are very necessary to reduce cost. Speed breaks are also necessary as they help to reduce the incidents of road accidents along slopes.

**Survival Strategies to Harsh Climate**

The inhabitants of Fundong have adopted an adaptive mode of dressing to protect themselves from the very cold climatic conditions. They cover most parts of their body with thick clothing so as to reduce exposure to cold during the rainy season and in the evening and morning periods of the dry season. These dresses cover the body, preventing it from heat and moisture loss. Some people usually wear special body oils and/or increase the glycerin content of their rubbing oil, all in a way to fight against heat loss and body dryness. Most kids are usually found having Vaseline oilmen, rubbed around their lips to prevent cracks and in their nostrils to prevent them from catching a cold. In most of the interior parts of Fundong Sub-division, make use of fire sides lit in their houses to constantly keep warm conditions. Figure 6 shows the survival strategies employed by the people of the Kom Highlands to cope with the harsh climatic conditions.

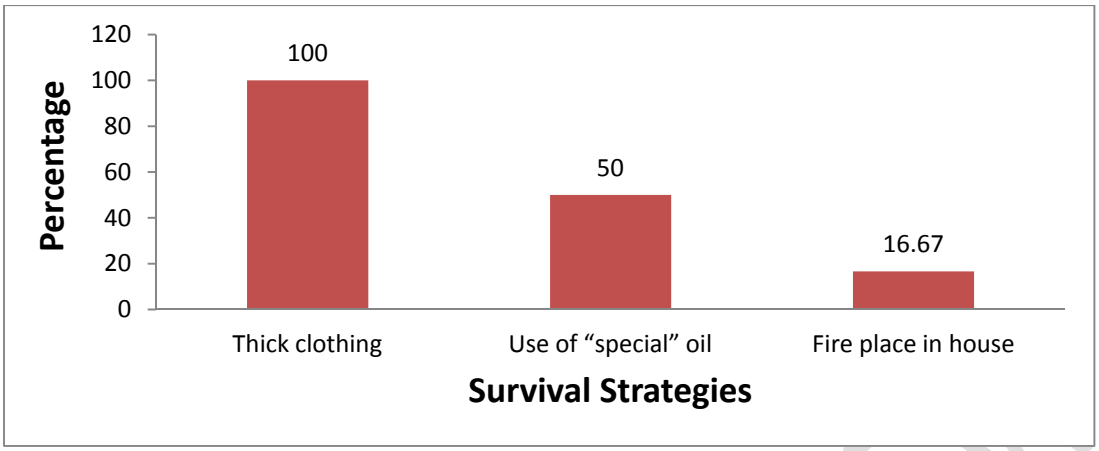


**Figure 6: Survival Strategies to Harsh Climatic Conditions**

Indications above show that during cold climatic conditions, most people in Fundong Sub-division wear thick and warm clothing to keep them warm and free from many cold related diseases. Others go as far as using some heat producing body oils like Vaseline. Those who lite fire in their houses for heat production are very few in the town but in the suburbs, it is the most commonly practiced strategy.

In a nut shell, all the above survival strategies are employed, depending on individuals and their levels of perception. Most people choose the survival option that is most suitable for them, considering the cost, technology and level of education. Hence, the effectiveness of these strategies also depends greatly on each individual's level of satisfaction.

**Constrains to Human Survival Strategies**

As mentioned above, the effectiveness or the extent to which these survival strategies are effective depends on the individuals themselves. This means that, given the various perceptions people have about a strategy, it leads to varied levels of effectiveness. For example, as concerns poor soils, many people believe in the use of fertilizers and manure to enrich the soil, while others strongly believe that fertilizers destroy their crops. Hence, a strategy may be effective to one person and ineffective to another.

Out of the 59 people who were interviewed, the following strategies can be drawn for those who consider their strategies as effective as well as those whose strategies are ineffective (Figure 7).

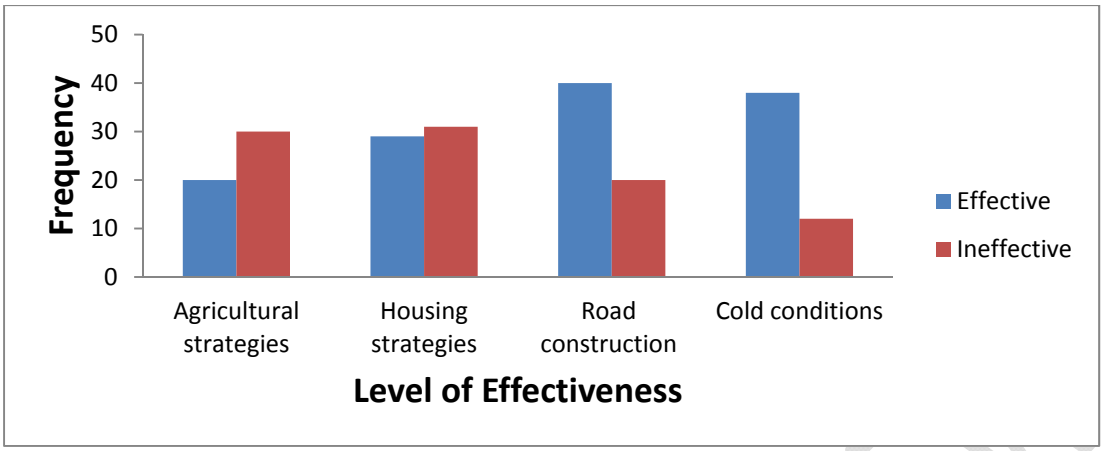


**Figure 7: Effectiveness of survival strategies**

It can be seen that a considerable number of people still consider these their strategies as ineffective, generally, the effectiveness of these strategies are constrained by a number of factors, some of which include poverty, ignorance, perception, culture, limited resources and level of technology. Hence, there is a need for more effective survival strategies.

**Poverty**

Poverty in this area is a common phenomenon. This means that there are very few high income earners in this region. Most people have just enough to take care of their basic needs and so there is hardly an extra means to help them strategize. This is mostly the case with the interior villages where people for example do not have money to buy fertilizers or very thick cloths. Hence, they instead have to lit fire places in the middle of their houses to keep them warm and instead of fertilizers, they get to practice the Ankara system or even bush fallowing – because they have abundant land for such a practice. Thus, the strategies are varied because some are affordable and others are not.

**Ignorance and Perception**

This is equally another constrain to the effectiveness of these strategies. Most people are not well informed about the havoc that poor soils, hilly conditions and cold climatic conditions cause in the region. They are equally unable to identify these harsh physical conditions and consider them so seriously, since they believe it is an irreversible situation. Because of this, they are hindered from thinking about the possible methods, strategies or solutions to combat the situation. So they

do things just because they see others doing them and seem indifferent about their effectiveness. Also, even those who are enlightened, educated or aware of such problems ravaging their region and the various ways which they can use to overcome the situation, have their different perception about the various strategies employed. For example, some people prefer natural manure to fertilizers because they think that fertilizers destroy the soil in a long run. That is, when one starts using fertilizers, it is difficult to stop because the soil situation will grow even worse than when the application of fertilizer was not yet effected. So they want to avoid a situation where when they are unable to afford these fertilizers in the future, their yields would be very poor.

**Limited Resources and Technology**

The fact that this region is not fortunate to be amongst the others that are blessed with enough **resources and technology** stands as a hindrance or a limitation to effective implementation of survival strategies in this region. This is so because some people may have the idea on an effective survival strategy, but they lack the resources or the techniques to carry out or implement the strategy. For example, creating fly overs is one of the best options for road construction in a hilly environment but the lack of financial resources and probably, the necessary equipment remains a major constrain.

**Culture**

Another factor that constrains human survival strategies is culture. This group of people has certain norms and beliefs that seriously prevent them from carrying out or implementing certain strategies to aid them cope with their difficult environment. For example, it was seemingly difficult to sensitize the population on the need to adopt an anti –slope wise farming method since they initially had slope wise cultivation rooted in the history and, by extension, their culture. Figure 8 shows the frequency of responses on the observed constrains to effectively adopt survival strategies in the different sectors.

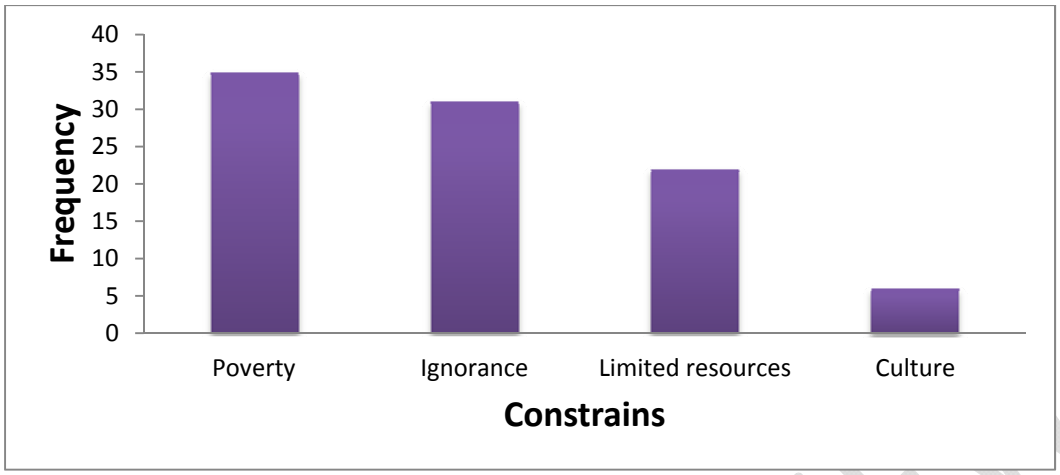


**Figure 8: Constrains to the Effectiveness of Survival Strategies**

It can be seen that the highest constrain to these survival strategies is that of poverty, followed by ignorance and limited resources in that order and lastly culture.

To test the effectiveness of survival strategies, the chi square analysis was conducted. With a degree of freedom of 2, at a 0.01% level of significance, the table chi square value is 9.21. The P-value for $X^2 = 9.12$ is 0.623 (above 0.05). This suggests an insignificant result with regards to the survival strategies employed. We therefore agree with the fact that the survival strategies for the harsh physical conditions in the Kom Highlands are inadequate. There is a need to suggest other survival and coping methods.

**Discussion of Findings**

Fundong Sub-division is characterized by a harsh physical environment with aspects such as poor soils, cold climatic condition and a very hilly and undulating terrain. All these mentioned conditions hinder them from enjoying nature's gift to them. These physical attributes operate in different magnitudes, with the hilly terrain and its poor soil conditions being very harsh.

It was realized that this difficult environment has constrained development activities in the domain of agriculture, settlement and road construction. For example, it is very difficult to farm on hills but the population has no other option rather than to do so and so they are faced with high rates of soil erosion, limiting their production output. The hilly slopes are exposed to

massive soil erosion and nutrient loss, which reduces agricultural productivity despite the lengthy time devoted for the practice. Also, the construction of roads and houses is very difficult and expensive as a lot of digging and terracing has to be done.

Apart from the cold climatic conditions witnessed in the area, there is also the presence of strong winds that destroy houses and crops are often attributed to a particular witchcraft group "*muso*". It is believed that this group manifests through strong winds, destroying houses and farmlands. This finding agrees with the earlier works of Gwan [15] who noted that every geographical environment is to some degree, harsh; the harshness being a factor of some of its physical or biotic attributes or both. It is also similar to the findings of Gwan [16] in Ekon-Lelu where he concluded that this environment contains many harsh elements that are inimical to the survival of inhabitants of this area.

The population of this area, despite all odds is still on an increase. The increase is due to the fact that some coping strategies have been implemented to help the population deal with the harsh conditions. These strategies have been adopted in the agricultural, housing, road construction among others.

For agriculture, the most adopted coping strategies are the adoption of anti-slope wise cultivation and the use of the "Ankara" system. The latter is widely used because it is less costly and its short term effects are very promising, unlike the use of fertilizers and manure which is rather costly because farmers have to purchase fertilizers. However, the long term effect of the adoption of the Ankara system is bad. An increase in population also means an increase in the demand for food and the use of agricultural land for the construction of infrastructure.

Another importance coping measure is the adoption of the strategy of planting twice in a year. While the population acknowledged the importance of using manure, they however indicated that poverty remains a problem since they lack the finances to purchase fertilizers.

For housing construction, a majority of the population have resorted to terracing which, unfortunately is not properly done. This accounts for the incidence of slope failures and the consequent destruction of houses. In addition to the use of terracing for road construction, the

population also adopts the use of speed brakes to reduce the incidence of accidents. This finding is similar to the earlier findings of Lambi [17, 18] on the coping strategy employed by the Kirdis in their hostile environment. His study noted that as part of their coping mechanisms, they embark on the terracing of slopes to ease farming and construction. The findings of this study also show some similarity with the earlier works which contend that the physical conditions and ecological diversity of mountain lands are associated with an extra ordinary variety of human cultures [19]. Consequently, many surviving indigenous people are found in the mountains. Their adaptation to these habitats, their cultures and environmental knowledge, are of singular interest and value for sustainable practices.

The major constrains to the effective adoption of coping strategies in Fundong Sub-division include, among others, poverty, ignorance, limited resources and culture.

**Conclusion and Recommendations**

Based on the results, this paper concludes that; (1) Kom displays a plethora of harsh physical aspects of her environment, (2) the survival strategies employed by the population of kom are not adequate. Thus there is a need for more technologically advanced strategies to facilitate adaptation not only for indigenes but also the nonindigenous.

Faced with the identified constraints, the following recommendations have been put forward which if carefully implemented, can redress the problems.

The government may consider as a major objective, the need to improve the road situation in this area, including fly-overs. For instance, the government may consider tarring the Fundong, Bafmen and Wum road. This will help to open or expose the region to many aspects of development (awareness, education, commercial activities and a general increase in income). Because the roads are very narrow, the government may give consideration to widening them or better still, creating a double lane road. This will boost development in this region and also reduce the rampant road accidents.

Specialists on environmental issues may also be trained as experts in the field, who be charged with the tasks of looking into the environmental issues of Kom, write reports on any changes and recommend possible solutions that could be implemented given the situation. By this method, proper management of the environment will be ensured and the inhabitants will keep abreast or

will be kept posted on the changes and challenges faced in their region and also consider solutions to these challenges. It will also save people the stress or burden of thinking that they have a responsibility to care for their environment.

The local council on her part need to take the responsibility of properly checking the construction sites and compare them with housing plans pertaining to each site seriously. This will help to reduce the consequences of poor construction, given that it is a very delicate event, constructing on a hilly area. More specific attention should be given to the foundation and digging of the area.

There is also the need to train more agricultural practitioners who will be responsible for educating farmers on agricultural issues like when and where to, and the right methods and proportions of fertilizers to apply. The issue of fertilizers should really be taken into consideration because most farmers hardly apply them in their required quantities and so are always very disappointed with their output.

Since poverty remains a major problem in terms of the purchase of fertilizers, it is necessary to subsidize the purchase of fertilizers in this area so as to encourage farmers to increasingly adopt this method.

There is also a need for slope stabilization and terracing. This will help to gain enough construction space and the process of constructing would be made easier. The physical environment will also get to change.

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