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Urfa-Harran Houses and Living Spatial Places

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1. INTRODUCTION

Şanlıurfa, which is one of the important cities of the southeast Anatolia region and central Euphrates area, was established at the head of the Balıklıgöl watershed on the north of Harran that stretches along a north-south axis. The settlement was established on the streambed plateau which, with the Harran plain, was created in the Eocene-Miocene geological periods in an area rich in water and defense and economic resources.

The Urfa and Harran houses which hold an important place in Anatolian domestic architecture became the topic of study for various disciplines in the context of the effect of human-nature interaction. In this study the characteristics of Harran house architecture and the possibility of its sustainability were examined. What was generally encountered in the southeastern Anatolian settlement region in spatial formation: architectural characteristics like the organizational plan with the courtyard closed to the outside and turned inwards, the block building technique and the use of regional material; as for in the societal understanding family structure, religious structure and economic and cultural influences were most important.

In Anatolia the history of settlements stretches from our day back 11,000-12,000 years. The factors influential in the creation of the houses that made up the settlements may be examined in two groups as natural and human factors. The natural factors may be evaluated as climate, land formations and material while the human factors may be evaluated as characteristics of the social-economic and user-based plan. In the formation of the spaces ethnic, historical and psychological evaluations mustn't be neglected.

In the creation of the settlement areas in the region: the fresh water that has its source in earthquake faults tied to the Harran region, the economic activity of the Harran plain and Balıklıgöl vicinity's suitability for defense ensured the creation of settlement areas in this region. The first settlement for this region called the Fertile Crescent began ever since the Neolithic period. The Harran Plain is one of the plains that appeared as the result of the tectonic plate in the southern region slipping straight north. The Harran Plain is on average 50 km long in the north-south direction and 25 km long in the east-west direction. In this area that is hot and dry today karstic water sources ensured the creation of the settlement core and at the same time the Karakoyun Stream in the north passes within the Harran Plain and ensures that animals would live in this region (Güzel 2013, 571-572).

1.1. DOMED HOUSES

The round house tradition is known by the term “tholos” used in classical architecture and is observed in a very large geographical area from the Mediterranean to Mesopotamia and from the east of Anatolia to Transcaucasia. In some regions it continued to exist in a broad slice of time from the Neolithic period to the Late Bronze Age (Eres 2010, 122-125). It is known that these types of civil architectural examples that could go as far as 6000 BC were used widely in Mesopotamia and the Aegean until 3000 BC. Different dimensional measurements that varied from 1.5-2 m to 20 m are encountered in very different types like a multi-room spatial assembly that has been divided or has remained single in capacity; wooden branch mesh, mud brick or stone architecture; and use as shelter, depot or cult purposes.

When 12th century Islamic period houses (Yardımcı 2007, 43-61), uncovered in Harran excavations, are taken up from the point of view of plans and wall techniques, it may be said that they don't resemble the domed architecture seen today in the region.

If researchers relying on travel notes or some archaeological evidence have developed various views related to today's Harran settlement, Eres states that there are differences between the photograph taken of the region at the beginning of the 20th century and the photographs taken in the 1960s. Again as Eres has stated in his study, some houses stand with a round plan; they are curvilinear, covered from the ground, and have the external contour of the buildings' recessive projection. Yet in the photographs taken in the second half of the 20th century and in the architectural documentation, these buildings are square and have perpendicular walls. They are covered with a dome above and the external contour of most of the buildings is a plain rectangular form (Akın 1985, pl. LIV-LV). Relying on these... There are two photographs that were taken from the exact same spot, one dated to the beginning of the 20th century and the other to the second half; the important differences make one conclude that rural architecture could change quickly in a short period of time. In the aforementioned study as related by Banse, while the building type that is round and whose dome starts at ground level originated from the “basic type”, they can be evaluated in four groups: the second level is round in plan and its top is cut in a conic-shaped form; the third level is the domed building with perpendicular walls one foot in height; and the building covered with a dome on top with perpendicular walls the height of a man is recognized as the most developed and comfortable structure (Eres 2010, 122-125; Banse 1912, 176-177).

As for today one encounters these types of houses mostly in the two regions.

The first region is between Urfa and Birecek and the second between Urfa and Akçakale. While the Harran houses in the second region are covered with brick domes, the houses in the other regions have been constructed with adobe. The reason why the houses in Harran have been covered with brick is because the earth in the region is suitable for brick construction and because the region is dry (See Picture 2).

It is possible to encounter other examples of these buildings that are known as kümbet houses in Mosul, Tiflis, Cyprus, the south of Italy, the rural Puglia region on the shore of the Adriatic Sea, Scotland, Spain, Iran, Afghanistan, China and Peru. In the Scottish islands these buildings which are called “beehive houses” at the same time created a tradition in the 18th century (Baran 2006, 141-144).

2. FACTORS AFFECTING THE CREATION OF THE HARRAN HOUSES

1. Natural values: They carry the natural traces of the environment in which they are found and history;
2. Social values: They carry the traces of the life style, beliefs and traditions; and
3. Structural values: The factors that create the traditional building systems.

2.1 NATURAL VALUES

The name of Harran city comes from “haran-u” that means travel/caravan in the Sumerian and Akkadian languages. The place that has been called Haran in the Old Testament is thought to be here. Historians tie the founding of the city to Kaynan, the grandson of the Prophet Noah or to Aran, the brother of the Prophet Abraham. The aforementioned region was the center of pagan religion in the Assyrian and Babylonian periods. In 774 it was the capital of the Umayyad state and Harran University acquired a great reputation in the world in the Abbasid period. It was destroyed in 1270 by the Mongols. The city is a settlement area tied to Urfa with a 5000-year history. This settlement, 44 km to the southeast of the city of Urfa, creates a tie between Europe and the Mesopotamian and Arab peoples. At 375 meters above sea level, it is a settlement area that with a predominantly land climate with 46 degrees in summer and below zero in winter (See Picture 1). Because rainfall is scarce there is never any green plant cover. The conditions of the natural environment are the reason why there is a different settlement fabric observed at Harran. The Harran settlement’s location on the plain and the existence of stone quarries in the area became the reason for the development of the brick-overlapping domed architecture that has a nearly 150-200 year history. The history and architecture of the Harran domed houses are woven together with the housing evidence found in Mosul, Tiflis and Cyprus and reaches 6000 BCE (Baran 2006, 142-143).

2.2 SOCIAL VALUES

In this historical settlement area a lifestyle peculiar to itself was created because of the suitable climate conditions and large land ownership. The associations that give weight to a ritual and religious character such as the tribal structure that has continued from the Ottoman period, and the positions of the ağa (local big landowner) and şeyh (tribal head) have influenced the lifestyle.

Alongside land organization the possibilities for communication which were still limited in the 1950s can be lined up among the reasons why traditional building stayed alive.

In social life the head of the family is the father. The oldest man is accepted as the leader/father. The children who have reached five or six are considered to be of working age. Because the people’s sustenance relies on agriculture and animal husbandry, the children are helpful for their families in proportion to their strength. As for the adults, they provide the economic, social and cultural development of the family and, if they have married, they never leave their families and continue their lives in the same house or in a place next to it.

The Harran houses are collective and closely textured adjacent buildings inside the city walls (See Picture 3). One of the reasons for the dwellings being adjacent and side by side is because of belonging to the same tribe.

The houses open on to short roads and squares of various sizes on the roads. These squares are spaces where the people's social communications are experienced intensely, where their conversations, meetings and games play out.

The clear design of the house plan isn't much seen in the village settlement. The development of the Harran houses creates a beautiful settlement organization and a naturally appearing neighborhood.

The smallest house is made up of three units. It is entered through a single-leaf entrance door and three rooms used together. According to the needs of the family, the number of rooms increases. Wealthy families with many children and more than one spouse reside in large houses with courtyards generally with one or two sides ringed with lines of cells and the other sides with high walls. The courtyard serves the purpose of salon, dining, sleeping, game playing, etc. (See Picture 12). In the courtyards in which daily life is led and home life is hidden behind high walls, there one finds the hearths that benefit the making of bread (See Pictures 4-5).

During the winter months the bread is made in the kitchen-pantry called the "tandırılık". This room at the same time serves as the bath.

In the neighborhood for a long time while the closed social building that religious and customary elements have influenced continues to exist, it has become the reason for variations tied to the user and the space.

For these festivities women prefer the houses and men the courtyard or the broad areas where the squares are found. *"In weddings the bride brought to the man's house on a horse while passing through the double-leafed door is brought to the courtyard. While the bride after the wedding for 40 days wears different clothes with the specially prepared crown on her head, she sits in the room more painstakingly prepared for guests. In this time visits to see the bride are made in this room. This space that is given the name of head room belongs to the head of the family except for special days. Generally the stove and tandir hearth are in this room"*.

The provisions depots in the courtyard, fodder rooms, stables and guest sections were formed as a separate section and these units were chosen in different dimensions. The rooms are ringed all around with ground cushions and pillows. In these spaces are multi-functional spaces for eating food, sitting, lying down and receiving guests (See Pictures 6-8).

Almost all the spaces are used from the courtyard. In the neighborhood there are various customs and beliefs connected with the houses. These beliefs influence the sections of the houses and the characteristics of their usage as follows:

In Harran before building a new house consensus is ensured among near relatives. In selecting the place, points that dominate the neighborhood are preferred. According to their beliefs, the house won't be built near houses accepted as unlucky. As for the day of the construction, attention is paid to its being a Monday or a Thursday which are accepted as lucky days.

Especially for the house, relations with relatives and the role of communications between families are big in the selection of the place. While the head of the family that is to have the house built carries the necessary stone from ruins in the vicinity, in order to bring luck he leaves one of these stones in the south which is the house's direction towards Mecca. Another tradition is the position of the hearth in the space. In Turkish

culture the hearth is always considered an important element in the house. For this reason the place of the hearth in the house is planned for the most central location.

At the same time in this region pouring water on the hearth and putting out the fire/hearth with the foot aren't received well. The hearth should be swept in the morning and the ash left in a suitable place.

Another element that carries importance in the house is the thresholds. This building element that is considered as a separator between spaces during construction is the subject of various beliefs. According to one belief, to step on the threshold and to sit on it are not correct. According to another belief that is based on worrying about its being able to shorten life, permission is never given for chiseling the threshold. These prohibitions became a matter that especially women and children who passed a large part of the day in the house has to practice (Baran 2006, 144-146).

2.3 STRUCTURAL VALUES:

Harran houses that have conic domes or a nearly square stone foundation and which are characterized as "domed", "coned" or "bee hive" and which the archaeologists have termed "tholos" (plural "tholoi") have an important place in the matter of traditional construction techniques.

Harran houses have been built with traditional methods by local masters. Similarities are seen because of the same shared culture in the construction of the houses.

The areas in which domed architecture has been seen are their being covered with loess dirt suitable for characteristic adobe construction that has the effect of easing the construction of these types of buildings. Researchers at the same time have stated their point of view on the living conditions that the domed houses ensure. The construction material have shaped this architecture in that the possibilities have been recognized and the land climate conditions have been discussed and in the region that is very hot in summer they provide a quite comfortable inner space (See Pictures 8-9-10). The inclined facade of the dome reflects the sun's rays and the thick adobe walls that perform an insulating function in summer ensures that the inner space remains cool. Thanks to the hole left in the highest point of the dome the air entering from the door creates air circulation that rises upwards in the space. In winter the smoke of the fire that burns in the middle of the space for heating purposes also leaves from this hole and the room doesn't choke over too much smoke. Because of it in this region in the periods in which the traditional farmer living style was the subject, the domed architecture offered comfortable living possibilities for the local people (See Picture 11).

The stone material that is necessary during the building of the houses would be secured by the head of the family and the construction master. For this in particular stones from old settlement areas in the near vicinity would be used. As for the brick and adobe materials, they would be prepared at the side of the stream outside the wall. The plan that the owner wanted would be drawn on the ground by two masters and the foundation holes dug.

The 60-70 centimeter thick main walls of the spaces would be built up to a height of 1.70-2.00 cm. When the building of the stone walls was finished, it would be the turn of closing the rows above and building the domes. The domes in a height of 2.50-3.00 meters with brick or adobe one row on top of another would be built in the traditional form (Baran 2006, 146, 147; Cetiner 1987).

The adobe-overhang dome is a technique that is used in the building of square or nearly square rectangular spaces whose interior opening doesn't exceed four meters. After the adobe body walls that border the space have been built up to 1.5-2.0 m, the adobe that is suitable for the corners of the wall are placed diagonally at 45 degrees to the wall. After this every row in the wall corner begins to be placed so as to be carried straight to the inner space, 1-2 cm. inside from the wall. In this form while every adobe row is carried straight inside a little bit from the row beneath it creates a wall system of slanting lines. So after eight to ten rows it makes a pendentive and now it proceeds to become a rounded dome rim from the square plan. Then the dome begins to bond in the corbelling technique. In order to reduce the adobe load that comes from above a little more corbelling is made in the adobe rows in the upper parts of the dome. For this reason the dome's height's cross section is not a half circle but is parabolic in form. A hole of up to 20 cm. is left in the top point of the dome. This empty space serves as a chimney and ensures the entrance of light inside. The outside facade of the dome would definitely be covered with mud plaster. In most buildings it has been observed that the inner surface is plastered. The corbelled dome building system provides spatial possibilities and greater limitation; this architectural tradition, after the radial dome was developed, continued its existence and today is still used in rural areas. The reason for this: geographic conditions in the regions where this tradition was observed have become difficult and at the same time for the construction of the developed dome materials like the wooden frame and the mould have become specialized and while many masters are necessary the corbelled dome can be built easily without a mould. There is a preference that the foundation of the domed buildings be made of stone but in places where finding stone is difficult the foundation is prepared directly with adobe.

The thickness of the wall is constructed with a thickness of one, two or three adobe bricks. There are examples in the majority of which the main wall of a domed unit was built with a thickness of one adobe brick, that every unit became the separate main wall's and because of it in the units that were adjacent side by side the walls might be two-adobe bricks in thickness. If adobe brick are encountered in different dimensions in the region one sees that the dimensions of 25 x 59 x 10 cm. were used the most. According to the number of adobe bricks used, the walls tied to these measurements it could be 50, 200, 150 cm. thick. In domed buildings rainwater would flow and leave without damaging anything and in the empty spaces between the domes that are side by side, earth fill would be put in order for the water to become a pond and an incline straight to the nearest main wall given. At the end of the main wall while mostly a trough of tile or of wood is located there, the flow of the water to outside the building without touching the surface of the wall is ensured.

There is an attention-getting point in this building system: so that every single domed unit's own walls come together with the neighbor's unit, while the inner walls of a building are 2-3 adobe bricks thick, the external main walls can be a single adobe brick thick. Under normal circumstances it is usual for the main walls that carry the roof to be thick according to the inner walls, even the inner walls sometimes are only for the purpose of dividing space. However, in this architecture the inner walls are thicker because of carrying a two-dome unit (See Picture 14; Eres 2010, 127-129).

The illuminating and air-conditioning window left on the very top is covered with mesh wire so that birds don't get in. In order for rain to not get in, a fringe or ridge would be created in roof form with three small stones on every top window. In order to get to the top window, while the brick weave is created, one can take advantage of the projections functioning as stair steps made when one brick apiece is skipped.

According to the location of the house small windows are opened in the spaces too. The carrier of the building in the construction in which soil mortar is used, all the walls, are begun to be built at once and finished without being left half done. Itinerant carpentry masters are responsible for the door-window woodwork. Almost every one of the houses has been washed with a red soil and straw mix inside and a dark earth and straw mix outside. The round cross-sectional transition from the square plan reflects the workmanship of the arch and vault in the units and the skill of the master (See Picture 10; Baran 2006, 147).

3. SPATIAL FORMATION

The aforementioned domed buildings, the inner opening space has been created through bringing side by side square small volumes that are nearly four meters. In this type of building in which every single domed space has become a “unit” because new units are added to the four sides according to the requirements of the users, the house can be created in the size and form wanted. In this building system the house can be enlarged by adding new domed units, while remaining tied to the requirements, after the first application because the area is being built at one time wasn’t necessarily envisioned and drawn from the beginning. A domed house houses a family and all the functional units like the essential workshop, store room, hayloft and stable for the production and storage of food for themselves and for the market. In these types of buildings the external facade generally is not orderly / with recessive projections. The building has more than one entrance and because most of the domed units are tied to each other through door openings the inner space assembly is known as a labyrinth. The passage amid the domed units is organized according to the functions of the spaces. While doors are found in the four walls of some spaces, in some spaces there is only one door. As some spaces are tied by function separate from the main entry door of the house they open through their own doors. These can be the guest room, stable, hayloft and workshop-kitchen unit.

A household, because of the traditional rural living culture’s need for a large family house, generally includes more than one housing unit. Sometimes in the housing part, a hearth can be found that is made to project outside. In the space known as the “ekmeklik” (place for making bread) and where the family’s weekly bread is produced or in the form of having been added to this building a small domed space for washing is found (See Picture 14; Eres 2010, 128-130).

4. HEAT USE IN HARRAN HOUSES AND ITS SUSTAINABILITY

Today the buildings that consume minimal energy and are built through the use of local materials are supported because of the productive use of energy and environmentally friendly and sustainable buildings. Anatolia has a large accumulation in design and practice. The different climatic regions in Anatolia have produced different local and special remedies. Harran’s traditional conic houses are one of the good examples that reflect this accumulation.

In Başaran’s study “Enerji Etkin Bina Tasarımına Geleneksel Bir Örnek: Harran Evi” (A Traditional Example of Energy Efficient Building Design: The Harran House) and in various similar studies, a thermal analysis of a typical Harran house was examined through various experimental ways (Başaran 2012, 22).

In the study made by Başaran on this subject, a Harran house complex’s humidity changes related to its internal and external heat, and the measures of heat on different surfaces and in the atmosphere.

The results of the experimental study showed that even in excessive summer conditions a livable atmosphere can be ensured in the inside. From the other side the importance of the thermal mass of the house through the air-conditioning effect that has its source in the conic structure and the hole on top has been evaluated. Through movement from the results of the measurements of the internal and external facade heat of the thick building element:

The size of the thermal mass of the building element provides the livable space in this very hot climatic region; at the same time the hole which has been designed in smaller thermal mass through the effect of the sun chimney adds to the air-conditioning of the conic building and to the livable interior volume.

As an addition to the thermal sustainability under the headings of spatial formation, functionality, construction technique, and materials, one sees that, while the environmental data is comfortably used, buildings have been produced.

--The passages to each one between spaces reduce the heat transfer and this practice at the same time provides shading.

--Heat loss from the windows is prevented. For this purpose importance is given to the placing and dimensions of the building element.

--Cool and wide cisterns –serdab (underground room) – are used in very many houses.

--In the daytime in hot weather one benefits from the spatial characteristics of the serdabs, and in the evening when there is a fall in the heat in the air the courtyard or the terraces are used.

--The snow that is stored in the serdabs during the winter months can be used in the hot months of summer.

--The material used on the external facade of the building and the wall and ceiling mesh system ensures heat insulation.

--The water channels in the courtyard and the pool ensure an acclimatizing effect.

--The use of renewable material in the buildings ensures their sustainability.

--The detailed practices in the construction system-the steps created in the facade etc. – always provide the opportunity of any kind of intervention.

--The buildings can be quickly produced. Constructing a dome takes approximately three hours and the need for special workmanship is not felt.

--The average life of the buildings is 50 years and there are examples that stretch to 100 years if looked after well.

--The cost of the building is low; it is built with local material and special workmanship isn't necessary.

--Spaces based on necessity can grow with additions.

References

- Akın, G., Doğu ve Güneydoğu Anadolu'daki Tarihsel Ev Tiplerinde Anlam, 1985, İTÜ. Mimarlık Fakültesi Yayını.
- Baran M., "Halk Mimarisinin Halkbilimi Bağlamında Değerlendirilmesine Harran Evleri Örneği", Millî Folklor, 2006, Yıl. 18, Sayı. 72, s.141-147.
- Başaran Tahsin "Enerji Etkin Bina Tasarımına Geleneksel Bir Örnek: Harran Evi", İzmir İleri Teknoloji Enstitüsü, Mimarlık Bölümü Özel Sayısı, 2012, sayı.2, s.22-23.
- Eres Z., "Urfa Çevresindeki Kerpiç Kubbeli Yapıların Arkeolojik Açından Değerlendirilmesi", TÜBA-AR 13 / 2010, s.121-140.
- Güzel A., "Coğrafi Özellikleri Bakımından Anadolu Şehirlerindeki Geleneksel Konutlar: Şanlıurfa Örneği", Turkish Studies - International Periodical For The Languages, Literature and History of Turkish or Turkic Volume 8/12 Fall 2013, p. 569-590, Ankara-Turkey
- Banse, E., "Die Gubâb-Hütten Nordsyriens und Nordwest-Mesopotamiens", 1912, Orientalisches Archiv 2/24 (1911-1912).
- Yardımcı, N., Harran Ovası Yüzey Araştırması I ve II., 2004, İstanbul.
- Yardımcı, N., Mezopotamya'ya Açılan Kapı Harran, 2007, Ege Yayınları.

The productivity of the Moroccan industrial sector analysis: Econometric modeling

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Abstract

The purpose of this article is to evaluate the elasticity of Gross domestic product to the added values of seven branches of Moroccan industries during the 1985-2015 period and the productivity of the industrial sector in both general and the seven industrial branches (processing and extractive industries) by using the Ordinary Least Squares (OLS) method, in order to identify sectors which have high growth prospects, and on which Morocco can capitalize to promote its economic emergence, create employment, stimulate growth and enhance its attractiveness on the international scene. To evaluate the productivity of industrial branches, we will refer to the Cobb-Douglas production function.

As a result of this study the labor-intensive branches whose labor productivity exceeds capital productivity are those which contribute most to national economic growth and are therefore more efficient. For the chemical and para-chemical sector, we notice that this last is a promising field, which augurs important prospects for development.

Keywords: Morocco, industrial sector, industrial branches, productivity, economic growth, attractiveness.

1. Introduction

In an international economic environment marked in recent decades by profound changes in favor of the dynamic of globalization. This last one is perceptible through various aspects associated with an increasing economic openness to trade in goods and services, an increasing mobility of factors of production and fierce competition in different markets.

In this context, the adoption and implementation of effective industrial policies were at the origin of developing many countries, considered today as the world's largest and fastest growing economies.

This new dynamic has affected virtually all industries around the world. Trade in industrial products grew further, reaching more than 80% of total world trade.

In terms of productivity, economists recognize the role of the industrial sector by defining it as the main place of productivity gains. Being at the heart of economic mechanisms, productivity is a measure of the efficiency with which the resources of a company or an economy are transformed into the production of goods and services, since it measures the quantity produced based on the factors labor and capital.

In the case of Morocco, the share of the industrial sector in GDP was highest during the period studied (1980-2015), with a share of 22 per cent in 1984 and 1985, ranking first, followed by those of Agriculture, Trade and Construction and Public Works.

During the last ten years, Morocco is looking for a new industrial strategy. Thus, in 2005, it launched the "Emergence Plan", a strategy to revitalize the Moroccan economy, through the strengthening, revitalization and competitive growth of the Moroccan industrial fabric, as well as the orientation towards new promising

sectors and high value-added products for which Morocco has competitive advantages, namely automotive, aeronautics, electronics, offshoring, textile and leather, agri-food and seafood processing.

Morocco has also initiated the National Pact for Industrial Emergence (PNEI) for 2009-2015, which aims in particular to build a strong industrial sector and create a virtuous circle of growth and to focus industrial recovery efforts on sectors for which Morocco has clear and exploitable competitive advantages, through dedicated development programs.

With a somewhat mixed assessment of the PNEI, the Kingdom has decided to launch the Industrial Acceleration Plan (PAI) for 2014-2020, which aims firstly to change the structure of its economy in the years to come, by capitalizing further on industry and to establish an industrial sector as a source of employment and an accelerator of economic growth.

The plan proposes to address several challenges, including an increase in the absorptive capacity of new assets over the next decade, a 9 percentage point increase in the share of industry in GDP to 23 pc in 2020, creation of 500,000 jobs, boosting export capacity in quantitative and qualitative terms and improving productivity.

The analysis of the indicators, which somehow reflect the performance of a sector of activity, by referring to several empirical studies, shows that the level of performance of an industrial branch differs according to the criterion applied and the adopted time horizon, while the analysis by region showed us that the majority of the industrial activity, production, number of companies, workforce, exports ... is concentrated at the level of the Grand Casablanca region with a trend of the emergence of that of Tangier-Tetouan.

In this respect, the assessment of the productivity of the industrial sectors during the period 1985-2015 seems essential to us in that it will enable us to identify the promising sectors with significant growth prospects and on which Morocco can capitalize on to promote its economic emergence, create employment and growth and enhance its attractiveness on the international scene.

Thus, we will refer to the production function of Cobb-Douglas type which expresses productivity, according to two factors of production, capital (K) and labor (L).

We will try to analyze the productivity of the seven industrial branches studied (processing and extractive industries), referring to the classification adopted in the framework of the Moroccan nomenclature of activities (NMA 2010), which is in perfect accordance with the classification in particular with regard to the branches.

In order to simplify the processing of our database and taking into account the availability of data, we opted for the classification by major sector of processing industries adopted by the Moroccan Industry Observatory, under the Ministry of Industry, Trade, Investment and the Digital Economy as part of its annual industry surveys and industry indicators.

Our study will focus on the evaluation of the elasticity of the gross domestic product (GDP) in relation to the added values of the industrial branches studied, and that of the overall industrial value added compared to the variation of the total factors of production. To this, it must be added the evaluation of the productivity of each branch in its own right, in order to try to provide answers to our basic problem.

2. Literature Review

2.1. Theoretical approaches to the growth-productivity relationship

Productivity remains a subjective notion and the method of its apprehension differs according to the point of view adopted and the expected objective of its assessment.

Measuring total factor productivity (TFP) is the simplest and most widely used econometric method for assessing the past and future performance of an economy, the ability to catch up with other economies, and the differences in level of income and growth¹.

The most widely used method in economic analysis is the Cobb-Douglas function, which is written as:

$$Y = AK^\alpha L^\beta$$

Or in logarithmic form:

$$\text{Log } Y = \text{Log } A + \alpha \text{Log} K + \beta \text{Log} L$$

With **Y**: logarithm of the output (output, added value)

L: logarithm of labor factor

K: logarithm of the capital factor

A: constant term or dimension coefficient characteristic of the economy in question.

A, β: Elasticity of output with respect to labor and capital

In our work, we will use value added (output - intermediate consumption) as output. This indicator refers to the real wealth produced by an economy in general and a particular branch of activity and aims to reduce the effect of the interaction between the variables of the economic branches studied.

For the labor factor "L", we chose as a variable the wage bill, because neither the number employed nor the number of hours worked seems to reflect the level of socio-professional qualification of the employees. All the more so as our study focuses on an economic sector that requires well-trained human resources and a highly skilled workforce.

For example, we can have a sector of activity that employs a large volume of labor in relation to another area, whereas its payroll is low because of the predominance of the working class with a low level of qualification, which explains to a large extent the low competitiveness of certain branches studied.

Concerning the capital variable "K", it represents the tangible fixed assets used in the production process of an industry.

However, due to the lack of aggregated data on investment by industrial enterprises provided by the Moroccan Industry Observatory in the annual industrial processing industry surveys, which corresponds to tangible and intangible assets (research and development costs, patents for inventions, etc.) and non-value (preliminary costs to be allocated over several financial years). Several theoretical and empirical studies have

¹“555” et al. (2005) “The Measurement of Total Factor Productivity: A Review of the Literature” (2005)

thus revealed the crucial and determining role of research and development investments in improving the performance and efficiency of a sector or an economy.

- In this sense, a study by P. Buigues and A. Jaquemin (1997) showed that there is a significant correlation between technological intensity and the level of industrial competitiveness². For the indicators of productivity, demand and wages, the study shows that during the period (1985-1994), higher growth was recorded in the high-tech sectors than in the medium or weak technological intensity sectors.

- Another study by Philippe Cuneo (1984) entitled "The impact of research and development on industrial productivity" reveals that, from a sample of 182 firms followed over the period 1972-1977, the effect of research and development on the productivity of companies appears clearly.

- According to P. Cuneo and J. Mairesse in their econometric study of individual data on "research and development and performance of firms" (1985), we show that in a sample of 390 large and medium-sized companies in the chemical, electronics and mechanics, based on econometric analysis in terms of production function, the results agree with the idea that research and development is a capital comparable to physical capital from the point of view of its productivity and profitability.

- For Jamal Bouoiyour, researcher at the University of Pau et des pays de l'Adour (France), he analyzes, within the framework of a panel data model, the relationship between trade openness, direct investment (FDI) and the productivity growth of North African countries (Algeria, Egypt, Morocco and Tunisia) from 1970 to 2001.

In this study, entitled "Productivity and openness in North Africa", the results suggest a significant effect of human capital, foreign investment and research and development on North African productivity, but a negative effect of imports.

2.2 / Review of empirical studies on the productivity of processing industries in the Mediterranean countries

In this section, we will review the studies which have dealt with the productivity and performance of the industrial branches in the countries around the Mediterranean in order to provide a relatively exhaustive analysis of the industrial fabric of the Mediterranean and better position Moroccan industry compared with other countries in the region.

- According to the study by Jamal Bouoiyour on "Productivity and openness in North Africa" during the period 1970-2001, several conclusions were reached, including the need to take human capital into account in the productivity of the countries of origin, as well as the quality of imported products, while placing great emphasis on the industrial sector (especially as the agricultural sector depends on climate hazards).

- Another study prepared in 2001 by Agnès Chevallier and Deniz Unal-Kesenci of the Center for Prospective Studies and International Information (CEPII) on "The productivity of Mediterranean industries" devoted to the comparison of manufacturing industries in five countries of the Euro-Mediterranean area at very different levels of per capita income and integration into the European Union. These are Spain, Portugal, Turkey, Morocco and Egypt which are compared to France.

² "Industrial competitiveness and productivity: the role of research and development" in *Journal of Economic Surveys*, N° 10, 1997.

The results show that in Morocco, during the period 1981-1997, the agro-food industries took the lead, followed by the textile sector. In Egypt, it is in mechanics that labor productivity is closest to the French level.

- As for a study published by Bouttaleb Kouider of Abou Bakr Belkaid University (Algeria) in 2005 under the theme "Efficiency of economic policies and growth: the case of Algeria", it reveals that in Algeria the Total Factor Productivity (TFP) has been negative for at least two decades, as noted in a study by the IMF (2003) that the problem is not the inadequate physical investment nor the human capital which knows fairly high rate.

This situation reveals a serious problem in the allocation of resources and their effectiveness, which means that the resources available to the country are far from negligible and are poorly managed.

- For Romains Bouis (2007) in his study "which sectors to reform to promote employment and growth, it proposes an estimation and a comparison of the intensity of the competition of different sectors in France compared to a set of countries (Belgium, Denmark, Finland, Italy), with the aim of identifying the sectors likely to be the subject of pro-competitive structural reforms.

Three sectors of the French economy appear to be subject to relatively low competition. These are retail trade, hotels and financial intermediation. Increased competition in these sectors, leading to levels of markups close to those observed in the most competitive countries, would ultimately increase the value added of the market sectors by 1.2% and create around 200.000 Employment opportunities.

- Another study on the product portfolio strategies of French industrial firms in the face of competition from low-cost countries by Claire Lelarge and Benjamin Nefussi (2010) proposes an empirical analysis of these strategies, which shows that firms Subject to this type of competition are significantly more diversified. Only the most productive companies associate these strategies with a true innovation effort, which explains their best performance.

- A joint project between the Ministry of Industry, Commerce, Energy and Mines of Morocco and the World Bank, published in 2010 on "the Moroccan manufacturing sector at the dawn of the 21st century", shows that 859 Moroccan manufacturing enterprises, those labor-intensive, labor productivity is about the same as in China, and barely higher than that of India. Morocco's macroeconomic and trade reforms, launched since the mid-1980s, must be supported and complemented by a "second generation" of more institutional reforms at the micro-economic level.

- In his study on "Overall factor productivity" (2002), Karima Zaimi shows that the TFP shows a marked improvement towards the end of the 1990s, due to the improvement in apparent labor productivity. The increase in industrial TFP is marked by two main trends: a slowdown in TFP over the period 1983-1989 followed by an acceleration of its growth rate during the 1990s.

This study also shows that more than 62% of the value added of the industrial sector comes back to work. This result illustrates the preponderance of labor intensive activities in the Moroccan industrial fabric.

- For Alain Henriot in his study entitled "The location of industrial enterprises: how to appreciate the attractiveness of territories?" (2004), he tries to assess the importance of different macroeconomic criteria in determining the location of industrial enterprises. The study points out that the United States and Japan are two polar cases: in the first case, all countries invest more than the potential estimated by the model, whereas the Archipelago suffers from a Deficit of foreign investment.

- Another study by Michel Aglietta and Robert Boyer (CEPII, 1982) entitled "Poles of competitiveness, industrial strategies and macroeconomic policy" shows that the industry's capacity for aggressive transformation depends first and foremost on the presence of competitive clusters, Their strengthening and renewal, and that an overvalued exchange rate too long leads to an industrial disaster.

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3. Methodology

3.1. Modeling the productivity of industrial branches

In the first step, we will try to estimate the elasticity of the gross domestic product (GDP) in relation to the added value of each industrial branch studied, in order to analyze the impact of each branch on the GDP and to determine the branch which created more wealth during the period 1980-2014. Then, we will look at the productivity analysis of the industrial sector in general and each industrial branch in particular, referring to the Cobb-Douglas production function involving labor and capital factors.

3.2. Definition and presentation of data

3.2.1 Gross Domestic Product

The gross domestic product (GDP) is the synthetic result of the production activity of all branches operating in Morocco's economic territory. It represents the total income generated by all industries during their production process.

At current prices, gross domestic product (GDP) grew by an average of 7.5% during the period 1981-2015, reaching its highest growth rate in 1986 (19%) and falling by 2 % in 1997.

Over the past decade, the growth rate has progressed from 4.5% in 2005 to about 12% in 2008, the highest value in the decade, to an average of 5% during the period 2009-2015 (figure n°1).

Following the evolution of the ratio for the industrial sector in GDP (figure n°2), we notice that it was highest during the period 1980-1990, with a share of 22 per cent in 1984 and 1985, with the largest share being in agriculture, trade and commerce, construction and Public Works.

During the period studied 1980-2015, it seems clear to us that industry contributes the most to the formation of GDP compared to other sectors with an average of more than 18% compared with 14% for agriculture, 5% for construction and 12% for trade.

3.2.2. The share of value added of industrial branches in overall industrial growth

If we analyze GDP by branch of industrial activity, we will see a divergence in the contribution of each branch and its growth potential (figure n°3).

It is evident from the fluctuating evolution of the industrial branches that the agro-food industries are at the top of the industrial branches in terms of their contribution to national wealth and show an upward trend from 1985 to 2014, whereas in 2015 they showed a slight decline.

The figures also show the remarkable growth potential of the chemical and para-chemical industries, on which Morocco is capitalizing on in its industrial acceleration plan to boost the industrial added value, exports and competitiveness of the industry.

Meanwhile, the textile and leather industries are showing modest growth during the period under review, although the Kingdom has comparative advantages in this area, except that it lacks a strategic vision to enhance its attractiveness and competitiveness.

As for the mechanical, metal and electrical industries, they registered on an upward slope and showed significant growth potential. However, during the period 2003-2013 this sector has almost stagnated, to borrow a relatively upward trend from 2014 onwards, a situation which calls for a new dynamic in this sector, through innovation and transfer of technology.

For the other manufacturing industries excluding petroleum refining, they generally experienced an increase, with the exception of the years 1999, 2000, 2011 and 2013, where they showed slight decline, while the oil refining sector and other energy products saw an increase in upward and downward trends during the period 1985-2015, indicating the weak contribution of this sector to industrial GDP, because the Kingdom imports about 95% of its energy needs, including oil, and the heavy investment required by refineries.

3.3. The characteristics of the sample

We have considered consolidating the branches of the industrial sector into seven major branches in order to simplify our analysis and to be in line with the classification used in national reports and plans.

The table below shows the position occupied by each of these branches in the Moroccan industrial fabric:

Table 1: The contribution of the seven selected sectors in national industrial growth (1985-2014)

Indicators	extractive Industries	Agrifood	chemical and parachemical	Mecanic, metal and electric	textile and leather	Other industries excluding refining	Petroleum Refining
Production	-	27%	41%	18%	7%	8%	7%
Employment	9%	20%	19%	10	36%	-	5%
Number of companies	-	25%	27%	19%	25%	3%	2%
Exports	27%	12%	26%	7%	19%	10%	6%
Investment	24%	16%	28%	13%	13%	1%	6%
Level of commitment Production/ Production- Exports+Imports	0,55	1	0,95	0,50	1,30	0,74	0,66

4. Discussion

4.1. Testing the effectiveness of Moroccan industrial policy

In this section, we analyze the elasticity of GDP with the added values of the seven branches studied during the period 1985-2015 and the productivity of the industrial sector in general and the seven industrial branches (processing and extractive industries) in particular (According to data availability), using the Ordinary Least Squares (OLS) method, to explain the variance of the dependent variable using a combination of explanatory factors (Independent variables).

4.1.1. Estimation of the elasticity of the GDP to the added values

$(LVA \text{ agro}) + \alpha_3 (LVA \text{ extractive industries}) + \alpha_4 (\text{Mechanical and metallic LVA}) + \alpha_5 (LVA \text{ textile and leather}) + \alpha_6 (LVA \text{ other manufacturing industries}) + \alpha_7 (LVA \text{ petroleum refining}) + \varepsilon_i$

With: LPIB: log of GDP during the period 1985-2015

LVA of branches: logarithm of value added of industrial branches

ε_i : Error term

The results clearly show the positive and significant link between the GDP (output) and the added values of the seven industrial branches studied (the parameters are highly significant and generally show a positive sign with the exception for oil refining).

The explanatory variables used account for more than 99% of the dependent variable. And for error independence, the Durbin-Watson statistic is around 2, which means that there is no positive correlation between residual values and individuals.

The elasticity of the GDP to the added value of the branches studied is 0.04 for the chemical and para-chemical industries, 0.16 for the agro-food industries, 0.10 for the extractive industries, 0.20 for the mechanical, metal and electrical industries, 0.22 for the textile and leather industries, 0.38 for the other manufacturing industries and -0.01 for oil refining.

This means that other industries, such as "textiles and leather", agri-food and "mechanical, metal and electrical" industries, are the industries that have the greatest impact on GDP growth over the period 1985-2014, chemical and para-chemical effects have only a minimal effect on GDP growth. An observation that contradicts what we observed in our descriptive analysis of data through several indicators, that the chemistry and parchment industry occupies the first position in relation to the other industrial branches in terms of production, enterprises, exports and investment.

In this context, we will divide our database by three periods to try to see the correlation between the added value of chemical and paracheical industries and economic growth.

The results show that the link between the GDP (output) and the value added of the chemical and paracheical industries was negative and not significant during the period 1980-2000, whereas the

relationship became positive is significant during the period 2000 -2015, due to the fact that the chemicals and paraceticals sector underwent a restructuring during the last ten years with a significant change in investments, given its promising growth potential and Morocco's willingness to make it a catalyst industrial growth and employment, alongside other industrial sectors, including aeronautics, automotive, electrical and electronics, and textiles and leather.

4.1.2. Estimation of Cobb-Douglas function

We analyze in this section the determinants of the productivity of the global industrial sector (manufacturing and extraction industries) and the seven branches studied.

$$- \ln / \text{Global industrial LVA} = C + \alpha \text{ Global LMS} + \beta \text{ LINV global} + \varepsilon$$

The results clearly show the positive and significant relationship between the industrial value added (output) and the inputs in factors of production, to have the stock of capital (investment) and labor (wage bill), because the parameters are highly significant and have a positive sign).

The elasticity of total industrial value added to the capital stock is 0.44, while that of labor is 0.35. This means that an increase in investment of 1% leads to a 0.44% increase in the industrial VA, and that an additional 1% of the wage bill leads to an increase of 0.35% of output.

Thus, industrial added value reacts more strongly to changes in capital than to labor, as the nature of industrial activity is highly capital-intensive and requires heavy investment, especially in terms of innovation and new technologies, in order to be competitive on the international scene and bringing added value to the economy.

Regarding the labor factor, it is clear that the industrial sector requires a highly skilled workforce, especially with the Kingdom's commitment to new global businesses, including automotive, aeronautics, mechanics and electronics. These require the development of training programs capable of supporting the current momentum of the industrial sector and the promotion of the industrial emergence of the Kingdom.

4.1.3 Evaluation of the productivity of each branch

$$- \text{LVA agro} = c + \text{LMS agro} + \text{LINV agro} + \varepsilon$$

With:

- LVA agro, chemical, textile : Logarithm of the added values of the industrial branches studied

- LMS agro, chemical, textile ...: logarithm of the payroll of each branch

- LINV agro, chemical, textile ...: logarithm of investment committed in each branch

The results show a positive and very significant link between the added values of the seven industrial branches studied and the factors of production (labor and capital), insofar as the parameters are highly significant and have a positive sign.

The elasticity of the value added to the capital stock is 0.16 for the agri-food industries, and that of labor is 1.05. This means that the agri-food sector reacts more than proportionally to wage bill than to investment, because this economic activity is linked to the agricultural sector, which employs more than 40% of the working population.

This leads us to wonder about the future of the sector and its competitiveness, which now requires more than ever to use new technologies to promote its productive performance and enable the Kingdom to take advantage of its comparative advantages in this field.

For the chemical and para-chemical industries, the figures show that the elasticity of their value added to investments is 0.64 and 0.09 at work. This corresponds perfectly to what has been mentioned earlier in economic theory, which reveals that the chemical and para-chemical sector is highly capital-intensive and requires heavy investments for its development.

Morocco spared no efforts to stimulate a new momentum in this field, as it ranks first in terms of investment in the industrial sector during the period 1985-2014 with a share of more than 28%, which justifies its contribution with 41% to national industrial production in 2014.

Concerning the "textile and leather" sector, the figures show that the elasticity of their added value to the wage bill is 0.82 and 0.06 for investments. This means that this branch is strongly linked to the labor force, which contributes to its added value, as it remains the main employer of labor with more than 26% of the total workforce Industries in 2014.

This positive impact proves to be important that the sector has long been successful in placing Morocco in an advanced position in international markets.

However, the data show that the textile and leather sector has declined by 61% in the number of its enterprises, from 2171 in 2003 to only 839 in 2014. In addition, the share of exports of this sector in relation to total exports, from 30% in 2005 to 12% in 2014, which threatens the future productivity of the sector and requires measures to new dynamic, in order to resume its position in the national economic fabric.

For the "mechanical, metal and electrical" industries, the figures show that the elasticity of their value added to the wage bill is 0.65 and 0.12 for investments. This means that the "mechanical, metal and electrical" branch is strongly linked to the labor force, which contributes to its added value, even though this branch only holds 11% of the workforce employed by the global industrial sector.

However, over the past few years, these industries have almost stagnated, an indicator that aims to give new momentum to this sector, through innovation and transfer of technology, all the more so because this branch is largely dependent on new technologies to promote production processes and further contribute to enhancing national economic growth and boosting the competitiveness of domestic industry.

For the mining extractive industries, the figures show that the elasticity of their value added to the wage bill is 0.87 and 0.35 for investments.

It is clear that the labor factor contributes to raising the added value of the sector, more significantly in relation to the allocation of capital, which confirms that the field of mining remains labor-dependent, rather than on sophisticated machines and developed technology that will undoubtedly have a remarkable effect on the development of the sector and the improvement of its performance especially in export.

Regarding the petroleum refining sector, the figures show that there is no significant relationship between value added and the labor and capital factors linked to this branch.

For their part, other manufacturing industries, including electronics, woodworking and wood products manufacturing, publishing, printing and reproduction ..., the results show that the elasticity of value added to the payroll is 0.51 and 0.06 to investments. This means that any 1% increase in payroll leads to a 0.51% increase in output, and that a 1% increase in investments implies a 0.06% increase in value added.

This branch is linked to the labor force, which contributes remarkably to enhancing its added value, while the productivity of capital is low.

Conclusion

By means of the equations of economic growth and productivity of both the industrial sector in general and the seven industrial branches in particular, it appears that "other manufacturing industries", "textiles and leather", "agri-food" and the "mechanical, metal and electrical industries" are the sectors that have the greatest impact on GDP growth during the period 1985-2015, while the chemical and para-chemical sector only began to have a significant effect from the 2000s onwards the increase in investment flows, which shows promising prospects, all the more so as investment in a capital-intensive sector is paying off only in the medium and long term.

Extractive industries contribute weakly to national growth, while there is a negative link between the added value of the "oil refining" industries and GDP.

For its part, industrial added value reacts more strongly to changes in capital than to labor, as the nature of industrial activity is highly capital-intensive and requires heavy investment, especially in terms of innovation and new technologies, in order to be competitive on the international scene and bringing added value to the economy.

Regarding the labor factor, it is clear that the industrial sector requires a highly skilled workforce, especially with the Kingdom's commitment to new global businesses, including automotive, aeronautics, mechanics and electronics. This requires the development of training programs, capable of supporting the current dynamics of the industrial sector and encouraging the industrial emergence of the Kingdom.

In this respect, and after an assessment of the productivity of the industrial branches, it is clear to us that labor-intensive branches whose labor productivity exceeds that of capital are those which contribute most to national economic growth and are more efficient.

This does not mean that the chemical and para-chemical sector remains at the top of the list in terms of investment in the industrial sector during the period 1985-2014, and is a promising area, the impact of which is already beginning to be felt during the last ten years on economic growth, which bodes well for important development prospects.

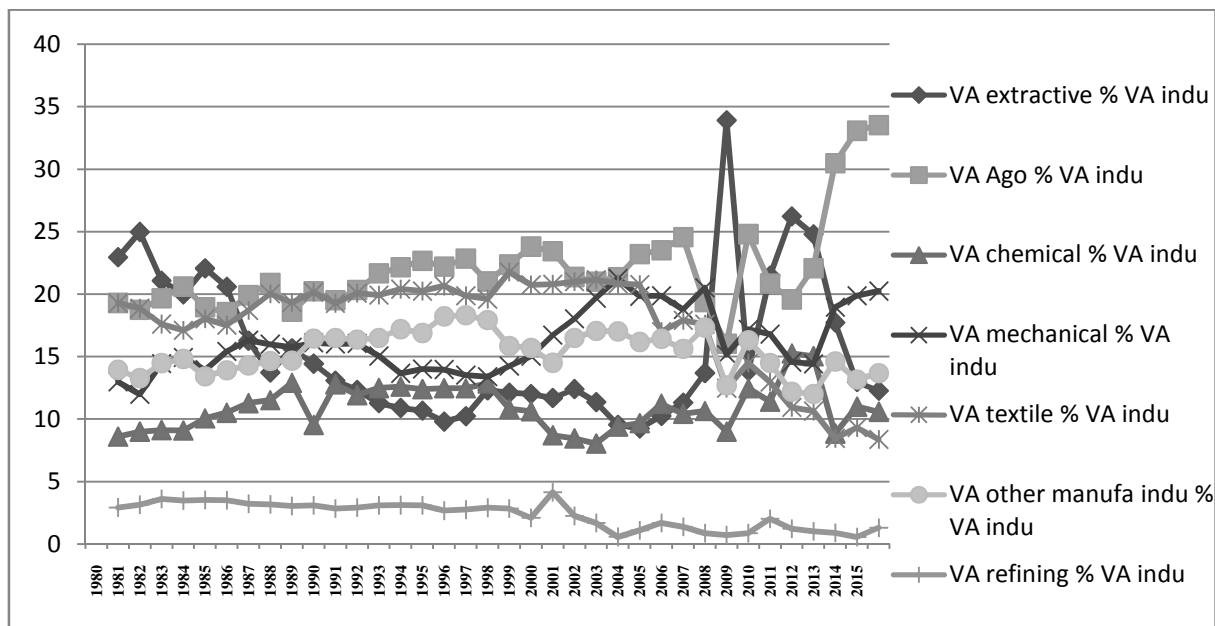
These results should in no case lead to too clear conclusions. They refer to the need to deepen the analysis of the links between the productivity of the industrial branches studied and other external variables, such as the rate of trade openness, human capital and training and research and development.

References

- Aglietta, M. et Boyer R. (1982). "Pôles de compétitivité, stratégie industrielle et politique macroéconomique", CEPII, N 8223, (pp, 31-44).
- Combemale, P (1993). "La productivité, analyse de la rentabilité de l'efficacité et de la productivité", édition Nathan, (pp, 15-23).
- Allen, F. et Gale, D (1997). "Financial Markets, Intermediaries and Intertemporal Smoothing", Journal of Political Economy, University of Chicago Press, vol. 105 (3), (pp, 523-46).
- Académie des technologies (Juin 2004). Le système français de recherche et d'innovation.
- Agrawal, L. et Cockburn I. (2002). "University Research, Industrial R&D and the Anchor Tenant Hypothesis".
- Amable B, Barré R. et Boyer R. (1997). Les systèmes d'innovation à l'ère de la globalisation, Economica.
- Aglietta M. (1982). "Régulation et crises du capitalisme. L'expérience des États-Unis", Calman Lévy 2ème édition.
- Aglietta M. (2004), Commission européenne, "European Competitiveness Report 2004", Commission Staff Working Document, SEC 1397, Bruxelles.
- Aglietta M. et Orlean A. et Oudiz G. (1980), "L'industrie française face aux contraintes de change". Economie et Statistique, n° 119, (pp. 35-63).
- Aglietta M., Orlean A. et Oudiz G. (1980), "Contraintes de change et régulations macroéconomiques nationales".
- Ambapour S., (2001). "Estimation des frontières de production et mesure de l'efficacité technique", document de travail du Bureau d'application des méthodes statistiques et informatiques.
- Agbodji, A.E., (1996). "L'efficacité technique dans l'industrie ivoirienne", Mémoire de DEA, PTCI, Université d'Abidjan.
- Betbèze J.-P. (2005). Financer la R&D, rapport du CAE.
- Boyer R. (2003). La croissance début de siècle. De l'octet au gène, Albin Michel Économie.
- Boyer R., Dehove M., et Plihon D. (2004). Les crises financières, rapport du Conseil d'analyse économique, no 50, La Documentation française.
- Bouis R. (2007). "Quels secteurs réformer pour favoriser l'emploi et la croissance", DGTPE.
- Branstetter L. (2001). "Are Knowledge Spillovers International or International in Scope Microeconomic Evidence from the United States and Japan", Journal of International Economics.
- Branstetter L., Nakamura Y. (2003). Is Japan's Innovative Capacity in Decline?, NBER.
- Barlet C., (1994). "R&D, investissement direct à l'étranger et commerce extérieur : analyse théorique et application à l'industrie manufacturière", Thèse de doctorat de Science économique, Université de Paris I.
- Battese, G.E., Coelli, T., (1995). A model for technical inefficiency effects in a stochastic frontier production for panel data, Empirical Economics, (pp, 325-332).
- Chambolle T., Méaux F. (2004). Rapport sur les nouvelles technologies de l'énergie, Paris, ministère délégué à la Recherche et aux Nouvelles Technologies, la Documentation française.
- Cohen E., Lorenzi J.-H., (2000). Politiques industrielles pour l'Europe, rapport du CAE, no 26, Paris, la Documentation française.
- CEPII, 1998, "Compétitivité des nations, Economica, Paris, (pp, 95-125).
- Carlton D. et Perloff J. (1998) Économie Industrielle, Edition De Boeck.

- CREPON B., LUNG N. (1999). "Innovation, emploi et performances", Document de travail G 9904, Insee, Direction des études et Synthèses Economiques.
- David P., Goddard J.-G., (2005). "Comment améliorer la cohésion de l'espace européen de recherche : l'articulation public/privé", Prisme du Centre Cournot.
- Dasgupta P., David P. A., (1994). "Towards a New Economics of Science", Research Policy, vol. 23, (pp. 487-52).
- DATAR, (2004). "La France, puissance industrielle : une nouvelle politique industrielle par les territoires", Paris, La Documentation française.
- Debonneuil M., Fontagné L. (2003). Compétitivité, rapport au CAE, La Documentation française.
- François J.-P., (1998). "Innovation, croissance et emploi des entreprises industrielles", ronéotypé, Direction Générale des Stratégies Industrielles, SSI.
- Gathon, H.J., Pestieu, P., (1995). "La performance des entreprises publiques, une question de propriété ou de concurrence", Discussion Paper 95/06, CREPP, Université de Liège.
- Gabszewicz, J.J. (2003). La concurrence imparfaite, Collection repères La Découverte, Paris, 2ème édition.
- Humbert, M. (1995). "Elargissement des fondements théoriques standards des politiques industrielles ", Revue d'économie industrielle Vol. 71.
- Jaidi, L. (1992). "L'industrialisation de l'économie marocaine: acquis réels et modalités d'une remise en cause", édition du CNRS, Paris, (pp, 10-50).
- Kang S.-I., (1997). "La compétitivité technologique internationale", Thèse pour le doctorat es sciences économiques, Université Paris I.
- Leleu, H., Derveux, B., (1997). "Comparaison des différentes mesures d'efficacité technique : une application aux centres hospitaliers français. Economie&Prévision", (pp, 129-130, 101-119).
- Mathis J., Mazier J. et Rivaud-Danset D., (1998), "La compétitivité industrielle", Bordas, Paris.
- Moati P. 2000, "Evaluer les performances d'un secteur d'activité", CREDOC, Cahier de recherche n 148.
- Moati P., (sept, 1996), "Méthode d'étude sectorielle", Cahier de recherche CREDOC, vol.2, n°93.
- Moati P., (nov, 1997). "Méthode d'étude sectorielle", Cahier de recherche CREDOC, vol.3, n°109.
- Moati P., (sept, 1998). "Méthode d'étude sectorielle", Cahier de recherche CREDOC, vol.4, n°118.
- Moati P., (nov, 1999). "Méthode d'étude sectorielle", Cahier de recherche CREDOC, vol.5, n°135.
- Moati P., Chessa C., et Pouquet L., (Oct, 1998). "Les déterminants sectoriels des défaillances d'entreprise dans l'industrie manufacturière", Cahier de recherche CREDOC, n°121.
- Meesen, W., Van Den Broeck, J., (1977). Efficiency estimation from Cobb-Douglas production function with composed error, International Economic Review, 18.
- Projet conjoint entre le Ministère de l'Industrie, du commerce, de l'énergie et des mines du Maroc et la Banque mondiale,(2001). "Le secteur manufacturier marocain à l'aube du 21^{ème} siècle", résultats de l'enquête pour l'analyse de la compétitivité des entreprises, (pp, 5-11).
- Porter M.E, (1993), L'avantage concurrentiel des nations, Interéditions. Paris.
- Tirole J. (1995). Théorie de l'organisation industrielle, Édition Economica.

Figure n°3 The share of value added of industrial branches in overall industrial growth



Source : HCP

- The estimation of the elasticity of the GDP to the added values

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCHIMICAL_PARACH	0.045364	0.043065	1.053393	0.0301
LINDU_AGRO	0.161546	0.061011	2.647808	0.0007
LINDU_EXTRACTIVE	0.104684	0.022122	4.732124	0.0001
LINDU_MECANIC	0.200610	0.061124	3.282039	0.0045
LINDU_TEXTILE	0.224861	0.058432	3.848253	0.0055
LMANUFACTURER	0.387845	0.101795	3.842823	0.0007
OIL RAFFINING	-0.015494	0.021101	-0.734265	0.0164
C	2.589315	0.190494	13.59262	0.0000

R-squared	0.997711	Meandependent var	12.70546
Adjusted R-squared	0.997118	S.D. dependent var	0.695179
S.E. of regression	0.037320	Akaike info criterion	-3.540921
Sumsquaredresid	0.037606	Schwarz criterion	-3.185413
Log likelihood	69.96613	Hannan-Quinn criter.	-3.418200
F-statistic	1681.458	Durbin-Watson stat	1.901496

The following table presents the results for the estimated equation per period:

Period	Variable	Coefficient	Std.Error	t-Statistic	Prob
1980-1990	VA Chemical & paracheical industries	-0.006042	0.116093	-0.052047	0.9618
1990-2000		-0.267466	0.862540	-0.310091	0.7768
2000-2015		0.140712	0.065179	2.158865	0.0529
R-squared		0.998188			

- Estimation of Cobb-Douglas function

Variable	Coefficient	Std. Error	Prob.
LINVESTMENT_GLOBAL	0.445949	0.075666	0.0000
LMS_GLOBALE	0.355196	0.100906	0.0016
C	3.340777	0.475533	0.0000
R-squared	0.947206	Meandependent var	11.19943
Adjusted R-squared	0.943295	S.D. dependent var	0.496373
S.E. of regression	0.118200	Akaike info criterion	-1.338237
Sumsquaredresid	0.377224	Schwarz criterion	-1.198117
Log likelihood	Hannan-Quinn criter.		-1.293411
F-statistic	Durbin-Watson stat		1.833002
Prob(F-statistic)			

Evaluation of the productivity of each branch

Branches	Explicative Variables	Explained Variable
		Production
Agri-food Industries	Constante	0.380232 (prob : 0.5256)
	LINV	0.162035 (prob : 0.0200)
	LMS	1.050293 (prob : 0.0000)
	R2	0.938762
	R2 adjusted	0.934226
	Durbin-Watson stat	1, 755307
chemical and paracheical Industries	Constant	2.889484 (prob : 0.0000)
	LINV	
	LMS	0.643911(prob : 0.0000)
		0.093051(prob : 0.0030)
	R2	0.858660
	R2 adjusted	0.848190
Textile and leather	Constant	1.775328 (prob : 0.0114)
	LINV	0.069061 (prob : 0.0000)
	LMS	0.824976 (prob : 0.0122)
	R2	0.836894
	R2 adjusted	0.824812
	Durbin-Watson stat	1.718567

"mechanical, metal and electrical" Industries	Constant	2.980612 (prob : 0.0000)
	LINV	0.126831 (prob : 0.0177)
	LMS	0.655151 (prob : 0.0000)
	R2	0.966239
	R2 adjusted	0.963739
	Durbin-Watson stat	1.702791
Extractive Industries	Constant	-0.448730 (prob : 0.7788)
	LINV	0.358881 (prob : 0.0015)
	LMS	0.875836 (prob : 0.0026)
	R2	0.763980
	R2 adjusted	0.746497
	Durbin-Watson stat	1.817534
Oil Refining	Constant	7.010148 (prob : 0.0000)
	LINV	-0.148544 (prob : 0.0059)
	LMS	0.185480 (prob : 0.0330)
	R2	0.110736
	R2 adjusted	0.044865
	Durbin-Watson stat	1.688764
Other manufacturing industries	Constant	4.962329 (prob : 0.0000)
	LINV	0.061739 (prob : 0.0153)
	LMS	0.513172 (prob : 0.0000)
	R2	0.898199
	R2 adjusted	0.890658
	Durbin-Watson stat	1.821205

OUTCOME OF NATIONAL TOTAL SANITATION PROGRAMME IN BUSIA COUNTY, KENYA

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Abstract

Busia County was among counties with lowest sanitation coverage of 42%. Ministry of health initiated National Total Sanitation Programme (NTSP), 2012 in pursuit of total sanitation. Quasi-experimental study design was used data was collected using structured questionnaires and observation checklists. Multi stage-random sampling was used to sample 459 respondents. There was an improvement ($P < 0.001$) in latrine coverage, latrine sharing with neighbours, usage of latrine by children and Open Defecation (OD) after NTSP implementation. Latrine coverage and usage of latrine by children increased by 11% and 32% respectively while latrine sharing with neighbours and OD reduced by 37% and 47% respectively after the implementation of NTSP in Busia County. Households were twice likely to own a latrine after implementation of NTSP ($OR = 2.04$ (1.42-2.94) $p = 0.0001$). Significant improvement in hand washing in critical times with soap after latrine usage [329 (81.0%) after NTSP implementation from 186 (45.6%) baseline; $p < 0.001$].

Key words: sanitation coverage, hygiene practices, diarrhoeal burden, solid waste, sustainability of sanitation behavior change

1.0 INTRODUCTION

According to a desk study carried out by the Water and Sanitation Program, 2012, poor sanitation costs Kenya Ksh. 27 billion each year. This sum is the equivalent of US\$8 per person in Kenya per year or 0.9% of the national GDP. About 21 million Kenyans use unsanitary or shared latrines. While 5.6 million have no latrine at all and defecate in the open. The Busia County was among the counties with the lowest (42%) sanitation coverage, with more than half of the population defecating in the open. Diarrhea and cholera were among the top three diseases causing morbidity and mortality in Busia County and with Cholera outbreaks frequently being reported in the Busia County (MoPHS, 2012).

Kenya and its partners had tried several conventional approaches to tame poor sanitation including financial subsidies, promotion through sani-centre, coercion by public health officers as well as in some communities making the construction of latrines a pre-condition for gaining access to water supply and legislation through act of parliament (National environmental and sanitation act, 2010). However these approaches have not been

found to yield sustainable changes in the sanitation behavior change (Deepak and Moulik, 2007). The key issue of motivating sanitation behavior change had not been addressed by conventional approaches to sanitation which emphasized latrine construction rather than sanitation behavior change (MoPHS, 2008).

Due to the failures of conventional sanitation approaches that emphasized on latrine coverage through coercion and financial subsidies to beneficiaries by the authorities, the ministry of health in partnership with UNICEF designed a participatory sanitation program tapped National Total Sanitation Program (NTSP) to address the sanitation behavior challenges. National Total Sanitation Program (NTSP) was implemented (from July 2012) in Busia County as a pilot program with the aim of achieving total sanitation which had poorest sanitation indicators.

National Total Sanitation Programme was a Joint Ministry of Health-UNICEF program that addressed itself to the pursuit of total sanitation in Kenya (MoPHS, 2010). The NTSP refers to complete eradication of all indiscriminate and (1) unhygienic practices in the disposal of (2) excreta, (3) drainage and (4) solid waste. The objectives for NTSP were divided into stages which included: Stage 1. No village in Kenya practices open defecation (OD), by 2012, improve sanitary household latrine coverage from existing 49 % to 100 % by 2015, all Kenyans practice hand washing with soap at critical times by 2015. Stage 2; and then address the environmental health risks that are posed by poor drainage and solid waste disposal by 2015-2030 (MoPHS, 2010).

The NTSP adopted Community-Led-Total Sanitation approach (CLTS) that was pioneered in 1999 by Village Education Resource Centre and Water Aid in Bangladesh. Community-Led-Total Sanitation approach was an innovative approach for mobilizing villages to adopt total sanitation and hygiene practices (Kumar, 2005). With CLTS approach, communities analyze their sanitation conditions, understand the impact of open defecation on health and the environment and take collective action to adopt sanitation and hygienic practices like total use of hygienic latrines, i.e., no open defecation or open/hanging latrine in use, hygienic latrines well maintained, good personal hygienic practices, using sandals when defecating, effective hand washing after defecation and before taking or handling food, water points well managed, safe water use for all domestic purposes, food and water covered, garbage disposal in a fixed place and domestic animal excreta disposed of in a hygienic way, waste water disposal in a hygienic way (Water Aid, 2007; Kamal and Chambers, 2008). Currently, majority of villages in Busia County have been certified to have attained total (100%) sanitation hence have adopted sanitation and hygienic practices.

1.2 Study Objectives

The study was part of the main study '*Evaluation of social-Economic returns on investment for National Total Sanitation Program (NTSP), in Busia County, Kenya*. The main objective was to determine the outcome of National Total Sanitation Programme (NTSP) in Busia County, Kenya. The specific objectives were:

- a) To determine the sanitation coverage after the implementation of NTSP in Busia county
- b) To determine the hygiene level and practices after implementation of NTSP in Busia County
- c) To determine the solid waste management and diarrhoeal burden in Busia County after implementation of NTSP.
- d) To determine the sanitation options, scaling of the ladder and sustainability of sanitation behavior change after implementation of NTSP in Busia County.

2.0 Materials and Methods

2.1 Study site

This study was carried out in Busia County because Busia was among counties with lowest sanitation coverage of 42% hence NTSP was launched in 2012 as a pilot programme by the ministry of Health in pursuit of total sanitation. Busia County is one of the 47 Counties in Kenya and covers an area of 673.6 square km and lies between latitudes 0° 1' 36'' South and 0° 33' North and longitudes 33° 54' 32'' East and 34° 25' 24'' East. The County is divided into five administrative Sub- County namely Township, Funyula, Matayos, Nambale and Butula. The Sub-County are further sub-divided into 17 locations and 52 sub-locations. It was projected that by 2015 Busia County will have a population of 378,649 (GoK, 2009). According to the Busia county statistics (2008), 65.99% suffers absolute poverty, 61.4% food poverty.

2.2 Research design

Quasi experimental study design was used i.e. data was collected after implementation of NTSP and results compared with the baseline (data collected before implementation of NTSP). Only villages where NTSP had been implemented and certified by the stakeholders as to have achieved total sanitation were included in the study. The outcome of NTSP is total sanitation behavior change (100% total sanitation) that is if the households build and use their own latrines, observe sanitation and hygiene practices like hand washing with soap after visiting toilet, before eating, proper household hygiene, proper disposal of infant excreta and no open defecation in the triggered villages at all. To establish outcome of NTSP, several parameters will be measured. This will include Level of sanitation and hygiene practices, sustainability of sanitation behavior change, burden of diarrhoeal disease and sanitation options.

2.3 Target population

The target population was stakeholders of NSTP. They stakeholders included; NTSP beneficiaries (28,130 households), NTSP implementers (30 public health officers, 15 Community Health Extension Workers, 30 Community Health Workers and UNICEF (Main sponsor).

2.4 Sampling design

Multi-stage random sampling design was used to sample the location and sub-location and villages from the four divisions of Busia County which had been certified by stakeholders to have attained total sanitation. Random sampling was applied to sample within, locations, sub-locations, villages and households for study. The sampling frame shall be based on Busia County administrative boundaries.

The formula previously used by Fisher *et al.*, (1998) was adopted to determine the sample size of this study.

$$\text{Sample size } n = \frac{Z^2 pq}{e^2}$$

Z- Standard normal deviate set at 2.17 (97% confidence interval)

$$q = (1-0.42) = 0.58$$

P-Sanitation coverage in Busia County, 42% (MoPHS, 2010)

e- Precision set at 0.03 to improve precision and accuracy

$$= \frac{2.17^2 \times 0.42 \times 0.58}{0.03^2}$$

$$= 459$$

$$= 459$$

A total of 459 respondents/households participated in the study as show below (Table 2.1)

Table 2.1: Sample Size distribution in the study area

Sub-County	Number of Households	Percentage	Sample Size			
			Households(H)	Facilitors(F)	Sponsor	Total(H+F)
Matayos	11721	41.7	179	12	1	191
Nambale	6002	21.3	92	6		98
Butula	5320	18.9	81	5		86
Funyula	5087	18.1	78	5		83
Total	28130	100.0	430	28	1	459

2.5 Data Collection procedure

Tools that will be used to collect primary data will include structured questionnaires and observation checklists

3.0 RESULTS

3.1 Outcome of NTSP in Busia County

3.1.1 Socio-Demographic Profile:

A total of 406 household/respondents were interviewed after NTSP implementation in Busia County of which Budalang'i sub-county had 40 (9.9%), Butula Sub-county 100 (24.6), Matayos Sub-county 89 (21.9%), Nambale sub-county 100(24.6 %) and Samia Sub-county 77 (19.0%). The mean age of respondents was 42 years of which 259 (63.8%) were female (Table 3.1). Greater proportion of the respondents had attained primary level education 209 (51.6%) while 107 (26.4%) had no education at all (Table 3.1). Most respondents were not employed 257 (63.3%) while most of those employed or self-employed earned ≤ 10000 returns per month (Table 3.1). The mean number of people per family was 8 members (Table 3.1).

Table 3.1: Socio-demographic data after NTSP implementation

Variables		Frequency N=406	Proportion (%)
Sub-county			
	Budalangi	40	9.9
	Butula	100	24.6
	Matayos	89	21.9
	Nambale	100	24.6
	Samia	77	19.0
Age of respondents			
	Mean, Std. Deviation	42.00	
Education level of respondents N=406			
	University/College	18	4.4
	Secondary	72	17.7
	Primary	209	51.6
	None	107	26.4
Occupation of respondents N=406			
	Self employed	124	30.5
	Formally employed	25	6.2
	Not employed	257	63.3
Income returns N=149			
	<10,000	113	75.8
	10,001-20,000	11	7.4
	20,001-50,000	17	11.4
	>50,000	8	5.4
Number of people in family			
	Mean, Std. Deviation		
Type of house N=406			
	Grass thatched, mud walled	95	23.4
	Semi-permanent	252	62.1
	Permanent	59	14.5

3.1.2 Latrine coverage

Comparing baseline and after implementation of NTSP in Busia County, there was a high significant statistical difference ($P < 0.001$) in latrine coverage, latrine sharing with neighbours, usage of latrine by children and Open Defecation (OD) (Table 4.7).

Latrine coverage and usage of latrine by children increased by 11% and 32% respectively while latrine sharing with neighbours and OD reduced by 37% and 47% respectively after the implementation of NTSP in Busia

County. This shows a very high significance difference impact of NTSP implementation as compared to the baseline survey.

Table 3.2: Summary of Key variables before and after implementation of NTSP in Busia County

Key Variable	Study		P-value
	Baseline	Implementation	
Latrine coverage	309(76%)	351(86.5%)	P<0.001
Latrine sharing with neighbours	315(77.2%)	161 (39.7%)	P<0.001
Usage of latrine by children	188 (46.1%)	318 (78.3%)	P<0.001
Open defeacation (OD)	336 (82.4%)	140(34.5%)	P<0.001

Findings indicate that households were twice likely to own a latrine after implementation of NTSP which was highly significant at 95% Confidence Interval (OR=2.04 (1.42-2.94) p= 0.0001). Moreover, households were 0.19 less likely to share latrine with neighbor (OR=0.19 p=0.0001). See Table 3.3.

Table 3.3. Multivariable analysis of Baseline and after NTSP Intervention on key outcome variables in Busia County

		Crude OR (95% CI)	P - value
Latrine ownership	Baseline	1	
	Intervention	2.04 (1.42, 2.94)	0.0001
Latrine share	Baseline	1	
	Intervention	0.19(0.14, 0.269)	<0.0001
Hand washing facility at latrine	Baseline	1	
	Intervention	2.41 (1.73, 3.36)	<.0001
Hand washing with soap	Baseline	1	
	Intervention	5.99 (3.72, 6.99)	<.0001
Hand washing before/after handling food	Baseline	1	
	Intervention	5.99 (3.72, 6.99)	<.0001

Diarrhea cases	Baseline	1	
	Intervention	9.04 (6.10,13.04)	<0.0001
	Baseline	1	
	Intervention	0.12 (0.08,0.18)	<.0001

Reasons given for lack of latrine included; 30(54.5%) lack of money, difficult to keep it clean 1(1.9%), no land 6(10.9%), weak soil ground 5(9.1%), no reason 7(12.7%) and lack of knowledge 6(10.9%). For those who lack latrine, majority 46 (83.6%) share with neighbours, 3 (5.5%) defecate in bush, 5 (9.1%) special place in the compound and others unspecified places 1 (1.8%). Some respondents 175 (43.1%) indicated that there are some families still not having a latrine.

Slightly less than a half [189 (47.5%) after NTSP implementation from 193 (47.3%) baseline] don't share latrine with son or daughter-in-law with father or mother-in-law. Majority 123(75.9%) of those who don't share latrine with mother- or father-in-law and son or daughter-in-law have provided them with latrine.

Latrine usage improved to 352 (90.3) with findings indicating that majority of latrines [303 (80.4%) after NTSP implementation from 114 (27.9%) baseline] were adequately clean while [256 (68.1%) after NTSP implementation from 116 (28.4%) baseline] of latrines were found to eliminate bad odour. Most latrines 229 (60.3%) separate human excreta from human contact while about 250 (61.6%) of latrines had a closing door.

After implementation of NTSP, open defecation reduced to 140 (34.5%) from 336(82.4%) baseline. This represented a highly significant improvement [P<0.001]. The findings also showed that more young children started using latrines [318(78.3%) after implementation from 188 (46.1%) baseline; (P<0.001)]. Majority 360(88.7%) dispose infant excreta in latrine after wiping them, while few 15 (3.7%) bush, roadside 1 (0.2%), garden 24 (5.9%) and 6 (1.5%) dispose in other unspecified place.

3.1.3 Hygiene practices

There was a significant improvement in hand washing in critical times with soap after latrine usage [329 (81.0%) after NTSP implementation from 186 (45.6%) baseline; p<0.001]. Households were six times (OR=5.99 p=0.0001) likely to wash hands after latrine usage after implementation of NTSP. Compared to baseline, 178 (43.6%) of households, more 274 (67.5%) had installed hand washing basin/leaky taps within 3 metres radius around the latrine (P<0.001). Households in Busia County were twice (OR=2.41 P=0.0001; highly significant) likely to have a hand washing basin/leaky tap after NTSP intervention. Some of the reasons given for not having leaky taps/ hand washing facility were; 53 (54.1%) were unaware of existence of leaky taps, 35 (35.7%) found them unnecessary/not important and only 10 (10.2%) was due to inadequate water.

For respondents who had installed leaky taps within 3 metres radius of latrine after NTSP implementation, 251 (65.9%) had water as compared to baseline 65 (15.9%). This indicated a significant change (P<0.001).

Majority 365 (90.6%) of households after NTSP intervention wash hands with soap after handling children's excreta. This was a significant improvement (p<0.001) in comparison to baseline 175 (42.9%). A large

proportion 370 (91.1%) of households wash hands with soap before and after handling food as compared to baseline 217 (53.2%), (<0.001). The respondents were 9 times likely to wash hands after NTSP intervention which was highly significant.

3.1.4 Drinking water

The main source of drinking water was borehole 146 (36.0%), protected spring 115 (28.3%), piped water 79 (19.5%), river 65 (16.0%) and others 1 (0.2%). Most households were of the view that water was fit/clean for human consumption 296 (72.9%). There was a significant improvement ($P=0.003$) in households accessing clean water.

Though only those with view that water was not clean were expected to treat water, also other respondents treated their drinking water by chlorination 302 (88.3%) being the preferred treatment method, followed by boiling 25 (7.3%), decanting 9 (2.6%) while others 6 (1.7%). These represented a significant improvement ($\chi^2=76.477$ $df=4$ $p=0.000$). Majority 312 (78.8%) store water in plastic Jerricanes while 181 (44.6%) store in pottery pot 265 (66.9%), 38 (9.6%) drink directly from tap and water tanks 64 (16.2%). Majority of storage facility/containers were hygienically clean 338 (86.7%).

3.1.5 Solid waste disposal

The most preferred site for waste disposal was compost pit 214 (53.0%) and road side 2 (0.5%). There was a notable reduction in solid waste disposal in the bush [from 152(37.3%) to 25 (6.2%)]. Majority 322 (81.9%) of compounds were found to be clean hence traces of solid wastes were not sighted [the change was significant after NTSP implementation ($p<0.001$)] (see table 3.4).

Table 3.4: Solid waste disposal sites

Disposal site	Study	
	Baseline	Implementation
Compost pit	135(33.1%)	214 (53.0%)
Special place in compound	61 (15.0%)	119 (29.5%)
Bush	152 (37.3%)	25 (6.2%)
Roadside	3 (0.7%)	2 (0.5%)
Burning	57(14.0%)	44 (10.9%)
Total	408 (100.0%)	404 (100.0%)

3.1.6 Diarrhoeal burden

There was a huge reduction [43 (10.6%) after NTSP implementation from 197 (48.3%) baseline] of those households whose family members suffered from diarrhoea with only 32 (84.2%) seeking medical treatment. For those who seek medical treatment, 27 (79.4%) spend less Ksh 1000, 4 (11.8%) spend Ksh 1001-3000 and 3(8.8%) Ksh 3000-5000. Households were 0.12 less likely to suffer from diarrhea after NTSP implementation (OR=0.12 p=0.0001).

Analysis of hospital records for the past three months prior to evaluation indicated that 97 cases reported in 5 health facilities with running stomach, diagnosed and treated of diarrhea related conditions. Bulang'i recorded 20(20.6%), Butula 29 (29.9%), Funyula 17 (17.5%) and Nambale 11 (11.3%). For Budalang'i 7(25.0%) were treated as in-patient,13 (18.8%) as out-patient; Butula 6 (21.4%) in-patient, 23 (33.3%) outpatient; Funyula 4 (14.3%) in-patient, 13 (18.8%) outpatient; Matayos 10 (35.7%) in-patient, 10 (14.5%) out-patient and Nambale 1(3.66%) in-patient, 10 (14.5%) out-patient. This study is consistent with an evaluation study on CLTS carried out by Joyce and Lorreta, (2009),in Ghana which indicated that in almost every community, members pointed to diarrhoeal disease reduction as a benefit of CLTS implementation. Some women in several communities were able to indicate that previously their children could have about 5 episodes of diarrhoea in a month, but the trend had been reduced to about 1 episode per month.

3.1.7 Sanitation option and Scaling up the ladder

Slightly more than a half, 179 (51%) of the respondents had ordinary/traditional pit latrine as there sanitation option while a paltry 7(2%) were using pour and flush latrine (see table 3.4 below).

About 253 (64.2%) respondents had scaled up the sanitation ladder after NTSP implementation compared to 44(10.9%) at baseline. Moreover, 174 (44.7%) of the respondents latrine were found to be full and had constructed new ones (emptied).

Most common materials used for construction of latrines superstructure was Iron sheet roofing and mud-walled 99(27.4) while grass thatched timber walled was the least used (1 (0.3%) material by respondents (See table 3.5 below)

Table 3.5: Sanitation option and Materials used for constructing s

Sanitation option	Frequency/Percentage (%)	
	Baseline	After NTSP implementation
Ventilated improved latrine (V.I.P)	111(35.7%)	91(25.9%)
Ordinary pit latrine	32(10.3%)	179(50.8%)
Pour and Flush latrine	19(6.1%)	7(2.0%)
Open pit latrine	145(46.6%)	73(20.7%)
Others specify	4(1.3%)	2(0.6%)
Total	311(100%)	352 (100%)
Materials for constructing latrines superstructure in Busia County		
Type of material		
Iron sheet roofing and brick walled	93 (30.9%)	88 (26.2%)
Grass thatched mud walled	82 (27.2%)	89 (26.4%)
Grass thatched timber walled	31 (10.2%)	17 (5.1%)

Iron sheet roofed mud walled	94 (31.2%)	99 (29.5%)
Other specify(grass thatched & walled	1 (0.3%)	43 (12.8%)
Total	301(100.0%)	336(100.0%)

4.0 DISCUSSION, CONCLUSION AND RECOMMENDATION

4.1.1 Latrine coverage

The study provides evidence that a pure behavioral intervention with no monetary subsidies substantially increased sanitation coverage in Busia County. Access to and usage of latrine improved significantly by 11% and 32% while open defecation reduced by 47.9% ($p < 0.0001$). The finding is consistent with community-led sanitation programs that have been evaluated in India that have increased latrine access by 20-50% (Pattanayak *et al.* 2009; Arnold *e.,t al.* 2010; Patil *e.,t al.* 2014). Compared to baseline, 114(27.9%), majority of latrines were found to be clean after NTSP implementation, 303(84.4%). Moreover, 256 (80.4%) of latrines eliminate bad odour. This finding is attributed to the fact that improvements in sanitation systems generally occur incrementally rather than in a single leap (Cairncross and Feachem, 1993). Studies also indicate that, presence of a latrine is no guarantee of a sustained behavior change for those with it. Users need to understand and want benefits of improved sanitation for themselves or their community for behavior change to last (Rebecca *et al.*, 2003).

According to the WHO, 2008, each household should have a latrine. In the study, sharing of latrine with neighbours reduced to 161 (39.7%) NTSP implementation from 315 (77.2%) baseline.

Although the NTSP led to significant improvements in sanitation, coverage, access, quality of latrines, decrease in sharing of latrines, open defecation, a risky sanitation practice, was not fully eradicated and villages did not reach total sanitation (100%) status or universal access as intended by the program, however the villages had been certified as to have attained total sanitation (ODF). This finding is attributed to cultural tradition practices by some respondents where mother or father- in-law is not allowed to share a latrine by son or daughter in- law, 189 (47.3%) yet only 123(75.9%) have provided latrine for mother or father-in-law.

The other reason, was failure by some children excreting in latrine, For the fear that children might fall into the toilet (Adeniyi, 1973, Mertens *et al.*, 1992; Esrey and Habicht, 1986). some respondents who don't own latrine thinking that its due to lack of money 30(54.5%) lack of money, difficult to keep it clean 1(1.9%), no land 6(10.9%), weak soil ground 5(9.1%), no reason 7(12.7%) and lack of knowledge 6(10.9%).

4.1.2 Hygiene practices, diarrhea burden and drinking water

Hygiene refers to practices ensuring good health and cleanliness for sanitation facilities (WHO, 2004). Today it is widely acknowledged that the provision of sanitation facilities and water supply without proper hygiene practices is not enough to bring down morbidity and mortality rates (Lagardere, 2007). The WHO (2004) defined the three key behaviors in hygiene - which can reduce diarrhoeal cases by up to 47% (Luby *et al.*, 2004) - as follows: hand washing after defecation/visiting latrine, before and after handling food, the use and maintenance of latrines and keeping drinking water free from faecal contamination. These behaviors are indicated as having the greatest impact on people's health. From the study findings, There was a significant improvement in hand washing in critical times with soap after latrine usage [329 (81.0%) after NTSP implementation from 186 (45.6%) baseline; $p < 0.001$]; 365 (90.6%) of households after NTSP intervention

wash hands with soap after handling children's excreta; 370 (91.1%) of households wash hands with soap before and after handling food as compared to baseline 217 (53.2%), $p < 0.001$. A large proportion of respondents were 9 times likely to wash hands after NTSP intervention which was highly significant. This significant improvement is attributable to sanitation and hygiene education that was given during NTSP implementation (Khan, 2008, Iagardere, 2007, WHO, 2004). According to WHO, (2008), a good hygiene education programme provides information and understanding about those behavioral changes which bring the greatest health benefits, and proposes gradual improvements both in practice and hygiene facilities. Hand washing with soap is one of the most effective and inexpensive ways to prevent diarrhoeal disease. By washing hands with soap, families and communities can help reduce child morbidity rates from diarrhoeal diseases by almost 50 per cent (UNICEF, 2008). In other related studies, Wilson *et al.* (1991), Pinfold *et al.* (1996) and Hoque *et al.* (1996) reported reductions in diarrhoea incidence through the promotion of hand washing. Kaltenthaler *et al.* (1991) also reports that hand washing with soap is an intervention that appears to be both highly effective, reducing diarrhoea incidence by between 27-89%. Significant association was therefore established between diarrhoea and washing of hands with soap after visiting latrine ($p = 0.001, 0.000$). That is, households that did not use soap in washing their hands after toilet visits were much more susceptible to diarrhoea attacks. An intervention study by Khan (1982), Han and Hlaing (1989) and Shahid *et al.* (1996), reduced the incidence of diarrhoeas through hand-washing with soap after defecation and before ingesting food.

There must be a hand washing basin with clean water and soap close to the toilet facilities which will make it possible for users of the sanitation facility to wash their hands after each visit. There should be separate, similar facilities near to kitchens or where food is handled (WHO, 2008). In the study, Compared to baseline, 178 (43.6%) of households, 274 (67.5%) had installed hand washing basin/leaky taps within 3 metres radius around the latrine ($P < 0.001$). Households in Busia County were twice ($OR = 2.41$ $P = 0.0001$; highly significant) likely to have a hand washing basin/leaky tap after NTSP intervention. However, not all those who had installed the leaky taps/ hand washing basins did not have water 251(65.9%). This represented a significant improvement from the baseline ($P < 0.001$). The finding might be attributed to inadequate water 10(10.2%), lack of knowledge of benefits of hand washing, 53 (54.1%).

According to Collins, (2008), Some 94% of diarrhoea cases are preventable through improved water supply sanitation and hygiene which according to Fewtrell *et al.* (2007) result in the isolation and/or destruction of pathogenic material and, hence, a break in the transmission pathway. In the study, there was a huge reduction [43 (10.6%) after NTSP implementation from 197 (48.3%) baseline] of those households whose family members suffered from diarrhea as reported by the households. Analysis of hospital records for the three months prior to evaluation indicated that 97 cases reported in 5 health facilities with running stomach, diagnosed and treated of diarrhea related conditions. According to Curtis *et al.* (2000), some causes of diarrhoea may be due to errors of metabolism, chemical irritation or organic disturbances but majority are due to water and sanitation.

In Busia County, main source of drinking water was borehole 146 (36.0%), protected spring 115 (28.3%), river 65 (16.0%) and others 1 (0.2%) while only a handful of respondents are connected to piped water, 79(19.5%). This might lead to lack of treatment of drinking water by some households, the quality of water source and other factors which include quantity of water, availability of latrine facilities coupled with open

defecation, housing conditions, level of education, economic status of households and general sanitary conditions (personal or domestic hygiene) surrounding homes might have contributed to the incidence of diarrhoea in for households (Timaeus and Lush, 1995). Higher incidence of diarrhea rates were recorded mainly in households that use other sources of drinking water other than piped water due to possible contamination of the water sources of which some are unprotected and unhygienic storage containers 68 (13.3%), non-treatment of water before use. According to Esrey *et al.* (1985), significant health gains accrue by ensuring access to an improved water source within 1 kilometer of the user's house. Further significant health gains are accrued once water supply is delivered on-plot through taps (Howard and Bartram, 2003).

4.1.3 Solid waste and scaling-up of the ladder

Domestic waste includes ordinary refuse, garbage, rubbish and all forms of refuse from household activities (Day, 2008). In the study, there was a significant improvement ($P < 0.001$) in general cleanliness of the compound with the most preferred solid waste disposal method being composite pit 214 (53.0%) and special place in the compound 119 (29.5%). However, disposal of solid waste in the bush was still being practiced 25 (6.2%) and burning 44 (10.9%). The significant improvement was attributed to increase in awareness in through NTSP. Solid waste that is not disposed properly from households poses a serious health hazard and lead to the spread of diseases (Altaf and Deshazo, 2010). Dumping solid waste in a special place poses as a health hazard for its more less of crude dumping (Gerransi, 2004, Andrew, 2009). According to (Day, 2008), unattended waste lying around attracts flies, rats, and other creatures that in turn spread disease. Wastes like broken bottles, empty cans collect water in them when it rains, and this may become breeding ground for mosquitoes. Moreover, they can cause injury and general unsightness/nuisance in the compound (Andrew, 2009).

4.1.4 Sanitation options, scaling up the ladder and sustainability of sanitation behavior change

According to the study findings, the most preferred sanitation option was ordinary pit-latrines 179 (50.8%) compared to 32 (10.3%) baseline. The increase might be attributed to those who had open pit latrine opted to scale up their sanitation option to ordinary pit latrine. Moreover, there were those without latrine might have opted to construct ordinary pit latrine instead of other sanitation option. It's should be noted that before implementation of NTSP there were more V.I.P latrines 111 (35.7%) than after implementation of NTSP 99 (25.9%). This drop could be attributed to those households filling latrines but could not construct new ones because of cost implication or preferred ordinary pit latrine.

From the study findings, it's clear that there was scaling up the sanitation ladder in the study area. The sanitation coverage after NTSP improved from 309 (76%) to 351 (86.5%). The scaling of sanitation ladder included repairing of existing latrines and building new ones using locally available materials. The most common scaling up the ladder was construction of ordinary/ traditional pit latrines because they can easily build using locally available materials and cost effectiveness.

Only those villages which had been declared to have achieved total sanitation (100%) had been included in the study. However, on evaluation of the NTSP, it was established that the sanitation coverage stood at 86.5%. According to a study by Joyce and Iorreta, (2009), found out that communities that achieved total sanitation status within two months of triggering achieved markedly faster and higher access gains and remained compliant more often than communities that took many months to achieve total sanitation status. Close to 95% percent of the quickly attained total sanitation communities had sustained their behavior change 4-28 months after ODF declaration, as evidenced from environmental observation, latrine ownership records, reported

ownership rather than on behavior change to eliminate open defecation. Study findings indicate that there are still some households without latrine sharing is still practiced, hygiene practices are also lower than expected. This is a clear indication that the village members slipped back to poor sanitation practices. Implementing agencies can effectively influence most factors associated with achievement and sustainability of sanitation behavior outcomes for scaling up sanitation (Joyce and lorreta, 2009). It is not yet known what impact this has on health when a community fails to sustain total sanitation status. Whether improved sanitation access must be 100 percent to reach evident health improvements, or whether 80 to 90 percent access might reduce the incidence and prevalence of diarrhea. In the study area, the reported incidence of diarrhea fell markedly. Studies in countries where total sanitation programmes had been implemented earlier found that 10 to 30 percent of households slip back to or continue open defecation including poor hygiene practices in communities previously declared to have achieved total sanitation status (Joyce and lorreta, (2009). It is clear that scaling up sanitation requires programs with built-in incentives and checks to support sustainable behavior change.

After NTSP implementation, the villages were declared to have achieved total (100%) sanitation. On evaluation, the sanitation coverage was found to be 86.5%, hand washing with soap in critical times [329 (81.0%) after NTSP implementation from 186 (45.6%) was not 100%. This clearly indicates that though there was initial sanitation behaviour change, sustainability was the challenge. A rapid assessment of the Total Sanitation Campaign in India conducted by WSP found a strong positive correlation between program processes and desired outcomes, including processes for catalyzing behavior change (WSP, 2012). A study in Bangladesh on the sustainability of NTSP outcomes concluded that behavior change at scale was sustained by a shift in social norms away from open defecation, and that sustained latrine usage and ownership were associated with market availability of goods and services, and continued government programs for sanitation promotion and follow-up by facilitators on a regular basis (WSP, 2012). From the study findings, it was noted that there was inadequate follow-up with the communities by the facilitators and public health officers to the extent that in some villages, the facilitators did not undertake any follow-up visits after the triggering exercise. Moreover, for sustainability of sanitation behavior change, there ought to be leadership support from various government and other partnership agencies in terms of resources to facilitate sanitation and hygiene promotion, fellow-up and logistics.

4.2 Conclusion

The NTSP is one important non-subsidies approach that leads to sustainable sanitation behavioral changes. It has significant potential to empower many communities to improve the national coverage for sanitation and hygiene practices. The NTSP pilot project undertaken in Busia County has demonstrated an approach that can rapidly change perception and attitude of communities towards sanitation and hygiene practices to inspire actions and take up improved services. It transforms the community perception and understanding of sanitation and builds on local practices and innovations to provide appropriate services to meet the needs and capacity of the communities. The study focused on villages that had been declared to have achieved total (100%) sanitation, the coverage stood at 86%, a clear indication of that some community members had back-slided i.e. some members had gone back to poor sanitation and hygiene practices like open defecation among others. For the purposes of rolling up the NTSP, some lessons learnt ought to be adopted in order to achieve total sanitation in the country.

4.3 Recommendation

- i) Community participation and mobilization to ensure that all members of the community members are involved in triggering process. Carrying out of NTSP triggering process ought to be done on a weekend to include all members of the villages
- ii) Sanitation and hygiene education and promotion is crucial for the purpose of creating awareness to the community members
- iii) Training of facilitators and triggering of the villages. This will equip the facilitators the necessary tools for triggering the villages
- iv) Follow-up and monitoring ought to be done on a regular basis by facilitors. This ensures sustainability of sanitation behavior change by community members and avoid fall back to poor sanitation and hygiene practices
- v) Logistics will ensure proper and organized implementation of NTSP during roll-out phase in entire country.

REFERENCES

- Adeniyi, J. D.** (1973). Human waste disposal programme: the place of health education. *International Journal Health Education*. 16: 206-13.
- Andrew M.** (2009). *Destiny Africa's Green Africa plastics recycling*, Kenya. Government printers
- Altaf MA, Deshazo JR.** (2010). Household Demand for Improved SolidWaste Management: A Case Study of Gujranwala. Pakistan. *World Development* 2010 . 24: 857-868.
- Cairncross S. and Feachem R.** (1993). *Environmental Health Engineering in the Tropics: An Introductory Text*. Chichester: John Wiley & Sons
- Curtis V, Cairncross S, Yonli R.** (2000). Domestic hygiene and diarrhoea— pin pointing the problem. *Tropical Medicine and International Health*, 5:22–32.
- Collins, T.** (2008). Providing toilets, safe water is top route to reducing world poverty: UN University. http://www.eurekalert.org/pub_releases/2008-10/unu-pts101408.php (Date assessed: 19th November, 2008).
- Deepak, S. and Moulik, G.** (2007). *Community-Led Total Sanitation in Rural Areas An Approach that Works*. WSP, India
- Gerrans, G. C.** (2004). Waist Deep in Waste – Reduce, Re-Use, Recycle. *Spectrum*; Vol. 32 (1): 32-36.
- Esrey S., Potash JB, Roberts, L, and Shiff, C.** (1991). Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. *Bulletin of the World Health Organization*, 69:609–621.
- Esrey, S. A. and Feachem, R. G.** (1986). Interventions for the control of diarrhoeal diseases among young children: promotion of food hygiene. WHO/CDD/89.30, WHO, Geneva.
- Huttly, S, Morris S, Pisani, V.** (1997). Prevention of diarrhoea in young children in developing countries. *Bulletin of the World Health Organization*, 75:163–174.
- Howard, G.** (2002). *Water Supply Surveillance: A Reference Manual*. WEDC, Loughborough, UK.

Huttly, S. R. A., Lanata, C. F. and Gonzales, H. (2004) Observations on handwashing and defaecation practices in a shanty town of Lima Peru. *Journal of Diarrhoeal Diseases Research*. 12:14–18.

Hoque, B. A., Juncker, T., Sack, R. B., Ali, M. and Aziz, K. M. A. (1996). Sustainability of a water, sanitation and hygiene education project in rural Bangladesh: a 5-year follow-up. *Bulletin of the WHO*. 74: 431–437.

Fewtrell, L., Prüss-Üstün, A., Bos, R. and Bartram, F. G. (2007). Water, sanitation and hygiene: quantifying the health impact at national and local levels in countries with incomplete water supply and sanitation coverage. World Health Organization, Geneva, (WHO Environmental Burden of Disease Series No. 15).

Joyce M. and Lorreta R., (2009). Evaluation of strategy for scaling up Community led total sanitation in Ghana Final report, unicef

Kaltenthaler, E., Waterman, R. and Cross, P. (1991). Faecal indicator bacteria on the hands and the effectiveness of hand-washing in Zimbabwe. *Journal of Tropical Medicine and Hygiene*. 94:358–363.

Kar, K. (2008). Subsidy or self respect? Participatory community sanitation in Bangladesh. Bangladesh, Prakashan

Kamal, K. and Chambers, C. (2008). Handbook on community- Led Total Sanitation.UK, Plan International

Kumar, C. (2004). A guide to participatory approaches to achieving total sanitation. Bangladesh, Prakashan

Lagardere, J. (2007). Methodology for a health and hygiene baseline survey for WSUP projects. MSc. Thesis: Cranfield University. Pp – 6

Mertens, T. E., Jaffar, S., Fernando, M. A., Cousens, S. N. and Feachem, R. G. (1992). Excreta disposal behaviour and latrine ownership in relation to the risk of childhood diarrhoea in Sri Lanka. *International Journal of Epidemiology*. 21(6):1157-1164

MoPHS, (2010). CLTS Trainer’s manual. Nairobi, Government Printers

Pinfold, J. V. and Horan, N. (1996). Measuring the effect of a hygiene behaviour intervention by indicators of behaviour and diarrhoeal disease. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 90:366–371.

Rebecca, S. Andrew, C. and Beenakumari, G. (2003). Sanitation and the poor. WELL Resources Centre for Water, Sanitation and Environmental Health. London, UK

Shahid, N. S., Greenough, W. B., Samadi, A. R., Huq, M. I. and Rahaman, N. (1996). Hand washing with soap reduces diarrhoea and spread of bacterial pathogens in a Bangladesh village. *Journal of Diarrhoeal Diseases Research*. 14:85–89.

Timaeus, I. M. and Lush, L. (1995): Intra-urban differentials in child health. *Health Transition Review*. 5:163–190.

Water Aid, (2007). Community Led Total Sanitation (CLTS).An Evaluation of the Water Aid's
CLTS Programme in Nigeria. Water Aid, Nigeria

Wilson, J. M., Chandler, G. N., Muslihatun and Jamiluddin. (1991). Hand washing reduces diarrhoea episodes: a study in Lombok, Indonesia. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 85:819–821.

WSP, (2012). Economic Impact of poor sanitation in Sub Saharan Africa. World Bank

WHO, (2004).Water sanitation and health. Geneva, WHO WSP-Knowledge Links. 2005. Formative Research for IEC Manual. New Delhi: Water and Sanitation Program-South Asia

WHO. (2008). Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. <http://www.who.int/topics/diarrhoea/en/> (Date assessed: 12th November, 2008).

WHO , (2008). Global water and supply and sanitation assessment 2000 report. Geneva, WHO

E-commerce and Consumer Rights: Applicability of Consumer Protection Laws in Online Transactions in East Africa. *

Abstract

The huge platform that e-commerce has provided East African traders for business is noteworthy. Not only has the traders benefitted from transgressing territorial boundaries for the sale of their products, the consumer of goods and services have been provided with multiples choices of products and quality goods at competitive prices. Internet has thus revolutionalized the way Kenyans and the rest of the world buy and sell their products.¹

In East Africa e-commerce is still in the formative stages and consumers are opening up to the idea of online shopping and relatively few fully fledged online companies are already in operation in these countries. The frequent setback with trade conducted with the use of internet is data protection. Protection of data that is made available online by the consumer is misused and this is one of the major concerns that have emerged in the recent times.

Consumers have various rights that are granted to them by the provisions of our Consumer protection laws. However these laws are ambiguous as to whether such provisions would be applicable to online transactions. Generally the terms of data protection are dependent on the contract that the parties have entered into. The disclosure and non-disclosure of the same would thus depend on that contractual relationship. Another one of the major concerns of a person dealing online is the jurisdiction of the cases in case of disputes. This paper seeks to establish the challenges and benefits of online trading within the East Africa Community e-commerce sector with Kenya as a case study. Further it also seeks to establish the performance of existing online business as well as establish the relationship between e-commerce models and their performance. The paper recommends that in order to improve customer trust in online businesses, the business owners need to invest in the requisite technology and system to secure their customers and their businesses as well as create consumer awareness to negate the poor perception of the sector by the consumers.

On the other hand, the government needs to invest in the enactment of laws and regulatory infrastructure that supports online purchasing. Most importantly the consumers have to be more willing to purchase products and services online. Finally, the governments in East Africa have to look into the policies and invest in system that will improve the current internet penetration rates across the East Africa members' states if the e-commerce is going to thrive.

Keywords—e-commerce; Consumer right; Online transaction.

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¹Kariuki.(2016/January 19). 'E-Commerce gaining popularity in Kenya as Mobile Phone technology grows.' *Daily Nation*. Retrieved from

I. INTRODUCTION

E-commerce though not specifically defined in our consumer protection and welfare laws,² is in general what others will call e-business, internet or online shopping. Recently Kenya has witnessed increase in the number of online shopping portals like Olx Kenya, Cheki, Rupu, Pigiame, and Jumia among other, where the physical presence of the customer in the supplier's store has been dispensed with. The traditional physical presence of a customer to order for the goods or services has been substituted with an online offer and acceptance. Are these transactions within the purview of our laws though not expressly stated? If not are they applicable by implication to guarantee consumer rights generally? What protection does the customer information available online has? Finally in case of a dispute where both the buyer and seller are in different countries which law applies, is it the customer's residence law or the seller residence law. These challenges on online trading will be the focus of this research paper and a recommendation on enactment of laws that supports e commerce will be proposed not forgetting investment in modern technology viable to online business.

II. CONSUMER PROTECTION ACT³

Consumers have various rights that are granted to them by the provisions of our Consumer protection laws.⁴ The Kenyan Consumer Protection Act⁵ is the fundamental and principal Act that lay down and guarantees rights to consumers. *In John kinyua Munyaka & 11 others vs. The county government of kiambu and 3 others*,⁶ for example the court noted that the health and safety of consumers was paramount. Further regardless of whether the retailers were pursuing to enforce their own rights or whether they were petitioning on behalf of their clientele the regulation of drinking hours cannot, by any stretch of imagination, be construed to interfere with consumer rights.

Although the Act does not mention online transaction, the interpretation section defines 'internet agreement' as consumer agreement formed by text-based internet communications. Further sections 31, 32 and 33 on disclosure of information on internet agreement, availing of a copy of the agreement to a consumer and circumstances for cancellation of an internet agreement prescribes the basic requirement for an online transaction in Kenya. However the Consumer Protection Act provides a narrower picture. The challenges facing e-commerce such as misuse of data made available by online transaction and the problem of jurisdiction in case of disputes are not covered by this Act bringing more ambiguity and confusion in addressing the same challenges. In most online shopping portals the terms are already fixed with only two options that is 'I Agree' or 'I Disagree' icon .This leaves the customer with no other option, except to accept the terms of the contract if the customer wants to move forward with the transaction. The negotiation is lacking, section 31 of the Consumer Protection Act provides that before a customer enters into an internet agreement ,the supplier shall disclose the prescribed information to the consumer with an opportunity to accept or decline or correct errors before entering into the agreement. The section brings about negotiation and standard contract with the two icons "I Agree" or "I Disagree" would be cancelled since the supplier did not

² Consumer Protection Act No 46 of 2012 and Competition Act 2009.

³ Act No. 46 of 2012.

⁴ Lunani S (2017). *Consumer Protection Policy and Practice in East Africa* .A text book on consumer protection laws in the East Africa.

⁵ *Supra*.

⁶ *John kinyua Munyaka & 11 others vs. The county government of kiambu and 3 others*.

provide the customer with an opportunity to accept or decline the agreement or to correct the errors immediately before entering into it.⁷

III. KENYA INFORMATION AND COMMUNICATION ACT 2009⁸

Apart from the principal law for consumer protection, many other laws cover online transaction. The Kenya Information and Communication Act 2009 is another functional and comprehensive legislation which provides a legal framework for e-commerce.⁹ It essentially covers commercial transaction, in specific between the government, its agencies and ordinary citizens. The transactions are focused towards e-governance and are aimed at implementing measures for authentication of the electronic records by use of digital signatures for issuing or granting of any licence, permit, sanctions or approval.¹⁰ The Kenya Information and Communication Act is an attempt by the government to digitalize its services by making every piece of information available online and further ensuring that such transactions are secured.¹¹ It further creates offences that protect e commerce transactions.¹² The most significant characteristics of this Act, is that it provides legal recognition to electronic records.¹³ The Act reinforces the Evidence Act on admissibility of electronic records.¹⁴ This legal recognition forms the foundation of all e commerce undertaken by customers and effective enforcement of all the rights of the customer, if ignored and infringed. The recognition does not cover all the aspects of e commerce with respect to consumer welfare. It covers primary commercial transactions between the public and government in effective service delivery. It also provides an avenue for the Minister responsible for Information to prescribe regulations providing for the manner and format in which such electronic records shall be filled, created or used.¹⁵ An ordinary Kenyan does not necessarily enter into electronic contracts but he impliedly uses electronic commerce for online shopping, online banking and money transfer activities. No specific provision for the same has been laid down under the Act even though the preamble to the Act provides that the Act facilitate the development of electronic commerce.¹⁶

IV. LAW OF CONTRACT

Although the Law of Contract Act,¹⁷ is silent on electronic contracts in Kenya, the Consumer Protection Act and Kenya Information and Communication Act provides legal recognition to the concept of electronic contracts. The Kenya Information and Communication (Amendment) Act 2009 introduced section 83J which affords validity to contracts formed through electronic means. Section 83J states that:

In the context of contract formation, unless otherwise agreed by the parties, an offer and acceptance of an offer may be expressed by means of electronic messages, thus where an electronic message is used in the formation of a contract, the contract shall not be denied validity or enforceability solely on the ground that an electronic message was used for the purpose.

⁷ Section 33(1)(b) of Consumer Protection 2012.

⁸ Chapter 411A Laws of Kenya.

⁹ See preamble to the Kenya Information and Communication Act 2009.

¹⁰ Section 83S of the Kenya Information Communication Act. 2009

¹¹ Section 83N *Ibid*.

¹² Sections 83U, 83V, 83W, 83X, 83Y, 83Z, 84A, 84B and 84C. *Ibid*

¹³ Section 83 G.*Ibid*.

¹⁴ Section 106A-106I of the Evidence Act Cap 80 Laws of Kenya.

¹⁵ Section 83S *ibid*.

¹⁶ *Supra* Note 7.

¹⁷ Chapter 22 Laws of Kenya.

The amendment has thus brought out validity even to e-contracts but fails to lay down the method for the implementation of the fundamental principles for formation of a valid contract like acceptance, revocation etc. The validity and enforceability granted to e contracts, is a step towards ensuring that the rights of consumers who carry e-commerce are protected. Though e commerce concept is valid, in practice it is difficult to ensure that the essentials of a valid contract are complied with. For example it is difficult to distinguish between a person competent to contract or otherwise when transacting online. This often results in minors, lunatics and other incompetent people entering into contracts. As was held in *Halima Abdinoor Hasssan & 3 Others v. Corporate Insurance Company Limited [2015] e KLR*, the parties to a contract of insurance or any other contract must have legal capacity to enter into a binding contract. A contract with a minor or lunatic is void. Such contracts would still be void online.

Another challenge on e contracts is its admissibility in a court of law. Section 106 B of the Evidence Act¹⁸ provides for admissibility of electronic records. It states that any information contained in an electronic record which is printed on paper, stored recorded or copied in optical or electro- magnetic media produced by a computer shall be deemed to be also a document and shall be admissible in any proceedings, without further proof or production of the original as evidence of any contents of the original or of any fact stated therein where direct evidence would be admissible. Hence, an e contract can thus be admissible as evidence and such a positive step ensures that the contracts if entered by a consumer online for provision of a particular service or good if breached can be redressed. In the case of *Republic v. Barasa Wayu Matuguda [2011] e KLR* the court held that: “...any information stored in a computer which is then printed or copied shall be treated just like documentary evidence and will be admissible as evidence without the production of the original.”

However section 106B also provides that such electronic evidence will only be admissible if the conditions laid out in that provision are satisfied. In *Richard Nyagaka Tongol vs. Independent Electoral & Boundaries Commission & 2 Others [2003] e KLR*. Referring to the case of *Paul Gitenyi Mochorwa vs. Timothy Mose E. Bosire*,¹⁹ the judge held: “Section 106 A-106 H of the Evidence Act are statutory safeguards for the integrity of documentary evidence in relation to the production of electronic records.” Section 106 has been amended to include admissibility of computer outputs in the media, paper, optical or magnetic form. Sections 106F, 106 G, 106H and 106 I of the Evidence Act raises a presumption as regards electronic agreements, electronic records, digital signatures certificates and electronic messages. Thus the amendment and new introductions brought about in the ancillary Act of parliament with respect to electronic records guarantee that consumer rights are being protected by legally recognizing the contents and further making them admissible as evidence in a court of law. The irony however is that even with the application of such laws; consumer rights in e commerce are still infringed.

Protection of data that is made available online by the consumers is misused and this is one of the major concerns that have emerged in the recent times. Generally the terms of data protection are dependent on the contract that the parties have entered into. The disclosure and non-disclosure of the same would be dependent on the contractual relationship between the parties. If any person who knowingly does an act which causes an unauthorized modification of data held in any computer system shall on conviction be liable to a fine not

¹⁸ Cap 80 Laws of Kenya.

¹⁹ *Kariuki v. Republic*, Petition No. 9 of 2002.

exceeding five hundred thousand shillings or imprisonment for a term not exceeding three years or to both.²⁰ Nonetheless, there is no express legislation that contains provisions for data protection for online transactions. The Kenya Information and Communication Act only cover some aspect. For example under section 83Z any person who knowingly discloses any password, access code or any other means of gaining access to any program or data held in any computer for any wrongful gain, unlawful purpose or knowingly that the disclosure is likely to cause prejudice to any person shall commit an offence and on conviction be liable to a fine not exceeding two hundred thousand shillings or to imprisonment for a term not exceeding two years or to both.²¹ These are the only provisions that act as a legal framework for data protection in the country. Apart from the legal safeguards in place, it is essential for the entity collecting information to have a privacy policy that offers data protection. Unauthorized access to personal information available online and any misuse of such personal information should be punished.

Another one of the major concerns of a person dealing online is the jurisdiction of the cases in case of disputes. Though it is a well-known fact that consumers can approach a resident magistrate court depending on their pecuniary limits, the question as to which of these courts has jurisdiction is among the areas of ambiguity.

In general civil suits are instituted following the provision of section 15 of the Civil Procedure Act,²² which states that every suits shall be instituted in a court within the local limits of whose jurisdiction the defendant at the time of the commencement of the suit actually and voluntarily resides, or carries on business, or personally works for gain or the cause of action wholly or in part arises.²³ Whether this law would be applicable to online transaction is where the confusion lies.

Further the internet can be accessed from anywhere in the country and the difficulty arises where the online good or service provider is based in another country with regard to jurisdiction. In such cases which law will apply, is it the supplier residence law or consumer residence law. This is an area that has not been fully addressed. Section 3 of the Consumer Protection Act provides that when interpreting or applying the Act a person, court or the Advisory Committee may consider appropriate foreign and international law. What is 'appropriate law' in the eyes of the court? What are the tests for such? This is even more ambiguous. Further the Penal Code,²⁴ under section 6 states that when act or omission which if wholly done within the jurisdiction of the court would be an offence against an Act of Parliament is done partly within and partly beyond the

²⁰ Section 83X *ibid*.

²¹ Section 83Z (a),(b) and (c) *ibid*.

²² Cap 21 Laws of Kenya.

²³ *Kimani Waweru & 28 others v Law Society of Kenya & 12 others* [2014] eKLR. Where the court held that in determining the place for trial with respect to the any proceedings where there is an application for transfer, the court must therefore take the convenience of the parties and their witnesses as a primary consideration. Indeed, one of the principles for the determination of the place of suing in an application for the transfer of cases pending before the subordinate courts is the place where the defendant resides or carries on business.

jurisdiction of the shall be tried and punished under the Act. Can this provision be used to remedy the ambiguity in our Consumer Law?

The advancement of technology and availability of internet in Kenya offers a platform for a majority of bank services online. A part from the electronic and card payment, mobile banking in Kenya is one of other constructive facilities provided by banks for fund transfer.²⁵ Safeguard needs to be taken in this area as well. In *Benard Murage v Fineserve Africa Limited & 3 others*,²⁶ the risk of misuse of customer information in the use of the Thin Sim Technology was emphasized and the customers' privacy needs to be safeguarded.

Although the laws described above provide protection mechanism for online transactions, consumer rights can still be violated in cases where the online shopping portal itself is a fraud.

Section 84B of Kenya Information and Communication Act²⁷ provides that any person who by fraud causes loss of property to another person by an input alteration, deletion or suppression of data or any other interference with the functioning of a computer system with the intent to procure for himself or another person an advantage commits an offence and upon conviction is liable to a fine not exceeding two hundred thousand shillings or to imprisonment for a term not exceeding three years or to both.

Safety measures undertaken by the customer for protecting their rights would include for example paying cash on delivery. Their bank information in this regard is protected from misuse when made available online.

V. CONCLUSION

Though there exist various Act of Parliament guaranteeing consumer rights, the Acts are insufficient and or lacking in protecting e commerce. The government needs to invest in the enactment of laws and regulatory infrastructure that supports online purchasing. Most importantly the consumers have to be more willing to purchase products and services online. Finally, the governments in East Africa have to look into the policies and invest in system that will improve the current internet penetration rates across the East Africa members' states if the e-commerce is going to thrive.

References.

Consumer Protection Act No. 46 of 2012.

Competition Act. No 12 of 2012.

KariukiJ. (2016/January 19). 'E-Commerce gaining popularity in Kenya as Mobile Phone technology grows.' *Daily Nation*. Retrieved from www.nation.co.ke > Business.

Law of Contract Act Cap 23 Laws of Kenya.

Lunani,S. (2017) *Consumer Protection Policy and Practice in East Africa*. (Unpublished).

²⁵*Supra* note 1.

²⁶ High Court ,Nairobi, Petition 503 of 2014[2015] e KLR

BASELINE SURVEY OF SANITATION AND HYGIENE IN BUSIA COUNTY, KENYA

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Key words: sanitation coverage, hygiene practices, solid waste, drinking water, diarrhoeal burden

Abstract

Busia County was among counties with lowest sanitation coverage 42%. Baseline survey was part of the main study 'evaluation of the social-economic returns on investment (SROI) on National Total Sanitation Programme (NTSP) in Busia County' which was to establish sanitation coverage and hygiene practices. Quasi-experimental study design was used while multi stage-random sampling was applied to sample respondents from villages. About 459 respondents participated in the study while data collection tools included structured questionnaires, and observation checklist. Latrine coverage in Busia County was 309 (76.1%). More than half, 193 (62.9%) of the latrines were not hygienically clean and most of them 193 (62.9%) emitted bad odour/smell. Only 180 (45.1%) of respondents wash their hands with soap after visiting the latrine. Main source of drinking water was borehole 188 (46.1%) of which was not clean 188 (46.1%). About 194(48.0%) respondents indicated of their family suffering diarrhea in the last two weeks prior to the baseline survey.

1.0 INRODUCTION

Sanitation refers to interventions for the safe management and disposal of human excreta, with the principal safety mechanism being separation of excreta from all future human contact. It includes both hardware (e.g. latrines, sewers) and software (hand washing, regulations) (WSP, 2012; WHO, 2010).

There are currently 2.6 billion people worldwide without access to improved sanitation. Inadequate sanitation is a key link in the cycle of poor sanitation related diseases and poverty that affects the world's poorest people (Andrew, *et al.*, 2003; WSP, 2012). There are an estimated 565 million people in Sub-Saharan Africa without access to improved access to sanitation and, worse, 224 million practice open-defecation, the riskiest sanitation practice of all (UNICEF, 2009a). According to a desk study carried out by the Water and Sanitation Program, 2012, poor sanitation costs Kenya Ksh. 27 billion each year. This sum is the equivalent of US\$8 per person in Kenya per year or 0.9% of the national GDP. About 21 million Kenyans use unsanitary or shared latrines. Water and sanitation programme, 2012 established that poorest quintile is 270 times more likely to practice open defecation than the richest. According to a rapid assessment of water and sanitation carried out by Ministry of Health in 2012, the national sanitation coverage stood at 49%. Busia County was among the

counties with the lowest (42%) sanitation coverage, with more than half of the population defecating in the open. Diarrhea and cholera were among the top three diseases causing morbidity and mortality in Busia County and with Cholera outbreaks frequently being reported in the Busia County (MoPHS, 2012).

1.2 Study objectives

The aim of baseline survey was to establish the level of sanitation and hygiene practices in Busia County, with a view of implementing National Total Sanitation Programme (NTSP).

1.3.2 Specific Objectives

- 1) To determine sanitation coverage in Busia County
- 2) To determine hygiene practices in Busia County
- 3) To determine diarrhoeal burden in Busia

2.0 MATERIALS AND METHODOLOGY

2.0 Study site

This study was carried out in Busia County because Busia was among counties with lowest sanitation coverage of 42% hence NTSP was launched in 2012 as a pilot programme by the ministry of Health in pursuit of total sanitation. Busia County is one of the 47 Counties in Kenya. The County covers an area of 673.6 square km and lies between latitudes 0° 1' 36'' South and 0° 33' North and longitudes 33° 54' 32'' East and 34° 25' 24'' East. The County is divided into five administrative divisions namely Township, Funyula, Matayos, Nambale and Butula. The divisions are further sub-divided into 17 locations and 52 sub-locations. According to the Busia county statistics (2008), 65.99% suffers absolute poverty, 61.4% food poverty. The major causes of poverty in Busia County have been identified as food insecurity, unemployment, low literacy levels, poor health, polluted environment among others. The sanitation coverage stands at 42% and latrine coverage is at 58% (MoPHS, 2011).

2.2 Research design

Quasi-experimental study design was used in the study. Data was collected before-and after the intervention without control group (Kothari, 2004). The target population was 28,130 households who were the beneficiaries National Total Sanitation Programme (NTSP).

2.3 Sampling design

Multi-stage random sampling design was used to sample the location, sub-location and villages from the four sub- County of Busia County. Random sampling will be used to sample within, locations, sub-locations, villages and households for study. The sampling frame was based on Busia County administrative boundaries. The formula previously used by fisher *e.t al.*,(1998) was adopted to determine the sample size of this study.

$$\text{Sample size } n = \frac{Z^2pq}{e^2}$$

Z- Standard normal deviate set at 2.17 (97% confidence interval)

q = (1-0.42) =0.58

P-Sanitation coverage in Busia County, 42% (MoPHS, 2010)

e- Precision set at 0.03 to improve precision and accuracy

$$= \frac{2.17^2 \times 0.42 \times 0.58}{0.03^2}$$
$$= 459$$

A total of 459 respondents were included in the study. Respondents per Sub- County was allocated proportionately as per the households in the four Sub county where NTSP was implemented (See table 2.1).

Table 2.1: Sample Size distribution in the study area

Division	Number of Households	Percentage	Households(H)
Matayos	11733	41.7	191
Nambale	6009	21.3	98
Butula	5325	18.9	86
Funyula	5092	18.1	83
Total	28130	100.0	459

The research tools were piloted in Igero sub location, Matayos division of Busia County. This sub location was not included in the study but had the same characteristics with the study area. The lesson learnt through this process was incorporated into the final research tools before the actual study was carried out. Data collection tools included structured questionnaires and observation checklists. To ensure reliability and validity, 8 public health officers were recruited as research assistants and trained on the basics about the study for 3 days.

3.0 RESULTS

Although a total of 450 respondents were to participate in the study, only 408 successful interviews were done during baseline survey, representing a response rate of 90.7%. This was because the county is geographically vast and also time allocated for baseline survey was short.

3.1 Socio-Demographic Profile:

A total of 408 household/respondents were interviewed during the baseline survey in Busia County of which Budalang'i sub-county had 69 (17%), Butula Sub-county 53 (13%), Matayos Sub-county 59 (14%), Nambale sub-county 177 (43%) and Samia Sub-county 50 (12%). The mean age of respondents was 42 years of which 53% were male (Table 3.1). Greater proportion of the respondents had attained secondary level education 148 (36%) while 102 (25%) had no education at all (Table 3.1). Most respondents were not employed 155 (38%) while most of those employed or self-employed earned 20,001 – 50,000 returns per month (Table 3.1). The mean number of people per family was 8 members (Table 3.1).

Table 3.1: Socio-demographic data for baseline survey

Variables	Frequency N=408	Proportion (%)
Sub-county		
Budalangi	69	17
Butula	53	13
Matayos	59	14
Nambale	177	43
Samia	50	12
Age of respondents		
Mean, Std. Deviation	41.5, 13.849	
Education level of respondents		
University/College	79	19
Secondary	148	36
Primary	79	19
None	102	25
Occupation of respondents		
Self employed	130	32
Formally employed	123	30
Not employed	155	38
Income returns N=253		
<10,000	52	21
10,001-20,000	78	31
20,001-50,000	80	32
>50,000	43	17
Number of people in family		
Mean, Std. Deviation	8, 4.14	
Type of house		
Grass thatched, mud walled	136	33
Semi-permanent	190	47
Permanent	82	20

4.3 Sanitation Coverage

Latrine coverage in Busia County was 309 (76.1%) and for those who do not have latrine, most 76 (75%) of respondents disposed of their excreta in neighbors' latrine, 20 (19.2%) defecate in bush/forest, 2 (1.9%) special place, 1(1%) road side while 3(2.9%) of those without a latrine did not indicate where they dispose of their human waste. Majority, 320 (78.4%) of the respondents confirmed that there were households without latrines.

Majority, 46 (92%) of respondents in Samia Sub-county had latrines while Nambale Sub-County had the highest 38(21%) number of respondents without latrines (Table 3.2). Slightly more than a half, 54(52.9%) of the respondents without latrines did not attain any form of education ($\chi^2 = 88.331$, $df=3$, $p=0.000$)

Table 3.2: Latrine coverage

Sub-county	Do you have a latrine		P-value
	Yes	No	
Budalangi	51 (74%)	18 (26%)	0.005
Butula	35 (66%)	18 (34%)	
Matayos	38 (64%)	21 (36%)	
Nambale	139 (79%)	38 (21%)	
Samia	46 (92%)	4 (8%)	
Total	309 (76%)	99 (24%)	

There was statistical significant difference between sub-county and latrine ownership

($p=0.005$). Respondents of age < 30 years exhibited a higher percentage 33(38.8%) without a latrine while more female 60 (31.3%) of respondents did not have latrine than their male counterpart 39 (18.1%). A significant statistical difference between sex and having a latrine was established ($p=0.002$).

Greater proportion of latrines in Busia County as established from the survey were made of Iron sheet and mud walled 97(31.9%) followed closely by Iron sheet and brick/block walled (Figure 3.3)

Table 3.3: Materials for roofing and walling the superstructure

Materials for roofing and walling the superstructure	Frequency N=304	Percentage
Grass thatched and Mud walled	82	27.0
Iron sheet and brick/block walled	93	30.6
Grass thatched and timber walled	31	10.2
Iron sheet and mud walled	97	31.9
Other specify (Grass thatched for roof and wall)	1	0.3
Total	304	100.0

The main reason given for not owning a latrine is because of lack of money 49 (50.5%), while 2 (2.1%) did not give a reason for not having a latrine (Table 3.4)

Table 3.4: Reason for not having a latrine

Reason for No Latrine	Frequency N=97	Percentage
Lack of money	49	50.5
No land to build latrine	32	33.0
None	3	3.1
No problem	11	11.3
Difficult to keep it clean	2	2.1
Total	97	100.0

About 169 (42.2%) of households have open pit latrine and only 17 (4.2) constitute flush toilet (Table 3.5).

Table 3.5: Type of latrine

Type of latrine	Frequency N=399	Percentage
Ventilated improved pit latrine (VIP)	106	26.6
Flush toilet	17	4.2
Open pit-latrine	169	42.4
Unimproved toilet/Ordinary pit latrine	14	3.5
None	93	23.3
Total	399	100.0

Sharing of toilet is high in Busia county, with 271 (66.6%) of households reporting to be sharing latrine with neighbors. The study further reveals that sharing of latrines with neighbours was more rampant 58(84.1%) in Budalang'i compared to other sub-counties counties (Table 3.6). However, there was no statistical significant difference between sub-counties and sharing of a latrine with neighbours ($p=0.555$).

A higher proportion 66 (64.7%) of respondents who had not attained any level of education are less willing to share a latrine with son or daughter-in-law and father or mother-in-law ($p<0.001$).

Table 3.6: Latrine sharing within sub-counties

Sub-county	Share latrine with neighbors		Total	P-Value
	Yes	No		
Budalangi	58 (84%)	11(16%)	69	0.55
Butula	38(72%)	15(28%)	53	
Matayos	46(78%)	13(22%)	59	
Nambale	134(76%)	43(24%)	177	
Samia	39(78)	11(22%)	50	
	315(77%)	93(23%)	408	

Close to a half, 191 (46.8%) of respondents did not share latrines with son or daughter in-law and father or mother- in-law. When compared between Sub-Counties, sharing of latrine with son or daughter-in law and father or mother-in- law was least in Samia sub-county 18 (36.0%). There was a significant statistical difference between sub-counties and sharing of latrine with son or daughter-in-law and father or mother-in-law ($p=0.016$).

Only 28 (6.9%) of the respondents have constructed latrines for their mother or father-in-law and son or daughter in-law, however the rest of the respondents indicated, they defecate in bush 111(60.6%), nearby forest 8(4.4%) and neighbours latrine 64 (35.0%). Slightly more than a half, 218 (53.3%) of the respondents children don't defecate in latrines. Moreover, Only 102 (25%) of the respondents interviewed disposed of children's faeces in latrine, the rest of the respondents, threw in bush 205 (50.2%), roadside 10 (2.5%) and garden 91 (22.3%).

On physical check, 232(75.1%) of respondents latrine are suitable for use since they separate human excreta from human contact. About 153 (49.8%) latrines had faulty doors/not closing. More than half, 193 (62.9%) of the latrines were not hygienically clean and most of them 193 (62.9%) emitted bad odour/smell.

Open defecation was rampant in Busia county with 202 (49.5%) of the respondents having faeces within the compound on physical check by research assistants. More of faeces was seen on disposed off on the roadside/shamba and nearby bushes in villages 382(94.1%).

4.4 Hygiene practices

Hand washing practice with soap in critical time is low with slightly more than a half 228 (56%) lacking a hand washing facilities within a radius of 3 meters around the latrine. Out of those respondents with hand washing facility/leaky tins only 64 (36%) had water. The reasons given for not having hand washing facility/leaky tin within a radius of 3 meters were, inadequate water 159 (72.9%), didn't know (5.5%) and 47 (21.6%) felt the hand washing facility was unnecessary / not important.

Only 180 (45.1%) of respondents wash their hands with soap after visiting the latrine. About 45(26.1%) of respondents who wash hands with soap frequently after visiting latrine, 71 (41.0%) always and 57 (32.9%) quite often.

A higher proportion 231 (57.6%) of respondents, did not wash hands with soap after wiping children faeces, of which majority indicated reason as; lack of water 141 (75.8%) , 38(204%) not necessary/ important and the rest were ignorant of the hand washing practice with soap after handling children faeces.

Slightly less than a half 187 (46.8%) of the respondents did not wash hands with soap before and after handling food.

4.5 Drinking water

The main source of drinking water in Busia was borehole 188 (46.1%) while others source of drinking water was from river 78 (19.1), spring 91 (22.3%) and piped water 51 (12.5%). About 188 (46.1%) of respondents were of the opinion that water for drinking was not clean.

Due to the unclean nature of the water, more than a half 166 (53%) of respondents treat their water, with chlorination being the most preferred treatment method 174 (66.9%). Other water treatment methods for drinking include, boiling 79 (30.4%), decanting 2 (1%) and others (2.7%). Methods for water storage included pottery pot 50 (12.4%), plastic Jerricane 337 (83.4%) and tank and tap 17(4.2%). A higher percentage of the storage containers were not hygienically clean 236 (57.8%).

4.6 Solid waste

A third 134 (33.1%) of the respondents disposed off their solid waste in a compost pit while 151 (37.3%) bush, 60 (14.8%) special place in compound, 57 (14.0%) burn and 3(0.7%) burn.

Most of the respondent's compound were generally not clean 263 (64.9%) that is there was presence of litter within the homestead.

4.7 Scaling up the ladder

Majority, 311 (76.2%) had not emptied the full pits or replaced with new ones. Moreover, a hand full of the respondents 44 (10.9%) were found constructing new and better latrines.

4.8 Diarrhoea burden

Close to a half 194(48.0%) of respondents confirmed of their family members suffering from diarrhea in the last two weeks prior to the baseline survey with most suffering once 124 (64.9%), twice 36 (18.8%) and frequently 31 (7.6%).

About 147 (77.8%) seek medical treatment in health facilities within the Busia county. Slightly half 84 (53.2%) of the respondents whose family members suffered from diarrhoea indicated to have spend less a ksh 1000 on treatment, 52 (32.9%) Ksh. 1001-3000, 15 (9.5%) ksh.3001-5000 and 7 (4.4%) more than ksh. 5000

4.0 DISCUSSION, CONCLUSION AND RECOMMANDATION

4.1 Discussion

4.1.1 Socio-Demographic profile

The purpose of this study was to evaluate the socio- Economic returns on investment for National Total Sanitation Programme in Busia County, Kenya. A total of 408 respondents participated in the study during baseline study while 406 respondents were included in the study after NTSP implementation. Study findings. Study findings indicate mean age of respondents was 42 years of which greater proportion of respondents were male. This could be attributed to the fact that most women spent more time vending for their families. Most households are headed by male counterparts. Majority of respondents had attained basic level education, while majority were either self or not employed with an income \geq Ksh 10,000 yet average household has 8 members. Absolute Poverty is widespread in County and currently stands at 52% (GOK, 2012). Some of factors enhancing poverty include harmful cultural practices, lack of income, high level of unemployment, low school enrollment, regular incidences of sanitation and hygiene related diseases, poor housing and limited access to clean and drinking water (GoK, 2012).

4.1.2 Latrine coverage

Latrine coverage stood at 76.1%in Busia County. These findings are inconsistent with study findings by the Ministry of Health, (2012), the national latrine coverage stood 49%. This might be attributed to the efforts that had been carried out by non-governmental organization like world vision, AMREF, and department of public health to curb escalating poor sanitation and hygiene related diseases like diarrhea, cholera, malaria among others (GOK, 2012). From the study findings, open defecation, the most risky form of poor sanitation is rampant with about a quarter, 99(24%) of respondents lacking latrines. Moreover, 320(78.4%) of respondents indicated that there were indeed households without latrines. Households have resorted to sharing latrines with neighbours, 271(66.6%). Feaces was sighted on the roadside, within homestead compounds, roadside, shamba and near bushes, 382 (94.1%). Though 76,1% owned latrine, more than 193 (62.9%) were not hygienically clean and153 (49.8%) of latrine did not have a closing door hence couldn't provide privacy. This feature can discourage majority of persons from using the latrine. For latrines which were not hygienically clean can likely attract flies. Flies are known to act as transmitters of diseases causing pathogens through oral-feecal transmission (MoPHS, 2008). This will increase the burden of diarrheal dieases among others. This studies are consistent with water and sanitation programme, 2012 which established that approximately 21 million (52.5% of the population) of Kenyans use unsanitary or shared latrines while 5.6 million have no latrine at all and defecate in the open (WSP, 2012).

Further, study findings indicate that for those without latrine, slightly more than half, 54 (52.9%) did not attain any form education. This study finding is consistent with findings from WHO/UNICEF, 2009 that showed those without any form of education view latrine ownership as less important and not adding value to their health status. Surveys have found that people value household latrines, more for the resulting convenience,

privacy, safety, prestige (e.g., families are ashamed when they cannot offer guests proper toilet facilities) and aesthetic benefits (sight, odor), than for their health benefits (Bruijne *et al.* 2007).

Children too don't use latrines compounding the problem of open defecation, 218 (53.3%). Instead, children faeces is disposed in bushes 205 (50.2%), roadside 10(2.5%) and garden (91 (22.3%). This study findings were consistent with study findings of Ministry of public health and sanitation (2008) which indicated that open defecation is rampant in rural areas. Children faeces are likely to transmit pathogens in the environment (WHO/UNICEF, 2009). Faeces left lying on the ground, thrown on a heap or outside the compound near the home or in living areas was found to be associated with increased incidence of diarrhoea (Han and Moe, 1990; Traoré *et al.*, 1994). The excreta can contaminate water sources, which can be drunk directly or used in food preparation (Curtis *et al.*, 2000). Baltazar and Solon (1989) found a 64% increase in pathogen positive diarrhoea in families where children's faeces were inadequately disposed off.

Cultural practice of mother or father-in-law not sharing latrine with son or daughter-in-laws plays a role in rampant open defecation. Study findings indicated that 191(46.8%) of respondents don't share latrines with their father or mother-in-law since it's culturally unacceptable. Moreover, when mother or father-in-law visit their son or daughter in-law, they are ushered in bush/forest 111(60,6%),8(4.4%) respectively.

Open defecation is costly and has a public consequence. According to a desk study carried out by the Water and Sanitation Program, 2012, poor sanitation costs Kenya Ksh. 27 billion each year. Water and sanitation programme, 2012 established that poorest quintile is 270 times more likely to practice open defecation than the richest. Impact of poor sanitation has been exhibited in burden of diarrhoeal diseases. It is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms through the fecal-oral transmission (Keusch *et al.*, 2006). Open defecation leads to contamination the environment with disease causing organism that can be transmitted from person to person through oral-faecal transmission.

Improvements in sanitation have been shown consistently to result in better health, as measured by less diarrhea, reductions in parasitic infections, increased child growth, and lower morbidity and mortality (Patricia *et al.*, 1999).

According to WHO, each household must have a latrine that meets certain indicators prescribed by World Health Organization (WHO, 2012). That a household must have a latrine that should be hygienically clean and offers privacy, presence of hand washing basin with water at the latrine with soap. Sharing of latrines by neighbours can overstretch the facility and even compromise on hygiene (patricia *et al.*, 1999).

Access to latrine, if not supported by appropriate changes in behavior, limits the potential health gains and wider benefits associated with sanitation improvements. Presence of a latrine is no guarantee of a sustained or sustainable behavior change for those with it. Users need to understand and want benefits of improved sanitation for themselves or their community for behavior change to last (Rebecca *et al.*, 2003). Findings show that for those without latrine half 49 (50.5%) indicate money as reason for not owning a latrine while others cited lack of space to construct latrine. Latrine ownership does not necessary mean you have money to build a latrine. Simple latrine like pit latrine which can be constructed from locally available material can serve the purpose of separating excreta from human contact.

4.1.3 Hygiene practices, drinking water and diarrhoeal burden

Hygiene refers to practices ensuring good health and cleanliness. Hygiene ranges from personal hygiene, through domestic up to occupational hygiene and public health. Today it is widely acknowledged that the provision of sanitation facilities and water supply is not enough to bring down morbidity and mortality rates (Lagardere, 2007). Hand washing with soap in critical times is one of the most effective and inexpensive ways to prevent diarrhoeal diseases. Kaltenthaler *et al.* (2011) also reports that hand washing with soap is an intervention that appears to be both highly effective, reducing diarrhoea incidence by between 27 and 89%. By washing hands with soap, families and communities can help reduce child morbidity rates from diarrhoeal diseases by almost 50 per cent (UNICEF, 2008). There must be a hand washing basin with clean water and soap at least within 3 metres from the latrine facilities which will make it possible for users of the latrine to wash their hands after each visit. There should be separate, similar facilities with running water near to kitchens or where food is handled (WHO, 2008). Study findings indicate, hand washing practice with soap in critical time is low in the study area with slightly more than a half 228 (56%) lacking a hand washing facilities within 3 meters from the latrine. More so, less than half 180 (45.1%) of respondents wash their hands with soap after visiting the latrine. Even those with the leaky tins/hand washing facilities only 64 (36%) had water. This could be attributed to inadequate water supply hence households preserve water for main domestic use than for hand washing purposes. In the study area most, 231 (57.6%) of respondents, did not wash hands with soap even after wiping children faeces.

Slightly less than a half 187 (46.8%) of the respondents did not wash hands with soap before and after handling food. This might be attributed to inadequate water and generally lack of awareness on the health benefits of hand washing practice. Hygiene education is necessary for it helps individuals, families and communities to become aware of the link between poor hygiene behaviors and diseases. A good hygiene education programme provides information and understanding about those behavioral changes which bring the greatest health benefits, and proposes gradual improvements both in practice and hygiene facilities (WHO, 2008).

From the study findings main source of drinking water in Busia was borehole 188 (46.1%) while others source of drinking water was from river 78 (19.1), spring 91 (22.3%) and piped water 51 (12.5%). This may be attributed to the fact that governments both at national and county level are charged with the responsibility for providing piped water however less resources have been allocated to this functions. Moreover, the connection fee and piping materials from the main water supply are costly hence most respondents couldn't afford (GoK, 2012). Also noted, sources of water in the County for the residents were borehole, river and spring, of which majority were not protected at all. These sources were open for contamination for water contamination. A higher percentage of the storage containers were not hygienically clean 236 (57.8%). This observation could be due partly to the possible contamination of the water sources especially borehole, spring and river, all of which are unprotected and unwashed containers/storage facilities.

Diarrhoeal diseases are the third leading cause of death from infectious diseases (WHO, 2008), a leading cause of Childs death (Boerma *et al.*, 1991) and a major child health problem in developing countries including Kenya (Genser *et al.*, 2008). Study findings established that, 194(48.0%) of respondents confirmed of their family members suffering from diarrhea in the last two weeks prior to the baseline survey. The study also

noted that treatment of diarrhoeal disease was costly which might impact negatively to the residents of Busia County. The high prevalence of diarrhea might be attributed to poor access to water, hygiene and sanitation within the county (Amokrane *et al.*, 2007 and Woldemicael, 2001, GoK, 2012). Accordingly some 94% of diarrhoeal cases, Collins, (2008) are preventable through improved sanitation and water supply which according to Fewtrell *et al.* (2007) result in the isolation and/or destruction of pathogenic material and, hence, a break in the transmission pathway. Mertens *et al.* (1992) also reported that unsafe faeces disposal was associated with a 54% greater diarrhoeal risk in Sri Lanka and deduced that if such practices were reduced from 91% to 50% of the population then 12% of diarrhoeal episodes could be prevented.

4.1.4 Solid waste and scaling up the ladder

Slightly a third 134 (33.1%) of the respondents disposed off their solid waste in a compost pit which is the safest method of solid waste .Improper waste disposal was witnessed in the study area which included dumping in bush, and roadside. Indiscriminate disposal of waste pollutes the environment.

Most of the respondent's compound were generally not clean 263 (64.9%) that is there was presence of litter within the homestead. Majority of latrine owners were still using their first latrine 311(76.2%), had not emptied the full pits or replaced with new ones. Moreover, a hand full of the respondents 44 (10.9%) were found constructing new and better latrines.

4.2 Conclusion

The sanitation coverage is low in the study area with open defecation still prevalent in the study area. There are still some households without latrine in the study area. Hygiene practices in the Busia County are poor with most households not washing their hands with soap in critical times like washing hands after visiting the latrine, washing hands before and after eating food, washing hands after handling children faeces, poor waste disposal and not treating the drinking water. The key issue for poor sanitation and hygiene in the study area is sanitation behavior change that is lacking. Awareness through health promotion should be stepped up for households to realize the benefits of total sanitation and hygiene practices.

4.3 Recommendations

The low figures for access to sanitation emerging from this study reveal the necessity for action. Previous interventions including subsidizing latrine construction and awareness-raising have not worked sufficiently and new and improved methods have to be used. Sanitation behavior change needs to be stepped up through National Total Sanitation Programme (NTSP). This approach emphasis on community to take the lead in sanitation and hygiene for sanitation is a private practice with a public consequence. It is expected that especially demand creation through NTSP will be able to largely increase the number of households with access to improved sanitation and proper hygiene practices.

REFERENCES

- Ahmed, N, Zeitlin M. Beiser, A, Super, C, Gershoff SN** (1993). A longitudinal study of the impact of behavioural change intervention on cleanliness, diarrhoeal morbidity and growth of children in rural Bangladesh. *Social Science and Medicine*, **37**:159–171.
- Andrew M.** (2009). Destiny Africa's Green Africa plastics recycling, Kenya.
- Bruijne G. et. al.** (2007). Sanitation for All? Thematic Overview Paper 20. Netherlands: International Water and Sanitation Centre
- Birmingham M, Lee L, Ndayimirije N.** (1997). Epidemic cholera in Burundi: patterns of transmission in the Great Rift Valley Lake region. *The Lancet*, **349**:981–985.
- Curtis V, Cairncross S, Yonli R.** (2000). Domestic hygiene and diarrhoea— pin pointing the problem. *Tropical Medicine and International Health*, **5**:22–32.
- Esrey S., Potash JB, Roberts, L, and Shiff, C.** (1991). Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. *Bulletin of the World Health Organization*, **69**:609–621.
- Feachem, R.** (1984). Interventions for the control of diarrhoeal diseases among young children: promotion of personal and domestic hygiene. *Bulletin of the World Health Organization*, **62**:467–476.
- Ferley, J, Zmirou, D, Collin J, Charrel, M.** (1986). Etude longitudinale des risques liés à la consommation d'eaux non conformes aux normes bactériologiques. *Revue d' Epidémiologie et de Santé Publique*, **34**:89–99.
- GoK,** (2009). Busia District development plan 2008-2012. Nairobi, Government Printers
- Huttly, S, Morris S, Pisani, V.** (1997). Prevention of diarrhoea in young children in developing countries. *Bulletin of the World Health Organization*, **75**:163–174.
- Kenya National Bureau of Statistics,** (2011). Kenya Demographic and Health Survey 2008-09. Nairobi, Government Printers.
- Kothari, C.** (2004). Research methodology: methods and techniques. Bangalore, India, Prakashan
- Moe CL, Sobsey MD, Samsa GP, Mesolo V** (1991). Bacterial indicators of risk of diarrhoeal disease from drinking-water in the Philippines. *Bulletin of the World Health Organization*, **69**:305–317.

MoPHS, (2008). Sanitation and hygiene report. Government printers

MoPHS, (2010). CLTS Trainer's manual. Nairobi, Government Printers

MoPHS, (2011). Rapid sanitation and hygiene survey. Nairobi, Government printers

Patricia, B.Diane, B. Anne and Swindale (1999). Water and Sanitation Indicators measurement guide. IMPACT, London.

Rebecca, S. Andrew, C. and Beenakumari, G. (2003). Sanitation and the poor. WELL Resources Centre for Water, Sanitation and Environmental Health. London, UK

WHO, (2000). Global water supply and sanitation assessment. Geneva, who

WHO and UNICEF, (2010). Global water supply and sanitation assessment report. Geneva, WHO

WHO/UNICEF,(2009). Diarrhoea: Why children are dying and what can be done. Geneva, WHO

WSP, (2004). Sanitation and hygiene in Kenya: lessons on what drives demand for improved sanitation. Nairobi, World Bank

WSP, (2009). Training of Trainer's manual on CLTS. South Asia

WSP, (2012). Economic Impact of poor sanitation in Sub Saharan Africa. World Bank

Ideology in Editorials: An Investigation of Ideologies in the Peace Messages Related to the 2013 General Elections in Kenya

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Abstract

This article applies Critical Discourse Analysis to analyze ideologies in the peace discourse in Kenya in the run up to the 2013 General Elections. Ideology can be seen as a set of beliefs held by a particular group that influences the way people behave. The article focuses on the newspaper editorial because it, in particular, functions not only to report the news but also to interpret the news for the reader. In this article, the authors analyse the ideologies in the editorials on peace published in the mainstream newspapers, namely The Daily Nation, The Standard and their weekend editions Sunday Nation and Sunday Standard. The analysis is centered on the ideologies encoded in the language used in the editorials. The authors argue that language is a tool used by editorial writers to convey the newspapers' ideological position and to influence readers to support their opinions. It emerges that both newspaper publications expressed ideologies that sought to extol peace. Peace was depicted as a valuable resource and anybody or any action deemed to be anti-peace was depicted negatively and condemned.

Key Terms: critical, discourse, editorial, ideologies, language, peace.

1.0 Introduction

General Elections are held in Kenya every five years preceded by campaigns. During the campaigns, the politicians try to outdo each other in order to win votes. The mechanism they use is language. The campaigns get dirty as candidates seek to make their parties popular to the extent of attacking their opponents. The ethnic nature of Kenyan politics makes the battle more fierce as politicians group themselves along tribal lines. The run-up to the 2013 elections was no exception and with the unprecedented violence that had occurred in 2007/2008, it was necessary to call for peace (Human Rights Watch, 2013). The print media ran editorials on peace related to the elections.

Newspapers as part of the print media play a significant role in the communication sector and in order to communicate, people use language. Fowler (1991) points out that a particular ideological position about the world is articulated and represented through language in any oral or written form. Language is therefore used as a tool in different newspapers to articulate each newspaper institution's ideological stance. According to Van Dijk (1995), ideologies are evaluative and provide the basis for judgements about what is good or bad, right or wrong and thus also provide basic guidelines for social perception and interaction. The analysis of editorials can reveal politically and ideologically based opinions and attitudes. The reader can consciously or unconsciously support the opinions due to the linguistic choices in an editorial (Thompson & de Klerk, 2002). Fowler (1979) observes that discourse is a ground for both ideological processes and linguistic processes. Texts are seen as built out of choices of words, grammar and the like that convey ideological meanings. Fowler (1979) acknowledges the relationship between language and ideological processes. Caldas-Coulthard (2003) also emphasizes that the language of the media is one of the most persuasive which can reach out to a lot of people from all levels in literate societies.

2.0 The Editorial as a Genre

The newspaper's main role is to transmit news and it is often regarded as a source of ideological significance. One of the modes of transmitting ideologies in the newspapers is editorials. The mainstream newspaper editorials use diverse styles and discursive strategies to express the voice of the institution's opinions and often the belief of any dominant group the institution represents (Miranti, 2014). Furthermore, MacDougall (1973), Fowler (1991) and Reah (2002) point out that the content of the rhetorical document, the newspaper is presented in a particular way not only to arouse interest and curiosity in readers but also to influence the reader's views and speak for the institution's point of view through analysis and comments on the news.

According to Van Dijk (1998), news reports can offer a broad picture of social solidarity by reinforcing national identity and shared beliefs through language choices. The section of the newspaper which presents the writer's commonsense assumptions of an event is the editorial column. It presents the editorial decisions and viewpoints of the newspaper institution. Kress and Hodge (1979) call this section the paper's ideology. Like MacDougall (1973) and Fowler (1991), they stress that its perception of reality speaks directly with clarity to its readership. Having this ideological role to play, editorials are therefore expected to be linguistically complex. They address the daily events and prominent issues openly, directly and accurately. As such communicative elements of structured persuasive and argumentative patterns or textual format are reflected (MacDougall, 1973; Fowler, 1991; Van Dijk, 1996).

It is evident that a number of language and discourses are transmitting to people through diverse types of media like internet, television, newspapers, advertising or radio broadcast among which the role of newspapers in ideological manipulation is prominent. Effectively, Fowler (1991) assumes that newspapers are not neutral in covering diverse events based on the viewpoints followed by them.

In the Kenyan case, the article argues that the editorial writers played a key role in managing and shaping the public opinion on the peace process by conveying ideologies that were pro-peace and anti-violence. The ideologies were in line with the newspaper institution's point of view regarding peace.

3.0 Theoretical framework

The analysis was guided by Critical Discourse Analysis (CDA). Critical Discourse Analysis is not a homogenous theory or conceptual framework. Rather, it is a broad spectrum of several approaches of analyzing discourse. CDA encompasses different approaches, which engage in the social analysis of discourse, and these approaches "differ in theory, methodology, and the type of research issues to which they tend to give prominence" (Fairclough & Wodak 1997). Teun van Dijk (1993) asserts that: Critical Discourse Analysis (CDA) is obviously not a homogenous model, nor a school or a paradigm, but at most a shared perspective on doing linguistics, semiotics or discourse analysis.

The newspapers, according to critical discourse analysis perspective, depict different events and phenomena based on political and social perspectives. It means that the mass media are embedded with hidden ideologies and manipulated discourse structures. Critical discourse analysis, in Gee's (2004, pp. 32-33) view is "an approach to language analysis that considers texts as parts of specific social practices that have political implications about issues of status, solidarity, and of distribution of social goods and power". In fact, "CDA examines how texts represent and construct reality within a specific ideological system through implicit messages based on what is said and left unsaid" (Heros, 2009, p. 173).

However, different theorists agree that CDA is primarily concerned with language use as a socially constructed practice. Language is not used in vacuum but rather in particular social, political, cultural and psychological

contexts. With this in mind, CDA seeks to explain the complex relationships between the structure of texts and their social functions especially when they are used to create and maintain differential power relations and structures. Therefore, there is a dialectical relationship between discourse and the social context in which it is produced whereby discourse is shaped by the social context in as much as it also shapes that social context. Perhaps the most central tenet of CDA is its critical approach. CDA seeks to reveal concealed relations and causes between discourse and society most of which are not evident to the people involved in the discourse. According to Fairclough: Relationships between discursive, social and cultural change are typically not transparent for the people involved. Nor is technologization of discourse. 'Critical' implies showing connections and causes that are hidden; it also implies intervention, for example providing resources for those who may be disadvantaged through change. (1992:9)

4.0 Methodology

The study adopted an analytic research design. The newspaper editorials used were those that were published from 1st November, 2012 when political alliances were formed and the campaigns began to gain momentum to 31st March, 2013 when the ruling on the presidential election petition had been made. In all, 90 editorials had commentaries on peace; *The Daily Nation* had 46 while *The Standard* had 44. From these issues, we read and identified 20% of each newspaper publication's editorials according to Alreck and Settle (1995). The data consisted of a corpus of sentences which were selected and organized according to the tools of analysis used.

5.0 Presentation and analysis of data

Ideology in this article was analyzed using two of the tools of CDA proposed by Huckin (1997): presupposition and metaphor.

5.1 Presupposition

Presupposition is the use of language in a way that appears to take certain ideas for granted, as if there were no alternatives. Presupposition can occur at the sentence level in the form of persuasive rhetoric that can be used to convey the impression that what an agent of power says carries more weight (Huckin, 1997). Writers can also manipulate readers through presupposition.

Data Set 1: Ideology on voter expectations

1. Many will be wondering whether they really will have the chance to vote in a fresh crop of leaders to drive the country forward in peace and prosperity or whether they will just be playing their roles in a script destined to climax in death and destruction.
2. All will be praying that Kenyans have learnt their lessons and will never again allow themselves to be misled into mindless violence against their neighbours.
3. They (Kenyans) will also be hoping that the Independent Electoral and Boundaries Commission delivers on the promise of a free and fair election, one which there will be no grounds for dispute and in which the loser will have no option but to gracefully concede.
4. We should all pray that our institutions of governance will take this country to the next level. Now that we have a reformed Judiciary, there could be no excuse for people to take up arms should they feel aggrieved that they have been rigged out. The rule of law must prevail.

Interpretation

Text 1 presupposed the passive role of voters and was ideological as it put the blame on some higher power that decided the fate of voters. The phrase ‘playing their role in a script’ was used to express the ideology that leaders have not lived up to the expectations of voters despite numerous promises to make a difference. Probably even the coming elections would not make a difference. The voters are portrayed as people who are ‘used’ to vote but do not get what they voted for.

Text2 presupposed that Kenyans acted on orders of some people not mentioned in the text to cause violence. The words ‘misled’ and ‘mindless’ encode the ideological perspective (negative attitude) of the newspaper towards violence. Violence leads to destruction of neighbourliness and should be condemned. The phrase ... learnt their lessons...’ alludes to the loss of life and property that was caused by the post-election violence of 2007/2008.

The editor used the verb phrase ‘will also be hoping’ in text 3 to imply a sincerely held wish but one that could not necessarily be expected to come to fruition. It was ideological in that it questioned the credibility of the IEBC to deliver free and fair elections.

In text 4, the editor used the adverb ‘now’ to presuppose the previous state that the Judiciary was ineffective and people may have been justified to turn to violence as a solution to their grievances. The statement was ideological in that it expressed the efficiency of the current Judiciary as a fact and condemned violence. The use of the word ‘reformed’ ideologically implies a positive change in the Judiciary which could be trusted to settle disputes fairly and avoid violence. Texts 1-4 attest Fowler’s (1991) view that a particular ideological position about the world is articulated and represented through language in any oral or written form. The ideologies are shaped using lexical choices from the perspective of the newspaper.

Data Set 2: Ideology on law and order agencies

1. In Samburu and Turkana, what might be the regular cattle-rustling has escalated into a deadly attack on a police patrol, resulting in the death of 40 officers and deployment of the military.
2. We must also take a close look at the capacity of the law and order agencies to put in place effective security everywhere. It is not enough to react after such blatant security breaches.
3. The police, in turn, must guarantee the security of all Kenyans before and after the polls. They must ensure that the cowardly elements behind the leaflets end up where they belong- in jail.

Interpretation

Text 1 was ideological as it depicted the officers as vulnerable victims of the attack. According to Miranti (2014) editorials use diverse styles to express the voice of the institution’s opinions. The choice of words in text 1 attests to this. The verb ‘escalated’ and the premodifier ‘deadly’ depicted the intensity and destructive nature of the attack and the negative attitude towards it. This was a threat to peace at the time because the officers were expected to protect Kenyans yet they were not safe. Many of them were killed yet they were supposed to be armed. The government needed to protect its officers.

Text 2 was ideological in that it implicitly expressed the inefficiency of the law and order agencies. It implied that the lapses in security occurred due to inefficiency and the agencies acted after the attack when it was too late and many officers had died. The term ‘blatant’ showed the failure on the part of the security agencies to put in place measures to counter such attacks. This interpretation is supported by Heros (2009) who asserts that CDA examines how texts represent and construct reality within a specific ideological system through implicit messages on what is said and left unsaid.

In text 3, the editor referred to those spreading hate leaflets as ‘cowardly elements.’ This was ideological as it portrayed the people negatively by dehumanizing them and stating that such people belong to jail. It depicted the newspaper institution’s disaffection with the people who were anti-peace and the police were mandated using the modal ‘must’ to ensure security of Kenyans. According to Wells (1992), the way sentences are worded can greatly influence the reader’s perception of the ideas expressed in a text. The reference to the people as ‘elements’ was meant to cause readers to view them negatively and hopefully detest them.

Data Set 3: Ideology on the conduct of leaders

1. Meanwhile, as the campaigns become more frenetic, we would urge all presidential candidates to ensure peace and calm prevail.
2. Given the fluid nature of the transition, with petitions over the presidential elections still pending before the Supreme Court, it behoves those in government to act with prudence and sobriety. They should adopt a more mature way of handling such potentially explosive issues.
3. While campaigning across the country, politicians have pledged to work towards peace before, during and after the elections. But the utterances by some and behavior of others who posit themselves as more loyal to their tribal chiefs create the impression the efforts at ensuring peace are yet to yield fruit. In other words, some politicians do not value peace.
4. Then came one veteran politician’s warning that “outsiders” were not welcome to register to vote in parts of Narok, echoing similar yesteryear sentiments that ended rather tragically for some voters.

In text 1 the writer depicted the candidates as powerful by using the verb ‘urge.’ The person being urged is powerful over the one urging. It expressed the ideology that peace was paramount especially with the urgency of the campaigns as elections drew nearer. Michira (2014) observes that ideologies framed and sustained in various discourse equally establish power relations because the linguistic forms that mediate them also express and manipulate power.

Text 2 was ideological in that the editor depicted those in government negatively by implying that they were not handling issues maturely; neither were they acting with prudence and sobriety. As leaders, they were expected to be cautious especially on divisive issues as the situation in the country was still delicate. The adjective ‘fluid’ implied that the state of the transition was subject to change. The election petition had not been solved and the law was also unclear on the way forward before the transition.

Text 3 is ideological as it depicts politicians as people who are tribal and whose actions do not match with their words. They say one thing but do what they deem fit depending on the circumstances. The editor depicted the politicians as enemies of peace and an obstacle in the fight for peace. As leaders, they were expected to be at the forefront in supporting the peace process.

Text 4 encoded the ideology that some people were perceived as outsiders in some parts of the country owing to the ethnic nature of politics. In past election years this perception has caused loss of lives as depicted in the phrase ‘ended tragically for some voters.’ In fact in 2007/2008, such tribal sentiments caused massive violence that led to the loss of 1300 lives and the displacement of over 600,000 people (Human Rights Watch, 2013). According to Michira (2014), Kenyan politics is inherently ethnic in nature and this is one of the factors behind the Post-Election Violence (PEV) after the 2007 elections. The word “outsiders” in text 4 is put in double quotation marks to show that the editor used the exact words of the politician to validate the view that indeed the leaders were tribal. The editor distanced himself/herself from the statement to further depict the politician negatively.

Data Set 4: Ideologies on peace

1. Kenya has all the ingredients for a major take off if the election goes off relatively peacefully.
2. We believe that national unity is a collective calling and therefore, everyone should be involved in making this country the “island of peace”....
3. Alternative to peaceful elections costly
4. A Five per cent growth level for an economy like ours is dismal, but the bank says this is what we will achieve with peaceful elections. What this means is that a chaotic poll could plunge the figures to catastrophic levels, but are our politicians listening?
5. Once again, we revisit our call for sobriety in the ongoing presidential campaigns fro we feel they are threatening to get out of hand.

Interpretation

Text 1 was ideological since editor depicted peace as a requisite for progress in Kenya using the conditional clause ‘if the election goes off successfully.’ The condition for progress was the success of the election. That was the belief of the newspaper. What was implied but left unsaid is the fact that without peace, Kenya would not progress to a higher level.

Text 2 was ideological as the editor used the factive verb ‘We believe...’ to express the view of the newspaper on national unity as a fact that the reader would find difficult to challenge. This is supported by Van Dijk (1998) who says that news reports can offer a broad picture of social solidarity by reinforcing national identity and shared beliefs through language choices. The writer used the phrase to call on all Kenyans to take peace as a collective responsibility.

Text 3 was the title of the editorial and encoded the ideology that peaceful elections were a must as without it the consequences would be unbearable to many. In the Kenyan context, the alternative meant violence which caused suffering to the wananchi and was hardly felt by leaders. This was because Kenyans would turn against one another, kill and destroy property but leaders never killed each other. The word ‘costly’ implied the great suffering Kenyans would face as a result of not ensuring peaceful elections. Words are never neutral; they carry the power that reflects the interest of those who speak or write (Fowler et al, 1979). Since editorial writers have the power to control what the readers are exposed to, they can manipulate language to attract readers. The headline has used the catchy word ‘costly’ to influence readers’ perception of the need for peace.

Reah (1998) observes that headlines are creatively designed to attract the attention of the reader by arousing their interest and curiosity.

Text 4 encoded the ideology that peace in a country also determines economic growth but chaos dent a country's growth as implied in the phrase 'that a chaotic poll could plunge the figures to catastrophic levels.' The rhetorical question at the end 'but are our politicians listening?' is ideological as it paints the politicians negatively by implying that they have an 'I don't care' attitude.

Text 5 encoded the ideology that the Nation newspaper as an institution is concerned about Kenya. The phrases 'once again' and the verb 'revisit' point to the fact that it was not the first time the media group had called for peace. The editor implies that despite the earlier call for sobriety, the people concerned had not heeded the call forcing them to make another one. The leaders were depicted as negligent on matters concerning peace and were only interested in getting votes. This is supported by Wray (1998) who asserts that the lexical choices used in a newspaper indicate the writer's ideological perspective.

3.2 Metaphor

Faiclough (1989) observes that metaphor is a way of representing one aspect of experience in terms of another and is by no means restricted to the sort of discourse it tends to be stereotypically associated with. It is the relationship between alternative metaphors that have different ideological attachments. Newspapers use metaphors to make their texts more interesting and rich and to inspire certain feelings in readers. The data below depicts the metaphors used in the editorials.

1. As Kenyans troop to registration centres to record their names in the voters' roll, there will be a lot of apprehension over what may unfold as the General election next March approaches.
2. Memories of the widespread violence that nearly tipped Kenya over the precipice in the wake of the disputed elections of 2007 are still fresh.
3. Many will be wondering whether they really will have the chance to vote in a fresh crop of leaders to drive the country forward in peace and prosperity; or whether they will just be playing their roles in a script destined to climax in death and destruction.
4. And now on the steps of yet another General Election, all voters are being asked to deposit their peace dividend in the Kenyan bank of opportunity.

Interpretation

In text 1, 'troop' is a metaphor used to describe refer to the large number of Kenyans that were going to register. The ideology is that majority of Kenyans were democratic and wanted to exercise their right to elect leaders of their choice.

The phrase 'tipped over the precipice' in text 2 depicts that Kenya was almost totally destroyed by the violence that erupted in 2007/2008 due to the disputed elections. The editor creates a feeling of disaffection with violence due to its destructive nature implying that Kenyans needed to maintain peace.

In text 3, 'script' is a metaphor referring to the fact that Kenyans vote each election time but do not get the new leaders as promised. It was ideological as it depicted voters as people who took part in a process whose

end result their participation does not determine. The leaders always make promises that seem new every election time but after being elected into office, they hardly fulfill or even attempt to fulfill their promises.

'Dividend' in text 4 refers to the benefits of peace to a country and encodes the ideology that the editor was advocating for peace at the time. The metaphor was used to inspire positive feelings about peace in the reader by using language to construct peace as beneficial to all.

4. Conclusion

This article set out to analyze the ideologies encoded in the editorials on peace in the run up to the 2013 General Elections in Kenya. It was guided by Fairclough's (1989) Critical Discourse Analysis theory. It sought to demonstrate that ideologies reside in texts, that it is not possible to read off ideologies from texts and that texts are open to diverse interpretations (Fairclough, 1995). Ideology was analyzed under the categories of presupposition and metaphor. The analysis revealed that language can indicate underlying ideologies by reporting and reshaping articles in different ways. This attests Fowler's (1979) observation that discourse is a ground for both ideological and linguistic processes. The presuppositions and metaphors were explained and the ideologies identified according to the data given. The editorial texts analyzed showed that the editors used presupposition and metaphor to sum up, simplify, intensify or even personify the messages with a view to influencing the readers towards their ideological leanings. The journalist, having the power and control over their articles, used this to control the minds of their readers. The ideological perspectives touched on Kenya's judicial system, the politician's tribal and selfish nature during election campaigns, extolling peace, condemning violence and depicting peace as a prerequisite for progress and economic growth.

Overall, the article concludes that the content of the editorial was presented in a particular way not only to arouse interest and curiosity in readers but also to influence them and speak for the institution's point of view through analysis and comment on the news. Language was used as a tool in each of the newspaper publications to articulate ideologies that were consistent with the need for peace in the country at the time. This was done with a view to influencing the readers to adopt the opinion of the newspaper institution and seek to maintain peace at the time.

References:

Alreck, P.L., & Settle, R.B. (1995). *The survey research handbook*. (2nd ed.) Chicago: Irwin.

Caldas-Coulthard, C. R. (2003). *Critical discourse analysis: Cross-cultural representation of "otherness" in media discourse*. UK: Palgrave Macmillan.

Fairclough, N. (1989). *Language and Power*. London: Longman.

Fairclough, N. (1992). "Introduction." In Fairclough, N. (Ed.) *Discourse and Social Change*. Cambridge: Polity Press, 1-30.

Fairclough, N. (1995). *Critical discourse analysis: The critical study of language*. New York: Longman.

- Fairclough, N. & Wodak R. (1997). Critical discourse analysis. In T. van Dijk (Ed.), *Discourse Studies: A multidisciplinary Introduction* (pp. 258-284). London: Sage.
- Fowler, R. (1991). *Language in the news: Discourse and ideology in the press*. London and New York: Routledge.
- Fowler, R. (1979). *Language and control*. London: Routledge and K. Paul.
- Gee, J. P. (2004). Discourse analysis: What makes it critical? In R. Rogers (Ed.), *Critical discourse analysis in education* (pp. 19–50). New Jersey/London: Erlbaum Associates Publishers.
- Heros, S. (2009). Linguistic pluralism or prescriptivism? A CDA of language ideologies in *Talento*, Peru's official textbook for the first-year of high school. *Linguistics and Education*, 20, 172-199. <http://dx.doi.org/10.1016/j.linged.2009.01.007>
- Huckin, T. N. (1997). Critical discourse analysis. In T. Miller (Ed), *Functional approaches to written text* (pp. 78-92). Washington, CD: US Department of State.
- Human Rights Watch. (2013). High stakes: Political violence and the 2013 elections in Kenya. Printed in the USA. Available at: <http://www.hrw.org/sites/default/files/reports/kenya0213webwcover.pdf>. Accessed on 10th December, 2013
- Kress G. & Hodge R. (1979). *Language as Ideology*, London: Routledge.
- MacDougall, C.D. (1973). *Principles of editorial writing*. USA: W.M. C. Brown Company Publishers.
- Michira, J. N. (2014). The language of politics: A CDA of the 2013 Kenyan Presidential Campaign Discourse. *International Journal of Education and Research*. Vol. 2(1): 1-18.
- Miranti, I. (2014). *Transitivity analysis in the construction of ideology: A comparative study on The New York Times and the Washington Times' editorials*. Unpublished Bachelors Thesis. Dian Nuswantoro University: Semarang.
- Reah, D. (2002). *The language of newspapers*. London & New York: Routledge.
- Thompson, S. & de Klerk, V. (2002). *Dear Readers: A Textual Analysis of Magazine Editorials*.
- Van Dijk, T. (1993). *Elite discourse and racism*. London: Sage.
- Van Dijk, T. (1995). Discourse analysis as ideology analysis. In C. Schäffner & A. Wenden (Eds.), *Language and pace* (pp. 17-33). Aldershot: Dartmouth.
- Van Dijk, T. (1996). *Opinions and ideologies in editorials*. International Symposium of Critical Discourse Analysis, Language, Social Life and Critical Thought, Athens.
- Van Dijk, T.A. (1998.) *Ideology: A Multidisciplinary approach*. London: Sage Publications.
- Wells, S. (1992). The Questions of Cultural Identity. In: S. Hall, D. Held & T.M.C. Grew (ed) *Modernity and its Future*. Cambridge, Oxford, Blackwell: open University Press.
- Wray, A., Trott, K. & Bloomer, A. (1998). *Projects in linguistics. A practical guide to researching language*. London: Arnold.