Volume 3. no. 2
January 2011

ISSN: 1992-2744

International Journal of Disaster Management and Risk Reduction (IJDMRR)

Centre for Disaster Management and Humanitarian Assistance

Masinde Muliro University of Science & Technology, Kakamega, Kenya

Published by the Centre for Disaster Management and Humanitarian Assistance at Masinde Muliro University of Science and Technology, Kakamega Kenya

ISSN: 1992-2744

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AIMS AND SCOPE

The ***Journal for Disaster Management & Risk Reduction*** is an international, multidisciplinary journal, which provides a swift publication outlet for research and technical reports on various facets of disasters situations, their scientific aspects and social impacts. It also attends to issues of conflict management, peace research and humanitarianism. Its objectives are to:

- Identify techniques, methods, policies, education & training suitable for disaster risk reductions globally
- Contribute to decision-making by providing information on progress and constraints in disaster management
- Contribute to solving emerging global hazards by stimulating demand-oriented applied science

ISSN: 1992 - 2744

Printed by the University Press, Masinde Muliro University of Science and Technology, Kenya

HOUSEHOLD CHARACTERISTICS INFLUENCING NUTRITIONAL IMPROVEMENT OF CHILDREN DURING AND AFTER THE CONFLICTS IN TRANS-NZOIA DISTRICT, KENYA

By

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Abstract

Conflicts are known to displace people leading to food insecurity. In Kenya, during the 1992 and 1997 elections periods respectively, there were widespread ethnic clashes which left many families homeless. The displaced families often lose their livelihoods, and lack adequate food supplyrendering children less than five years vulnerable to malnutrition. This condition reduces body immunity leading to increased susceptibility to diseases and death. This study was conducted in Kolongolo (displaced population) and Namanjalala (resettled population) areas of Trans-Nzoia District between March and August 2006. The main objective was to investigate the effects of human induced social conflicts on nutritional status of children under five years of age in the affected population. The Research design was descriptive survey. Cluster sampling was used to determine the family sample size of households and purposeful sampling procedures were used to determine the households which had children under five years of age. A total of 160 households were identified for the study. Chi-square tests and Pearson correlations were used to analyze data. Results established that educational level and professional training of parents had an effect on the nutritional status of the children under five years of age. It was therefore recommended that there should be improvement of women education levels and economic capacity which can enable them provide nutritious meals for their families.

Key words: Conflicts, Malnutrition, Displacements, Households, Characteristics, Trans-Nzoia District, Kenya.

Introduction

Some of the environmental threats to children commonly associated with conflict include displacement from ancestral land, family separation, destitution and loss of access to key services. The impoverishment of families impacts upon children in a number of ways, but most significantly, it leads to under-nourishment and malnutrition. A historical overview of conflicts in Kenya shows that many people are forced to flee their homesteads. Displaced families are usually confronted with reduced or no source of income, leading to food insecurity at household level (Otuya, 2008).

In the 1990's the number of conflicts and natural disasters increased. Today there are 35 million displaced persons in the World; of those 90 % are women and children (UNICEF, 1994). Mothers and children are especially susceptible to malnutrition, especially when men who are either aggressors or defenders are killed in the fighting. Thus, armed conflicts bring forth a broad range of factors increasing children's vulnerability to malnutrition.

Children form an important part of the foundation for future sustainability of any society. Thus their physical, mental and behavioural development needs to be safeguarded at all times for a healthy society. Under nutrition, particularly in children, is a vice locked around humanity, preventing individuals and even whole societies from achieving their full potential. Undernourished children have lowered resistance to infection and are more likely to die from such common childhood ailments as diarrhoeal diseases and respiratory

infections. Those who survive may be locked into a vicious cycle of recurring sickness and faltering growth, often with irreversible damage (UNICEF, 2006).

In the study area, many families have not been re-settled, and unable to go back to their original land. Quite often, donors and relief agencies shy away from assisting IDPs especially if the root causes are political (Kamungi, 2001). This continually puts children in the affected populations at risk, as the conditions of reduced capital, income and unemployment persist. Also at risk are mothers, who if not properly nourished during pregnancy, may give birth to malformed infants who are predisposed to developmental disorders (FAO, 1999). Malnutrition in mothers undermines breastfeeding, a globally recommended nutritious feeding methods for infants.

In Kenya no documented data exists on the nutritional status of children less than five years of age and its impact specifically in displaced families. With prevalent social conflicts, which have continually persisted since early 1990s, in various parts of the country, there is need to evaluate the effect of such conflicts on the nutritional status of children in the affected areas

Methodology

Study design

This research was conducted through a descriptive survey focusing on the nutritional status of children under five years of age among the locally displaced persons in Trans-Nzoia District, Kenya. The purpose of this design was to gather data at a particular point in time with the intention of describing the nature of existing conditions, or determining the relationships that exist between specific events (Cohen and Marion, 1985). The study involved a survey on a cross-section of the clash affected area, with one (Kolongolo) cluster representing people in displaced environment and a control cluster in Namanjalala representing settled people.

Study area

This study was conducted in Trans-Nzoia district, located within Rift Valley province of Kenya and to the north of Mt. Elgon. It approximately lies between longitude 34°-36° E and latitude 0° - 2°N and is bordered by Uganda on the western flank, Bungoma and Mt. Elgon districts in the west, Pokot in the north and Uasin-Gishu District on the east. Kolongolo the displaced and Namanjalala the settled settlements are located approximately 40km North West of Kitale town. Detailed description of the study area is depicted in Otuya (2008) and Otuya *et al* (2010).

The population of this study included all children under five years in the conflict-affected area and a control area, where parents of the children were interviewed. Questionnaires and personal interviews were also administered on Administrators, church leaders, health and Non-Governmental Organization officers. The researcher used a two-staged sampling method to determine the sample size of the family households. At the first stage, clustering was used in which clusters of displaced persons were identified for analysis. This was followed by purposeful sampling within the selected clusters to identify households of children under five years of age. A total of 160 households were identified for the study.

Sources of Primary Data

Primary data collection was done in two stages. In the first stage, data was collected from parents of children under five years of age. Structured interviews were conducted using pre-tested questionnaires administered to heads of households. Information was collected on the demographic characteristics of household members and socio-economic factors. Unstructured interviews were used to obtain qualitative information from parents about the nutritional status of their children. Direct observation was an important tool in collecting data from children under five years of age where their skin texture and hair colour were recorded. Anthropometrics data was collected where by age/weight/height measurements were taken from children below the age of five years. SECA electronic scales were used to measure weights of both mothers and children. Height measurement was taken with the subject in the standing position, using a measurement board. Two readings were recorded and their average used in the final analysis. In the second stage, quantitative data were collected from administrators, church leaders, health officers and Non-governmental Organization officers using pre-tested questionnaires

Sources of Secondary Data

Secondary data was collected and useful documents like growth-monitoring cards or any other formal cards were used where available to get the required information.

Data analysis

Data was analysed using statistical package for social sciences (SPSS) version 10.0 to get frequency and factor ranking. Chi square tests and Pearson correlations were carried out to ascertain the significance levels of parameters under investigation. The tests were carried out to establish the relationship between the nutritional status of children under five and variables such as income, educational level of the parents and conflicts.

Results and Discussion

Factors affecting nutritional improvement among children under five years

Effects of family size on the nutritional status of the children

Differences in the size of the family from the study area were assessed to determine whether the family size has an effect on the nutritional status of the children. The study revealed that there were no significant association ($p>0.05$) between size of family and nutritional status of children in both settlements. The family size did not have an effect on the nutritional status of the children in the study area.

A similar study conducted by Gobotswang (1985), considered possible associations of the nutritional status of children under five years of age with the number of people in the household and the number and sex of the working adults in the household. The results showed no significant relation between the size of the household and the nutritional status of the children. This suggests that the assets base of a household is more important than its size. However, the family size structure can have a positive effect on child nutrition in some instance (Ricci *et al* 1996).

FAO (1996) argues that the size of family does not affect the nutritional status of children under five years of age. Food insecurity during armed conflicts which is caused by decline of agricultural production because of physical insecurity, lack of agricultural inputs and extension services, destruction of food processing, storage and distribution systems as well as roads and markets. With all these problems associated with displacement, the nutritional status of children under five is affected.

Effects of Educational level and professional training of Parents on the Children's nutritional status

Assessment of educational level and professional training of parents/guardians from the study areas was carried out in order to determine whether their educational level and professional training had an effect on the children's nutritional status. The study revealed that there was a significant association ($p < 0.05$) in the education levels of parents/ guardians and the children's nutritional status.

There were only 11.9% of parents with educational level below Kenya Certificate of Primary Education in Kolongolo as compared to Namanjalala, which had 23.8%. Kolongolo had 11.3% of the parents with educational level above Ordinary level (O-level) while Namanjalala had only 1.9 %(Table1).

The study further revealed that more parents from Kolongolo had some form of professional training (20 .1%) as compared to those from Namanjalala (7.5%) as seen in Table 1. These variations in both the educational level and professional training of parents in the study areas had an effect on the nutritional status of the children under five years. The children whose parents had a higher educational level and some form of professional training had a balanced diet as compared to those with a lower educational level and no form of professional training.

Table 1. Educational Level of Parents and Nutritional Status of Children

Settlement Area	Educational level of parents									
	Below KCPE		KCPE level		KJSE level		'O' Level		Above 'O' level	
	N	%	N	%	N	%	N	%	N	%
Kolongolo	38	23.8	22	13.8	7	4.4	10	6.3	3	1.9
Namanjalala	19	11.9	27	16.9	1	0.6	15	9.4	18	11.3
Total	57	35.7	49	30.7	8	5.0	25	15.7	21	13.2

Settlement Area	Professional training			
	Trained		Untrained	
	N	%	N	%
Kolongolo	12	7.5	68	42.8
Namanjalala	32	20.1	46	28.9
Total	44	27.6	114	71.7

Table 2: Professional Training of Parents

A similar study was carried out in Canada in 2007, whose findings established that 23% of the children from households headed by a person with no education were underweight, compared to 15% and 12% of the children from households headed by a person with some primary or secondary education respectively.

Other studies have shown that education has a significant relationship to diet (Asha and Devi 2007). Mothers who are schooled have a better understanding of dietary need for their families, meal patterns and choice of foods. ACC/SCN and IFPRI (2000) have for instance, shown that there are four critical reasons why child nutrition improved in the developing world (especially Sub-Saharan Africa and South Asia) between 1970 and 1995: improvements in women's education accounted for almost 45 percent of the total reduction in child malnutrition during this period, followed by improvements in per capita food availability, improvements in the health environment, and improvements in women's status relative to men. That study established that investments in these four areas could significantly reduce child malnutrition but, improving women's education besides per capita food availability, offers the best hope for reducing child malnutrition in the future.

This study leads to similar findings in relation to education. In some studies the education level of women has been used together with other indicators as a proxy for the relative position of women (women's social status) in the society. It is argued that women with higher status in the society have the ability to make decisions that improve the nutritional status of children while those with low status do not (Smith *et al* 2003). On the other hand, illiteracy in mothers has been shown to be closely associated with malnutrition Barret and Browne (1996).

Government and Non-Governmental Organization's role in Re-construction Activities

Government officers e.g. Chiefs, Assistant chiefs and officers in charge of Humanitarian organizations such as Red Cross and Churches were interviewed to find out the kind of assistance they offered during and after displacement as seen in
Table 3. Findings of the study established that Government and Non-Governmental Organizations such as the Kenya Red Cross Society and the Catholic Church attempted to provide security and humanitarian assistance such as food, clothing and shelter at the beginning of the conflict in 1992 and 1997 respectively. The humanitarian assistance was effective in the first month and when the displaced people settled around the market place the assistance diminished with time and finally disappeared.

The Catholic Church provided materials and settled only a few people on one farm because the numbers were overwhelming. The study discovered that most families who were displaced in 1992 still remain at the market place and there was no organization giving them support.

Concerning security matters the Governments intervention was to put up a police post near Kolongolo market, which was functioning, but this had not improved security. The people cannot go back to their farms to till and improve on food security.

Interviews with field nutritionists revealed that 50% of them make efforts to provide nutritional education among the displaced persons. This, has however been hampered by lack of facilitation by the government to enable them reach the displaced who are about 30kms away from the main office. The officers go to the field at least once in a month; this cannot make effective follow-up on nutrition matters.

Kind of assistance Offered	Government		Non- governmental	
	Initial stage	Latter stage	Initial stage	Later stage
Food	80%	20%	100%	20%
Clothing	85%	30%	80%	10%
Shelter	100%	60%	100%	50%
Security	100%	80%	None	None

Table 3: Government and Non-Governmental Organization's role in re-construction activities

Conclusions

Education and professional training of parents was identified as a major factor affecting nutritional improvement of children under five years of age during and after conflicts. Most parents from both settlements were found to have education up to Kenya Certificate of Primary Education and only few had their education above ordinary level.

The size of the family did not seem to affect the nutritional status of children in displacement and showed no significant associations in both settlements. In both areas, families with more members experienced similar problems of food insecurity as those of few members.

Recommendations

In order to reduce the large numbers of children who are malnourished, there should be a sustainable effort by the government institutions and Non-Governmental Organizations involved in children's welfare to ensure that continued humanitarian assistance is given to displaced persons. Efforts should also be made to strengthen food security within a household to ensure not only the availability of enough food to eat but also that the quantity of the food is of sufficient nutritious value.

Improvement of women education levels and economic capacity can enable them provide nutritious meals for their families.

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DISASTER AND EMERGENCY DIPLOMACY WITH REFERENCE TO THE INDIAN OCEAN TSUNAMI CRISIS

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INTRODUCTION

This article starts from the hypothetical point of view that the Indian Ocean tsunami that occurred off northern Sumatra in 2004 resulted in one of the largest humanitarian disasters in modern times. This particular case, it is advanced, serves to highlight and demonstrate several critical issues in humanitarian disaster diplomacy. The crisis graphically illustrated the road blocks to the information dimensions of globalization and the role of national identity and foreign policy sensitivity. It also underscored issues pertaining to international coordination, the role of the United Nations (UN), and short versus long-term solutions. It is established that the scale of what was essentially a maritime – coastal disaster also necessitated the use of the military assets of external powers rather than traditional Non-Governmental Organization (NGO) operations.

THEORETICAL FRAME WORK

The theoretical framework of this article is adopted from our study of disaster preparedness and management (Okoth and Matemba, 2009: 143) It is based on the Recognition – Primed Decision (RPD) model (Klein, 1998).

RPD model is about actors who make quick and effective decisions when faced with complex situation. In this model, the decision maker is supposed to work out a possible course of action, compare it to the constraints imposed by the emergency situation, and select the first course of action. RPD model combines two approaches of developing a decision: The first is recognizing which course of action makes sense; the second, evaluating the cause of action via imagination to gauge if the actions resulting from that decision make sense. RPD is immensely relevant to the actors in the organizations that are affiliated with emergency services. However, although the technique is rapid, it is susceptible to serious failure in unusual or misidentified circumstances. Besides, difference of being experienced or in experienced plays a major role in the decision making process.

HISTORICAL BACKGROUND

It is imperative to observe that national disasters and emergencies are a violent and intermittent component of individual and international life. Although scientific knowledge of disaster phenomena such as flooding, drought, hurricanes and typhoons, tropical cyclones, avalanche, earthquake and volcanic eruption and disease transmission has significantly increased, in many instances, predictions of precise occurrence remain problematic. Additionally, there is also difficulty of long periods of dormancy between catastrophic events or between causation and detection. For instance, Krakatoa, a triple-cone volcanic island in the Sunda strait between Java and Sumatra, had, despite minor eruption, been dormant for over two hundred years, prior to its eruption in 1883. (Wincester, 2003). The event itself was not only novel, but alarming as well. However, its news rapidly spread-aided by the developments such as Morsecode, the Reuters news

agency and the submarine telegraph cable, reaching the front page of the *Boston Globe* four hours after initial report from the Lloyd's agent to Batavia (Wincester, 2003). Nevertheless, scientific understanding of the event at that time was limited.

It suffices to state that the irregularity of some phenomena has significant diplomatic consequences, as is shortly discussed in this article, in terms of policy agenda of international, regional and scientific organizations. Other features of whether the issues remain (or not) on the natural disasters of significance for diplomacy are related to location. In many cases, disasters occur in remote regions of states, raising issues of access, over flight, international co-ordination and the presence of external organizations and agencies in moving to or operating in politically sensitive areas. The hurricanes Katrina and Rita that affected the southern United States underlined the logistical, policing and governance encumbrances and vulnerability of a super power to large-scale natural disasters.

In some cases states have policies that place secrecy or severely restrict information on major disasters and emergencies. China, for example, restricted information about the earthquake that hit Tangshan, a coal mining and electricity centre one hundred miles south-east of Peking, which measured 7.8-8.2 on the Richter Scale, killingan estimated 242,000 people. In the American earthquake in contrast, Mikail Gorbachev, the president of the Seviet Union, cut short a US visit in 1988 and accepted a large – scale Western emergency relief effort (Willets, 1993).

INTERNATION DISASTER RELIEF

International disasters have been handled through a mixture of adhoc cooperation involving states, international charitable organizations and individual UN agencies, underpinned by adhoc financial appeals, rather than from a permanent central UN budget, sufficient for complex disasters and emergencies. In many instances, individual state pledges are not matched by actual contribution. For instance, following the Bam earthquake, Iran received approximately $17 million out of a pledged $ 1 billion (*Sunday Times, January 9, 2005*). In an effort to improve the co-ordination role of the UN, the General Assembly adopted Resolution 46/182 in 1991, which included provisions for a high-level Emergency Relief Co-ordinator (ERC) and a Department of Humanitarian Affairs (DHA), later reorganized as the office for the co-ordination of Humanitarian Affairs (OCHA), headed by Under-Secretary General Jan Egeland from Norway (http:// ochaonline.un.org). The permanent element of the UN OCHA's budget covered by UN central funds has nevertheless, remained small (about 10 percent; US $ 11 million), and in addition to having to deal with over eighteen UN agencies, the OCHA headquarters is functionally split between Geneva and New York, reflecting the organizational 'turf' wars of UN agencies. Whereas Geneva operations include technical needs assessment and 'hardware' co-ordination, the New York elements include strategic policy coordination and financial appeals (Bailey, 1989: 45-46).

EARLY WARNING SYSTEMS AND THE INDIAN OCEAN tsunami

A tsunami early warning system, the only one, was established in the Pacific following the 1960 Chilean and 1964 Alaskan tsunamis. The Pacific Tsunami Warning Centre (PTWC) is managed by the US National Oceanic and Atmospheric Administration (NOAA), and is the

operating arm of the International Co-ordination Group for the Pacific (IGG-ITSU) established by UNESCO's Intergovernmental Oceanographic Commission (IOC) [illegible]). It suffices to observe that no system had been established prior to the Indian Ocean Tsunami, covering the Indian Ocean (www.unesco.org/tsunami). The Pacific Early Warning System has twenty six member states, namely: Australia, Canada, Chile, Colombia, the Cook Islands, Costa Rica, the Democratic People's Republic of Korea, Ecuador, El Salvador, Fiji, France, Guatemala, Hawaii, Indonesia, Japan, Mexico, New Zealand, Nicaragua, Peru, the Republic of Korea, Samoa, Singapore, Thailand, the Russian Federation, the USA, and the Philippines (www.unesco.org/tsunami).

The Indian Ocean tsunami struck at 7.58:50 local time (12.58:50 GMT), on December 26, 2004, off the west coast of northern Sumatra. The earthquake began twenty five miles under the seabed. It registered 8.9 on the Richter scale and generated a tsunami which reached Kenya and Somalia 2,800 miles away (*The Guardian*, December 27, 2004; *Daily Nation*, December 28, 2004). The Tsunami travelled in parts at speeds of up to 500 miles per hour (mph), flooding the low-lying islands like Andaman and causing extensive devastation in Indonesia, Thailand, Sri Lanka and Southern India before reaching East Africa. An estimated 300,000 people died in the Indian Ocean tsunami (*The Guardian*, December 31, 2004).

INFORMATION AND COMMUNICATION

The role of information and communication in the Indian Ocean tsunami crisis is particularly striking. Instead of suggesting a high degree of inter-connectedness as an element of so-called globalization, the case illustrates the central role of communication failures-the influence of information standard operating procedures on distribution; information bottleneck; and the limited natures of international contacts between different monitoring or other scientific institutions concerned with tracking seismic and metrological data. Within a region prone to volcanic activity and quakes, minor tremors were accepted. The high dependence of states within the Indian Ocean region on tourism also meant that there was reluctance within Indian Ocean authorities to put out alerts warning of possible high levels of abnormal volcanic or possible tsunami activity.

Although the initial seismic activity off Sumatra was monitored at 7.58a.m. on December 26, 2004 in Padang, central Indonesia, the station experienced communication difficulties reaching the National Earthquake Centre in Jakarta. Elsewhere, the seismic activity was recorded at the Nagano observatory in Japan, in Australia and Honolulu. Information from these sources was distributed nationally and as part of standard procedures to their diplomatic posts overseas rather than to countries (*Sunday Times*, January 2, 2005). Moreover, the initial routine Honolulu bulletin referred only to the Pacific region, despite the estimate being quickly revised to 8 on the Richter Scale (www.prh.noaa.gov/ptwc/wmsg). Other reporting bottlenecks occurred, for instance, in the Andaman and Nicobar Islands naval command with New Delhi.

A further important factor in the communications failure was the timing of the crisis. International crises often have a habit of coinciding (by design or otherwise), with periods of international shutdown. In the tsunami case, breaking over the holiday weekend of December 26-27, 2004, meant that national and international organizations were without key operational personnel or at minimum manning, as was the case at the Comprehensive

Nuclear Test Ban Treaty Organization, headquartered in Vienna, with a world-wide network of monitoring points. The Honolulu warning centre in the Pacific also had no points of contact in the Indian Ocean region (http:// ochaonline.un.org). The overall effect of bottlenecks and lack of linkage was to cut or severely reduce warning time, leaving little or no time for emergency response that would have mitigated the overall loss of human life.

NATIONAL PERSPECTIVES, INTERNATIONAL DISASTER CO-ORDINATION AND NATIONAL FOREIGN POLICY SENSITIVITY

The diplomatic management of the actual crisis raised a number of issues regarding national response and how international cooperation would be organized. At a national level, one of the key questions concerns whether a head of state or government should be recalled to take personal charge of national policy. Is recall necessary and can decision making in an international disaster crisis (at least for states) be delegated and/or conducted electronically or via conferencing? In essence, does key leadership make a difference, and what is the effect on decision outcomes of non recall?

The issues arose in the case of the United Kingdom (UK) and in similar cases such as the European Union High Representative Solana, who in a move of *reapolilik*, continued with a private visit to the United States to see Condoleezza Rice (the then US Secretary of State) and later to the Middle East. In the British case, the British Premier remained in Sharmel Sheikh, Egypt, on vacation during the initial phase of the crisis, instead of returning to London. Decision making was conducted by the Deputy Premier along with the Foreign Secretary and Chancellor of the Exchequer, by telephone and conferencing with the Premier. The case provoked considerable domestic controversy – that on the grounds of the nature of the disaster and loss of British nationals, it was proper for the Premier to handle the issue personally. This in face of the fact that the premier left the G-8 Summit at Gleneagles, Scotland, following the London bombings, and closed the Summit early (*The Guardian*, December 31, 2004).

The tsunami crisis, therefore, on account of the foregoing, made a dent on British policy. The response was initially bureaucratic – led, with incremental moves 'trickled out' by the Department for International Development and Ministry of Defence (MOD), for instance, financial aid and individual worship deployment (*The Guardian*, January 3, 2005). The initial government financial donation to the crisis was itself overtaken by the UK domestic combined charities' Disaster Emergencies Committee pledges of £ 20 million, triggering the UK government to progressively increase its pledged contribution. However, eventually, UK financial commitments to the UN Office for the Co-ordination of Humanitarian Affairs (UNHA) Indian Ocean Earthquake-Tsunami Appeal (2005) rose to US$ 60 million, (5.8 percent), the fifth largest donor behind Japan (22 percent), private contributors (21 percent), Norway (6.8 percent) and Germany (6.3 percent) in phase one (http://ochaonline.un.org).

The development of the international diplomatic efforts in the tsunami crisis was influenced by a core of factors, including the critical attitude of the United States to the UN; the range of UN agencies involved; pressure for a UN-co-ordinating role, particularly from smaller developed donors; and the foreign policy sensitivities of disaster – affected countries.

It suffices to observe that the diplomatic aspects of the crisis were unusual in several ways. In particular, the United States initially attempted to manage the crisis, in tandem with its 'small coalition' view outside the frame work of the UN but later shifted to at least formally accept a UN co-ordinated operation. On December 29, 2004, President Bush announced the creation of a core group comprising India, Japan, Australia, plus the United States, to manage the crisis (*The New York Times*, December 30, 2004). Conspicuously absent were the roles of the UK, a close US ally in the Iraq conflict, the UN and any potential major donor. Nevertheless, the US model was endorsed by Indonesia which had earlier advanced a similar regional proposal (*The Guardian*, January 1, 2005).

The US, however, modified the core group approach at the Jakarta one -day summit on January 6, 2005, under pressure from the UN and several leading donor countries. (*The New York Times*, January 7, 2005). The summit was attended by the heads of government and /or foreign ministers from all the Association of South East Asian (ASEAN) countries (Brunei, Indonesia, Malaysia, Philippines, Singapore, Vietnam, Cambodia, Thailand, Laos and Burma) as well as China, the UK, Japan, South Korea, India, Sri Lanka, Maldives, Australia, New Zealand, the US, Canada, the EU Commission, the UN, the World Health Organization (WHO), UNICEF, the World Bank, the African Development Bank (ADB), the Islamic Development Bank (IDB) and the International Monetary Fund (IMF). Invited as observers, were France, Germany, the Netherlands, Denmark, Norway, Sweden, Timorleste, South Africa, Russia, Iran, Italy, and the International Committee of the Red Cross (ICRC).

The concept of a regional donor group was, however, strongly supported by Japan, whose foreign ministry nevertheless indicated that the group would cease to exist after the Jakarta Summit and become part of the overall international effort. However, the group had been 'innovative and effective in mobilizing aid' (*Financial Times*, January 7, 2005). Japan, via 'quiet diplomacy,' further consolidated its lead donor position (US $ 240 million) with meetings held with the World Bank and the Asian Development Bank, with Sri Lanka on January 10, 2005, on medium-term assistance (*Financial Times*, January 11, 2005).

The decision of the US was also influenced by recognition of the perceived need to repair its international image, damaged by the Iraq conflict. The tsunami crisis provided a rare opportunity to use overwhelming military power. Elements of a US carrier group were rapidly deployed off Indonesia and Sri Lanka for large scale emergency humanitarian assistance. In effect, control of hard military power was traded off for possible 'soft' power, image and presentational benefits. This was typically American style of foreign policy and diplomacy in operation (Okoth, 2010:27-28).

The shift from the Aid Donor Core Group to an effort with substantial UN involvement represented a success for the State Department's multilateral diplomacy. Colin Powell, the then US Secretary of State, visited the region January 4-7, 2005 and represented his country at the Jakarta Summit. In an unusual piece of domestic public diplomacy, a national appeal to the American public was made via a joint address by Presidents Bush, Carter and Bush Senior (*The Washington Post*, January 8, 2005).

The Jakarta Tsunami Summit Conference is itself interesting in three further regards. First, although the US modified its position, the conference membership formula was still in practice one of the G-8 (minus), plus the ASEAN and international/regional organization and other regional actors (already mentioned), thereby giving the conference a strong

regional emphasis. Second, the conference was G-8 minus European powers, which signalled regional and other political sensitivity, despite the large donor position. Third, eleven countries (already mentioned), had only observer status and were not invited as full members of the summit. Moreover, the African constituency was virtually unrepresented as only one country – South Africa – attended as an observer. This, despite the fact that many African countries, especially those bordering the Indian Ocean, were adversely affected by the tsunami (*Daily Nation*, January 1, 2005; *The Standard*, January 2, 2005; The *New Vision*, January 5, 2005).

National and foreign policy sensitivities are an important and often over looked dimension in major international disasters and emergencies. The Russian Federation, for instance, was reluctant to call in outside assistance in the case of the nuclear submarine Kursk disabled in the Barents Sea (*The Times*, August 13, 2000). China has been reluctant to disclose information on major accidents, medical emergencies (such as the 'bird' flu epidemic) or natural disasters. In the case of the Indian Ocean tsunami, sensitive issues arose because of long-standing insurgencies in two of the affected countries (Indonesia bedevilled by the Aceh separatist movement; Sri Lanka bothered by the Tamil Tigers). Other political factors affecting Indonesia included the previously difficult debt rescheduling/ structural adjustment negotiations with the IMF. Neither Indonesia nor Sri Lanka wished to see emergency/separatist issues or their domestic position on these weakened. Among the donor states, German assistance was linked initially to political progress in the two countries, but this position was later the subject of clarification by the German Foreign Minister. The UN Secretary-General signalled unwillingness to link the issues by not travelling to areas of Tamil Tiger influence in Sri Lanka.

Extreme logistical problems generated by the scale of the tsunami devastation necessitated reliance upon external military assets particularly helicopter and amphibious operations. Indonesia, for instance, put a time limit for the withdrawal of foreign military personnel which was set for the end of February or beginning of March 2005. Conversely, several donor states were concerned over the ambiguous status of Indonesian operations (either anti-insurgent or humanitarian assistance). For instance, the Royal Malaysian Air force refused to helicopter-lift Indonesian military forces on the grounds that its helicopter contingent was for 'aid' operations (*The Times*, January 15, 2005).

It is instructive to observe that disaster-affected countries were also concerned with the possible presence and large numbers of NGOs and, to a lesser extent, intergovernmental organizations. Administrative and military restrictions were placed on NGO access to and in Aceh province by Indonesia. India refused to accept foreign aid and closed the Andaman land Nicobar Islands, where an estimated four thousand people died, to NGOs (*Financial Times*, January 5 and 8, 2005). Indian policy reflected sensitivity over its image – projected as an emerging major power, and bidding for a permanent UN Security Council seat. (Okoth, 2010:33-34). India wished to be seen as part of the solution, not part of the problem.

DEBT RELIEF, ORGANISATION ISSUES AND EARLY WARNING SYSTEMS

As part of the Western response to the Indian Ocean tsunami, the Paris Club and others considered in early January, 2005 several debt relief proposals including a debt repayment moratorium (Canada and Germany) and debt 'write-off' (the UK). The proposals did not seem to be fully considered or take account of regional sensitivities (already discussed) on

debt. Additionally, some of the disaster - affected countries had neither used the Paris Club even in the Asian financial crisis, nor had Paris Club arrangements. In fact, for Thailand, Malaysia and India, debt relief could have been counter-productive, damaging their credit – worthiness and access to private capital markets, since the Paris Club would also require private creditors to write off their debt. The proposals were examples of the problem governments and bureaucracies face in crisis ,in which there is short decision –making time, to come up with distinct and innovative solutions to problems .The pressure to repeat similar ideas (for instance, on debt relief) , is strong, with the result that often initiatives take on the appearance of standard operating responses. According to the Indonesian Finance Minister, 'We didn't ask for a debt moratorium- they offered it to us' [*The Guardian,* December29,2005].

In the tsunami crisis, many diplomatic posts in the Indian Ocean region found it difficult to report accurate information and assessment on the nature and magnitude of the crisis because of factors such as standard operating procedures, staffing and logistical problems. Admittedly, many were not prepared for a complex and large-scale disaster, especially in national and international multi-agency communication, or the protection of nationals and tracing missing persons or victims. In several European countries, reviews were implemented to evaluate the rational response. In Denmark, for instance, a public review was undertaken to improve future Danish emergency preparedness. The report identified a number of difficulties for Denmark during the crisis, including the level of emergency preparedness of the Danish Ministry of Foreign Affairs[MFA] and embassy in Bangkok; communications between the MFA and other Danish authorities; and limited international co-operation and co-ordination during the first phase of the catastrophe. The report also identified the problem of swiftly obtaining a precise basis of information for the initiation of humanitarian assistance, and that the EU underestimated the extent of the catastrophe (www.um.dk,Tsu15/06/05).

As observed earlier, no political or economic consensus existed before 2005 to extend the Pacific tsunami warning system (PTWC) to similar arrangement for the Indian Ocean or other regions. In June 2004, the IOC meeting at technical level in Bangkok failed to reach agreement on the issue. It was only following the massive catastrophe and loss of life in the Indian Ocean tsunami that the international community, along with UNESCO/IOC, eventually moved to establish an Indian Ocean system. A by product of the tsunami crisis was the resumption of talks between Acech separatists and the Indonesian government, mediated by Finland, leading to a peace agreement in July 2005[www.um.dk, Tsu15/06/05].

The technical, administrative and economic issues of an early warning system were reviewed at the World Conference on Disaster Reduction in Kobe, January 18-22, 2005 and the Phuket Regional Ministerial meeting, January 28-29, 2005.The IOC agreed at the twenty third session of the IOC Assembly, June 21-30, 2005 to establish an Early Warning and Mitigation System for the Indian Ocean.

Three factors can be advanced for the failure to implement an early warning system outside the Pacific region. First, was the failure to secure internationally adequate funding or the technical support or a lead technology state?
Second, the question did not, in view of other competing issues, move on to the regional or international agenda. Third, there were some organizational factors. These particularly

focus on UNESCO/IOC. From an international relations theoretical perspective, they illustrate the process of agenda setting and how organizations track the dominant agenda. In this case, UNESCO/IOC main focus followed the lead ideas in the UN during the 1980s and 1990s, such as sustainable development and small island states. The Director General of the IOC was not prepared to push or develop agendas outside that frame work.

SUMMARY, CONCCLUSION AND RECOMMENDATIONS

The article is being summarized under five major issues. First, the Indian Ocean tsunami crisis highlighted the problem of the limits of co-ordination between or among institutions. Second, the crisis was a major example of information failure. Third, the crisis illustrated the failure or inability of organizations – national and international to transcend the main agenda. Fourth, the crisis provided evidence on the limited role of NGOs in some disasters because of foreign policy sensitivities which encumbered the conduct of diplomacy. Fifth, the crisis illustrated the role of standard operating procedures in national, regional and international organizations.

From the foregoing, conclusion can be drawn to the effect that the massive catastrophe and loss of life in the Indian Ocean tsunami crisis warranted the use of all the three tracks of diplomacy. Track one diplomacy (official diplomacy) which involves state actors both at national and international levels. Track two diplomacy (unofficial) diplomacy which involves non- state actors at individual, group and institutional levels, from the domestic or national dimensions. Track one-and-a half diplomacy which combines the efforts of actors in tracks one and two.

It is, therefore, being recommenced as follows: First, there is need to establish, in the participating countries, Ministry of Foreign Affairs (MFA) based task forces from the outset of a crisis (including travel agencies, emergency services and insurance companies). Second, there is need to establish rapid deployment teams in participating countries (individually), the region and the UN, with the view to enhancing especially multilateral diplomacy. Third, crisis preparedness of embassies (satellite phone, communications equipment, training, volunteers) must be strengthened. Fourth, cooperation with the Ministries of Foreign Affairs and mobile telephone companies on information related to emergencies (nationally, regionally and internationally) needs to be enhanced. Firth, common forms and procedures for registration of missing persons and persons affected by catastrophe need to be developed. Sixth, cooperation on crisis management under the auspices of the UN and regional organizations like the EU, the African Union, ASEAN, the Organization of American States (OAS), the Pacific Rim countries, etc, needs to be enhanced. Seventh, there is dire need to intensify participation in humanitarian operations and cooperation within the UN and regional organizations on the basis of bilateral and multilateral diplomacy.

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REVERSING ENVIRONMNENTAL DEGRADATION THROUGH INNOVATIVE AGRICLTURAL PRACTICES: POLICY OPTIONS FOR KENYA

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ABSTRACT

The problem of low agricultural productivity, poverty and attendant environmental degradation in sub-Saharan Africa is currently among fundamental concerns of policy makers. In response to these challenges, Kenya recognizes the need to conserve natural resources and maintain quality environment. However continued pursuit of intensive agricultural policy based on external inputs is at crossroad with sustainable agriculture paradigm. Intensive agricultural production systems invariably contribute to environmental degradation. Alternative farming methods such as organic farming that promise sustainability require policy attention. According to agro-ecology principles, organic farming voluntarily internalizes external environmental costs that may be borne by society unless legislation and sanctions exist to check against potentially harmful practices.

Understanding factors affecting performance of organic farming especially among smallholders, who constitute 75% of agricultural production in Kenya, is essential to formulation and implementation of policies in its support. This study identifies various social economic factors influencing performance of organic farming by smallholders.Logit Models revealed that distance from nearest market center, farm-size, livestock housing system, extension and household income had significant effect on adoption. It is constrained by inadequate or non-existent framework of agricultural incentives, institutions and services. Policy makers should promote organic farming through offering environmental benefits. Formation of extension associations by farmers practicing organic farming and information and promotional activities to stimulate demand should also be pursued.

Key Words: Environmental degradation, Sustainability, External inputs, Agro-ecology principles, Organic farming, External costs

INTRODUCTION

Convectional agricultural systems based on high energy external inputs mainly pesticides and inorganic fertilizers(phosphates and nitrates) is increasingly being linked to environmental degradation and attendant external costs/negative spillovers borne by society. These negative spillovers or external costs affect people's welfare yet there is no monetary compensation for the losses. As the negative spillovers are incidental or external to the market they do not appear in cost account of the producer although for individuals affected or society as a whole, they represent real cost (OECD, 1994). An externality exists when there is un-priced interdependency between two economic agents e.g. a farmer who conserves his farm confers non market benefit on his neighbors and society by way of reduced siltation and nitrogen leaching.

Environmental degradation broadly refers to any negative change in environment, land, soil, air, and water that is perceived to be deleterious or undesirable. The undesirable changes associated with conventional agriculture include soil erosion, acidification, reduced biological productivity and diversity. Though conventional agriculture has greater immediate impact than organic input in many farms, less than 50% efficiency in use of nitrogen applied is lost from soil system through leaching, runoff and volatilization to become hazardous and economic wastes or negative spillovers (Olembo, 1991).The hazards include eutrophication of water surfaces, green house warming and disruption to nitrogen cycles. Health hazards include cancer predisposition to both children and adults.

Organic farming involves substituting resources produced on- farm for purchased synthetic fertilizers and agricultural pesticides and using other effective mechanisms such as crop rotation to achieve effective and efficient short and long term use of natural resources. On-farm resources include cover crops to enhance soil fertility and weed control, livestock waste and crop residues, green manure and nitrogen fixing legumes such as Crotalaria, Calliandra and Sesbania. Sustainable agricultural development conserves land, water, plant and animal plant genetic resources to ensure attainment and continued satisfaction of human needs such as access to food .It calls for integration of economic and development policies so that incase of conflict between the two, ecological interests are given preference (FAO, 1998).

The technological aspects in organic farming include radical decreases in energy and material use and increase in energy efficiency, recycling and production of environmentally sound products (FAO, 2003). Reduction of negative environmental impacts are embedded in organic farming practices that incorporates acquisition of carbon sinks (carbon sequestration) and /or partial or total reduction of carbon emission related to substitution of carbon emitting fuels (carbon substitution). Switching away from high-energy content, chemical agri-inputs (fertilizers and pesticides) cuts down on energy levels offloaded into the environment. Mixed farming and diversity of organic crop rotations protect the fragile soil surface and may counteract climate change through restoring the organic matter content (FAO, 2001).

Organic management combine traditional conservation minded farming methods with modern technologies in order to rely more on native renewable resources and to exclude chemical inputs such synthetic, pesticides and fertilizers (OECD, 2003). Organic farming is a means to internalizing the external costs to the society (Lampkin, 1995, Alterieri et.al, 2001). Organic production management system promotes and enhances biodiversity, biological cycles and soil biological activity as it is based on minimizing use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.

Reganold *et al* (1987) in a study in USA reports a thicker topsoil layer in organically managed plots than conventional plots. He concludes that organic agriculture system is more effective than conventional system in reducing soil erosion and maintaining soil productivity, reduces the risk of nitrate leaching and is an economically efficient solution for reducing the cost of cleaning up drinking water by minimizing the nitrate and pesticide contamination of ground water. FAO, (2002) suggest that the higher levels of organic matter and practices of minimum tillage in organic systems increases water percolation

and retention ability of the soil and thus reducing irrigation needs and improves drought resilience for crops that would otherwise wilt.

Considerable body of research reveals there is higher abundance of arthropods (insects such as spiders, mites, centipedes, millipedes) in organic agricultural systems compared with other production systems (OECD, 2001). This evidence suggests that organic farms perform better in respect to floral and faunal biodiversity (Stolon *et. al.,* 2001). This appears to be linked to absence of pesticides, lower density of crops and higher incidence of weeds providing a food source (OECD, 2001). The greater abundance of arthropods and weeds encourages and attract other wildlife higher up the food chain such as birds.

Pretty and Hine, (2000) observe that organic management offers good prospects for raising yields and achieving sustainability .Organic farming ability to contribute to welfare of the present and future generations by providing adequate, healthy and safe food, goods and services in economically viable and environmentally friendly way through conservation of natural resource in resource poor and marginal areas can rise the productivity of traditional system relying on local resources. However, they doubt whether it is possible for organic farming to attain the high yields achieved with use of synthetic inputs in high potential areas.

Uphoff and Altiereri (1999) reports a several fold increase in yields for crops that the poor rely on (rice, beans, maize, cassava, potatoes) relying on labour and know how rather than on expensive inputs and capitalizing on the processes of intensification and synergy. Organic farming increases the stability of production as seen in lower coefficients of variance in crop yields (Uphoff and Altiereri, 1999). This is attributed to better soil and water management and conservation.

A number of studies have been carried on adoption of organic farming, mostly in Europe and United States of America (U.S.A). In analysis of motivation and aims of conversion, negative experiences with conventional farming were found to be the reason for taking up organic farming. In a survey of 63 farmers in Germany the following difficulties were mentioned: decline in farm income (32%), soil exhaustion and soil erosion (14%), increase in animal diseases (32%), increase in pesticides costs and aversion to use of pesticides (19%) (Vogtmann *et. al,* 1993).

To analyze external (socio-economic) benefits of organic farming both under long-term experimentation and farmer observation. Stolze *et. al* (2000) used multi- criteria analysis tool in study of European farms. The study concluded that organic farming had beneficial effects on soil organic matter compared to conventional farming. The study further concluded that under European conditions, organic farming performed better than conventional farming with regard to certain parameters. The study found 30-40% earthworm diversity more under organic farming compared to conventional farming and up to 90% more total mass of micro-organisms and abundance of saprophytic soil fungi under organic systems compared to conventional systems.

Under organic farming, integration of biodiversity at farm level is more likely to be achieved than under conventional system and this has a value for agro ecosystem sustainability (Fabio, Caporali, *et. al* (2003). Furthermore, the diverse cropping pattern tends to attract beneficial insects thus enhancing biodiversity. On the other hand, intensive

land use under conventional system drastically reduced landscape diversity and agricultural sustainability. As such higher profits of conventional agriculture occur at expense of biological richness and environmental health. Though the study found that organic farming improved the landscape aesthetics, its impact (landscape aesthetics) was difficult to quantify

METHODOLOGY

Criteria for Selection of Study Area

Vihiga District has one of the highest population densities in Kenya rural areas (886 people per km2) and poverty levels of over 62% (CBS, 2004). The high population density and poverty levels has implication on food security, agricultural input constraints and environmental degradation. Alternative agricultural production methods including organic farming to address external input constraints, increased income and on-farm employment have been suggested and promoted in the area. The study analyzed the social economic factors and relevance of organic farming to smallholder situation, which is predominant in the area. The study defined adopters as farmers who had incorporated the new organic production methods into the farming system on continuous basis for at least three years. Non-adopters were those farmers who had stopped using the new organic production methods within three years after trial stage.

Conceptual Framework

Performance was used to refer to adoption of organic farming technologies and comparison between organic and conventional agriculture on the basis of profitability, and potential environmental and livelihood impacts. The study was conceptualized on Random utility (Welfare) maximization theory. According to the theory each farmer seeks to maximize satisfaction. . Accordingly, farmers when considered as consumers of agricultural innovations, choose alternatives that give them highest utility (satisfaction). A farmer maximizes utility within limits set by his/her available resources. The decision to adopt an innovation is a behavioral response arising from a set of alternatives and constraints facing the farmer as a decision maker. Leagans (1979) groups the alternatives and constraints as incentives and disincentives respectively. Adoption proceeds only when incentives outweigh disincentives. Adoption is therefore a function of constraints and alternatives subject to welfare maximization criteria (profitability, environmental conservation and food security) incase of organic farming. Mathematically, the constraints and alternatives are presented by equation 1 -:

$$DADPT = f(a, c_{ie}) \quad \ldots\ldots (1)$$

Where

DADPT =Adoption decision

a = alternatives for achieving food security, environmental conservation and profit objectives either through organic or conventional farming

c_{ie} *= internal and external constraints facing the farmer.*

The alternatives present the cost of the next best benefit foregone (opportunity cost). As such the small-scale farmer will have to weigh between organic and conventional farming contribution to his objective of attaining household food security, optimizing profit and conserving the environment. However alternatives, which seem to be profitable from economic point of view, may face a peasants' resistance. Resistance to change by peasants is not a sign of incompetence or irrationality. Uncertainties and the need to meet minimal

survival levels of output in addition to the rigid social institutions, force most peasants to respond in rational manner when confronted with alternative opportunities (Todaro, 2000). Accordingly when risks of uncertainly are high (such as lack of reliable market, pests), a small scale farmer may be very reluctant to shift from a traditional technology and crop pattern that over the years he/she has come to know and understand to a new one such as new organic farming methodologies that promises higher yields but may entail greater risks of crop and market failure.. The contribution of organic farming to welfare of an individual farmer or society (equation 2) is thus a function of environmental conservation, profit and food security.

$$W_{of} = f(E, \Pi, Fs) \quad (2)$$

Where

W_{of} = *Welfare contribution by organic farming*

E = environmental conservation

Π = *Profit*

Fs = *Food security*

Sample Size Determination

The sample size was obtained by calculating the number of observations potentially needed to estimate a difference between two (2) means (with a confidence level of 95%, a coefficient of variation in adoption of organic farming of 68% and to observe a level of difference of 25%. Poate and Daplyn, (1993) provide equation (3) which can be applied to determine households per stratification group (adopters versus non adopters)

$$n = 2[zc/d]^2 \quad (3)$$

Where

n=sample size per each stratification group

Z= 1.96 for 95% confidence interval

c = Coefficient of variation (68%)

d = Level of difference (25%)

Calculation using equation 3 resulted in a minimum of 57 households per stratification group hence, a minimum sample of 114 households. To increase level of accuracy 128 households were interviewed.

Sources and Methods of Data Collection

Both primary and secondary sources of data were used. Primary data for the study was generated by means of a pre-tested questionnaire. The questionnaire included background information, household social economic attributes, technology characteristics, institutional variables and farm specific characteristics. In addition, primary data was collected through informal interviews with extension agents and NGOs promoting organic farming while secondary data was from FAO and government publications, abstracts and participatory rural appraisal (PRA) reports.

Model Specification

In adoption studies, responses to a question such as whether a technology was adopted are either Yes or No, hence dichotomous dependent variable. The independent variables that affect adoption can be both quantitative and qualitative. When the dependent variable is quantitative and continuous linear models such as OLS (ordinary least squares) can be used. However when the dependent variable is dichotomous, the use of OLS is inappropriate because of the basic assumptions of OLS such as normality and

homoscadicity may be violated. Moreover the computed probabilities may lie outside the 0-1 range (Greene, 1994). To overcome this problem logit or probit models have been recommended (Gujarati, 1988). Since the dependent variable used is dichotomous and equals 1 if the ith household adopts organic faming and 0 if otherwise, use of logit was found suitable. Logit and probit models with flexible functional forms in the independent variable tend to work well. The exact distribution of F depends on the distribution of the random error term. The probit model arises from assuming a normal distribution, and a logit model from assuming a logistic distribution. Under the standard assumptions about the error term, there is no a priori reason to prefer probit to logit estimation (Greene, 2000). Accordingly, in most applications it seems not to make much difference. Considering all these aspects a logit model was preferred because it can be interpreted easily (Maddalla, 1983).

Logit models provide empirical estimates of how changes in exogenous variables influence the probability of adoption of any technology. The results of the logit model estimates are reported as the marginal effects of a change in the exogenous variables, that is, the change in the probability of choice due to a one-unit change in the exogenous variable. Limited dependent variable (Tobit) models on the other hand are regression models in which the range in value of the dependent variable is constrained in some way. It is used where intensity of adoption e.g. level of fertilizer application are being studied. Tobit coefficients do not directly give the marginal effect of the associated independent variables on the dependent variable. However, their signs show the direction of change on the probability of adoption as the respective explanation variable changes (Amemiya, 1984, Maddala, 1985, Godwin, 1992). The objective of the study was not on intensity of organic farming adoption.

Let $Y^*i = \beta iXi + \mu i$,

Where Y^*i is the dependant variable, β is a vector of parameters to be estimated, Xi is a vector of dependent variables and μi is the error term. In practice, Y^*i is unobservable. What we observe is a dummy variable Yi defined by $Yi = 1$ if $Y^*i > 0$ (and ith household adopted organic farming), $Yi = 0$ if otherwise).

RESULTS AND DISCUSSION

The survey covered Sabatia and Vihiga Divisions of Vihiga District. The actual survey took two months between January and February, 2005.A baseline survey had been carried out for four weeks between November and December 2004, to identify adopters and non-adopters. The final sample for analysis in the study had 122 respondents. The youngest respondent was 23 years while the oldest was 79 years old. The mean household size and number of children was 4.55 and 6.49 persons respectively. A household was defined as all people who live under one roof and are subject to decisions made by,the household head. A household head was defined as the person who is the owner of major resource notably land.

Factors influencing adoption of organic farming were analyzed using a logit regression model

The estimates in Table 1 indicated the significance ($p< 0.05$) effect of labour, extension services, distance from market, household income and livestock housing on adoption of organic farming.

Goodness of fit measures indicated by Chi test ($\chi 2$) indicated that the estimated model fitted the data reasonably well and that the explanatory variables are jointly significant in

explaining adoption of organic farming in the study area. Interpretation of the coefficient with logistic regression is not as in linear probability models (LP) where coefficients estimate the change in probability to adopt. However, dividing the logit coefficients by a factor of 4 gives an approximation of LP coefficients (Maddalla, 1983). Thus the coefficient on extension, which is 0.96346, was interpreted, as LP of 0.24086.The interpretation is that keeping all other factors constant, repeated access to extension services (workshops, field-days, seminars)increases probability to adopt by 24%. The same reasoning was applied in interpreting the other significant factors.

Independent variable	Coefficient	S.E	Coefficient/S.E
Intercept	-.2.90920	.27193	-10.69834***
Age (X_1)	-.00548	.01508	-.36308
Labour (LAB)	.15418	.09634	-2.37462***
Farm size (FMS) (x_3)	-.22877	.12506	.56735
Incentive (Dummy x4) **1=Yes, o =No**	.48263	.31062	1.55378
Extension (EXT)(x_5)	.96346	.23758	4.05540***
Distance (x_6)	.22352	.06404	-3.49042***
Credit (Dummy x_7) **1=Yes, o =No**	.30193	.31551	.95691
Income (INC) (x_8)	. -80100	.31603	-2.53458***
Education (EDUHH) (x_9)	.09228	.06219	1.48379*
Manure (x_{10})	.12031	.10960	1.09774
Livestock housing (HHS)	-1.03108	.21952	-4.69703***
Sex **1=Male, 0=Female**	.24966	.34417	.72541
O.M availability **1=Adequate, 0=inadequate**	-.15129	.29184	-.51839

χ^2 =561.782, Sample size= 122, DF=107, pseudo R^2=0.18, P = .000

Table 1: Logit Analysis for adoption of organic farming, Vihiga District
Source: "Author's" survey, 2005, ***, ** and * Significant at .001, .05 and.10 level of significance

The research results are in tandem with (FAO, 2003) findings suggesting that, in developing nations such as Cuba, Brazil, Kenya and South Africa, non market organic farming and certified organic agriculture will increase in the long run depending on technological

innovations and factors that challenge agricultural development as a whole, such as credit and extension access, marketing and infrastructure development . Accordingly, specialized extension especially on integrated pest and disease management that is part and parcel of organic farming could result in increased organic farming adoption as disease problem was quoted as one of the major reasons by those abandoning organic farming in the study area.

Distance from the nearest market has negative effect on adoption of organic farming. An increase in distance from nearest market by 1km is likely to result into household's adoption decreasing by 5.6%.The results are in support of Walaga (2003) suggesting that organic markets in developing countries are limited mainly to large cities. Improving rural infrastructure, increased urbanization and ready market for producers are likely to lead to increased organic production. Deliberate measures should be undertaken by the government to improve rural infrastructure as to reduce marketing costs to enable organic farming thrive.

Farmers in the study area face organic material input constraints leading to its abandonment. These findings are in agreement with previous studies (FAO 2002) that organic farmers face supply constraints such as provision of adequate organic inputs and which are expected to increase especially in high potential areas. The current livestock housing systems where free range livestock management system dominates means more manure, a major source of organic inputs, is lost thus lowering its production potential. More efforts should be made to promote semi intensive and intensive livestock management in the area in order to increase manure production potential for increased organic farming adoption. This is in tandem with findings by Otieno et al (1995) who in a study of manure management in the area found higher and thorough manure production under intensive grazing and semi- intensive management Systems. Towards this end, credit and extension to promote zero/semi-zero housing system could be exploited and availed to farmers to achieve this.

The study revealed that organic farming is labour intensive and on average requires 50% more labour input in comparison to conventional farming. An increase in household labour by one labour unit is likely to decrease adoption by 4%, which is a paradox. This could be explained by the fact that larger households are mostly likely to offer their labour for sale to earn a living in absence of better paying on-farm opportunities. Labour intensive activities carry high opportunity cost for such households in presence of alternative livelihood options that meet their immediate needs. Furthermore motivation for manual work and healthy status of family members, which was not included in the study, could have masked the effect of household labour on adoption. Higher prices for organic produce that adequately compensate for labour input can serve as an incentive towards organic farming adoption. Institutional support, for example, through free certification schemes that ensures premium prices can have positive impact on organic farming adoption.

Increasing income of the household by 1% is likely to decrease adoption by 20%. Higher disposable income increases purchasing power hence ability to purchase external inputs such as pesticides and fertilizers. Increased off-farm employment opportunities offering better remuneration for members of the household are likely to work against organic farming. To avoid such scenario, strategies to promote organic farming and organic products as safe, healthy and environmentally friendly should be considered especially targeting the middle and high-income earners. This can act as a guarantee of market for the

producers. Furthermore policy interventions in favour of organic farming movement such as certification schemes that ensure premium prices will guarantee better farmer income to off-farm income earning opportunities thus working in favour of organic farming adoption.

CONCLUSION

The farmers using organic management principles combined traditional conservation minded farming methods relying more on native renewable resources while excluding chemical inputs such as synthetic, pesticides and chemical fertilizers. However, inadequate sources and availability of organic material are major constraints facing organic farming in smallholdings. The farmers produced uncertified organic produce.

The findings suggest that organic farming performs better in respect to floral and faunal biodiversity. Farmers used the improved diversity to avoid risk, increase food security and generate income as well to optimize land use and help adapt to changing conditions such as drought and increased market prices. Most of the adopters had improved livestock housing management systems (zero or semi zero). Improving livestock housing system could improve manure availability potential and collection efficiency with positive impact on organic farming adoption.

Organic farming can contribute to economically and environmentally sound agricultural sector in addition to improving livelihoods through increased income and food security impacts for external input constrained farmers. However the actual impact particularly on the environment will depend much on management practices of individual farmers and whether policy environment in favour of organic farming is formulated and implemented. The findings suggest that extension and research support could enhance adoption of organic farming and that organic farming is likely to develop close to urban centers. Increased urbanization and rural infrastructural development is therefore likely to provide impetus for its growth.

POLICY IMPLICATIONS AND RECOMMENDATIONS

Promotion of organic farming in Kenya requires policy instruments in addition to those based on legal regulations and economic incentives to support and facilitate its development. The support should take place within the domain of agriculture policy, the farming community and food market as well as institutions specifically set to coordinate its development. Enabling policies such as specialized research and extension services geared towards providing knowledge in terms of integrated pest and disease control, value addition and marketing should be pursued. Extension associations consisting of farmers interested in organic farming with a purpose of organizing and promoting organic farming should be explored. Furthermore, the government should exploit ways of forming a conversion scheme to support farmers who wish to convert to organic farming and offer free certification to encourage adoption. This will ensure premium prices hence increased adoption.

Inforrmation campaigns and promotional activities to stimulate demand should be pursued in order to provide sufficient guarantees to producers and encourage adoption. The campaigns should focus on strongly influencing consumer perception that organic food is healthier, safer and environmentally friendly. Both print and electronic media should be used to reach wider catchments of consumers. Integrating environmental education in to the school curriculum will ensure achievement of this goal in the long term. Accounting for various environmental externalities (both negative and positive) arising from different

farming systems is a key policy challenge. To meet the challenge and enable farmers make rational decisions as to the most appropriate system to adopt and in devising incentives and sanctions for and against negative and positive externalities respectively, a willingness to pay premium price for organic produce backed by field experimentation on parameters such as soil loss prevention should be undertaken in future studies to guide policy makers.

Acknowledgements

The authors are grateful to Deutscher Akademischer Austausch Dienst (DAAD) for their research funds to undertake the study. Special thanks to academic staff of the University of Nairobi, faculty of agriculture in general and the late Mrs Yobera, Dr.Mugivane and Dr. Kangethe Gitu in particular for making this study possible through their comments and critique. Thanks are due to all enumerators and farmers who participated in this study.

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FACTORS INFLUENCING SMALLHODERS' ADOPTION OF VEGETATION STRIPS AND DISPERSED TREE ON CROPLAND AGROFRESTRY TECHNOLOGIES, NAKURU DISTRICT, KENYA

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Abstract

Cases of declining food productivity among smallholder farmers as results of deteriorating soil fertility, farm subdivision and soil erosion on slopping lands have been cited in Nakuru district. To protection agricultural land from these non- sustainable land-use practices, farmers need to urgently adopt simple and reliable land management agroforestry innovations. This study was conducted to investigate and document socio-economic constraints related to adoption dispersed trees on cropland and contour vegetation strips technologies. The study was undertaken in Rongai and Njoro divisions of Nakuru district1999/2000. Purposive, proportionate and simple random sampling techniques were used to select a total of eighty small scale farmers as respondents. This study utilized both descriptive and inferential statistical methods in data analysis. Both primary and secondary sources on information were used in data collection. Primary data was collected by use of a structure questionnaire that contained the items in the objectives. Research results showed that, level of education, age, and gender was not statistically significant in the decision to adoption of dispersed tree and contour vegetation strips. Similarly frequency of contact and methods of passing extension information were found to be significant with dispersed trees on cropland vegetation strips contour strips. Lack of information on securing tree seedlings, lack of capital resource and an availability of labour especially during peak periods were sited as some of the factors that hinder adoption. There is need for intensive extension effort towards providing information on agro forestry to encourage more farmers to adopt system of agriculture that can maintain soil and water through demonstrations on farmers' fields, field days, farm visits and agricultural shows.

Key words: *Adoption, soil fertilityDdispersed trees on cropland and Contour vegetation strips*

Introduction

Nakuru district, Kenya is already experiencing the problem of environmental degradation in Njoro and Rongai divisions (Aboud, 1993). Farmers and livestock owners need alternatives to new agricultural technologies and simplified trees on cropland systems that have been promoted over the last few decades as part of development efforts. Generally adoption of agro forestry technologies as often been invoked as a solution to problems of land and water degradation, as well as an answer to shortages of food, fuel wood, cash income, animal fodder and building materials in Sub-Saharan Africa (Rocheleau et al., 1988). This is especially important in difficult environment, where people must manage hill slops, dry farm lands and fragile rangelands to survive and earn their living (Rocheleau et al., 1988).

Adoption of agro forestry is now largely viewed as away of developing appropriate sustainable land use and production systems. Indeed, there is a general consensus that future land use systems and production technologies must give farmers more flexibility to respond to more rapid Shifts in social, economic and ecological condition due to population pressure and climate change. New agricultural production system and technologies must

maintain, or restore, the soil and water resources upon which rural like depend. The purpose of this study was to investigate the socio-economic constraints that influence the adoption of dispersed trees and contour vegetation strips to sustain soil fertility and water resources.

Materials and Methods

Since the earlier works of Rogers (1983) efforts to explain determinants of adoption have been expanded. Feder et al., (1985), Nkonya et al.,(1997). Feder et al., (1985), defines adoption as the degree to which a new technology is used on long run equilibrium when farmers have complete information about the technology and its potential. On the other hand aggregate adoption is defined as the process of diffusion of a new technology within a given geographical region (Senkondo et al., 1999) Nkonya et al., (1997) pointed out that factors affecting adoption differs across countries and are location specific thus calling for studies that are location specific. Hence understanding of both processes is important for extension workers, policy makers and researchers involved in agroforestry. According to Rogers and Shoemaker (1971) and Rogers (1983), adoption of innovations is function of several factors; it is a sequential process of decision making that involves the following five stages: awareness stage, interest stage, evaluation stage, trial stage and adoption stage- a full-scale acceptance and integration of the technology. During this process, an innovation is evaluated using six criteria relating to innovation characteristics namely; relative cost, trial ability, compatibility adaptability, observability and complexity. These are considered by the farmer in turn to examine the factors affecting the probable adoption of new technological innovations (Reed, 2008).

This study was under taken in Rongai and Njoro Division of Nakuru District. Both primary and secondary sources of information were used to collect data from small scale farmers. This study utilized descriptive survey research design. Structured questionnaire was used to collect both qualitative and quantitative information that comprised of farmers personal data including: age, educational level, gender, land size, land tenure, income, source of farm labour, crop and animal productivity, common extension approaches and frequency of conduct with extension agents were also investigated. A statistical formula given Kathuri and Pals (1993) was sample size, eighty respondents who were then identified and interviewed. However, in choosing sample size, other constraints: financial, energy and time were also considered.

Purposeful sampling technique was used to identify three most degraded location in each division, a table random numbers are given by Fischer in Agarwal, (1991) was used in picking the farmers. Responses from the individual farmers' were pooled for purposes of data analysis. Data was analyzed using (SPSS) a statistical package for social scientist computer programme. Descriptive and inferential statistics were applied to test the null hypotheses. Interpretation of data was based mainly on chi-squares values for all the independent variables. In testing these null hypothesizes, chi-square values calculated to taste the level of significance for each of the above factors (independent variables). The null hypotheses of significant relationship were excepted if calculated X2 statistic were greater than critical X2 at alpha 0.05 or 0.01 in some instances. The hypotheses on the other hand were rejected if the calculated X2 statistic were approximately equal to the critical X2 (chi-square distribution) or less at alpha 0.05 ($P<0.05$).

RESULTS AND DISCUSSIONS

Farmer's Characteristics

Over 80% of the respondents had basic education. They were in their mid-forties and a mean income of over Kshs. 100,000. Men formed 65% and women 35% of the respondents. Almost all the respondents owned farms whose average size was 1.42 hectares. Over 78% of farmers reported to be using family members as their main source of labour which is either not always available or may be devoted to other farm activities and only 23% of the respondents are willing to go for hired labour.

Relationship Of Farm Size To Dispersed Trees On Cropland And Contour Vegetation Strips

Relationship between farm size to contour vegetation strips and dispersed trees on cropland were tested at ($P \leq 0.05$) gave chi-square values of 5.375 and 5543 respectively against the critical chi-square value 7.8147 at 3 degrees of freedom. The results showed that adoption of contour vegetation strips and dispersed trees on cropland were not statistically significant (see table 1 below). This similar to the findings of Swinkels and Franzel (1997) who found out that adoption of an agroforestry technology depends on its profitability and acceptability. The results disagree with those found by Amudavi (1993) and Salasya (1998) in a study conducted in Kenya found significant relationship adoption of techonologies as land size is a proxy to wealth and social status and indeed large technological advances require land farms. The results similarly disagree with those found by Salam et al. (2000); Upadhyay et al. (2003); Boz and Akbay (2005) who found out the owners of larger than average land holdings are likely innovators

Table1: Relationship of Farm Size to Dispersed trees on cropland and vegetation strips Contour Strips

FARM SIZE IN ACRES	DISPERSED TREES ON CROPLAND ON CROPLAND		VEGETATION STRIPS CONTOU STRIPS	
	Adopted	Not Adopted	Adopted	Not Adopted
0 t 5.0	36	24	30	28
5.01 to 10	4	9	6	9
10.01 to 10	2	0	0	2
>15.01	3	2	2	3
TOTAL	45	35	38	42
Observed chi-Square Value(X2)		5.357		5.453
Critical-Chi-Square Value (X2)		7.8147		7.8147

Relationship of Farm Income Dispersed trees on cropland and vegetation strips Contours

When all chi-square values for the two technologies were calculated against the independent level of income the chi- square values was lower than the critical chi- square value as shown in the (Table 2). Hence the adoption of dispersed trees and contour vegetation strips is not influenced by level of income. This can be explained the fact farmers have known the importance of growing trees and are no longer driven by income in an effort to conserve their lands from loss of soil fertility.

FARM INCOME (Kshs)	DISPERSED TREES ON CROPLAND		CONTOURVEGETATION ST	
	Adopted	Not Adopted	Adopted	Not Adopted
0 to 50,000	11	7	9	9
50,00 to 100,000	15	12	11	6
100,001 to 200,000	16	10	10	15
>200,001	13	6	7	12
TOTAL	45	35	38	42
Observed Chi-Square X2		6.588		7.450
Critical chi-square-Chi-Square X2		7.8147		7.8147

Table 2; Relationship of Farm Income with adoption Dispersed trees on cropland and vegetation strips Contours trips.

Relationship of gender with Relationship Dispersed trees on cropland on cropland and vegetation strips Contours trips

When all chi-square values two technologies were calculated against and gender, chi-square values were lower than the critical chi- square value as shown in the (Table 3). However findings disagree with those found by Cook and Grut (1989). whose work on agro forestry in Sub-Sahara Africa; a farmer's perspective, found out that decisions regarding agro forestry are often made based on gender. The results of this study show gender does influence decision making at various stages of tree planting and cutting both on household farm as well as on community land.

FARM INCOME (Kshs)	DISPERSED TREES ON CROPLAND		CONTOURVEGETATION ST	
	Adopted	Not Adopted	Adopted	Not Adopted
MALE	28	26	24	29
FEMALE	18	9	14	13
TOTAL	45	35	38	42
Observed Chi-Square X2		1.796		.0300
Critical chi-square-Chi-Square X2		3.8452		3.8452

Table 2; Relationship of gender with adoption Dispersed trees on cropland and vegetation strips Contours trips.

Relationship of Farmers age and level of education contact with adoption of Dispersed trees on cropland and vegetation strips Contours strips.

According to (Reij and Waters-Bayer (,2001) innovators tend to be old and long experienced farmers. However, there no statistically significant relationships with age and level of education on the two technologies.. This can explained by the fact that younger and old farmers and both educated and lowly education favour agro-forestry innovations as a

solution to problems of land and water degradation, as well as an answer to shortages of food, fuel wood, cash income, animal fodder and building materials in their community.

Adoption in Relation to Extension Service and labour availability with adoption of Dispersed trees on cropland and vegetation strips Contours strips

When chi-square test was calculated for farmers' frequency of contact with extension and labour were analyzed at alpha level 0.05, with 4 degrees and 1 degree of freedom respectively, neither dispersed trees on cropland nor contour vegetation strips was not statistically significant This could attributed to lack of extension in the study area . Indeed it was difficult to rate the extension service in this study in terms of it's adequacy and usefulness since the scope of this study was limited only to agro forestry adoption and provision of extension services and labour was not influencing level of adoption either. It could d be concluded agro-forestry innovation decision process takes place without external input. Thus farmers often promote their innovations energetically to their peers investing considerable time and resources. However, effective communication on agro-forestry technologies that have the capacity to meet diverse range of objectives is key to their adoption.(Strong and Jacobson,2006).

Problems which are hindering adoption of agro forestry Technologies by small holder farmers in Rongai and Njoro division, Nakuru District. Some of problems that underpin the adoption of the technologies cited which hinder adoption of the selected technology by smallholder farmers in Nakuru District, Kenya. Those who lack information on where to secure the right seedlings, lack resource especially capital, have problem of labour unavailability especially during the peak period when it has to compete elite crops.. Lack of knowledge and skills on agro forestry systems Such problems have also been cited by (Salasya, 1998).

CONCLUSION

Farm size and income, gender and age did not influence farmers' adoption of contour vegetation strips, while labour constraint seemed to influence smallholders farmers' adoption of dispersed trees. Similarly, level of education, frequency contact between the extension staff and the farmer and also the method used in passing extension message seemed not significantly influence adoption of dispersed trees on cropland and contour vegetation. Constraints, which hinder adoption of dispersed trees on cropland include: lack of a awareness of agro forestry technology information, lack of knowledge on place of where to secure the right tree seedlings, and over reliance on family labour which is unavailability especially during the peak period and low- level.

RECOMMENDATIONS

Intensification of dissemination of agro forestry information that relate to economic incentives, land use systems and land tenure conditions through enhanced extension services field days, farm visits, shows and holding farmers' demonstrations at tree nursery sites. This should focus on new agro forestry technologies that must maintain or restore soil and water upon which rural depends were there has been a lot of (deforestation) to open up for arable farming.

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WIDOWS IN RELATION TO HIV AND AIDS INFECTION IN BUTERE/MUMIAS DISTRICT: SOCIO-CULTURAL CHALLENGES

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ABSTRACT

The study investigated social-cultural factors that increase vulnerability of widows to this infection in the former Butere/Mumias District of Western province - Kenya. It was guided by Functionalism theory, demonstrated by "Behavioral change model" conceptual framework. The study design was a descriptive cross-sectional survey and purposive sampling procedure was used to collect data on 400 widows and the distribution was 80 widows in each of the former five Divisions: Mumias, Butere, Khwisero, Matungu and South Wanga. The study covered the period May-July 2006. Data was collected using questionnaires and analyzed using Excel and SPSS software. Results indicated that 75% and 95% of the widows in the study were in the age range of 21-40 years and had basic education, respectively. There was a significant ($p<0.05$) positive association ($r=0.621 \pm 0.031$) between HIV and AIDS awareness and Knowledge about HIV status of widows. However there was a significant ($p<0.05$) negative association ($r =-0.125 \pm 0.048$) between literacy rate and knowledge of HIV status. Majority (67%) of them were remarried or traditionally inherited with a higher percentage (70.5%) in polygamy. The key reasons given for remarriage or traditional inheritance were; sustenance (20%), sexual fulfillment (19%), culture fulfillment (14%) and peer pressure (12%). The important cultural practices noted to increase propagation of HIV and AIDS were; shaving with common razor blades during funeral ceremonies (34%), indiscriminate sex during funerals (21%) and traditional widow inheritance by male relatives (20%). It was concluded that widows in the District experience socio-cultural challenges that could be reduced by remodeling and intensification of HIV and AIDS awareness programs. The results of the research will help to protect and empower widows socio-culturally in order to help reduce vulnerabilities to the infection.

Key words: *HIV and AIDS, socio-cultural, challenges, widows, Butere/ Mumias District, Kenya*

INTRODUCTION

AIDS is the most globalized infection in history and there is evidence of its growing 'feminization' (Dunkle et al., 2004). According to UNAIDS (2009) Sub-Saharan Africa is the region most affected and has 67% of all people living with HIV and AIDS worldwide. In many parts of Africa, the transmission rate for women is already higher than for men (Andayi, 2008). The shift has come about not because women are taking greater risks in their sexual lives, but because of social and cultural inequality (Ibid), economic marginality, and restricted access to power in public and private life, and legal systems that discriminate against women and deprive them of basic rights (FHI, 2010). Women are physiologically, socio-culturally and economically more vulnerable than men to HIV infection (FHI, 2010; MOH, 1997 & UNAIDS, 2004). HIV infection is transmitted predominantly through heterosexual contact and it affects the health and the lives of many economically prime people leaving behind socio-economic disturbance (MOH, 2005).

In Kenya the ratio of HIV infection for women to men is relatively high (Andayi, 2008). In the year 2006, NACC and NASCOP (2007) reported Kenya's HIV prevalence rates for females and males as follows: National (female (6.7%): male (3.5%)), Western province (female (6.4%): male (4.2%)) and Butere- Mumias District (female (6.9%): male (4.5%)). Over 300 deaths, due to AIDS and related complications are reported in Kenya daily (NACC, 2005). There is need for continuous concerted efforts to minimize the spread of the infection by studying individual groups of people basing on common characteristics (Andayi, 2008).

Widows are particularly vulnerable socio-culturally and often men take advantage of their situation to establish multi-sexual relationships that increase their risk to infection (Human Rights Watch, 2003 & FHI, 2010). According to (Human Rights Watch 2004) many widows are left with the burden of raising large families; they are denied property inheritance rites and are commonly stigmatized and discriminated due to negative beliefs about them. Such cases have been cited in Western Province of Kenya by Human Rights Watch (2003) and (2004). NACC & NASCOP, (2007) identified priority areas in reduction of HIV transmission as: empowering young adults, prevention of violence against women and removal of punitive laws, policies, practices stigma and discrimination that block effective response to HIV.

The research particularly targeted widows in the former Butere/Mumias District of Western Province, Kenya where the HIV prevalence for women is high (6.9%). According to the theory of Functionalism change in an environment of an individual or population can cause modification in behavior which easily increase or decrease vulnerability to a harmful situation. The socio-cultural challenges in the environment of widows could increase vulnerability to HIV and AIDS (Figure 1).

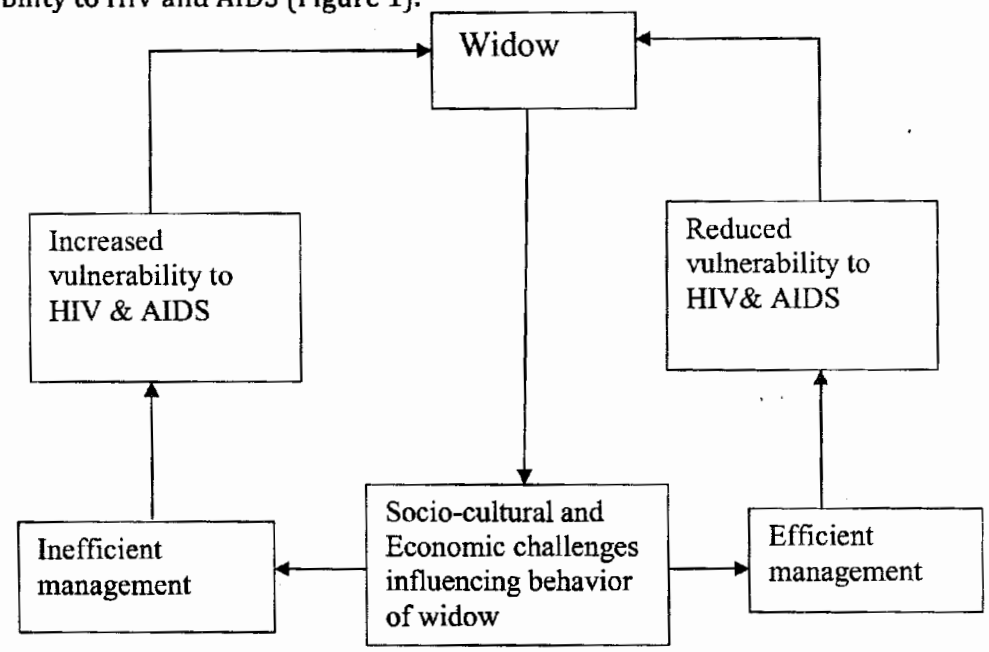

Figure 1: Behavioral change model for widows

MATERIALS AND METHODS

This research was carried out in the former Butere/Mumias District in Western Province of Kenya (Figure 2). They lie between longitudes 36.5 E and 36 E and latitudes 0.15 N and 1 N of the Equator. The districts cover a total area of 939.3 km^2, and had a total human population of 564,620 (Mumias Finance Planning, 2004). The district was divided into five administrative divisions namely; Butere, Mumias, Matungu, Khwisero, and South Wanga (Etenje). The District had good rainfall conducive for arable farming with two rainfall seasons and high temperatures all the year round. They also fell under a rich agricultural zone with good soils able to support a variety of crops like maize, beans, sunflower, bananas, sweet potatoes, tea, coffee, finger millet and cassava. However, they were generalized as being food deficit areas since most arable land is under sugarcane production. Sugarcane is the main cash crop and it is grown in Mumias, Matungu, South

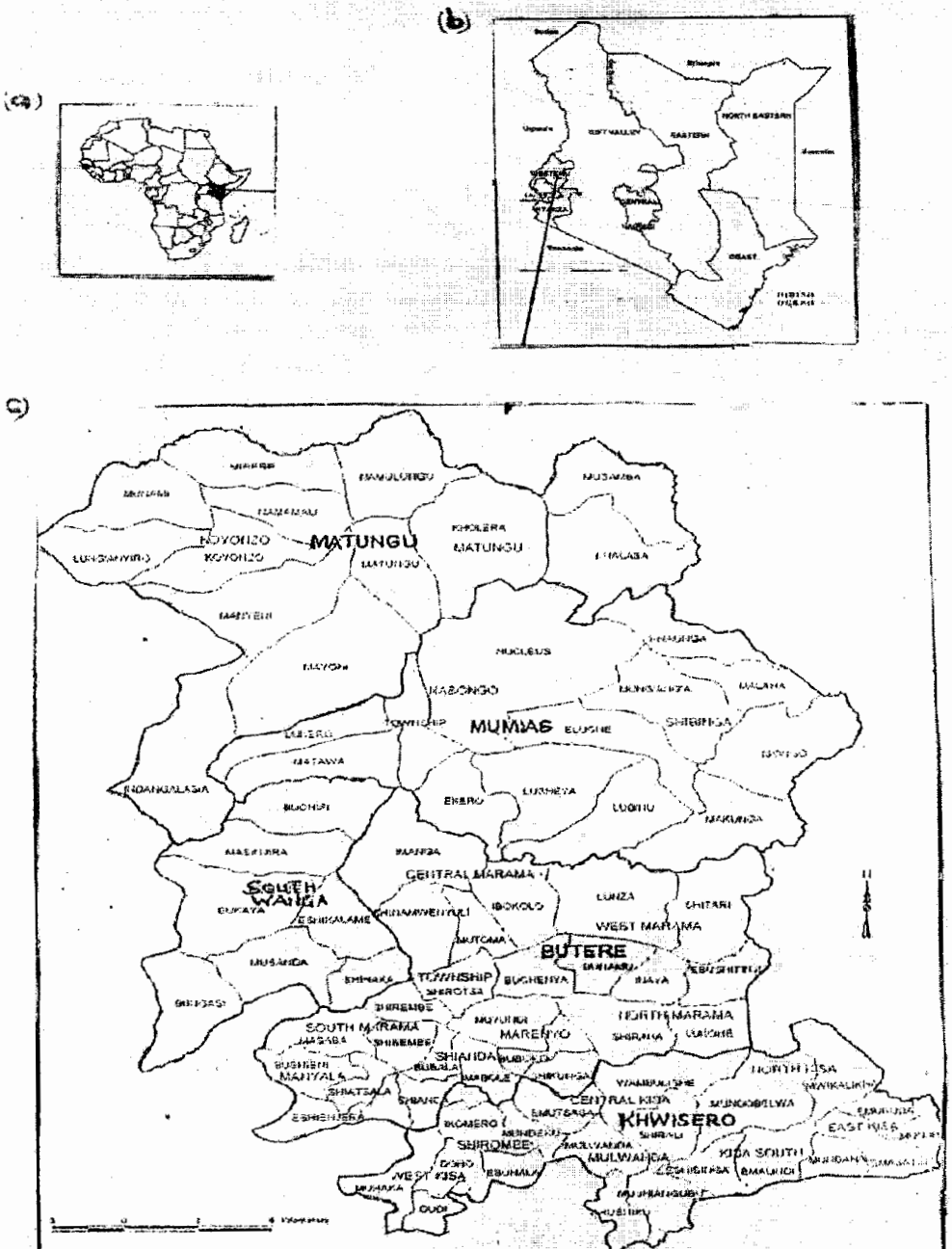

Figure 2: Maps of; (a)

Africa, (b) Kenya and (c) Butere-Mumias District

Source: MOH, 2005; MFP, 2004.

Wanga and Butere divisions. According to Mumias Finance Program (2004), the district has one manufacturing industry – Mumias Sugar Company (MSC), which is the largest sugar factory in the country and has attracted a diversity of people especially in Mumias division. A descriptive cross-sectional survey study design and purposive sampling procedure was used to collect data. A sample size of 400 widows was determined using a statistical formula for population for large populations by Cochran (2000).

The purpose and importance of the research was verbally explained to the leaders and widows who were willing to be interviewed. Consent was also sought from the widows who agreed to participate. The environment was made conducive for the participation by developing rapport between the researcher and the widows. Each widow participating in the research was guided in understanding the questions. This exercise was conducted at individual client level to maintain confidentiality and trust.

A pilot study was conducted on 40 widows in two villages of Khwisero and Butere divisions to measure the validity and reliability of the research instrument. Widows selected for piloting, were not part of the research sample. The questionnaires of the pilot research were assessed and the weaknesses identified e.g. blank spaces, inaccurate responses and inconsistencies on the instrument. The instrument was modified accordingly. Document analysis was used by the researcher to corroborate responses given in the questionnaires. To attest reliability, test-retest reliability method was used. The widows selected for pilot research were given instrument at different times within a period of two weeks. The scores were computed to establish Pearson Correlation Coefficient. The calculated value was r= 0.8 which was relatively higher than the set value of 0.5. This showed high reliability. Document analysis was used by the researcher to corroborate responses given in the questionnaires.

The respondents were requested and assisted to fill a pre-structured questionnaire. Participation was done at individual level to maintain confidentiality due to stigma and discrimination still high in rural areas. Research Assistants who were qualified social workers (specifically women) were trained in data collection techniques and employed to assist in data collection. The illiterate respondents were assisted to complete the questionnaire, by translating the questions into their understandable languages. Keen observation was also employed to ascertain the responses. The responses enhanced formulation of useful recommendations to the research.

Documented data were obtained from HIV workers and survey reports from Kenya Demographic Health Survey (KDHS), UNAIDS websites and NACC/NASCOP reports. The data were cleaned before coding. The summarized questions were entered on a spreadsheet Microsoft Excel and then imported into Statistical Package for Social Sciences (SPSS). Validation and further cleaning was done before the data were subjected to statistical analysis.

Analysis was done using Chi-square test and Pearson's correlations test to compare proportions of categorical variables and any associations and/or relationships. Frequencies

of responses were also calculated to determine the means of responses. Presentations were done graphically using charts and tables.

RESULTS AND DISCUSSION

Age range of widows versus vulnerability to HIV

From the research findings majority (75%) widows fell under the age range of 21-40 years (Andayi, 2008). The mean age of the widows was 33.6 indicating that most widows were in their prime ages of production. This is a youthful age when most women are sexually active and reproductive and therefore vulnerable to HIV and AIDS FHI (2010). The results corroborate the findings by Ndeda (2000) where it was noted that HIV infection primarily affects people between 15-45 years.

Other related studies in Kenya also indicated that youths (age 15-45 years) are exposed to HIV and AIDS due to being biologically sexually active (MOH, 1997). According to MOH (1997), peer influence plays a significant role in determining the level of involvement in risk practices especially among the youth and in more traditional societies peer grouping reinforces strong common social beliefs that can lead to HIV risk. Peer pressure could therefore be a contributory factor to the youth's involvement in HIV risk behavior. Along with this, Zahra et al. (2006) recommended peer education as a more effective method for AIDS education among the youth.

Education level versus vulnerability to HIV

About 95% widows had basic education (Andayi, 2008). This implies most of the widows could access some information about HIV and AIDS through reading, listening to media attending seminars among others. This is in agreement with MOH (1997) who noted that high illiteracy caused inaccessibility to accurate and reliable information about HIV and AIDS. It was noted by FHI (2010) that poorly educated women and girls are too often victimized by misinformation or lack of information about the epidemic, safer sex options and legal rights. The results of this study show that most widows had basic education that could enable them to be educated and trained prevention strategies against the pandemic hence reducing their vulnerability.

Knowledge about personal HIV status declined as the education level increased (Andayi, 2008). This observation corroborates observation by Snelling et al. (2006) that though education modified the association between HIV and AIDS knowledge and protective measures, stronger associations were seen at lower levels of education. This is however contrary to expectations in many societies where stronger associations are usually expected at higher levels of education as noted by FHI (2010). The results may have implied that highly literate widows could have been ignorant about their HIV status due to fear of being tested, fear of stigmatization or social status assumption (Andayi, 2008). Accordingly, FHI (2010) observed that Stigma, denial and discrimination (SDD) has made many people not to talk openly about HIV and AIDS.

HIV and AIDS Awareness versus knowledge about personal HIV status

Statistical tests on HIV and AIDS awareness versus knowledge about HIV status among the widows showed a significant ($p< 0.05$) and positive ($r=0.621 \pm 0.031$) association (Andayi, 2008). Many (83%) widows who were highly informed on facts about HIV knew their personal HIV status. This corroborates finding by Snelling et al. (2006) who observed a positive association between increased knowledge of HIV and AIDS and HIV protective behavior. Some widows may also be forced by circumstances like curiosity and/or health of the family to know their HIV status. On the other hand many (86%) widows who were less informed about HIV and AIDS did not know their HIV status. This could be associated with ignorance and probably belief in wrong facts about HIV and AIDS.

Many widows in the study expressed fear in knowing or revealing their HIV status (Andayi, 2008). UNAIDS (2004), noted that some women hesitate to seek HIV testing or fail to return for their results after voluntary guidance and counseling because they fear possible result of physical violence, expulsion from their homes or social ostracism. Similarly CAPA (2010) indicated that stigma, denial and discrimination (SDD) has made many women not to talk openly about HIV and AIDS.

Socio-Cultural practices in Butere Mumias District

(i) Religion versus socio-cultural practices

Majority (85%) of the widows were Christians (Andayi, 2008). Although Christian values stand against issues of polygamy and inheritance (MOH, 1997), results of this research revealed that, many did not adhere to their religious beliefs in that many (43%) were inherited and in polygamous relationships (60.8%) while others (24%) were willing to perform cultural rituals. Inheritance and polygamy are key cultural practices that increase vulnerability of widows to HIV and AIDS infection (Human Rights Watch, 2004). Religion was therefore reflected in this research as not having been able to eliminate the widows' choice for cultural practices. The results of this study could be implying that culture dominated over religion in this District. Although religion promotes moral values, widows committed to their religion are often vulnerable because of some principles which demand that women submit to their husbands. They are not in a position to negotiate for safer sex or to tell their partners they do not wish to engage in sexual intercourse, and are thus vulnerable to sexual abuse and possible infection with HIV (FHI, 2010).

(ii) Sexual relationships of widows

The study showed that many widows (67%) were in an alternative sexual relationship through remarriage or inheritance. About 70.5% widows were in polygamy (Andayi, 2008). A report by MOH (1997) earlier documented that 70–80% prevalent mode of transmission of HIV is through sexual contact (heterosexually and homosexually). According to CNIS (2000), marriage and other long term monogamous relationships do not protect women from HIV. In any form of marriage vulnerability of widows to HIV infection may increase because of cultural emphasis on submissiveness of women to men making them in most cases unable to negotiate for safe sex. This also corroborates studies in Sub-Saharan Africa documented by Human Rights Watch (2003) and FHI (2010) that women seldom use condoms for protection in marriage hence are sexually vulnerable to HIV and AIDS.

iii) Reasons for alternative sexual relationships

The important reasons for inheritance or remarriage were; sustenance (20%), sexual fulfillment (19%), replacing father figure (18%), culture fulfillment (14%) and peer pressure (12%), (Andayi, 2008). The high percentages of sexual fulfillment, replacement of father figure and peer pressure as reasons for inheritance/remarriage could have been an indicator that most the widows were youthful and therefore sexually active. The high percentage of sustenance as a reason for inheritance/remarriage reflected the widows as having dependency syndrome on men. This could have been so because of widows having inadequacy in resources food (22.2%), shelter (17.3%), clothing (19.6%) and medication (15.6%). The socio-economic dependence could lead to sexual exploitation by some of the men hence increasing vulnerability to the infection. USAID (2006) also observed that women who were economically dependent on men feared violence, loss of financial security or being abandoned, especially if they tried to negotiate the use of condoms within their marriages. MOH (1997) report also revealed that women were susceptible to sexual transmission of HIV due to dependence on men for economic support.

Other reasons given for remarriage/inheritance of widows included protection from harassment (7%), seeking favor (4%), hostility from relatives (3%) and revenge (1%). According to Iwere (2000) the role of religious communities, traditional healers, and community leaders in challenging stigmatization, discriminatory and harmful cultural beliefs and practices about widows can help reduce their vulnerability.

(iv) Cultural practices that increase vulnerability to HIV infection

The cultural practices like shaving with common razor blades (34%, indiscriminate sex (21%), cultural widow inheritance by relatives (20%) and personal choice inheritance (20%) were revealed as still highly practiced in this District (Andayi, 2008). Human Rights Watch (2004) documented that where cultural practices such as wife inheritance and cleansing of widows among others were conducted, AIDS prevalence was usually high. Indiscriminate sex and inheritance often involve multiple sexual partnerships and in accordance to gender related power the women are socially disadvantaged. This observation is in agreement with UNAIDS (2006c), MOH (1997) and Maman et al. (2002) who documented that gender norms in many cultural societies reinforced a belief that men should seek multiple sexual partners, take risks and that women and girls should be ignorant and passive about sex, leaving them unable to negotiate safer sex or access appropriate services. A similar observation was also documented by USAID (2006) that inability of women to negotiate for safe sex was as a result of traditional norms/roles expected of women socio-culturally and that were passed from one generation to another. These norms or roles work against prevention messages that support fidelity and other protection measures from HIV infection.

CONCLUSION AND RECOMMENDATIONS

The research carried out in Butere and Mumias District established that most widows experience socio-cultural challenges in relation to HIV and AIDS. Many widows were in their youthful age where they are sexually active and therefore mostly in alternative sexual relationships. Cultural practices like widow inheritance, polygamy and indiscriminate sex during funerals are still dominant in this District yet they increase risk to HIV infection.

Most of the widows had basic education hence could access some information about HIV and AIDS. However, knowledge about personal HIV status declined as the education level increased and this was could be associated to fear of stigmatization, stigmatization and social status assumption. According to the study, HIV and AIDS awareness relates positively with knowledge about individual HIV status.

This study revealed that many widows observed their cultural values more than religious values. This was shown by the high percentage of widows willing to perform cultural rituals, inherited and those in polygamous sexual relationships all of which are against their faith in Christianity. Many widows in the District were reflected as having a cultural dependency syndrome that increases their vulnerability to HIV infection.

The study recommended that HIV and AIDS awareness program should be remodeled (developed into positive HIV prevention messages that help normalize HIV) and intensified in order to attract their attention as well as reduce fear developed for the pandemic. Peer education (observed as a more effective method of education) on issues about HIV and AIDS should be implemented in all sectors of this District in order to increase knowledge and positively change the community's attitude. Religious and administrative bodies should take the lead in educating the Butere-Mumias community (through vertical and horizontal grass root and elite approach) against retrogressive cultural practices that can increase HIV risk. Research should be done to unearth the alternative cultural practices in this community that do not involve sexual contact or exchange of body fluids in order to safeguard those involved against the infection. The government should enact laws of heavy penalty for gender discrimination and empowerment of widows socio-economically in this District.

Results generated from this research could also assist government, NGOs, CBOs and other relevant institutions to formulate policies that protect and empower widows socio-culturally in order to help reduce both vulnerabilities to the infection.

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METRIBUZIN SORPTION DYNAMICS IN ACID SOILS OF NZOIA SUGARCANE ZONE IN WESTERN KENYA

By

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ABSTRACT

The adsorption, desorption and leaching of metribuzin in agricultural soil samples taken from Nzoia sugarcane farming area in Kenya were determined using standard methods. The Freundlich adsorption isotherm constants (K_f and 1/n) were found to be 0.54 μg/g and 0.61 μg mL^{-1}, respectively. 94.9% of the residues were recovered after 6 hours of the desorption test and 93.7% of applied dose was found in the leachate after 9 hours of leaching in a soil column. The adsorption curves indicated L-type of adsorption for 0.1, 1.0 and 2 μg L^{-1} initial pesticide concentrations and S-type for the 5 ppm initial concentration with peak equilibrium adsorption established after 4 hrs of exposure for the 0.1, 1.0, 2.0 μg L^{-1}, respectively, and after 6 hours for the 5 μg L^{-1} initial concentration. Although the metabolites were not determined, HPLC analysis showed that degradation was rapid and started to occur after 4 hours of exposure, influencing its adsorption isotherms.

Keywords: metribuzin; adsorption desorption leaching; tropical soil

Introduction

Metribuzin, 4-amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4*H*)-one, is a systemic triazine herbicide (Figure 1), used worldwide as a pre- and post-emergence selective herbicide on grasses and broad – leafed weeds (USEPA 1985, Singh 2008). It is a broad spectrum herbicide, absorbed predominantly by the roots but also by leaves with translocation acropetally through the xylem and its efficacy is poor when applied under dry conditions because of lack of root uptake (Locke and Harper 1991, Landgraf et al 1998). It is usually applied to soils with high organic matter or clay content where grass weeds are problem and has found wide application as a herbicide in protection of various crops including lucerne, asparagus, sugarcane, maize, potatoes and tomatoes as well as ornamentals and for landscape maintenance (USEPA 1998). It is applied by various methods including aerial and ground applications and chemigation although precautions should be taken to avoid nearness to desirable trees or other plants (Pauli et al. 1990, Fairchild and Sappington 2002). Metribuzin can be transformed in soils to desamino-metribuzin, diketo desamino metribuzin and diketo metribuzine (Webster et al 1975, Singh 2008). In temperate regions, metribuzin has been found to be weakly sorbed in soils and to have a potential for lateral and downward movement in the soil (Peter et al (1985), Harper (1988), Kim et al (1988), Bedmar et al (2004) Pauli et al 1990). The high efficacy of metribuzin to eradicate target weeds and grasses is complemented by its moderate

mammalian toxicity with acute oral LD_{50} of 1,960 mg/kg in rats for Sencor (USEPA 1998). Metribuzin is also known to have a negative ecological impact on the environment where it is applied (Verma et al 1982, Elia et al 2002)

The fate and behavior of metribuzin in soil would be governed by a variety of physical, chemical and biological factors, including sorption/desorption processes, volatilization, chemical and microbial degradation, plant uptake, surface runoff and leaching which are in turn determined by the characteristics and prevailing weather conditions. Its environmental persistence is determined by its rate of adsorption to soil particles, which is closely related to the organic matter content of the soil (Peter and Weber 1985, Khoury et al 2001). In soils with high organic matter content, adsorption is increased, loss through leaching is prevented, and the half-life can be stretched to several months (Sharom and Stevenson 1976, Khoury et al 2001). Other soil characteristics, such as low soil moisture, low temperatures, and acidic conditions, may also increase the persistence and adsorption of metribuzin as well as other triazines (Lalah et al 2001, Metribuzin residues have carried over into the season following treatment, especially on muck soils (McEwen and Stephenson 1979). Soil half-lives of less than one month to 6 months have been reported (USEPA 1988). However, the half-life of metribuzin is expected to vary according to soil type and climatic conditions and its behavior and fate is therefore expected to be different in tropical regions (Lalah et al 2001).

Metribuzin is marketed in Kenya under the trade name Sencor (NSC 2006, Lalah et al 2009). It is used widely in Nzoia sugarcane farming in Kenya especially in the Nzoia Sugar Company nucleus estate farms where Sencor (70% a.i.) has been applied steadily at the rate of 2 litres/hectare since 1998 with a total volume of 11,796 litres being used between 1998 and 2006 (NSC 2006, Lalah et al 2009). The use of herbicides such as metribuzin in Kenya is expected to continue increasing due to current increase in agricultural production and this calls for adoption of suitable scientific methods which include risk assessment, modeling for speciation and toxicity and following good agricultural practices (Lalah et al 2009, SETAC 2003).The fate of this herbicide in Kenyan tropical soils is not known and this is therefore a major source of concern to all. Its adsorption, desorption and leaching which would influence its distribution in soil and aquatic environment is expected to be different in tropical soils of Kenya due to differences in soil type and adverse climatic conditions. The aim of this work was to determine the adsorption, desorption and leaching of metribuzin in soil samples taken from Nzoia sugarcane farming area in western Kenya using standard test protocols. The data obtained would be useful making recommendations on its potential environmental impact and in modeling its speciation and toxicity in the local environment.

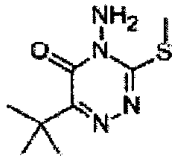

Figure 1: The chemical structure of metribuzin

Materials and Methods

Metribuzin (99.8% in purity) was obtained from Kobian (K) Ltd, Nairobi. Solvents and reagents including dichloromethane, acetone, acetontrille, calcium chloride, Florosil and sodium sulphate were also obtained from Kobian (K) Ltd, Nairobi. A Shimadzu HPLC machine, Model Shimadzu Comp. CMP – 20AC (120234532) was used for determination of

residues. Eyela digital rotary evaporator N – 100, a rotary shaker (SOI UK) and a Universal 16® centrifuge were also used.

Adsorption and desorption tests

The soil samples were obtained from the plough layer 0-20cm (FAO 1977), at four sampling points, in a field in Nzoia Sugarcane zone in Western Kenya. The soil samples were mixed well, air-dried, ground and sieved through a 2mm mesh. The soil properties (Table 1) were determined. The adsorption of metribuzin was determined according to the EEC protocol and as reporte by other researchers (EEC 1988, Lalah and Wandiga 1996, Mersie et al 1986, Pradas et al 1998, Singh et al 1989) as follows: - 0.01$CaCl_2$ aqueous solution (25 mL) containing standard Metribuzin (99.8% pure) at various concentrations of 0.1, 1, 2 and 5 µg L^{-1}, respectively, all at a desired pH of 5.9., were added to soil samples (5g in triplicates) in 100 mL pyrex conical flasks covered aluminium foil to avoid direct light. The samples were shaken continuously on a rotary shaker (Sol UK) at 10 rpm at room temperature (28±2°C) and samples were removed, in triplicate, after 2, 4, 6 and 16 hrs, respectively, for analysis of metribuzin in the soil and the aqueous media, respectively. The samples were transferred to centrifuge tubes (100 mL) and centrifuged for 5 min at 3000 rpm using a Universal 16® centrifuge. The supernatants were collected in 50 mL conical flasks and were partitioned in dichloromethane (3×30 mL), pooled and evaporated to dryness using the Eyela Digital rotary evaporator N-1000 and then made up to 5 mL. The 5 mL samples were cleaned up by elution with 50 mL dichloromethane through 5g Florisil packed in 10 cm diameter glass column with 2g of Na_2SO_4 placed on top for drying. The eluate was collected and rotary evaporated to 2 mL for HPLC analysis. HPLC was done with the parameters set as follows: injection loop volume 10 µL; elution with acetonitrile (99% pure) at room temperature; flow rate: 1.5 mL per min; detection: a UV detector at wavelength of 254 nm. The amount of metribuzin adsorbed by the soil was calculated as the difference between the initial concentration of metribuzin introduced into the solution and that remaining in the aqueous medium after equilibration with the soil.

For desorption studies, the soils (9 sets of samples) were equilibrated with an initial concentration of 5 µg L^{-1}. At the end of adsorption period (6 hr), the samples were centrifuged as described above and the aqueous portion decanted completely. The remaining soil samples were re-equilibrated in 25 mL of fresh 0.01 $CaCl_2$ aqueous solution on the shaker for 2, 4, and 6 hours, respectively, for analysis as described above.

Leaching test

The leaching experiments were performed in triplicate, using 450 g of soil in glass columns (45cm diameter, 3.8cm soil height) based on the EEC standard procedure and others (EEC 1988, Lalah and Wandiga 1996). The equivalent of 5 µg L^{-1} metribuzin in the soil was prepared by dissolving an appropriate amount of standard metribuzin in 0.01M $CaCl_2$ which was added on top of the soil column. Leaching was done for 10 hr draining with 1.94 L of 0.01M $CaCl_2$ at a flow rate of 3.6 mL min^{-1}. The leachate was collected and measured before partitioning 2 L of it with 250 mL dichloromethane for analysis of metribuzin as described above. The wet soil in the glass column was pushed by piston mechanism and left to drop gently on a piece of aluminium foil placed on the bench. Using a ruler, the various sections of the soil column were cut as follows: 0.-5, 5 - 10, 10 – 15, 25 – 20, 20 – 25, 25- 30 and 30 – 38cm. For analysis of residues, the sections of soil samples were dissolved in

dichloromethane and shaken for 2 hours, filtered and taken through the same clean-up and HPLC analysis as described above.

Results and discussion

The soil characteristics are given in Table 1. These characteristics indicate that this agricultural soil is slightly acidic and has very high organic carbon content (6.1%). The soil samples also had high moisture content. A high moisture content (mean of 25.2%) found in this soil could favour the formation of metabolites such as deaminometribuzin (DA) hence reducing percentage of adsorbed metribuzin in the soils with time (Khoury et al 2001). Degradation was rapid during adsorption tests and started after 4 hours in 0.1, 1.0 and 2.0 $\mu g\ L^{-1}$ samples and after 6 hours in the 5 $\mu g\ L^{-1}$ samples as shown by the HPLC chromatograms and this could have been influenced by the soil microorganisms as well as the physico-chemical parameters including soil organic matter and moisture contents. Microbial degradation has been reported as the major dissipation pathway of metribuzin in soil (USEPA 1998). From literature, it is known that metribuzin has a relatively high water solubility ranging from 1.03-1.2 g L^{-1}, a vapour pressure of 1.3×10^{3} Pa and a K_{oc} value ranging from 95-106 (WSSA 1989). These physico-chemical parameters of metribuzin and the soil characteristics would influence its dynamics in soil. From previous studies, it has been found that there is a correlation between metribuzine adsorption, desorption and leaching and soil organic matter content (Peter and Weber 1985, Savage 1976, Sharon and Stephenson 1976).

Table 1 The properties of Nzoia soil

Soil	%Clay	%Sand	%Silt	PH (H_2O)	%Organic Carbon	Moisture content
Nzoia	5.6	88.4	6.0	5.9	6.1	25.2

Table 2 shows the adsorption data obtained from the adsorption tests, showing that the peak/equilibrium amount of metribuzin adsorbed decreased with increase in initial metribuzin concentration in the water, with approximately 100% adsorption, 32.1% adsorption, 5.9% adsorption and 9.0% adsorption for the 0.1, 1.0, 2.0 and 5.0 $\mu g\ L^{-1}$ initial metribuzin concentrations, respectively. This indicates saturation at concentration above 0.1 $\mu g\ L^{-1}$ (Landgraaf et al 1998).

Table 2 Metribuzin adsorption in Nzoia soil samples.

Initial concentration (ppm)	amount adsorbed in soil (µg/g)	Time (hours)
0.1	0.008623	2
0.1	0.024412	4
0.1	0.150292	6
0.1	0.016152	16
1.0	0.047328	2
1.0	0.321486	4
1.0	0.118915	6
1.0	0.075061	16
2.0	0.06421	2
2.0	0.118061	4
2.0	0.095746	6
2.0	-0.0001	16
5.0	0.368822	2
5.0	0.451061	4
5.0	0.150219	6
5.0	0.119266	16

The adsorption curves (Figure 2), showing the amount of metribuzine adsorbed in soil with time, indicated L-type of adsorption for the 0.1, 1.0 and 2 µg L^{-1} initial metribuzin concentrations and S-type for the 5 µg L^{-1} initial metribuzin concentration with peak equilibrium adsorption established after 4 hrs of exposure for the 0.1, 1.0, 2.0 µg L^{-1}, respectively, and 6 hours for the 5 µg L^{-1} initial metribuzin concentration. Although the metabolites were not determined, HPLC data showed that degradation was rapid and started to occur after 4 hours of exposure of the pesticide in soil. This influenced the shapes of the adsorption isotherms as the amount of adsorbed metribuzin started to drop rapidly after peak adsorption (Figure 2).

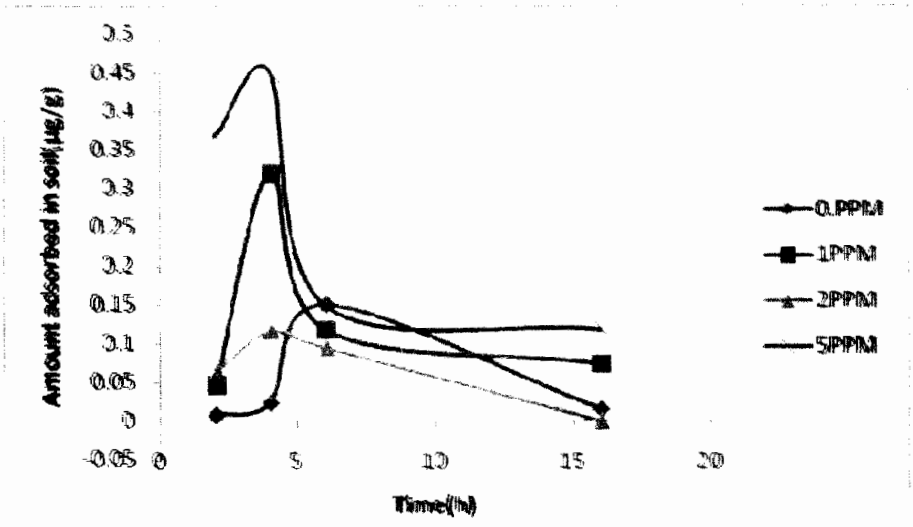

Figure 2. The adsorption isotherms for metribuzin in Nzoia soil

The experimental data were fitted to the Freundlich model in its linear form, $\log x/m = 1/n \log C + \log K_f$, where x/m is the amount of pesticide adsorbed in µg/g of soil, C is the initial concentration of metribuzin in 0.01M $CaCl_2$ water, K_f and 1/n are the Freundlich adsorption constants. A straight line graph represented by the equation $y = 0.613x - 0.267$ ($R^2=0.882$) was obtained using the data. The Freundlich adsorption constants for metribuzin in this soil was found to be 1/n = 0.613 µg/mL and K_f = 0.54 µg/g. It was noted therefore that metribuzin was moderately adsorbed on Nzoia soil organic content may be through. H – bonding mechanism as reported by Hyzak et al (1974) and high organic matter content influenced the observed fast degradation (Locke 1991, Harper 1988, Lalah et al. 2001). It is also noted that the high temperature of about 28ºC during the adsorption could play a role in its degradation and hence led to reduction in peak adsorption (Hyzak et al 1974, Lalah et al 2001).

Table 3 The desorption of metribuzin (5 ppm) from Nzoia Soil

Time in hours	Amount left adsorbed in soil (µg/g soil)	amount left as % of equilibrium adsorption
2	0.0262	17
4	5.7141×10^{-3}	3.81
6	8.8794×10^{-4}	0.59

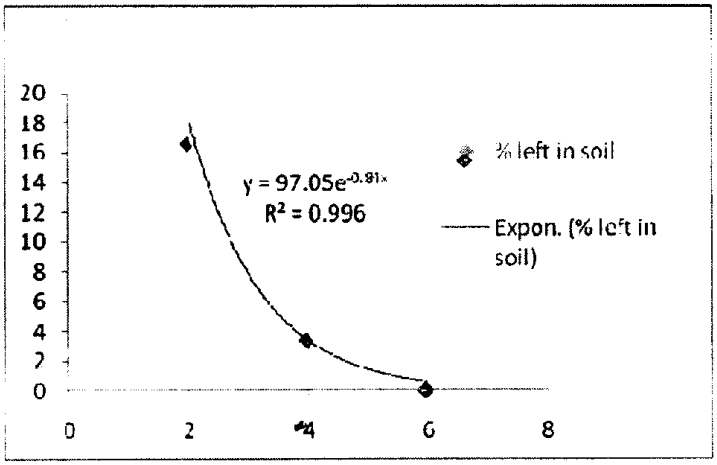

Figure 3. The desorption of metribuzin from Nzoia soil sample

For the standard desorption test, the soil contained an initial amount of 0.15 µg g^{-1} at saturation and desorption was rapid leaving only 17%, 3.85 and 0.59% of the metribuzin residues in the soil after 2, 4 and 6 hours, respectively (Table 3). The adsorption and desorption data together indicate that, although metribuzin is moderately adsorbed in this soil, it is also easily desorbed, with up to 99.4% of adsorbed pesticide removed in the desorption standard test after 6 hours of exposure to clean 0.01M $CaCl_2$ water. The desorption data gave an exponential relationship between the % desorption and time, represented by the equation $y = 97.05e^{-0.34x}$ ($R^2=0.996$), where y = % metribuzin left in soil and x = time in hours (Figure 3).

Table 4: The distribution of metribuzin in the soil column

Column section	Amount adsorbed in soil column section (µg/g soil)	% metribuzin in soil column section
0 - 5cm	0.04018	16.0
5 - 10cm	0.03909	15.5
10 - 15cm	0.03168	12.6
15 - 20cm	0.01821	7.2
20-25cm	0.05300	21.0
25 -30cm	0.06163	24.5
30 - 38cm	7.8266×10^{-3}	3.1

% based on total recovered residues (0.2516 µg/g soil) from the soil

Table 4 shows the soil column leaching profile of metribuin in Nzoia soil in 9-hr standard leaching test. The distribution of metribuzin in the sections of the soil columns is shown as amounts of recovered metribuzin in each section and also expressed as percentages of total recovered amount of metribuzin. These results show extensive vertical movement of metribuzin in Nzoia soil and are comparable with data reported in other studies which show that metribuzin is found mostly in the leachate (Feagly and Kim 1998, Singh 2008). The USEPA (EPA 1988) also considers metribuzin to be one of the compounds with greatest potential for leaching into and contaminating groundwater. It has been detected in Ohio rivers and Iowa wells and groundwater (USEPA 1988). USEPA recommends that it should not be applied where the water table is close or where soils are permeable such as loamy sandy soils (USEPA 1988).

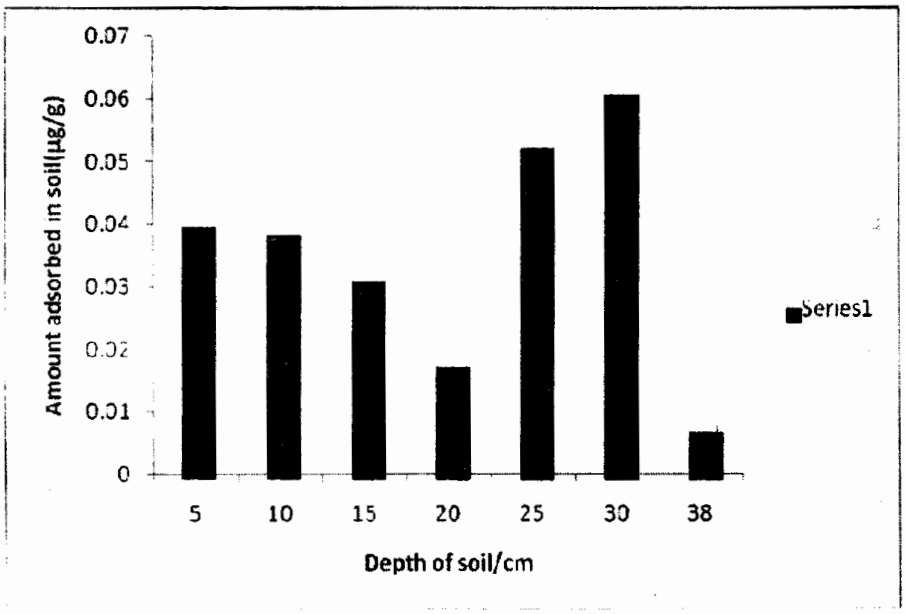

Figure 4 The distribution of metribuzin with soil depth.

For the standard leaching test done for 9 hours, a total of 0.2516 µg metribuzin per gram soil was recovered, distributed throughout the column with most residues (0.06163 µg/g soil) recovered in the penultimate section of the soil column (Table 4, Figure 3). This total recovered amount represented only 5% of the applied pesticide. Most of the pesticide (93.7%) was found in the leachate after 9 hours of leaching. Losses of residues (0.0634 µg/g equivalent to 1.3% of applied amount) occurred through adsorption on glass wall, degradation and volatilization during the experiments and through losses during extraction and analysis. The results show that metribuzin leaches easily in this soil presenting risks in groundwater. Other studies have also found high metribuzin leaching profiles. Feagly and Kim (1998) found 11.42% and 88.58% of metribuzine in soil and leachate, respectively, in a silty clay loam soil from Louisiana in a standard leaching test involving a soil column of 5.4 cm (i.d.) and 26 cm (vertical length). This extensive leaching property found in this soil type is consistent with literature reports which show that s-triazines are most mobile of all pesticides (Lalah et al 2001). Reports indicate that metribuzin is highly soluble in water, has a low tendency to adsorb to most soils but has moderate ability to adsorb to soils with high clay and/or organic matter content (USEPA 1988). Our results have supported these reports. In low clay and organic matter soil i.e. sandy soils, metribuzin is readily leachable. Apart from leaching, the major mechanism by which metribuzin is lost from the soil is microbial degradation and conditions which favour activity of soil microorganisms will increase the rate of breakdown (Bedmar et al 2004, Hyzak and Zimdahl 1974, Khoury et al 2001, McEwen and Stephenson 1979).

Conclusion

The adsorption, desorption and leaching data obtained in this study for metribuzin in Nzoia soil samples indicate that metribuzin is moderately adsorbed in this relatively high organic matter content soil. It leaches readily and therefore its extensive application in the area poses potential risk to the local aquatic environment. The study also indicates that application of metribuzin in this area during heavy rainfall periods should be avoided for better efficacy and for protection of the local aquatic environment.

Acknowledgments

The authors are grateful to Masinde Muliro University of Science and Technology and Prof. J. Shiundu for financial assistance, to Prof. L.O.Manguro, Chemistry Department, Maseno University, Dr. I.O. Kowino of the Department of Pure and Applied Chemistry, Masinde Muliro University of Science and Technology for allowing us to use the equipment. This study was partly supported by the IAEA CRP No. 13965 and we are very grateful for their financial support.

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SOCIO-ECONOMICS FACTORS INFLUENCING USE OF RECYCLED MAIZE AND WHEAT SEED BY FARMERS IN NAKURU DISTRICT KENYA

By
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Abstract

High yielding varieties suited for the major Agro-Ecological Zones of Kenya have been developed for the both Maize and Wheat. Despite the great efforts made by Kenya wheat and Maize breeders in the last thirty- (30) years to develop high yielding varieties for increased crop production, the challenge still remain to increase the low yields experienced by farmers at farm level. Seed recycling has been identified as one of the most important factors influencing production. The purpose of this study therefore, was to assess farmers' level of usage of farm saved seed, analyze and discuss factors fueling the practice. One hundred and fifty (150) farmers were randomly selected from Molo, Elburgon, Bahati, Njoro, Rongai, Naivasha, Gilgil divisions of Nakuru district. The seven divisions represent the three broad climatic zones of the district. The result showed that 100% wheat farmers depend on farm saved seed and 72.7% of the maize farmers do the same yearly. The cost of certified seed and liberalization of the seed industry have contributed immensely to the practice. Analysis of data showed that Chi-square relationship on education, credit access and usage of farm saved seed significantly affected the practice ($\chi^2 = 14.66$ with $P<0.05$; 6df was more than χ^2 critical =7.81) and ($\chi^2 = 9.05$ with $p<0.05$; 2df was more than χ^2 critical= 5.4 indicating that a higher proportion of farmers with informal education and primary level use farm saved seed more times than those with higher levels of education. Access to credit significantly contributed to the practice. The Seed and Plant Variety Act, CAP 326 of Kenya should be implemented to protect all categories of farmers in the country. Offenders must be made to compensate farmers unsatisfied with services. This can be done through a legal and institutional framework which can control and enable the seed industry be accountable.

Key Words: Adoption, seed recycling

Introduction

Wheat is one of the seven major crops that are central to achieving agricultural development in Kenya and is the second most important cereal crop after maize. The two crops have been given great emphasis in the seed industry because they command the largest seed market. Maize is a staple food in Kenya grown by 90% of farm households and provides about 40% of the population's requirements (NDP, 1997). Maize has an average per capita consumption of 103kg per year (Pingali, 2001). Small holders from diverse Agro-Ecological Zones (AEZs) produce about 85% of the country's maize with an average maize yields of 2 tons/ha (GOK, 1997). However potential yields of 6 tons/ha are possible through increased use of improved seed among other management practices.

Whereas farmers in the industrialized countries have a steady flow of new varieties, the reverse is true in developing countries, where a combination of both the formal and informal sector together account for less than 10% of all planted seed (World Bank, 1997). In developing countries, the challenge is not only to introduce particular new technologies but to also improve farmers' access to steady flow of new seed technology from research Morris, (1999). Seed regulatory frameworks that provide guidelines and standard practices

associated with crop variety and seed distribution have several common deficiencies evident in seed regulatory framework (Tripp, 1995). Foremost, among these are seed laws and plant breeding protocols of many developing countries are not consistent with the resources or purposes of national institutions. They have been modeled on European examples with reference to the social economic and technological circumstances of the country (Grobman, 1992). Most food crops produced in Kenya are grown from seed every new season. Seed of these crops may carry several important diseases, which may remain dormant in the seed between sowing and harvesting. Sowing of recycled seed may be infected or of low quality and therefore causing early infections in the crops, which will require immediate crop protection measures to avoid or reduce yield losses. The poor resource farmer may not be able to apply the required crop protection control measures and yet the use of seed with infection below a certain, thresh hold level is in general considered an economical and safe crop protection method. This study was therefore developed to assess farmers practice and perception, concerning use of farm saved seed in Nakuru district.

Research Methodology

A sociological survey was carried out in the three broad climate zones for wheat and maize growing areas of Nakuru district during the year 2003 to 2004. The study was carried out among small scale maize and wheat farmers to assess levels of farm saved seed usage. Seven divisions (Molo, Elburgon, Bahati, Njoro, Rongai, Naivasha, Gilgil representing high, medium and low climatic zones were selected. A sample size of one hundred and fifty (150) farmers was randomly selected from the seven divisions. Independent variables in the study were gender, age, education, credit and extension services. The practice of using farm saved seed was the dependent variable A questionnaire was administered in form of interview schedule to select farmers and data obtained was analyzed using SPSS version 12 for word.

Results and Discussion

The study illustrated in Table 1 shows that the estimated 150 farmers from the seven divisions, only 27.3% use certified seed. The expectation of the study was that more than 50% of the farmers were using certified seed due to the liberalization of the seed sector. Seventy-two point seven (72.7%) percent of the maize farmers use farm saved seed and (100%) for wheat farmers. Farm saved seed is also done at different levels by farmers as shown in Figure 1 that the use of advanced generation of maize and wheat seed was more than three times which concurs with studies by (Ouma *et al*, 2002) where farmers in Eastern province bought and recycled seed for more than 3 seasons. This can be seen in Figure 2 and Figure 3 where the most popular varieties farmers use in maize and wheat was developed more than ten years ago and HB614 was most popular being grown by 67.5% of the farmers and Kenya Kwale for wheat 75.5%. The source of seed that farmers use was found to be farmers own saved seed (66.7%) and (20%) use fellow farmers seed with only (13.3%) using certified seed.

Personal characteristics and use of farm saved seed

Farmers' personal characteristics which were believed to influence use of farm saved see included age, gender, education level, extension services and credit. These factors wer analyzed by hypothesizing that there was no significant relationship between recycling see

and socio-economic characteristics. The study showed that the proportion of farmers using different seed is independent of gender. Chi-square value of 1.09; P>0.05 was less than the critical value of χ^2=3.84. Hence the null hypothesis stating that there was no statistical significant relationship between use of farm saved seed and gender was accepted. Gender was not significantly related to the seed use which concurs with World Bank findings (1992) but contradicts Oywaya's (1995) findings. Results on farm saved seed use by education level were developed to investigate whether formal education and use of farm saved maize and wheat seed had any significant relationship. Results showed that a significant relationship exist between use of farm saved seed and education level with χ^2=14.66; P<0.05 was more than critical value χ^2=7.81. The null hypothesis was therefore rejected and the alternative accepted indicating that there was a statistically significant relationship between formal education and number of times a farmer recycles seed. This concurs with other studies by Amudavi(1993), Ndiema (2002) and World Bank (1993) which found formal education to influence farmers' adoption behaviour. Majority of the farmers 41.3% were of primary and below education level and this might have immensely contributed to high levels of seed recycling. Low utilization of recommended technologies due to inability to understand technology requirements and appreciate the basic principles requires additional effort by extension agents to educate the farmer to increases managerial competence, thereby enhancing the ability to assess, comprehend and respond to new ideas. It also enables the farmer to choose wisely from a stock of available technologies. Result on age were not statistically significant χ^2=3.42; P>0.05 was less than the critical value of χ^2=7.81. The results on credit accessibility and use of farm saved seed yielded significant relationship between seed used and accessibility to credit. The proportion of farmers accessing credit was very low χ^2=9.05; P<0.05; was more than its critical value of χ^2= 3.84. The null hypothesis was therefore rejected and the alternative accepted indicating that there was a statistically significant relationship between access to credit and number of times a farmer recycles seed which concurs with (Ouma et al, 2002) where cost of seed influenced use of recycled seed. Poor credit conditions may also be another reason that suppress the capacity for farmers to adopt use of certified seed (Ascroft *et al*, 1993)

Conclusion

The results of the study illustrate farmers' common practices in maize and Wheat production in Nakuru district. Several factors related to the practice have been discussed and various relationships examined qualitatively and quantitatively. The results show farmers recycle up-to three times the seed and that HB614 maize variety is popular with 67.5% of the farmers using it and recycling more than three times. The result also shows that education and access to credit have significant relationship and therefore influenced the use of recycled seed. The number of seed merchants in Kenya which stands at more than fifty to day should be carefully examined to ascertain their competence and ability to deliver right materials

Recommendation

1. There is need to protect the farmer by providing efficient and reliable feedback mechanism on the performance of seed delivered to the farmers so that they can have confidence in the sector
2. Parliamentary Act, CAP 326 part II defines the role of the ministry of Agriculture in making regulation to be followed in controlling production, processing, testing and

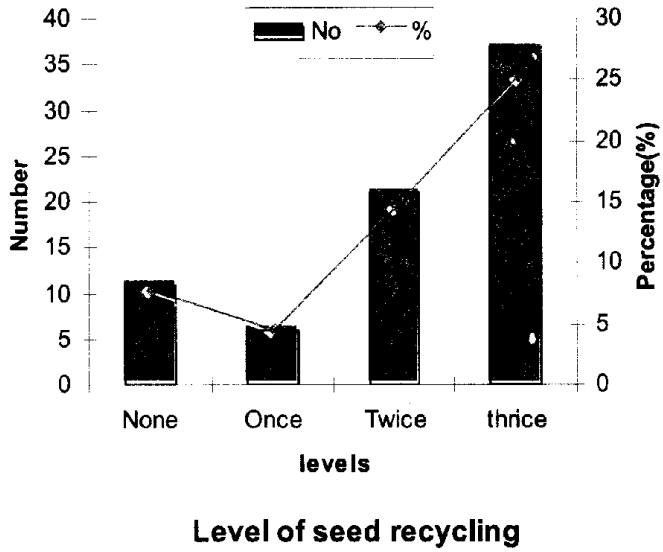
certification of seed and it is necessary to streamline the industry by controlling the number of seed companies.

3. Fraudulent traders and offenders should be made to compensate the farmers who purchase wrongly labeled or poor quality seed unknowingly.

Table 1: Frequency distribution on types of Maize and Wheat seeds used

	Maize		Wheat	
Type seed used	**Number**	**Percentage**	**Number**	**Percentage**
Certified seed	**41**	**27.3**	**0**	**0**
Recycled seed	**109**	**72.7**	**150**	**100**
Total	**150**	**100**	**150**	**100**

Figure 1: Showing the levels of recycling by farmers



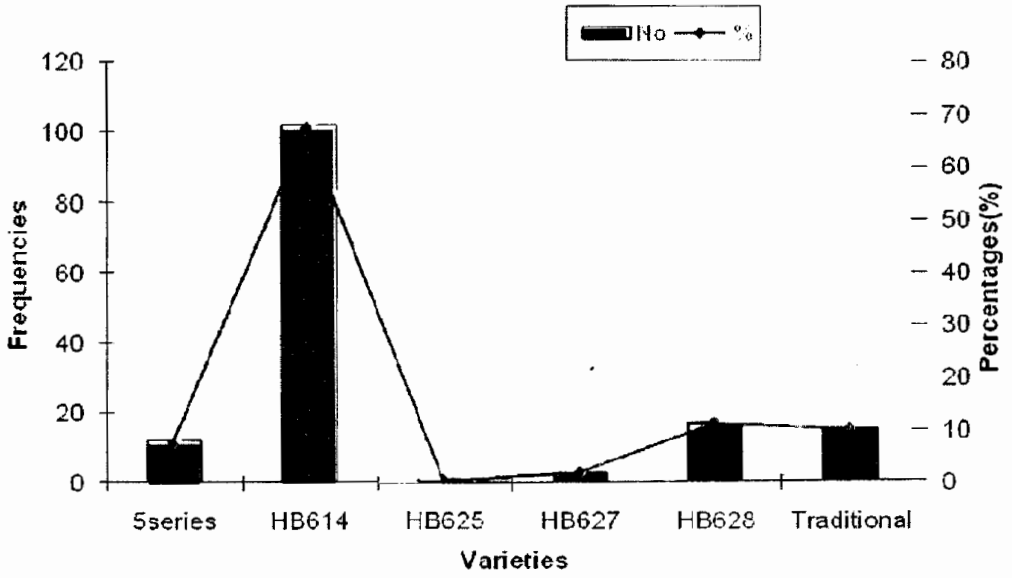


Figure 2: Popular Maize varieties with farmers

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CHILDREN EVER BORN IN KENYA: CONSEQUENCES OF FEMALE MIGRATION

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ABSTRACT

This study uses the Kenya Demographic and Health Survey (KDHS) conducted in 1993. It approaches and discusses the mechanisms through which migration may affect women's number of children ever born (CEB) in the context of the characteristics and fertility behaviour of individual woman. The paper hypothesises that women who migrate are a group whose behaviour patterns are to maximise their other lifelong aspirations instead of reproductive desires and actualization. That is, women who migrate are involved in behaviours and practices negatively influencing the number of children ever born per woman compared to those who do not migrate. The influence of migration on the number of children ever born (CEB) is estimated using comparison of the mean and multivariate analysis. Findings are that, female mobility is influenced by macro-level forces, spouses or older family member characteristics intending to optimise utility for the family or household rather than fertility behaviour and performance. That is, there is an inverse relationship between migration process and the number of children ever born.

INTRODUCTION

This paper examines the relationship between migration and children ever born. Firstly, it undertakes a systematic analysis of how migration affects fertility intermediate variables. Secondly, it identifies how the number of children ever born associate with the different migration categories and statuses. Differentials in fertility behaviour and levels across different areas, population strata and characteristics have been noted to be the most pervasive findings of demography (Anker and Knowles, 1982; Bongaarts, 1982; Bongaarts et al, 1984; Findley, 1982; Cochrane, 1989; Brass and Jolly (eds), 1993; Hobcraft et al, 1984; Jolly and Gribble, 1993; Shapiro, 1991; Robinson, 1992).

One major cause of the differentials widely recognised is the importance of the association between migration and fertility in population growth and redistribution. Several studies have shown that women who migrate to new environments where education is high, jobs are available, and living standard is high show almost universally lower fertility than their counterparts in areas of low education standards, non-availability of jobs or otherwise blue collar jobs if available, and low standard of living (Findley, 1982; Lee and Farber, 1984; Hervitz; 1985; Lee, 1992; Lee and Pol, 1993; Brockerhoff and Yang, 1995.

Although these relationships are often weakened after introducing controls for the different background characteristics and other factors influencing fertility, they are far from being of no significance. They do, however, vary substantially in degree from one region or country to another, a fact that has prompted analysts to believe that the ultimate explanation for fertility behaviour must be sought in cultural or institutional processes specific to an area. An alternative view, however, is that differentials are exaggerated in the course of the changes experienced in fertility behaviour, especially to low fertility, as some groups lead in social change while others lag behind (Sly and Wrigley, 1986; UN, 1987).

METHODOLOGY

Data Source

The study used the Kenya Demographic and Health Survey (KDHS) of 1993. KDHS have a number of questions about the characteristics of the woman that can be used to underscore fertility behaviour (CEB) and Migration characteristics. The KDHS can also be used to assess the fertility and background variables in which respondents live. In addition the questionnaire includes a few questions on the characteristics of husbands of ever-married women (GoK, 1989, 1994; DHS, 1990; Arnold1991).

Measurement Index: Children Ever Born (CEB) versus Migration Status

Migration status

In defining the migration status variable for the study, a woman's number of years lived in the current place of residence is taken into account. Those who answered 'always lived' are classified as never-migrants whereas those whose answers were in terms of 'number of years lived in current place of residence' or length of time in the current place of residence' excluding those who answered 'visitor' are regarded as migrants. The definition of migration status is thus undertaken by variously defining migration status in terms of migrants/never-migrants and migration streams. The flexibility of the definition and/or measurement of migration variable in the study may allow a fuller exploitation of the relationship between migration and fertility, even when using an aggregate measure like the children ever born (CEB).

Children Ever Born (CEB)

This is the basic measures of fertility. Other measures that are typically used for fertility analysis include: age-specific fertility rates (ASFRs) and their sum, the total fertility rate (TFR); general fertility rate (GFR); number of children ever born (CEB); Coale's marital fertility index (MFI), and parity progression ratios (PPR). However, their large relative sampling errors when some age groups include small number of cases make CEB better for migration-fertility study. In contrast, mean number of children ever born to women (mean CEB) represents childbearing experience of a real age cohort and reflects both current and past fertility behaviour.

Analysis Procedure

Migration differentials by children ever born

The analysis is undertaken using the fertility measure of children ever born (CEB). Although CEB does not sufficiently exploit the understanding of the dynamics of the fertility and its relationships with other population dynamics, it is however, the most appropriate measurement index in the circumstance of the data used. Children ever born does allow for the generation and generalisation of data and an understanding that can provide the basis for further analysis and understanding, particularly when one is using longitudinal data and approaches.

Besides, the use of a measure like the children ever born, by allowing identification of migrant and never-migrant fertility by background differentials and proximate variables,

may suggest which migration status and characteristics are relevant for the understanding of fertility and in a given country, region, or a group of people. Children ever born therefore are used as the dependent variable.

The association between migration and children never born is analysed, first as a function of the migration process characteristics, the background characteristics of women, and the fertility proximate variables, and secondly as a function of the woman's background characteristics and fertility proximate variables, when migration status categories are controlled. The analysis is divided into two sections viz:

Section one, compares the mean number of children ever born by differentials and different migration status categories using comparison of means and age specific standardization.
Section two, is a multivariate analysis (OLS) identifying the effects of factors net of all other factors.

Comparison of the Mean and Age-specific Standardization procedure

A comparison of mean procedure is used to measure the difference in the mean number of children ever born (CEB) controlled and standardised by age for the different background characteristics and fertility variables. The means procedure calculates subgroup means and related univariate statistics for dependent variables within categories of one or more independent variables.

The age specific standardisation procedure compares the sizes of different age groups at a particular point in time in order to eliminate the influence of the differences in age by adjusting the actual size of each age group according to different ages. It can be done by inferring the size of each cohort corresponding to an age group through the actual size of each age group and the existing life table or by calculating the age specific standardisation (Coale et al, 1994).

Multivariate analysis (OLS) procedure

Although the cases in the study survey are large enough to allow for analysis using comparison of means procedure when fertility differentials are analysed between migrants and never-migrants, the number of cells becomes very small when analysis is attempted further using migration status categories. Several variables cannot be controlled at any one time to allow the statistically robust analysis of the relative impact of migration characteristics on fertility. Besides, it is more appropriate to test the interrelations using a more dynamic procedure which, in addition to providing a measure of the relative influence of migration as one of the factors affecting CEB when other variables are controlled, is robust enough to encompass small sample sizes, and can also provide a series of analyses that can permit examination and assessment of the impact of migration process on fertility behaviour when migration is variously measured and/or controlled (Goldlust and Richmond, 1974; Hosmer and Lemeshow, 1989).

The Ordinary Least Squares (OLS) regression models presented yield indices indicating the factors that may help in understanding fertility behaviour characteristics when several parameters are controlled. In particular, the procedure is used to identify factors important for explaining the influence on fertility levels as a result of migration.

Furthermore, using the same variables, but changing the index of measurement of migration status, it is used to capture or give insight into the varied characteristics of migration process on fertility. In addition, the factors important in influencing fertility levels when migration status categories are controlled are also identified. These findings from the different regression models thus complement each other and show the complexity of the interrelationship under consideration.

RESULTS AND DICUSSIONS

Comparison of mean of number of children ever born by migration status and differentials

Table-1 presents both un-standardised and age specific standardised measures of fertility for the various migration status and differentials. In general migrants have a higher mean number of children ever born than never-migrants although the difference is not large and narrows considerably using the standardised figures. This may be attributed to the effect of age because migrants are older than the general population.

Furthermore, the fertility level of migrants may be influenced by the rural-rural migrant characteristics migrating for marriage hence influencing the overall fertility of migrants when combined. However, the fertility patterns between migrants and never-migrants are found to differ within their sub-categories. Comparison among the different sub-categories show that, urban natives have the lowest mean children ever born followed by urban-urban migrants, rural-urban migrants, urban-rural migrants, rural natives and rural-rural migrants respectively.

Thus, rural-rural migrants have the highest mean number of children ever born because women in this group will disproportionately migrate for marriage ('marriage-migration') and because of the persistent cultural support of high fertility still existing in the rural areas of Kenya. Urban-rural migrants have a mean number of children ever born falling between rural-urban and rural-rural categories implying an impact of both origin and destination on fertility behaviour of migrant women. Among the never-migrant categories, rural natives have the highest mean number of children ever born. The existing pattern seems to imply the influence of place of residence and especially place of destination on fertility behaviour.

Given the above fertility patterns in relation to migration status and their sub-categories, and the fact that approximately one-third (1/3) of the women being studied are migrants, the following section examines the extent to which migration may be an important underlying factor in influencing the differentials and differences in fertility levels of women. The average number of children ever born by the migration status, controlling for age, the different background characteristics and fertility intermediate variables, are applied to achieve the objective of the paper.

Table-1: Age Standardized Children Ever Born by differentials, 1993

	Non-Migrants		Migrants	
	Unstandar-dized	Standar-dized	Unstandar-dized	Standar-dized
Migration status				
Migrants			3.45	3.13
Never-Migrants	3.06	3.21		
Urban natives	1.71	1.99		
Rural natives	3.22	3.34		
Rural-urban			2.19	2.37
Rural-rural			3.47	1.54
Urban-urban			1.91	1.93
Urban-rural			3.13	3.08
Current Place of Residence				
Urban	1.71	1.99	2.14	2.26
Rural	3.22	3.34	3.98	3.42
Region of Residence				
Nairobi	1.36	1.53	1.99	2.13
Central	2.39	2.71	3.44	2.87
Coast	3.02	3.07	2.49	2.42
Eastern	3.43	3.23	3.68	3.25
Nyanza	3.47	3.51	3.36	3.34
Rift Valley	3.41	3.56	3.39	3.21
Western	2.01	3.07	4.28	3.66
Education Level				
No education	5.72	3.89	5.96	3.67
Primary	2.65	3.32	3.37	3.30
Secondary (+)	1.52	2.19	2.50	2.40
Ethnicity				
Kalenjin	3.65	3.65	3.68	3.62
Kamba	3.35	3.16	3.41	3.14
Kikuyu	2.28	2.65	3.24	2.73
Kisii	3.22	3.44	3.63	3.34
Luhya	2.12	2.93	4.05	3.55
Luo	3.47	3.48	2.49	2.75
Meru/Embu	3.42	3.20	2.36	2.07
Miji/Kiswahili	3.21	3.15	2.36	2.45
Taita/Taveta	2.64	2.80	2.76	2.49
Other	2.67	3.19	3.48	3.04
Contraceptive use				
Never used	2.44	3.04	2.80	2.88
Traditional method	2.96	3.24	3.23	3.28
Modern method	4.37	3.51	4.02	3.31

Marital status				
Never married	0.32	1.40	0.51	1.18
Married	4.70	3.73	4.06	3.43
Widowed	6.03	3.63	6.15	3.78
Divorced/Separated	3.20	2.77	3.25	2.64
Marital types				
Polygyny	4.58	3.75	3.93	3.44
Monogamy	5.16	3.76	4.74	3.44
Number of times married				
Once	4.63	3.66	4.00	3.39
More than once	4.83	3.49	4.94	3.45
Age at first marriage				
<15	5.97	4.58	5.90	4.76
15-19	4.59	3.75	4.25	3.68
20-24	3.95	2.90	3.54	2.77
25+	4.11	2.31	2.65	1.83
Work status				
Not working	2.44	3.23	3.24	3.26
Working	3.82	3.26	3.61	3.04
Age at first sexual intercourse				
8-14	3.92	3.71	3.81	3.52
15-25	3.16	3.06	3.33	3.05
26-33	3.91	2.24	0.85	0.48

Source: KDHS, 1993 data analysis.

In general, the interaction of fertility differentials controlling for migration status and age imply the underlying but small influence of migration process on fertility levels. Different patterns of fertility levels between migrants and never-migrants can be seen to exist by regions of residence, ethnicity, education levels, contraceptive use, marital characteristics, and sexual behaviour. For instance, results show that there exists some difference in residential fertility characteristics between migrants and never-migrants. Among contraceptive users, migrants using modern methods were found to have lower fertility levels than their never-migrants counterparts. In addition, ever-married migrants show lower fertility levels than never-migrants. In relation to work, migrants who are working have a lower fertility compared to the never-migrants working counterparts.

However, to identify which of the above differentials, net of all the factors associated with migration process, significantly influence fertility, multivariate analysis of fertility controlling for the differentials including migration status on one hand, and an analysis of fertility for each migration status categories controlling for the differentials on the other hand are performed.

Regression model findings

Association between the selected proximate variables and fertility

Table-2 shows that marriage is positively related to fertility level, whereas age at first marriage is inversely related with children ever born (Model-1). Women who marry late lose many potential years of childbearing, including probably the most fecund years, especially if the delay extends to the mid-twenties. Kenyan women who have married more than once and are in polygamous relationships have more children than those who have married only once and are in monogamous relationships.

However, evidence in the subsequent models where background characteristics and migration status variables are controlled shows that being in polygamous unions or having married more than once is negatively related to fertility levels. This may mean that the effects of being in a polygamous marriage and marrying more than once are similar, with the effect of the background variables and migration characteristics that may interfere with fertility behaviour. For instance, migration and education are positively related to one another but negatively related to fertility.

Women in polygamous marriage and those who have married more than once may lose their fertility due to lack of consistency and timing of their mating cycles, either because of competition for offspring among co-wives or because of a period of lack of a mating partner coupled with migratory activities. Other possible reasons could be because of reduced exposure risks between marriages or the waiting time before re-marriage.

Model-1 further shows that the mean number of sexual acts in a month is directly related to children ever born implying the desire for more children. Contraceptive practice is found to be associated with increasing number of children ever born. Women who are currently using a method of contraception have 0.65 more children than those who are not using any method. This may suggest that high parity common in Kenya may constitute the stimulus and consequent practice of family planning. Current users may do so for spacing of births, and few for terminating childbearing.

However, controlling for background and migration status (Model-3 and Model-4) variables does not change the pattern of interaction between the proximate variables and fertility. They confirm the direction and increase the magnitude of coefficient of significance for the level of fertility.

Table-2 Ordinary Least Squares (OLS) Regression of Children Ever Born (CEB) among women 15-49 years old, KDHS, 1993

Variable	Model1	Model2	Model3	Model4
Marital status				
Never dissolved	.279301*	.835017***	.835697***	862871***
Ever dissolved (RC)				
Age at marriage	-.188693***	-.178166***	-.178149***	-.181438***
Number of times married				
More than once	.471095***	-.144634	-.144294	-.160577
Once (RC)				
Type of marriage				
Polygyny	.642884***	-.236109***	-.236203***	-.234169***
Monogamy (RC)				
Contraceptive use				
Yes	.773954***	.16193***	.616274***	.604879***
No (RC)				
Age				
15-19		-6.711485***	-6.711074***	-6.697795***
20-29		-4.508480***	-4.508282***	-4.514353***

30-39		-1.968489***	-1.968303***	-1.966815***
40-49 (RC)				
Education attainment				
Primary		-.450636***	-.450101***	-.455122***
Secondary		-.869386***	-.868518***	-.898747***
Tertiary		-1.883911***	-1.881991***	-1.923077***
No-education (RC)				
Place of residence				
Urban		-.704183***	-.702610***	n/a
Rural (RC)				
Region/Province				
Nairobi		-.689477***	-.691159***	-1.096335***
Central		-.614936***	-.615182***	-.593580***
Coast		-.382303	-.385836	-.645089***
Eastern		-.321605	-.323844	-.308766
Nyanza		-.366017*	-.369864*	-.362978*
Rift Valley		-.290131*	-.290785*	-.324778**
Western (RC)				
Ethnicity				
Kalenjin		.327189*	.324446*	.340600*
Kamba		.149169	.148631	.129035
Kikuyu		-.042361	-.043168	-.067701
Kisii		.237232	.237812	.251913
Luo		.156832	.156097	.106335
Meru/Embu		-.034191	-.036719	-.072543
Miji/Swahili		-.436258	-.436893	-.263986
Somali		.032463	.032756	-.042773
Taita		-.029602	-.029747	.120608
Other		-.059069	-.059741	-.057623
Luhya (RC)				
Work status				
Yes		-.014770	-.014607	-.019113
No (RC)				
Migration status				
Migrant				-.006874
Never-migrant (RC)				
Migration streams				
i) Migrants				
Rural-urban				-.314252**
Urban-urban				-.847212***
Urban-rural				-.270877*
Rural-rural (RC)				
Adj. R^2	**0.07963**	**0.56069**	**0.56060**	**0.55888**
Constant	**7.392604**	**10.549981**	**10.553446**	**10.604568**
No. of cases	**5090**	**5090**	**5090**	**5090**

***P<0.001 **P<0.01 *P<0.05

CONCLUSION

Studies have shown that there exist differences between migrant and never-migrant women in fertility proximate determinants of marriage, contraception and the related background factors. In this paper, these same characteristics have been found also to affect the extent to which migration is associated with the differentials in the number of children ever born. Analyses using bivariate and multivariate procedures have produced results to support the following observations and conclusions.

Bivariate results

At a gross level, indications are obtained from the average number of children ever born as the primary index of fertility by migration status categories. For each residence category, within specific age groups, urban migrants have a lower mean number of children ever born than rural migrants. This pattern is sustained even when the data are standardized for age, although the magnitude of the difference is reduced and is small overall.

Comparison within the different migration status groups also indicates that urban natives have the lowest fertility levels of the never-migrants, whereas amongst migrants urban-urban migrants have the lowest mean number of children ever born. Rural-rural migrants have the highest mean number of children ever born. These findings suggest that fertility is more of a function of particular residential characteristics, especially the place of destination. Fertility is low in urban than rural areas, and many of the urban inhabitants are migrants.

The behavioural characteristics of women by different migration categories may also imply the operation of selective characteristics of women in relation to the nature of their migration destination. In addition, the fact that migrants in each of the residence categories have fertility only slightly above that of the never-migrants (as indicated by the standardized rates) in the same residential location suggests that either migrants adapt to the fertility norms and behaviour of the place of destination or they may have been selected by their characteristics which may be similar to or perceived by migrants to be similar to the fertility behaviour and characteristics of destinations.

Other differentials demonstrating the differences in fertility levels due to the influence of migration status include: region of residence, ethnic variations, education levels, contraceptive behaviour, marital characteristics, work status, and sexual behaviour. Migrants to rural regions have a higher mean number of children ever born than migrants to urban regions. The number of children ever born by migrants by different ethnic groups supports the above pattern.

Comparison of fertility levels of migrants by education levels shows that migrants with secondary plus education have the lowest levels; and that migrants using modern contraceptives have a lower mean number of children ever born than never-migrants using same methods. Women who migrate are in general more modern and in their attitude and more innovative in their desire to control their fertility than their never-migrants counterparts. In addition, migrants are obliged, influenced or motivated by the circumstances of their destination.

Married and widowed migrant categories have the lowest mean number of children ever born. Migration seems to disrupt marital behaviour, which is an important fertility level determining factor. Migration is positively related to polygyny and the number of times a women has been married (once or more than once). These characteristics have been noted to have inherent disruptive effect on the reproductive pattern and behaviour of women. Migrants also have a higher age at first marriage than never-migrants. Migrants marry relatively late compared to their never-migrant counterparts, which may culminate in lower fertility levels. Migration may also be a selective response to inability to find a new partner locally.

Migrant women who work have lower fertility than those who do not work; lower than even those of never-migrant women who work. This supports findings from other studies that migration and work status contribute to lower levels of fertility.

Multivariate results

Effect of the background factors and proximate fertility variables on children ever born

In general, the effects of the background and intermediate variables on fertility are similar in direction, if not in degree or significance for each measure of migration used (Model-1 and Model-2). The results demonstrate that education and fertility are negatively related; and that urban women have on average fewer children than do those in the rural areas. Work status shows a slight negative association with fertility levels, but the relationship is non-significant; and fertility is negatively related to contraceptive use. The results show lower fertility as age at marriage rises: late age at marriage reduces the period of exposure to the risk of pregnancy. In addition, marital status (ever-married) is associated with higher fertility.

Effect of migration status on CEB

Using never-migrants as reference category, regression results show that migration has negative effect on fertility. However, for migration status as defined used in Model-3, there does not seem to be a significant negative influence on mean number of children ever born. The greatest variations (R^2) appear when migration is measured using different streams (Model-4). This may be because of confounding factors between different migration status characteristics (migration streams). All variables considered in model-3 explain about 55% of variations in fertility level.

Although it would appear that contribution of migration itself is small in relation to the total variance explained by the background variables and the fertility intermediate variables (model-2), model-3 seems to suggest that unique contribution of migrant women to fertility levels may help to understand the observed fertility behaviour and characteristic among the migrants.

The effect of migration streams on fertility

Several theories about the relations between migration and fertility either specifically or implicitly state that migration between different places of residence has effect on fertility. The underlying assumption of these theories is that migrants between different residential categories find themselves in milieus substantially different from their place of origin and far removed from values and norms that characterise their previous residence.

Destinations may either have been chosen because of the contextual differentials or may affect migrant behaviour subsequent to the move. Additionally, the disparities between origin and destination may have been sufficiently great to disrupt normal behaviour such as child- birth for some time after the migration. The relation is best understood by giving attention to streams of movements.

Model-4 results show that migration between different types of residence has significant negative affect on the mean number of children ever born. This may suggest the underlying influence of residential characteristics on fertility behaviour and levels. Urban-urban migration characteristics show the highest influence on fertility levels, with the lowest variations associated with rural-rural migration. The magnitude of variation may also suggest the importance of the place of origin in determining fertility behaviour.

The results of the magnitude and direction of the association between migration and children ever born confirm the significance of migration process and also identify the unique combinations of the characteristics and direction of the migration categories characteristics that influence fertility.

The overall contribution of the variables used (R^2) in understanding the variations in CEB by the different models is as follows: proximate variables explain 7 percent of the variations in CEB; proximate variables and background characteristics explain 55 percent of variations in CEB; proximate variables, background characteristics and the different migration status indices (migrant/never-migrants or streams) explain 55 percent of the variations in children ever born.

In addition, the variations (R^2) in CEB by the different migration categories characteristics by differentials show that the never-migrants contribute 54 % of the variations in CEB; migrants, 55%; rural-urban migrants, 48%; rural-rural migrants, 54%; urban-urban migrants 53%; urban-rural migrants, 56%. This suggest migration status overall does not have any significant effect on fertility behaviour and levels. However, it is the types of migration that is important in influencing fertility behaviour and levels.

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POVERTY LEVELS IN NZOIA SUGAR BELT: CASE STUDY OF WEBUYE AND NALONDO DIVISIONS, BUNGOMA DISTRICT, KENYA

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Introduction

Poverty has been increasing steadily in the developing countries (Samir, 1995).The majority of the poor are found in South Asia and in sub-Saharan Africa. China, East Asia, the Pacific region and South Asia have experienced rapid economic growth compared to sub-Saharan Africa. Since independence in 1963, the government of Kenya has directed her development efforts towards fighting disease, ignorance, poverty and inequalities. In 1965, the ideas in the 1963 manifesto were published as Sessional Paper No. 10 of 1965 on "African Socialism and its Application to Planning in Kenya" (Kiruthu, 2005). Features of this Sessional Paper include: social justice, political equality, equal distribution of resources, high growing income per capita, mutual social responsibility, and check on rapid population growth through family planning among others to aid development. Despite these efforts to reduce poverty, the situation has continued to deteriorate. For instance in 1973, about 3.7 million people were classified as poor; and the number increased to approximately 15 million people at the turn of last century (GOK, 2001a). The elaborate 1997 Welfare and Monitoring Survey in Kenya indicated that 53% of the people in rural areas were categorized as overall poor (those lacking all basic needs like food, better shelter and clothing) and 51% as food poor (those lacking food but have other basic necessities like housing and clothing among others) (GOK, 2001b). By the year 2000, overall poverty in Kenya was estimated to have risen to 56%, implying that approximately 17 million of the country's 30 million people were living below poverty line (GOK, 2003b). The poor are clustered into certain social economic categories that include small-scale formers, pastoralists, agricultural and casual labourers, unskilled and semi-skilled workers, female-headed nuclear households, the physically handicapped, HIV and Aids orphans and street children, (GOK, 2002c). Kenya's largest crop area is mixed maize producers and the vast majority of the poor live in this area. Agricultural policies geared towards assisting farmers to increase their farm produce through provision of farm inputs and credit facilities haves not yielded good results (GOK, 2002a).

In both 1994 and 1997 welfare monitoring surveys, Bungoma was identified as one of the districts substantially contributing to national poverty. Approximately 56% (490,000 people) in the district fall below the poverty line, (GOK, 2002e). Six out of ten Divisions in Bungoma District cultivate sugar cane crop which has a ready market throughout the year, yet people are poor. From the MFP survey, poverty level seems to be increasing with time despite the government's efforts to reduce it.

Objectives of the study

The overall objective of the study was to investigate the challenges that hinder poverty reduction efforts in the study area and suggest ways of reducing poverty.

Specific objectives were to:

i. establish the levels of poverty within the study area
ii. evaluate the challenges to poverty reduction strategies in the study area

iii. establish the extent to which local stakeholders are involved in the implementation of poverty reduction strategies in the study area
iv. make policy recommendations

Poverty Levels

Relationship between Location and Annual Income of the Respondents

The results in Table 4.2 show that incidences of earning below Ksh 25,000 annually are higher in Sitikho, 84.0% followed by Bokoli, 75.3% then Sirare and Kabuchai with 62.9% and 61.8% respectively. Sitikho portrays higher incidences of poverty as compared to the other divisions. The reason for this headed families in Kenya are poorer than male headed families.

Table 4.2: Location and annual income of Household Respondents (N=371)

Division	Location	Below Ksh. 25,000	Above Ksh 25,000	Total
Nalondo	Kabuchai	55 (61.8%)	34 (36.2%)	89 (100.0%)
	Sirare	56 (62.9%)	33 (28.1%)	89 (100.0%)
Webuye	Bokoli	70 (75.3%)	23 (24.7%)	93 (100.0%)
	Sitikho	84 (84.0%)	16 (16.0%)	100 (100.0%)

Source: Field survey, 2006

Table 4.3 reveals that there is a significant relationship between the location where a person lives and the annual income, $p = 0.000$ an indicator that a relationship exists between locality and poverty level.

Table 4.3: Chi-square Test of the relationship between location and annual income of the Respondents (Combined locations)

	Value	df	*P-value* (2-sided)
Pearson Chi-Square	35.388	12	.000
N of Valid Cases	371		

Source: Field survey, 2006

Relationship between Level of Education and Annual Income of Household Respondents

Table 4.4 shows that the probability that the sampled population was earning below Ksh 25,000 annually reduces as the level of education increases with 82.1%, 82.8%, 64.7% and

51.1% for those with no formal schooling, primary education, secondary education and college and above respectively.

Table 4.4: Relationship between education level and annual income of Household Respondents (Combined locations) N=371

Education level	Below Ksh 25,000	Above Ksh 25,000	Total %
No formal schooling	23 (82.1%)	5 (17.8%)	28 (100%)
Primary Level	120 (82.8%)	25 (17.2%)	145 (100%)
Secondary level	99 (64.7%)	54 (45.3%)	153 (100%)
College and above	23 (51.1%)	22 (48.9%)	55 (100%)
Total	265 (71.4%)	106 (28.6%)	371(100%)

Source: Field survey, 2006

The chi-test in Table 4.5 shows the significance level of p= *0.000* which is an indicator that there is a strong relationship between the level of education and annual income of the respondent in combined locations.

Table 4.5: Chi-square Test of the relationship between level of education and annual income of the Respondents (Combined locations)

	Value	p-value (2-sided)
Pearson chi-square	55.723	.000
N of valued cases	371	

Source: Field survey, 2006

But when the locations are analyzed independently, they gave different relationships. Table 4.6 shows that the probability of a member of the population sampled was earning below Ksh 25,000 decreased as education level increased in Kabuchai and Sirare locations while in Bokoli and Sitikho locations no general trend was observed

Table 4.6: Relationship between education level and annual income of Household Respondents per location N=371

Division	Location	Education level	Below Ksh 25,000	Above Ksh 25,000	Total $ %
Nalondo	Kabuchai	No formal schooling	10 (90.9%)	1 (9.1%)	11 (100%)
		Primary Level	32 (84.2%)	6 (15.8%)	38 (100%)
		Secondary level	12 (32.5%)	20 (67.5%)	32 (100%)
		College and above	1 (12.5%)	7 (87.5%)	8 (100%)
		Total	55 (61.8%)	34 (38.2%)	89 (100%)
	Sirare	No formal schooling	8 (80%)	2 (20%)	10 (100%)
		Primary Level	30 (75%)	10 (25%)	40 (100%)
		Secondary level	17 (54.8%)	14 (43.2%)	31 (100%)
		College and above	1 (12.5%)	7 (87.5%)	8 (100%)
		Total	56 (62.9%)	33 (37.1%)	89 (100%)
Webuye	Bokoli	No formal schooling	0 (0%)	0 (0%)	0 (0%)
		Primary Level	28 (84.8%)	5 (15.2%)	33 (100%)
		Secondary level	30 (71.4%)	12 (28.6)	42 (100%)
		College and above	12 (66.7)	6 (33.3%)	18 (100%)
		Total	70 (75.3%)	23 (24.9%)	93 (100%)
	Sitikho	No formal schooling	5 (71.4%)	2 (28.6%)	7 (100%)
		Primary Level	30 (88.2%)	4 (11.8%)	34 (100%)
		Secondary level	40 (83.3%)	8 (16.7%)	48 (100%)
		College and above	9 (81.8%)	2 (18.2%)	11 (100%)
		Total	84 (84%)	16 (16%)	100 (100%)

Source: Field survey, 2006

Table 4.7 shows that there was a significant relationship between level of education and income p.m in Kabuchai and Sirare locations (*p = 0.000 at 95% confidence interval)*.There was no significant relationship between level of education and annual income of the respondent in Bokoli and Sitikho, *p = 0.063 and 0.689* respectively.

From this finding, it could be possible that household heads whose education level was college and above were more likely to be above poverty line (earning Ksh. 25000 and above p.a) as compared to those who had no formal education and those who had primary and secondary education. Those without education possibly lacked entrepreneurial and remained unemployed or got low farm produce because they were unable to adopt new farming methods. In areas where there was no relationships between education level and income p.a
like in Bokoli and Sitikho, could be those who had college and above level of education were engaged in income generating activities that did not require the use of skills of their training.

Table 4.7: Chi-square Tests of the relationship between level of education and annual income of Respondent per location

Division	Location		Value	df	P-value (2-sided)
Nalondo	Kabuchai	Pearson Chi-Square	56.957	9	.000
		N of Valid Cases	89		
	Sirare	Pearson Chi-Square	42.188	9	.000
		N of Valid Cases	89		
Webuye	Bokoli	Pearson Chi-Square	14.792	8	.063
		N of Valid Cases	93		
	Sitikho	Pearson Chi-Square	9.167	12	.689
		N of Valid Cases	100		

Source: Field survey, 2006

Relationship between Main Source of Income and Annual Income of the Respondent

Table 4.8 shows that most of the sampled populations (81%) considered farming as their main economic activity. Salaried employment was ranked second (13%) followed by business (6%). In Table 4.8, 77.6 % of the respondents who considered farming as their main economic activity, 60.9% who considered business as main economic activity and 36.7% of the salaried employed earned below Ksh 25.000 p.m. These results indicate that there are fewer tendencies for salaried people to leave below poverty line as compared to those who consider farming and business as their main economic activity.

Table 4.8: Main source of income and annual income of Household Respondents (N=371)

Main source of income	Below Ksh. 25,000	Over Ksh 25,000	Total
Farming	232(77.6%)	67(22.4%)	299(100.0%)
Business	14(60.9%)	9(39.1%)	23(100.0%)
Salaried employment	18(36.7%)	31(63.3%)	49(100.0%)
Total	264 (71.2%)	107 (28.8%)	371 (100.0%)

Source: Field survey, 2006

Results in Table 4.9 reveal that there was a relationship between main economic activities carried out by the sampled population and the annual income per household as depicted by p=0.000.

Table 4.9: Chi-square Test of the relationship between main source of income and annual income of the Respondent (Combined locations).

	Value	df	P-value. (2-sided)
Pearson Chi-Square	35.509	2	.000
N of Valid Cases	371		

Source: Field survey, 2006

Table 4.10 reveal that farming was the main economic activity in all the locations sampled and that the prevalence to poverty was higher among farmers than those practicing business and salaried employment as their main economic activity. Household heads on salaried employment had the lowest prevalence to poverty i.e. earning below Ksh 25,000 annually. Business people poor compared to salaried employed could be because they were engaged in small business that did not generate better income. Farmers were the poorest with 77.65% earning less than Ksh 25,000 annually. This could be because farmers were vulnerable to low prices for agricultural produce, high cost of production and exploitation by middlemen. This finding is consistent with Shins and Lyne (2004) who found out that in South Africa, farmers are poorer than those engaged in other income generating activities because farmers are vulnerable to natural disasters like drought, floods, pests and diseases.

Table 4.10: Main source of income and annual income of Household Respondent per location (N=371).

Division	Location	Main source of income	Below Ksh 25,000	Over Ksh 25,000	Total
Nalondo	Kabuchai	Farming	53(73.6%)	19(26.4%)	72(100%)
		Business	1(33.3%)	2 (66.7%)	3(100%)
		Salaried employment	0(.0%)	14(100.0%)	14(100%)
		Total	54(60.7%)	35(39.3%)	89(100%)
	Sirare	Farming	54(72.0%)	21(28.0%)	75(100%)
		Business	2(28.6%)	5(71.4%)	7(100%)
		Salaried employment	0(.0%)	7(100.0%)	7(100%)
		Total	56(62.9%)	33(37.1%)	89(100%)
Webuye	Bokoli	Farming	56(78.9%)	15(21.1%)	71(100%)
		Business	5(83.3%)	1(16.7%)	6(100%)
		Salaried employment	9(56.3%)	7(43.8%)	16(100%)
		Total	70(75.3%)	23(24.7%)	93(100%)
	Sitikho	Farming	69(85.2%)	12(14.8%)	81(100%)
		Business	6(85.7%)	(14.3%)	7(100%)
		Salaried employment	9(75.0%)	3(25.0%)	12(100%)
		Total	84(84.0%)	16(16.0%)	100(100%)

Source: Field survey, 2006

It was revealed in Table 4.11 that there was a significant relationship between main economic activities practiced by household head and annual income in Kabuchai and Sirare locations. The relationship between main economic activity and annual income diminished in Bokoli and Sitikho locations. Sitikho with p = *0.663* showed the highest unpredictability between income and main economic activity.

Table 4.11: Chi-square Test of the relationship between main source of income and annual income of the Respondent per location

Division	Location		Value	df	P-value
Nalondo	Kabuchai	Pearson Chi-Square	27.590	2	.000
		N of Valid Cases	89		
	Sirare	Pearson Chi-Square	18.069	2	.000
Webuye		N of Valid Cases	89		
	Bokoli	Pearson Chi-Square	3.814	2	.149
		N of Valid Cases	93		
	Sitikho	Pearson Chi-Square	.823	2	.663
		N of Valid Cases	100		

Source: Field survey, 2006

Relationship between Gender and Annual Income of the Respondent

There was an association between annual household income earned and gender of respondent. Table 4.12 shows that 65.4% males earned below Ksh 25,000 p.a as compared 78.9% females. These results show that women were most likely to be poorer than men. The reason for this could be because ownership of property is skewed in favour of men and that majority of women in the rural areas are affected in terms of access to credit since they do not have the title deeds as the culture does not allow them to own land (GOK, 2002d).

Table 4.12: Gender and annual income of Household Respondents (Combined locations) N=371

Gender	Below Ksh 25,000	Above Ksh 25,000	Total
Male	134 (65.4%)	71 (35.6%)	205 (100%)
Female	131 (78.9%)	35 (21.1%)	166 (100%)
Total	265 (71.4%)	106 (28%)	37 (100%)

Source: Field survey, 2006

Table 4.13 depicts a significance of p = *0.026* an indicator that there was a relationship between gender and annual income level at 95% confidence interval.

Table 4.13: Chi-square Test of the relationship between gender and annual income of the Respondent (Combined locations).

	Value	Df	P-value (2-sided)
Pearson Chi-Square	11.043	4	.026
N of Valid Cases	371		

Source: Field survey, 2006

Table 4.14 shows that in Kabuchai, Sirare and Sitikho the percentages of women earning less than Ksh 25,000 per annum was higher than that of men. In Bokoli more male than female earned less than Ksh 25,000 p.m.

Table 4.14: Gender and annual income of Household Respondent per location

N=371.

Division	Location	Gender	Below Ksh 25,000	Above Ksh 25,000	Total
Nalondo	Kabuchai	Male	30 (52.6%)	27 (47.4%)	57 (100%)
		Female	24 (75.0%)	8 (25.0%)	32 (100%)
		Total	54 (60.7%)	35 (39.3%)	89 (100%)
	Sirare	Male	23 (48.9%)	24 (51.1%)	47 (100%)
		Female	33 (78.6%)	9 (21.4%)	42 (100%)
		Total	56 (62.9%)	33 (37.1%)	89(100%)
Webuye	Bokoli	Male	41 (78.8%)	11(21.2%)	52 (100.0%)
		Female	29 (70.7%)	12 (29.3%)	41 (100.0%)
		Total	70 (75.3%)	23 (24.7%)	93 (100.0%)
	Sitikho	Male	39 (79.6%)	10 (20.4%)	49 (100.0%)
		Female	45 (88.2%)	6 (11.8%)	51 (100.0%)
		Total	84 (84.0%)	16 (16.0%)	100 (100.0%)

Source: Field survey, 2006

Table 4.15 reveals that there was a relationship between gender and annual income in Kabuchai and Sirare. The relationship between gender and annual income is lower in Kabuchai with p = *0.038* than in Sirare with *p = 0.004*. The relationship between gender and annual income was not significant in Bokoli and Sitikho Locations with *p = 0.368 and 0.239* respectively.

Table 4.15: Chi-square Test of the relationship between gender and annual income of the Respondent per location.

Division	Location		Value	Df	P-value (2-sided)
Nalondo	Kabuchai	Pearson Chi-Square	4.298	1	.038
		N of Valid Cases	89		
	Sirare	Pearson Chi-Square	8.349	1	.004
		N of Valid Cases	89		
Webuye	Bokoli	Pearson Chi-Square	.811	1	.368
		N of Valid Cases	93		
	Sitikho	Pearson Chi-Square	1.389	1	.239
		N of Valid Cases	100		

Source: Field survey, 2006

Relationship between Number of Children and Annual Income of the Respondent

Table 4.16 reveals that poverty reduces as the number of children increases in a household. For instance, 51.8% households with 5-6 children earned Ksh 25,000 and above p.m while 88.9% of the respondents without children earned below Ksh 25,000 p.a. Also 80.0% households with 1- 2 children and 80.5% with 3-4 children earned below Ksh 25,000 p.a. The reason for this finding could be children provide farm labour and therefore households with 5-6 children utilize this labour to earn more.

Table 4.16: Number of children and annual income of Household Respondents (Combined locations) N=371

Number of children	Less than Ksh 25,000	Over Ksh 25,000	Total
None	8 (88.9%)	1 (11.1%)	9 (100.0%)
1-2	44 (80.0%)	11 (20.0%)	55 (100.0%)
3-4	128 (80.5%)	31 (19.5%)	159 (100.0%)
5-6	43 (51.8%)	40 (48.2%)	83 (100.0%)
Above 6	41 (63.1%)	24 (36.9%)	65 (100.0%)
Total	264 (71.2%)	107 (28.8%)	371 (100.0%)

Source: Field survey, 2006

Table 4.17 depicts a p-value of 0.000 an indicator that there is a significant relationship between the number of children and annual income of the respondent

Table 4.17: Chi-square Test of the relationship between number of children and annual income of the Respondent (Combined locations).

	Value	Df	P-value (2-sided)
Pearson Chi-Square	27.452	4	.000
N of Valid Cases	371		

ource: Field survey, 2006

Table 4.18 overleaf shows households most likely to earn below Ksh 25,000 per annum in the Locations in which the study was carried out. The most prevalent households were those with no child in Kabuchai, then 1- 2 children in Sirare and Bokoli and those with 3-4 children in Sitikho. The results indicate that there is no linear correlation between number of children and annual income in households in the study area. Those with 0 and 1-2 children earned below Ksh 25,000 annually could be because they had not established a stable income generating activities and that the children were contributing to the generation of income in terms of farm labour. While those with 3-6 children earned a little more could be they had established stable economic activities and their children were contributing to income generation by providing farm labour. Also could be those household heads with 5 and above children had time to engage income generating activities outside home especially women because their children were not very young that needed their attention throughout the day.

Table 4.18: Number of children and annual income of Household Respondents per location (N=371)

Division	Location	No. of children	Below Ksh 25,00	Above Ksh 25,000	Total
Nalondo	Kabuchai	0	4 (100%)	0 (0%)	4 (100%)
		1-2	5 (71.4%)	2 (28.6%)	7 (100%)
		3-4	18 (60%)	12 (40%)	30 (100%)
		5-6	13 (44.8%)	16 (54.2%)	29 (100%)
		Above 6	14 (73.7%)	5 (26.3%)	19 (100%)
		Total	54 (60.7%)	35 (39.3%)	89 (100%)
	Sirare	0	2 (66.7%)	1 (33.3%)	3 (100%)
		1-2	10 (76.9%)	3 (23.1%)	13 (100%)
		3-4	20 (69.0%)	9 (31.0%)	29 (100%)
		5-6	10 (47.6%)	11 (52.4%)	21 (100%)
		Above 6	14 (60.9%)	9 (39.1%)	23 (100%)
		Total	56 (62.9%)	33 (37.1%)	89 (100%)
Webuye	Bokoli	1-2	15 (93.8%)	1 (6.3%)	16 (100%)
		3-4	44 (81.5%)	10 (18.5%)	54 (100%)
		5-6	5 (45. 5%)	6 (54.5%)	11 (100%)
		Above 6	6 (50.0%)	6 (50%)	12 (100%)
		Total	70 (75.3%)	23 (24.7%)	93 (00%)
	Sitikho	0	2 (100%)	0 (0.0%)	2 (100%)
		1-2	14 (73.7%)	5 (26.3%)	19 (100%)
		3-4	46 (100%)	0 (0.0%)	46 (100%)
		5-6	15 (68.2%)	7 (31.8%)	22 (100%)
		Above 6	7 (63.6%)	4 (36.4%)	11 (100%)
		Total	84 (84.0%)	16 (16.0%)	100 (100%)

Source: Field survey, 2006

Table 4.19 shows that there is no relationship between number of children per household and annual income in Kabuchai and Sirare Locations with p= 0.119 and 0.446 respectively. The relationship however is observed in Bokoli and Sitikho Locations with p-values of 0.004 and 0.001 respectively.

Table 4.19: Chi-square Test of the relationship between number of children and annual income of the Respondents per location.

Division	Location		Value	Df	P-value (2-sided)
Nalondo	Kabuchai	Pearson Chi-Square	7.337	4	.119
		N of Valid Cases	89		
	Sirare	Pearson Chi-Square	3.714	4	.446
Webuye		N of Valid Cases	89		
	Bokoli	Pearson Chi-Square	13.424	3	.004
		N of Valid Cases	93		
	Sitikho	Pearson Chi-Square	18.137	4	.001
		N of Valid Cases	100		

Source: Field survey, 2006

Relationship between Type of Main House and Annual Income of the Respondent

The type of the main house owned by a household is an indicator used to determine the level of poverty. From Table 4.20 it is observed that most of the households (53%) lived in mud walled houses (Houses whose walls and floor are made of mud), 39% in semi permanent (Houses whose walls and floor are made of mud, sand and cement) and 8% permanent houses. Table 4.20 reveals that households whose main house was mud walled were more susceptible to poverty with 84.8% earning below Ksh.25, 000 against 15.2% who earned above Ksh 25,000 per annum. Forty three point three percent (43.3%) of the households whose main house was permanent earned below Ksh 25,000 per annum while 56.7% earned above Ksh 25,000 per annum. The study found out more than half (56.7%) of those households whose main house was permanent earned above Ksh.25000 annually and were therefore, above poverty line as compared to those whose main house was semi permanent or mud wall (Table 4.20). However, quite a number (41.7%) of those whose main house was semi-permanent were also above poverty line.

Table 4.20: Type of main house and annual income of the Respondents (Combined location) N=371

Type of main house	Below Ksh 25,000	Above Ksh 25,000	Total
Permanent	13(43.3%)	17(56.7%)	30(100.0%)
Semi-permanent	84(58.3%)	60(41.7%)	144(100.0%)
Mud wall	167(84.8%)	30(15.2%)	197(100.0%)
Total	264(71.2%)	107(28.8%)	371(100.0%)

Source: Field survey, 2006

Using chi-square test, there was a significant association between the type of the main house of the household and annual income in combined locations *(p = 0.000)* Table 4.21.

Table 4.21: Chi-square Test of the relationship between type of main house and annual income of the Respondents (Combined locations).

	Value	df	P-Value
Pearson Chi-Square	40.647(a)	2	.000
N of Valid Cases	371		

Source: Field survey, 2006

Each location was also analyzed independently and still households living in mud walled houses were poorer than those living in permanent and semi-permanent houses in all the locations considered under this study (Table 4.22). The prevalence is high in Sitikho (92.1%), followed by Sirare (84.9%), Bokoli (81.4%) and lastly by Kabuchai (76.3%). The prevalence to poverty is significant to households living in semi permanent houses in Sitikho (73.5%) followed by Bokoli (73%) and Kabuchai (52.3 %) respectively. Households living in permanent house in Bokoli still portrayed a high prevalence to poverty at 61.5% compared to the other locations. This could mean that previously these household heads were living above poverty line (earning above Ksh 25,000 annually) by being salaried employed and were now retired or retrenched.

Table 4.22: Type of main house and annual income of Household Respondents per location N=371.

Division	Location	Type of main house	Below Ksh 25,000	Above Ksh 25.000	Total
Nalondo	Kabuchai	Permanent	2(28.6%)	5(71.4%)	7(100.0%)
		Semi-permanent	23(52.3%)	21(47.7%)	44(100.0%)
		Mud-wall	29(76.3%)	9(23.7%)	38(100.0%)
		Total	54(60.7%)	35(39.3%)	89(100.0%)
	Sirare	Permanent	2(28.6%)	5(71.4%)	7(100.0%)
		Semi-permanent	9(31.0%)	20(69.0%)	29(100.0%)
		Mud-wall	45(84.9%)	8(15.1%)	53(100.0%)
		Total	56(62.9%)	33(37.1%)	89(100.0%)
Webuye	Bokoli	Permanent	8(61.5%)	5(38.5%)	13(100.0%)
		Semi-permanent	27(73.0%)	10(27.0%)	37(100.0%)
		Mud-wall	35(81.4%)	8(18.6%)	43(100.0%)
		Total	70(75.3%)	23(24.7%)	93(100.0%)
	Sitikho	Permanent	1(33.3%)	2(66.7%)	3(100.0%)
		Semi-permanent	25(73.5%)	9(26.5%)	34(100.0%)
		Mud-wall	58(92.1%)	5(7.9%)	63(100.0%)
		Total	84(84.0%)	16(16.0%)	100(100.0%)

Source: Field survey, 2006

Table 4.23 show that there was a relationship between type of main house and annual income in households in Kabuchai, Sirare and Sitikho. The relationship is stronger in Sirare *(p = 0.000)* followed by Sitikho (*p 0.003)* and then Kabuchai (*p = 0.016)*. In Bokoli, there existed no relationship between type of main house and annual income per household (*p = 0.318)*. It was also observed that some houses were in poor conditions (Plate 4.1).

Table 4.23: Chi-square Test of the relationship between type of main house and annual income of the Respondents per location

Division	Location		Value	Df	P-Value
Nalondo	Kabuchai	Pearson Chi-Square	8.221(a)	2	.016
		N of Valid Cases	89		
	Sirare	Pearson Chi-Square	27.158(b)	2	.000
		N of Valid Cases	89		
Webuye	Bokoli	Pearson Chi-Square	2.288(c)	2	.318
		N of Valid Cases	93		
	Sitikho	Pearson Chi-Square	11.551(d)	2	.003
		N of Valid Cases	100		

Source: Field survey, 2006

Plate 4.1: A sample of the conditions of some houses in the study area

Source: Field survey, 2006

Relationship between Age (in yrs) and Annual Income of the Respondent

Table 4.24 shows that most of the respondents were in the age groups of 20-40 years (49.6%) and 41-60 years (40.43%). These are the age groups which form a significant proportion of the household heads. The Table shows that majority (78.8%) of those in the age groups 20-40 years followed by age group of more than 60 years (71.9%) and between 40-60 years (60.7%) earned less than Ksh 25,000 p.a, same to those in the age group of < 20 year. This is the proportion of the population that includes orphans. Over 60% of the respondents in the other age groups were also below poverty line.

Source: Field survey, 2006

Using chi-square test, the study observed that there was no relationship between growing cane or not and annual income of household heads in the study area with *p=0.755* (Table 4.29). This result further indicates that sugarcane growing was not improving the economic life of the farmers in the study area.

Table 4.29: Chi-Square Test of the relationship between cane growing and annual income of the Respondents (combined location).

	Value	df	P-value. (2-sided)	
Pearson Chi-Square	.097	1	0.755	
N of Valid Cases	371			

Source: Field survey, 2006

Table 4.30 show the analysis between growing or not growing cane and annual income per location. The study observed that most of the respondents growing cane from Kabuchai (61.5%), Bokoli (74.0%) and Sitikho (82.9%) locations were living below poverty line (earned below Ksh 25,000) while in Sirare, they were 55.6%. Sirare had a high percentage of respondents growing cane and living above poverty line (earning above Ksh 25,000 annually) compared to Kabuchai (38.5%), Bokoli (26.0%) and Sitikho (17.1%). The reason for this difference could be that most Sirare cane farmers grow cane without much involvement of the company therefore avoiding some deductions hence making profit.

Table 4.30: Cane growing or not and annual income of Household Respondents per location (N=371)

Division	Location	Growing cane or not cane	Below Ksh. 25,000	Above Ksh 25,000	Total
Nalondo	Kabuchai	Yes	16 (61.5%)	10 (38.5%)	26(100%)
		No	39 (61.9%)	24 (38.5%)	63(100%)
		Total	55 (61.8%)	34 (38.2%)	89(100%)
	Sirare	Yes	35 (55.6%)	28 (44.2%)	63 (100%)
		No	21 (80.8%)	5 (19.2%)	26 (100%)
		Total	56 (62.9%)	33 (37.1%)	89 (100%)
Webuye	Bokoli	Yes	54 (74.0%)	19 (26.0%)	73 (100%)
		No	16 (80.0%)	4 (20.0%)	20 (100%)
		Total	70 (75.3%)	23 (24.7%)	93 (100%)
	Sitikho	Yes	68 (82.9%)	14 (17.1%)	82 (100%)
		No	16 (88.95)	2 (11.1%)	18 (100%)
		Total	84 (84.0%)	16 (16.0%)	100(100%)

Source: Field survey, 2006

Using Chi-square test, it was observed that there was no relationship between cane growing and annual income of the respondents in Kabuchai (*p=.974*), Bokoli (*p=.580*) and

Sitikho (*p=.532*) Table 4.31. A slight relationship was observed in Sirare, *p=.025* however not very significant.

Table 4.31: Chi-Square Test of the relationship between cane growing or not and annual income of the Respondent per Location

Division	Location		Value	df	P-value. (2-sided)	
Nalondo	Kabuchai	Pearson Chi-Square	.001	1	.974	
		N of Valid Cases	89			
	Sirare	Pearson Chi-Square	5.015	1	.025	
		N of Valid Cases	89			
Webuye	Bokoli	Pearson Chi-Square	.306	1	.580	
		N of Valid Cases	93			
	Sitikho	Pearson Chi-Square	.390	1	.532	
		N of Valid Cases	100			

Source: Field survey, 2006

Relationship between Main Source of Water for domestic use and Annual Income of the Respondent

The study found out that the shallow well was the main source of water for domestic use in most households. Findings in Table 4.32 show that 73.6% used well water, 18.6% rainwater, 3.8% piped water, 2.7% river water and 1.3% pond water.

Table 4.32: Main source of water for domestic use and annual income of the Respondents (Combined Location) N=371

Main source water	Less than Ksh. 25,000	Above Ksh 25,000	Total	
River	7(70.0%)	3(30.0%)	10(100.0%)	
Piped	3 (21.4%)	11(78.6%)	14(100.0%)	
Well	237 (86.8%)	36(23.2%)	273 (100.0%)	
Pond	5(100.0%)	0(0%)	5 (100.0%)	
Rain water	13(18.8%)	56(81.2%)	69 (100%)	
Total	265 (71.4%)	106(28.6%)	371 (100.0%)	

Source: Field survey, 2006

All households using the pond as their main source of water were below poverty (earning below Ksh 25,000 p.a) line while majority of those using piped (78.6%) and rain water (81.2%) were above poverty line (Table 4.32). This finding implies that those households depending on rain as their main source of water were able purchase or construct tanks to harvest and store enough water for domestic use. Those, whose main source of water piped, stay next to urban or market areas that have piped water and were able to connect water to their houses or compounds. It was observed that not all households using well water had their own well; some used the neighbour's well since they could not afford their own. Using chi-square test, the study found that there was a significant relationship between the main source of water for domestic use and approximate annual income of the respondents with P=.000 (Table 4.33).

Table 4.33: Chi-Square Tests of the relationship between main source of water for domestic use and annual income of the Respondents (Combined location)

	Value	df	P value (2-sided)	
Pearson chi-Square	19.628	4	.000	
N of valid cases	371			

Source: Field survey, 2006

Main source of Fuel for domestic cooking.

The study found out that wood fuel was the main source of fuel for domestic cooking which was used by 98.65% of the households interviewed. Those who were using paraffin and gas were about 2% while there was no household using electricity as the main fuel for domestic cooking (Table 4.34) .It was also observed that supply of electricity had not reached the interior areas. Given that most households were earning below Ksh 25, 000, annually, it was possible that many could not afford to use paraffin, gas or electricity as the main source of fuel for domestic cooking. This trend of using wood fuel could easily lead to environmental degradation due to destructions of trees/forests and this will worsen the poverty situation in the area.

Table 4.34: Main Type of fuel used for domestic cooking as reported by household Respondents (N = 371)

Fuel Type	**Frequency & %**
Wood fuel	**366 (98.65%)**
Paraffin	**02 (0.54%)**
Gas	**03 (0.80.0%)**
Electricity	**0 (0.0%)**
Total	**371 (100%)**

Source: Field survey, 2006

Ownership of Household Goods

Ownership of household goods was also used to determine the level of poverty in the study area. Various household goods were owned as shown in Table 4.35. Bicycle and radio were the most popular household goods in all the 4 locations. Most households (93%) owned a radio, while 82% owned a bicycle. The study found out that most people used the bicycle as the main means of transport and the radio for news and entertainment. The sofa set and television set (T.V) were owned by very few households, 25% and 12% respectively. This is because some could not afford while others feared that the T.V will attract thieves or they will be seen to be doing well and therefore bewitched (cultural factor of poverty). However most households would not genuinely afford to own a car since their income was low.

Table 4.35: Ownership of household goods as reported by Household Respondents (N=371)

	Nalondo Division		Webuye Division	
	Sirare	Kabuchai	Sitikho	Bokoli
Characteristics	Freq & %	Freq & %	Freq & %	Freq & %
Ownership of bicycle **Yes** **No**	70(78.7%) 19(21.3%)	69 (77.5%) 20(22.5%)	88(88.0%) 12(12.0%)	77 (88.8%) 16 (17.2%)
Total	89(100%)	89(100%)	100(100%)	93 (100%)
Ownership of car **Yes** **No**	1(1.1%) 88(98.9%)	4(4.5%) 85(93.5%)	3(3.0%) 97(97.0%)	4 (4.3%) 89 (95.7%)
Total	89(100%)	89(100%)	100(199%)	93 (100%)
Ownership of radio **Yes** **No**	75(84.3%) 14(15.7%)	85(93.5%) 4(4.5%)	99(99.0%) 1(1.0%)	87 (93.5%) 6 (6.5%)
Total	89(100%)	89(100%)	100(100%)	93 (100%)
Ownership of T.V **Yes** **No**	20(22.5%) 69(77.5%)	14 (15.9%) 75(84.3%)	8(8.0%) 92(92.0%)	3 (3.2%) 87 (96.8%)
Total	89(100%)	89(100%)	100(100%)	93 (100%)
Ownership of sofa set **Yes** **No**	31(34.8%) 58(65.2%)	16(18.0%) 73(82.0%)	16(16.0%) 84(84.0%)	30 (32.3%) 63 (67.7%)
Total	89(100%)	89(100%)	100(100%)	93(100%)

Source: Field survey, 2006

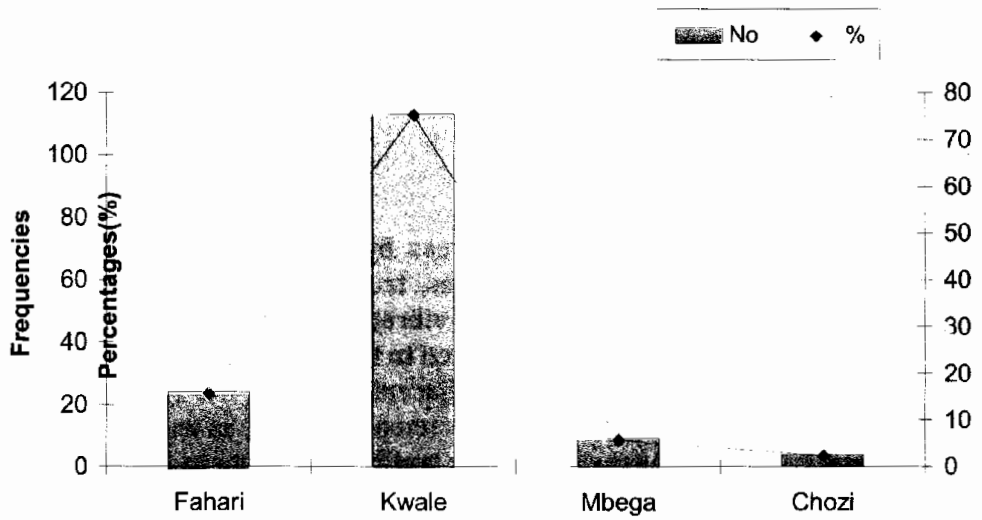

Figure 3: Popular wheat varieties with farmers

Table 4: Socio-Economic characteristics and use of farm saved seed by farmers

Socio-Economics characteristics	CS		FSS	Total	χ^2
Gender		Males	18(46.2%)	62(55.9%)	80
	Females	21(53.8%)	49(44.1%)	70	1.09ns
Age	15-25yrs	3(7.71%)	11(9.9%)	14	
	26-35yrs	2(5.1%)	7(6.3%)	9	
	36-45yrs	13(33.3%)	21(18.9)	34	3.4ns
	46-55yrs	21(53.8%)	72(64.9)	93	
Education	Informal	6(15.4%)	38(34.2%)	44	
	Primary	10(25.6%)	42(37.8%)	52	14.66**
	Secondary	14(35.9%)	24(21.6%)	38	
	Tertiary	9(23.1%)	7(6.3%)	16	
Credit	No	39(100%)	89(80.2%)	128	
	Yes	0(0%)	22(19.8%)	22	9.05**
Extension services	No	15(38.5%)	59(53.2%)	74	
	Yes	24(61.5%)	52(46.8%)	76	2.5ns

Note: CS=Certified Seed, FSS=Farm Saved Seed, ns=not significant, *=significant at P<0.1, **=Significant at P<0.05, *=Significant at P<0.01**

DYNAMIC ANALYSIS OF REINFORCED CONCRETE STRUCTURES UNDER HARMONIC INFLUENCE.

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Abstract

The vibration induced on buildings in urban areas by street traffic is a nuisance that requires mitigation. Heavy vehicles such as buses, trucks and trains often cause these vibrations. Nevertheless, traffic induced building vibrations in residential neighborhoods can be caused by a host of conditions that are related to the pavement structure, underlying soil condition, structural characteristics of the adjacent building, the type and volume of traffic on residential streets, uneven and rough pavement surfaces, as well as inadequacy in the pavement structure to support heavy vehicular traffic, contribute to the vibration of the adjacent property. Various researchers have made an effort to evaluate the level of traffic induced vibrations in reinforced concrete structures and find ways of mitigating the problem. In accordance to international codes and laws the allowed intensity of vibrations caused by railways and roads are limited to certain values. To attain these values different models have been developed within the last 30 years. The analytical and numerical models are used to determine the displacement of a structure at design stage, taking into consideration crack formation. Numerical and analytical models of determining displacement of reinforced concrete structures due to vibrations are presented in this article.

Keywords: *numerical model, analytical model, reinforced concrete, induced vibrations, harmonic influence, kinematics.*

INTRODUCTION

Vibrations induced in buildings are a common concern to many cities around the world. Complaints are usually made by owners of residential homes about annoying vibrations in their buildings as a result of heavy vehicles passing on adjacent roads. In some cases legal action is taken by home owners against city authorities claiming building damage. Vibration induced by road traffic is also of concern regarding its long-term effect on historic buildings, especially those in weak condition. Traffic vibration is mainly caused by heavy vehicles, such as buses and trucks. Small vehicles, such as passenger cars, rarely induce vibrations that are perceptible in buildings. Vibrations are induced as a result of the presence of discrete irregularities in the road surface, as well as periodic and random road surface irregularities and imperfections in vehicles themselves. Irregularities and imperfections lead to dynamic vehicle pavement interaction forces that in turn generate stress waves in the supporting soil. Stress waves in the soil eventually reach the foundations of adjacent buildings causing them to vibrate. Many factors affect vibration levels, among them the road condition, vehicle weight and speed, vehicle characteristics, soil stratification and properties, and building characteristics.

The problem of traffic-induced vibration has been of concern for a long time; initial studies were reported almost 80 years ago (Hyde and Lintern, 1929). More recently, numerous studies of building vibration induced by road traffic were undertaken around the world (Baikov and Sigalov, 1985; Hanazato et al., 1991; House, 1973; Nelson and Viranuvut, 1973;

Taniguchi and Okada, 1981; Yokota and Shimizu, 1984). These studies contributed significantly to identifying the nature of the problem and clarifying its extent and effect. In many of these studies, remedial measures were also investigated and vibration prediction methods were developed. Similarly, numerous other studies were undertaken to investigate vibrations induced by freight and passenger trains, subway trains, streetcars and trams.

Several remedial measures are usually suggested to reduce vibrations induced by road traffic. These includes periodic maintenance of road surfaces, traffic flow control, vehicle weight and speed control, improvement of road-sub base structure, soil improvement, screening of vibration using in-ground barriers, and the use of building isolation systems. Most of these measures, including road maintenance and speed control, are usually considered impractical or not cost effective. Consequently the problem continues to exist to this day. Numerical model is proposed in this article to predict the level of vibration and mitigation measures are put in place at design level.

SYSTEMS WITH ONE DEGREE OF FREEDOM.

Displacement of mass is function of external force, force of inertia and dispersion forces. Displacement of mass at unit force δ_{11}, considering that force of inertia and dispersion force are directed to the different sides (Maslennikov, 2005) is written in Eq. (1)

$$y_1(t) = \delta_{11}\left[J_1(t) - R_1(t)\right] + \Delta_{1F}(t). \quad (1)$$

After substitution of values $J_1(t)$ and $R_1(t)$ in Eq. (1)

$$y_1(t) = \delta_{11}\left[-m_1 \ddot{y}_1(t) - \beta_1 \dot{y}_1(t)\right] + \Delta_{1F}(t). \quad (2)$$

Where $\Delta_{1F}(t)$ - displacement of mass from applied external forces which can be substituted as $\Delta_{1F}(t) = \delta_{1F} F(t)$, where $F(t)$- is the main force; β_1- coefficient of non elastic resistance; m_1 - the concentrated mass.

Take all unknown members in the equation to the left:

$$\delta_{11} m_1 \ddot{y}_1(t) + \delta_{11}\beta_1 \dot{y}_1(t) + y_1(t) = \Delta_{1F}(t) = f(t). \quad (3)$$

Where $f(t) = -\delta_{11} m_1 y_\Delta(t)$ - is a variation function.

The common solution of the homogeneous Eq. (3) is presented (Maslennikov, 2000).

$$y_{(01)}(t) = \exp(-\alpha_1 t)\left[y_{01}\cos\omega_\alpha t + \left((v_{01} + \alpha_1 y_{01})/\omega_\alpha\right)\sin\omega_\alpha t\right]. \quad (4)$$

Where y_{01} and v_{01} - initial displacement and speed:

$\alpha_1 = \beta_1 / 2m_1$; $\omega_\alpha = \sqrt{\omega_1^2 - \alpha_1^2}$;

ω_1 - Angular frequency of free vibrations without taking into account damping. Partial solution at zero initial conditions is presented. The solution will be found in the form of Eq. (5), (Simionov and Liskov, 1996; Sveshnikov and Tighonov, 1967).

$$y_1(t) = \int_{-\infty}^{\infty} Y(\omega)\exp(i\omega t)d\omega. \quad (5)$$

Where $Y(\omega)$ - complex function of material argument (Bata, 1971); (ω)- a spectral variable.
Substitute Eq. (5) in Eq. (3).

$$\int_{-\infty}^{\infty} Y(\omega)\left(-\delta_{11}m_1\omega^2 + \delta_{11}\beta_1 i\omega + 1\right)\exp(i\omega t)d\omega = f(t).$$

Let $F(\omega) = Y(\omega)\left(-\delta_{11}m_1\omega^2 + \delta_{11}\beta_1 i\omega + 1\right)$, that represents spectral function of time function $f(t)$. From the given equation

$$Y(\omega) = \frac{F(\omega)}{-\delta_{11}m_1\omega^2 + \delta_{11}\beta_1 i\omega + 1} = F(\omega)K(i\omega),$$

Where $K(i\omega) = 1/\left(-\delta_{11}m_1\omega^2 + \delta_{11}\beta_1 i\omega + 1\right)$ - the complex transfer function representing properties of the system. This applies for all systems with one degree of freedom. It is presented in more convenient form, by dividing the numerator and a denominator by $(-\delta_{11}m_1)$, and let α_1 and $\omega_1 = 1/(\delta_{11}m_1)$

$$K(i\omega) = -\frac{\omega_1^2}{\omega^2 - 2\alpha_1 i\omega - \omega_1^2}. \quad (6)$$

Final equation for $y_1(t)$ will be formulated as

$$y_1(t) = \int_{-\infty}^{\infty} F(\omega)K(i\omega)\exp(i\omega t)d\omega. \quad (7)$$

Eq. (7) is convenient since the solution is submitted as product of two functions, one of which characterizes properties of the system, and another - type of influence. This expression is used below for analyzing of partial solutions at zero initial conditions.
Further of the solution requires the introduction of function of time in order to have a possibility to determine spectral function $F(\omega)$. Spectral function is associated to function of time by extend transformation Fourier

$$f(t) = \int_{-\infty}^{\infty} F(\omega)\exp(i\omega t)d\omega. \quad (8)$$

In turn

$$F(\omega)=\frac{1}{2\pi}\int_{-\infty}^{\infty} f(t)\exp(-i\omega t)dt. \quad (9)$$

The presented solution is used only for linear systems. Therefore it is enough to solve for one member of series, and then the solution from each member of the series is found by summing up.

$$y_0(t)=a_0\exp(-\alpha_0 t)\sin(\omega_0 t+\gamma). \quad (10)$$

Substitute the second derivative of Eq. (10) in Eq. (3).

$$f(t)=\delta_{1\Delta}a_0\delta_{11}m_1\exp(-\alpha_0 t)\left[\left(\omega_0^2-\alpha_0^2\right)\sin(\omega_0 t+\gamma)+2\alpha_0\omega_0\cos(\omega_0 t+\gamma)\right]. \quad (11)$$

In general the solution of trigonometrical functions shall replace indicative, which allows presenting the result at once for both members of Eq. (5). Time function shall take following form

$$f(t)=A_0\exp(-\alpha_0 t)\exp(i\omega_0 t)\exp(i\gamma). \quad (12)$$

For final solution the following should be taken into account,
$A_0=a_0\delta_{11}\delta_{1\Delta}m_1\left(\omega_0^2-\alpha_0\right)$, and for cosine – $A_0=2a_0\delta_{11}\delta_{1\Delta}m_1\alpha_0\omega_0$.
Substitute Eq. (12) in Eq. (9) and limit the integration, having values of time from 0 up to ∞.

$$F(\omega)=\frac{1}{2}\int_0^{\infty} A_0\exp(-\alpha_0 t)\exp(i\omega_0 t)\exp(i\gamma)\exp(-i\omega t)dt=$$

$$=\frac{A_0\exp(i\gamma)}{2\pi}\int_0^{\infty}\exp\left[-\left(\alpha_0-i(\omega_0-\omega)\right)t\right]dt.$$

Assume that $\omega>\omega_0$. As a result of integration

$$F(\omega)=\frac{A_0\exp(i\gamma)}{2\pi\left[\alpha_0-i(\omega_0-\omega)\right]}. \quad (13)$$

Value of spectral function (13) is entered and transfer function from Eqs. (16) and (17).

$$y_1(t)=\frac{A_0\exp(i\gamma)\omega_1^2}{2\pi}\int_{-\infty}^{\infty}\frac{\exp(i\omega t)d\omega}{\left[\alpha_0-i(\omega_0-\omega)\right]\left(\omega^2-2\alpha_1 i\omega-\omega_1^2\right)}. \quad (14)$$

Calculate integral of Eq. (14) with the help of deductions. It takes following form

$$\int_{-\infty}^{\infty} \exp(iax) f(x)\,dx,$$

$$\int_{-\infty}^{\infty} \exp(iax) f(x)\,dx = 2\pi i \sum_{k=1}^{n} res\left[\exp(iaz) f(z), z_k\right]. \quad (15)$$

$f(z)$, takes the following form

$$f(z) = \frac{1}{\left[\alpha_0 - i(\omega_0 - z)\right]\left(z^2 - 2\alpha_1 iz - \omega_1^2\right)} = \frac{1}{\psi(z)}.$$

Consider special points. $\alpha_0 - i(\omega_0 - z) = 0$ and $z^2 - 2\alpha_1 iz - \omega_1^2 = 0$. Then $z_1 = \alpha_1 i + \sqrt{-\alpha_1^2 + \omega_1^2} = \alpha_1 i + \omega_\alpha$; $z_2 = \alpha_1 - \omega_\alpha$; $z_3 = \omega_0 + i\alpha_0$. All special points are of the first order. Deductions for them are determined using formula:

$$res\left[f(z), z_0\right] = \frac{\varphi(z_0)}{\psi'(z_0)}, \text{ where } f(z) = \frac{\varphi(z)}{\psi(z)}. \quad (16)$$

The first derivative of the function, which is a denominator, has the following solution.

$$\psi'(z) = i\left(z^2 - 2\alpha_1 iz - \omega_1^2\right) + (2z - 2\alpha_1 i)\left[\alpha_0 - i(\omega_0 - z)\right]$$

The values of deductions:

$$res\left[\exp(itz) f(z), z_1\right] = \frac{\exp(-\alpha_1 t)\exp(i\omega_\alpha t)}{2\omega_\alpha\left[(\alpha_0 - \alpha_1) + i(\omega_\alpha - \omega_0)\right]};$$

$$res\left[\exp(itz) f(z), z_2\right] = \frac{\exp(-\alpha_1 t)\exp(-i\omega_\alpha t)}{2\omega_\alpha\left[(\alpha_0 - \alpha_1) + i(\omega_\alpha - \omega_0)\right]};$$

$$res\left[\exp(itz) f(z), z_3\right] = \frac{\exp(-\alpha_0 t)\exp(i\omega_0 t)}{i\left[(\omega_0 + i\alpha_0)^2 - 2\alpha_1 i(\omega_0 + i\alpha_0) - \omega_1^2\right]};$$

Substitute values of Eq. (12) in Eq. (11). As a result the expression takes the following form

$$y_1(t) = A_0 \exp(i\gamma)\omega_1^2 \left\{ \frac{\exp(-\alpha_0 t)\exp(i\omega_0 t)}{(\omega_0 + i\alpha_0)^2 - 2\alpha_1 i(\omega_0 + i\alpha_0) - \omega_1^2} + \frac{\exp(-\alpha_1 t)}{2\omega_\alpha} \times \right.$$

$$\times\left[\frac{\exp(i\omega_\alpha t)(\alpha_0-\alpha_1-i\omega_\alpha-i\omega_0)-\exp(-i\omega_\alpha t)(\alpha_0-\alpha_1+i\omega_\alpha-i\omega_0)}{2\omega_0(\alpha_1-\alpha_0)+i\left(\omega_0^2-\omega_1^2-\alpha_0^2+2\alpha_0\alpha_1\right)}\right]\Bigg\};$$

The solution which has been written through trigonometrical function is more convenient for practical use. By using Euler's formula

$$e^{\pm i\omega}=\cos\omega\pm i\sin\omega. \tag{17}$$

As result a complex transformations expression for displacement of mass m_1 is given as

$$y_1(t)=-\frac{A_0\omega_1^2}{\left(W^2-\alpha_\alpha^2\right)^2+4\alpha_\alpha^2\omega_0^2}\Big\{\exp(-\alpha_0 t)\Big[\left(W^2-\alpha_\alpha^2\right)\cos(\omega_0 t+\gamma)+$$

$$+2\alpha_\alpha\omega_0\sin(\omega_0 t+\gamma)+i\Big[\left(W^2-\alpha_\alpha^2\right)\sin(\omega_0 t+\gamma)-2\alpha_\alpha\omega_0\cos(\omega_0 t+\gamma)\Big]\Big]+$$

$$+\exp(-\alpha_1 t)\Big[\left(\omega_0/\omega_\alpha\right)\left(W^2-\alpha_\alpha^2\right)\sin\gamma\sin\omega_\alpha t-\left(\alpha_\alpha/\omega_\alpha\right)\left(\omega_\alpha^2+\omega_5^2+\alpha_\alpha^2\right)\cos\gamma\times$$

$$\times\sin\omega_\alpha t-\left(W^2-\alpha_\alpha^2\right)\cos\gamma\cos\omega_\alpha t-2\alpha_\alpha\omega_0\sin\gamma\cos\omega_\alpha t+i\Big[-\left(\alpha_\alpha/\omega_\alpha\right)\left(\omega_\alpha^2+\right.$$

$$\left.+\omega_0^2+\alpha_\alpha^2\right)\sin\gamma\sin\omega_\alpha t-\left(\omega_0/\omega_\alpha\right)\left(W^2-\alpha_\alpha^2\right)\cos\gamma\sin\omega_\alpha t+2\alpha_\alpha\omega_0\cos\gamma\times$$

$$\times\cos\omega_\alpha t-\left(W^2-\alpha_\alpha^2\right)\sin\gamma\cos\omega_\alpha t\Big]\Big]\Big\}. \tag{18}$$

Where $\alpha_\alpha=\alpha_0$; $\omega_\alpha^2=\omega_1^2-\alpha_1^2$; $W^2=\omega_0^2-\omega_\alpha^2$.

To find the solution of Eq. (11), it is necessary in Eq. (20) to carry out variation and find minimum values of the expression.

$$y_1(t)=-\frac{A_0\omega_1^2}{\left(W^2-\alpha_\alpha^2\right)^2+4\alpha_\alpha^2\omega_0^2}\Big\{\exp(-\alpha_0 t)\Big[\left(W^2-\alpha_\alpha^2\right)\cos(\omega_0 t+\gamma)+$$

$$+2\alpha_\alpha\omega_0\sin(\omega_0 t+\gamma)\Big]+\exp(-\alpha_1 t)\Big[\left(\omega_0/\omega_\alpha\right)\left(W^2-\alpha_\alpha^2\right)\sin\gamma\sin\omega_\alpha t-\left(\alpha_\alpha/\omega_\alpha\right)\times$$

$$\times\left(\omega_\alpha^2+\omega_0^2+\alpha_\alpha^2\right)\cos\gamma\sin\omega_\alpha t-\left(W^2-\alpha_\alpha^2\right)\cos\gamma\cos\omega_\alpha t-2\alpha_\alpha\omega_0\sin\gamma\cos\omega_\alpha t\Big]+$$

$$+i\Big[\left(W^2-\alpha_\alpha^2\right)\sin(\omega_0 t+\gamma)-2\alpha_\alpha\omega_0\cos(\omega_0 t+\gamma)\Big]+\exp(-\alpha_1 t)\Big[-\left(\alpha_\alpha/\omega_\alpha\right)\left(\omega_\alpha^2+\right.$$

$$\left.+\omega_0^2+\alpha_\alpha^2\right)\sin\gamma\sin\omega_\alpha t-\left(\omega_0/\omega_\alpha\right)\left(W^2+\alpha_\alpha^2\right)\cos\gamma\sin\omega_\alpha t+2\alpha_\alpha\omega_0\cos\gamma\cos\omega_\alpha t-$$

$$-\left(W^2-\alpha_\alpha^2\right)\sin\gamma\cos\omega_\alpha t\Big]\Big]\Big\}.$$

Using Euler's formula Eq. (17), the symbols entered above for A_0 in Eq. (12), it is easy to write down the solution for the two members of Eq. (11).

$$y_1(t)=-\frac{2a_0\alpha_0\omega_0\delta_{1\Delta}}{\left(W^2-\alpha_\alpha^2\right)^2+4\alpha_\alpha^2\omega_0^2}\Big\{\exp(-\alpha_0 t)\Big[\left(W^2-\alpha_\alpha^2\right)\cos(\omega_0 t+\gamma)+$$

$$+2\alpha_\alpha\omega_0\sin(\omega_0 t+\gamma)\Big]+\exp(-\alpha_1 t)\Big[\left(\omega_0/\omega_\alpha\right)\left(W^2+\alpha_\alpha^2\right)\sin\gamma\sin\omega_\alpha t-\left(\alpha_\alpha/\omega_\alpha\right)\times$$

$$\times\left(\omega_\alpha^2+\omega_0^2+\alpha_\alpha^2\right)\cos\gamma\sin\omega_\alpha t-\left(W^2-\alpha_\alpha^2\right)\cos\gamma\cos\omega_\alpha t-2\alpha_\alpha\omega_0\sin\gamma\cos\omega_\alpha t\Big]\Big\}-$$

$$-\frac{a_0\left(\omega_0^2-\alpha_0^2\right)\delta_{1\Delta}}{\left(W^2-\alpha_\alpha^2\right)+4\alpha_\alpha^2\omega_0^2}\Big\{\exp(-\alpha_0 t)\Big[\left(W^2-\alpha_\alpha^2\right)\sin(\omega_0 t+\gamma)-2\alpha_\alpha\omega_0\cos(\omega_0 t+\gamma)\Big]+$$

$$+\exp(-\alpha_1 t)\Big[-\left(\alpha_\alpha/\omega_\alpha\right)\left(\omega_\alpha^2+\omega_0^2+\alpha_\alpha^2\right)\sin\gamma\sin\omega_\alpha t-\left(\omega_0/\omega_\alpha\right)\left(W^2+\alpha_\alpha^2\right)\times$$

$$\times\cos\gamma\sin\omega_\alpha t+2\alpha_\alpha\omega_0\cos\gamma\cos\omega_\alpha t-\left(W^2-\alpha_\alpha^2\right)\sin\gamma\cos\omega_\alpha t\Big]\Big\}. \qquad (19)$$

Analysis is carried out using Eq. (19), taking the following assumptions: $\gamma=0, \alpha_0=0$. Instead of α_0 parameter factor ε_0 is entered, it is dependent on distance, as result Eq. (19) will be written as

$$y_1(t)=\frac{a_0\omega_0^2\delta_{1\Delta}}{\left(\omega_1^2-\omega_0^2\right)^2+4\alpha_1^2\omega_0^2}\Big\{\exp(-\varepsilon_0 S)\Big[\left(\omega_0^2-\omega_1^2\right)\sin\omega_0 t+2\alpha_1\omega_0\cos\omega_0 t\Big]+$$

$$+\exp(-\alpha_1 t)\Big[-\left(\omega_0/\omega_\alpha\right)\left(\omega_0^2-\omega_1^2+2\alpha_1^2\right)\sin\omega_\alpha t+2\alpha_1\omega_0\cos\omega_\alpha t\Big]\Big\}. \qquad (20)$$

ILLSTRATION OF THE ANALYSIS

Reinforced concrete beam (Popov and Rastorguev, 1974) is considered. The initial data for a beam contain stiffness matrix determined from statical analysis, the concentrated masses, and pseudo-static displacements. The concentrated masses have the following values $m_1=m_2=m_3=6.51kN/m$, concrete of class 25; $E_c=3.6\cdot10^7 kN/m^2$; $E_s=2.1\cdot10^7 kN/m^2$; the top reinforcement 2R6A; the bottom reinforcement 2Y25; stirrups 2R6 at 150мм. The objects creating kinematical influence is take as four axle moving lorry with a speed of V=13.84 m/s, with angular frequency $\omega_0=80s^{-1}$ and four axle tram moving with a speed of V=11.11m/s with, angular frequency $\omega_0=168s^{-1}$. Dispersion of energy in the ground depends on the distance $\varepsilon_0=0.04m^{-1}$. Distance between axes: $L_1=2m, L_2=5,7m$, $L_3=2m$. The shortest distance up to a building $L_0=10m$, distance at which begin influence begins is equal $L=50m$. Amplitudes of vibrations due to influence from all axes $a_{0i}=7.6$ micron; $L=50m$; $L_0=10m$ .Stiffness matrix for stage I

$$F = \begin{bmatrix} 9.20805 \cdot 10^{-5} & 1.12543 \cdot 10^{-4} & 7.16182 \cdot 10^{-5} \\ 1.12543 \cdot 10^{-4} & 1.63699 \cdot 10^{-4} & 1.12543 \cdot 10^{-4} \\ 7.16182 \cdot 10^{-5} & 1.12543 \cdot 10^{-4} & 9.20805 \cdot 10^{-4} \end{bmatrix}.$$

Stiffness matrix for stage II

$$F = \begin{bmatrix} 1.16390 \cdot 10^{-4} & 1.42254 \cdot 10^{-4} & 9.05254 \cdot 10^{-5} \\ 1.42254 \cdot 10^{-4} & 2.06915 \cdot 10^{-4} & 1.42254 \cdot 10^{-4} \\ 9.05254 \cdot 10^{-5} & 1.42254 \cdot 10^{-4} & 1.16390 \cdot 10^{-4} \end{bmatrix}.$$

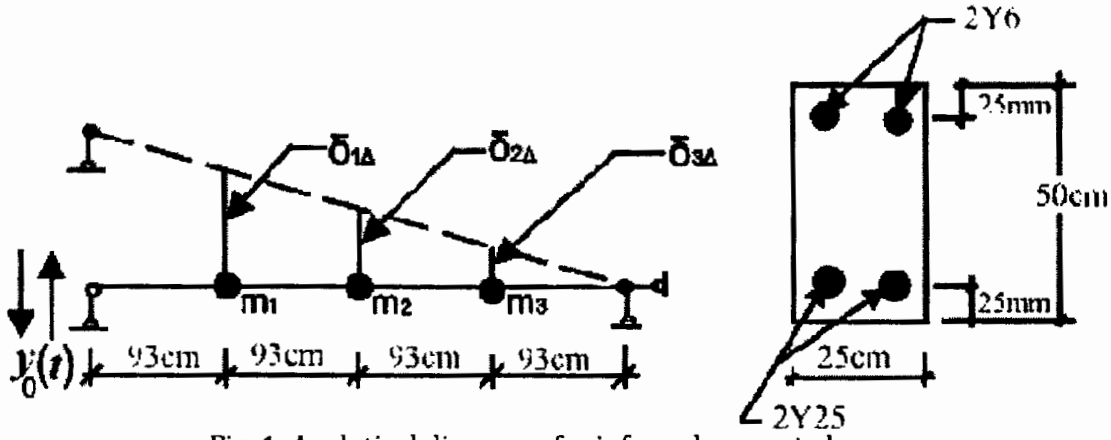

Fig. 1. Analytical diagram of reinforced concrete beam.

Using algorithm eq. (20), a program is made in symbols of MATLAB is formulated. Calculation is done with the help of computer complex MATLAB. The results of the calculation through a given time interval, equal 0.05sec, are illustrated in fig. 2. for displacement of mass m_2 from moving tram and fig. 3. for displacement of the same mass from moving lorry.

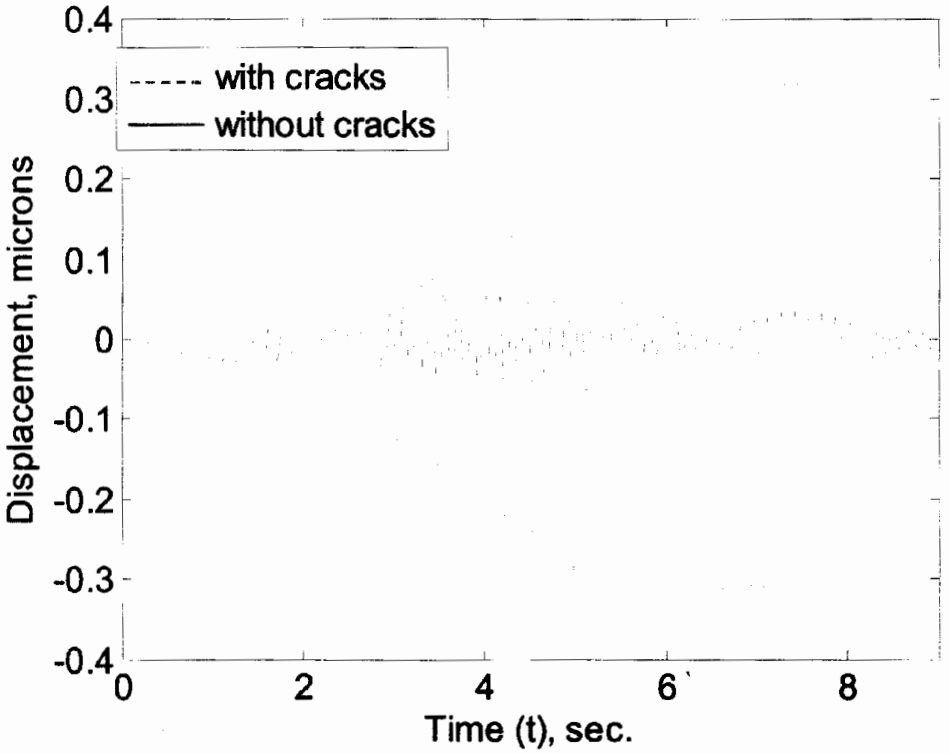

Fig. 2. Displacement of mass m_2 (Tram).

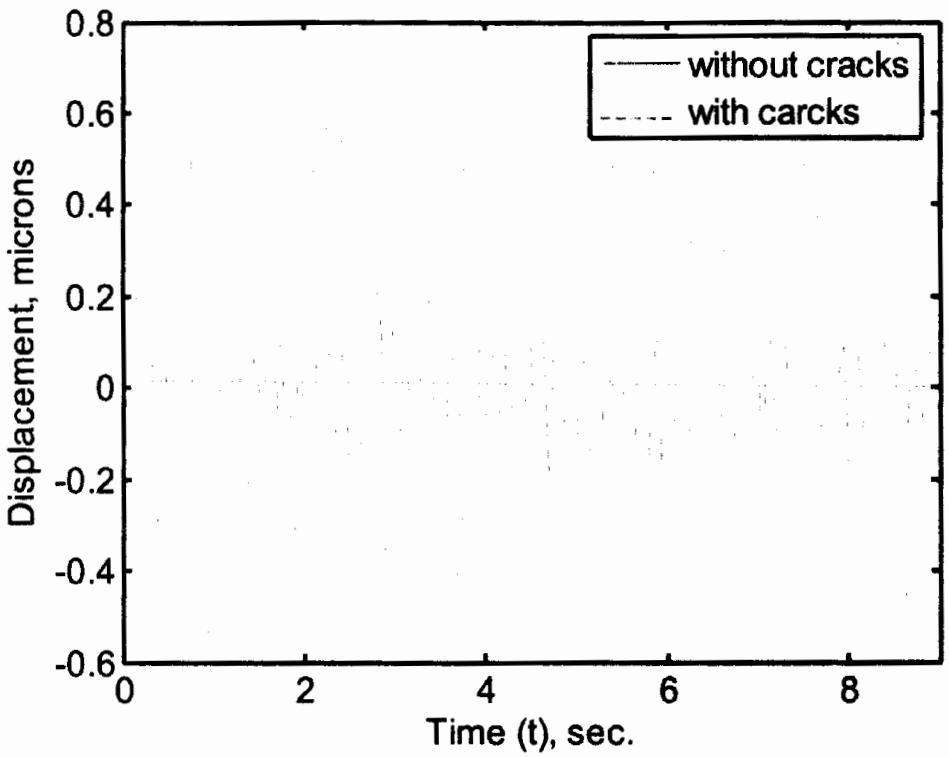

Fig. 3. Displacement of mass m_2 (Lorry).

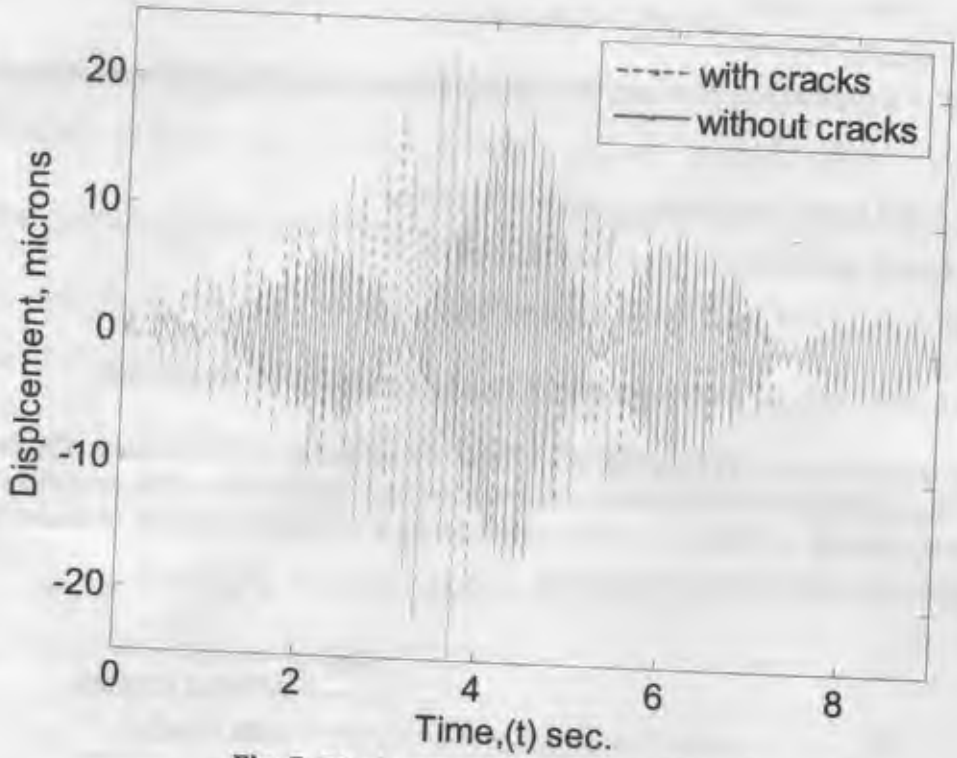

Fig. 5. Displacement of mass m_2 (Lorry)

DISCUSSION AND CONCLUSIONS

1. In this article displacements of reinforced concrete beam were investigated under harmonic influence. It is necessary to note, that under dynamic influence of amplitude of displacement can be as more as in the considered example, than in a beam without cracks, and it can also be less. The given example shows, that presence of cracks renders appreciable influence on displacement of a beam and, hence, it should be taken into account.
2. The analytical solution with the help of transformation Fourier for systems with finite degrees of freedom is given. Thus the program in "TBASIC" language which allows solving problems of determination of displacement of reinforced concrete structures under harmonic influence by an analytical model is developed.
3. It is necessary to note, that at dynamic influence of amplitude of displacement can be as more as in a considered example, than in a beam without cracks, and it can also less. The given example shows, that presence of cracks renders appreciable influence on displacement of a beam and, hence, it should be provided for. In symbols of MatLab, a program has been developed which allows solving problems of determining displacement of reinforced concrete structures at harmonic influence by numerical model.

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FACTORS ENHANCING VULNERABILITY TO HIV AND AIDS AMONG RESIDENTS OF CENTRAL DIVISION, MOYALE DISTRICT, KENYA

By

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ABSTRACT

The global pandemic of HIV and AIDS has now entered its third decade. It is now estimated that more than 33 million people are living with HIV and AIDS worldwide and 6800 and over 5700 new infections and deaths reported each day respectively, imposing a huge burden on health infrastructure and continuing to reverse decades of hard-earned economic and social development gains. In sub Sahara Africa, the most severely affected region in the world, more than 60% of hospital beds, are occupied by persons with HIV related diseases. It has been widely recognized that in order to have effective prevention programmes for HIV and AIDS, the broader determinants of health must be addressed. The main objective of the study was to determine the factors which enhance the vulnerability to HIV and AIDS among residents of Central division, Moyale district, Kenya.

Key words: vulnerability, economic, social cultural, religious, HIV and AIDS

INTRODUCTION

Background

In Sub-Sahara Africa, the most severely affected region of the world, more than 60% of hospital beds are occupied by persons with HIV related diseases (UNAIDS 2007). AIDS has orphaned more than 13 million children, leaving families and communities often overburdened with HIV victims to care for them (UNAIDS, 2007). Gender inequalities are a major driving force behind the HIV pandemic. Traditional social practices foster HIV and AIDS infection (Reid, 1999). Data suggest that relationships with prostitutes play a significant role in the spread of STI/HIV and AIDS in urban and rural areas (Caldwell and Caldwell, 1993).

According to the Moyale District health statistics, out of 2930 cases screened between year 2001 and 2005, 81% of the positive cases comprised the population between the ages 16-40 years (GoK, 2006). Statistics also indicate that Central Division, which is strategically situated along the great north highway, has the highest number of HIV and AIDS cases compared to the rest of the divisions. It has been shown that comprehensive prevention and care programmes that take into account a wide range of social, economic, cultural and political factors are more likely to stem the epidemic. Statistics also show that the prevalence rate in the District especially Central Division is increasing, whereas other parts in the country are decreasing (GoK, 2006).

Gender, Cultural and Economic factors and, HIV and AIDS

In sub-Saharan Africa, 57% of adults infected are women and 75% of young people infected are women and girls. Women's risk is known to be compounded by a variety of socio-economic and cultural reasons both customary and modern (Reid, 1999).

Factors recognized as associated with female vulnerability include, gender violence, poverty, inequality, mobility, insecurity, lack of family support and protection, heavy parental responsibilities and male dominance and aggression (Reid, 1999).

Deep-rooted aspects of African life also contribute to the vulnerability to HIV infection, often occurring when a girl has her first penetrative sexual encounter. In Malawi an elderly man is often called to have intercourse with girls on the last day of their initiation rituals (William, 1996). Sexual cleansing or death cleansing, is a wide spread ritual in Luo-Nyanza in Kenya, Malawi and Zambia.

A study on Northern Kenya corridor, along the Mombasa-Kampala highway showed that sex workers had more than 13 different partners per month, which include a broad range of occupations and socio-economic classes, 5,000-10,000 primary infections occurred in the year on this corridor and 66% of these could be prevented with increasing overall condom use (WHO, 2004).

Poverty gives rise to AIDS and AIDS leads to poverty. Poverty directly exacerbates HIV transmission through 'survival sex' (sex on occasional basis in exchange for money, food, consumption goods or favors) and inferior health care, particularly the lack of treatment for sexually transmitted infections (WHO, 2004).

MATERIALS AND METHODS

Study area

Central Division is one of the four Divisions in Moyale District, Eastern Province. It covers 453.2 km^2 and borders the Republic of Ethiopia to the North. It lies between latitude 02º 11' North and 02º 4' North and longitude 38º East and 39º 21' East. The Division lies within semi-arid zone of Kenya. With a population of 33084, the Division has the highest population density of 73 persons per km^2 (GOK, 2002), with Borana and Gabra being the major clans and over 95% being Muslim.

Study population

The study population included those who were sexually active in the age range 15-49 years and had resided in Central Division, Moyale District for more than one (1) year. By 2008 the population of persons of age 15-49 years in Central Division was projected to be 25,000 (GoK, 2006).

Sampling technique

Seven out of fourteen sub locations were randomly selected for this study (GoK, 2006). The number of respondents per sub location sampled was proportionately allocated according to the population size. Systematic random sampling was used to sample respondents in each sub location until the required sample size was arrived at. Three hundred (300) main respondents and 18 Commercial Sex Workers (CSWs) were recruited for this study.

Data collection methods

The research instruments included; Focus Group Discussion, Key Informants Interviews and questionnaire as described below.

Questionnaire

A total of 300 questionnaires were distributed to the main respondents in the study area. A further 18 commercial sex workers (Anjis) were interviewed in three main bars which hosted a majority of them. It was estimated by the District Statistics Office that a total of 30-60 CSWs were always present per day from evening hours in bars within Moyale town (Government of Kenya, 2006). Snow-ball sampling method was employed to recruit CSWs.

(a) Focus Group Discussion (FGD)

Three FGDs were held in Moyale town, the Central Division headquarters for youths, religious leaders, council of elders and the last with departmental represantives from government offices, teachers, and officials from non-governmental organizations. All the FGD participants were selected through positive/conversant sampling as recommended by Dawson et al., (1993).

(b) Key Informant Interviews (K.I.I.)

In each sub location selected, K.I.Is was held with various people whose responsibilities have a bearing on HIV and AIDS. A total of 14 key Informants were interviewed.

Pre-testing data collection tools

The research tools were piloted in Odda sub location, Moyale District. This sub location was not included in the study but had the similar characteristics.

Data Analysis

Data was processed using Software, Statistical Package for Social Sciences (SPSS). The study mainly employed descriptive statistics such as percentages and Pearsons' correlation and chi-square statistics. Chi-square statistic was used to determine the association between variables. The confidence level was set at 0.03.

RESULTS

Respondents' socio-demographic profile

The 15-25 years stratum had the largest proportion, 37.5 % (108), followed by 26-35 years stratum 34.7 % (100) and then 36-49 years 27.8 % (80). The 55.8% (158) of respondents had received secondary education, primary level education 22.6% (64), tertiary level of education, 19.4% (55), 2.2% (6) of the respondents had no formal education.

Economic factor enhancing vulnerability to HIV and AIDS

It was found that 62.5 % (180) of the respondents were not engaged in any form of income generating activity, 17.7 % (51) of the respondents were self employed, and 19.8 % (57) were in the formal sector. The level and magnitude of poverty in the study area can be seen from the following glaring characteristics; high levels of illiteracy, lack of proper shelter, high levels of school dropouts due to early marriages and lack of school fees, high levels of dependency, poor health standards and long distances traveled to health facilities, lack of sufficient water sources, large families of over 5.2 persons, lack of basic services prohibitive

traditional practices (GoK, 2003). Poverty increases the likelihood that poor women will be forced into transactional sex as a survival strategy. Similarly vulnerable children are more likely to be exploited in situations of poverty that include sexual exploitation and abuse (Kempe, 1999).

Commercial Sex Workers (CSWs)

The majority of CSWs interviewed were Ethiopian nationals who crossover to Kenya in the evenings. 55.6% of the CSWs handled 2 clients daily, 38.8% handled 3 clients a day. Only 5.6% handled 1 client. Clients handled daily were not regular customers. 94.4 % (17) of CSWs indicated that there were some clients who detested the use of condoms, 5.6 % of the CSWs insisted on the use of condoms during sexual intercourse. For the clients who insisted on having sex without a condom, 50% of the CSWs stated that they agreed upon payment of a higher fee whereas 16.6 % (3) of CSWs stated that they had no other choice, 16.6 % (3) agreed to avoid being beaten/assaulted, 5.6 % (1) CSW would agree after alcohol intoxication. CSWs in the study area provide sexual services in social context ready for HIV transmission, have limited education and hence choice, provide vaginal intercourse to large numbers of clients who in most cases seldom use condoms hence are frequently exposed to HIV/STIs. Alcohol and substance abuse coupled with impulsive sexual desire can reduce the ability to make responsible decisions (WHO, 2004). The 18 CSWs interviewed, take alcohol and/or drugs bhang, Miraa and Roger five, a strong sleep inducing pill) before having sexual intercourse.

Social cultural factors enhancing vulnerability to HIV and AIDS

Multiple Sexual Partners

A figure, 45 % (130) of the respondents admitted to having more than one sexual partner. There was a significant relationship between respondents' sex and respondents' having more than one sexual partner ($\chi 2=24.206$, df = 1, p = 0.000), with 56.8% accounting for female respondents. Out of the 130 respondents with more than one sexual partner, 44.7 % (58) reported as having two extra sexual partner, 36.2 %(47) had more than two extra sexual partners while 19.1 %(25) had one extra sexual partner.

Condom use

Out of 130 respondents with more than one sexual partner, only 47.4% did not use condoms when having sexual intercourse. With 65.8% of those respondents who did not use condoms accounting for female. There was a significant link between respondents use of condoms and religion ($\chi 2=8.173$, df=2, p=0.000). Female partners in the study area are expected to be submissive and are exposed to some form of exploitation, discrimination, violence and harassment. Findings from the study area indicate persistent negative attitude, myths, and misconceptions and alcohol use as an influence against condom use. Those who cross over to the neighboring country (Ethiopia) where commercial sex work is legal and alcohol is extremely cheap (Ksh. 25-35 per 300ml bottle of beer) drink and find themselves in a compromising situation.

Religion and condoms use

Religious groups in the study area strongly prohibit/ preach against the use of condoms. A high proportion, 71 %(204) of the respondents stated that their religion prohibits the use of condoms and instead promote abstinence and fidelity. A spot check in most retail shops

revealed only 4 available chemists/pharmacies in the town sale condoms, in rural areas, retail shops do not stock condoms at all. In health centers, the uptake is very low.

Marriage

47.9 %(138) of respondents reported of girls getting married at the age of over 17 years, while 45.8 %(132) indicated marriage age of girls between 14-16 years and only 6.3 %(18) reported marriage age being 10-13 years. Parents arrange, 62.8 %(181) or force their daughters into marriage, 11.8 %(34), 25.4 %(73) are voluntary. Parents receive dowry early without the knowledge of the girls. Studies show that younger women may be at risk of acquiring infection if they are exposed to HIV because of a higher prevalence of cervical ectopy, a biological vulnerability that was demonstrated for chlamydial infection and the possibility that immaturity of the genital tract may influence risk (Guinan, 1992).

Extra marital relationship (*Jaal na Jaltoh*)

Jaal na Jaltoh is a cultural tradition that allows married couples to have extra-marital relationship. 53.9 %(155) indicated that traditionally, married couples were permitted to have other sexual partners. When probed further, 75% (216) of the respondents confirmed that married couples had other sexual partners.

Female Genital Mutilation (FGM)

A figure, 38.9% indicated that girls are circumcised at the age below 9 years while 59.4% reported circumcision age as 10-13 years and 1.7% indicated 14-16 years. Circumcision is mainly done by traditional circumcisers at home (95.1 %) respondents while 4.9% (14) of the respondents reported of health workers participating in the circumcision of girls.
Traditional circumcisers use a single razor blade on several girls. Sharing of razor blades predisposes girls to HIV infections especially if one of the girls is infected with HIV (Mutenbei, 1998).

Wedding and Naming ceremonies

A figure, 64.6 % (189) of the respondents reported that cultural practices such as elaborate wedding ceremonies encourage the youths to involve in immoral behaviors. It was further disclosed in FGDs and K.I.I that during these ceremonies, unprotected sex, and alcohol and/or drug abuse are rampant.

Wife inheritance

A figure, 27.4 % (79) reported that wife inheritance is common in the study area especially in the rural areas where once a husband dies, a brother of the late husband or a close relative inherits the widow immediately and yet the deceased might have died of HIV and AIDS. Lack of VCT centres, ignorance and lack of awareness about transmission avenues propagate the culture.

Traditional midwifery and surgery

A figure, 9 % (26) of respondents reported that giving birth at home and traditional surgery e.g. cutting of epiglottis, is common especially in rural areas due to long distances to the nearest health facility. Traditional medical practitioners also perform surgery but do not use protective gloves, never sterilize and re-use surgical instruments.

Religious factors enhancing vulnerability to HIV and AIDS Veils (Niqab/Hiqab)

It was noted by all FGDs and K.I.I that most women conceal their identity and involve in multiple sexual relationships. This is a risky sexual behavior especially if the partners do not practice protected sex.

Splendour Muslim religious sect (*Garib/Majlis*)

Garib is a splendour religious sect from Islamic religion. Garib members meet over weekends in a member's home at night to eat, dance, wine and engage indiscriminate unprotected sexual activities with anybody present. Slightly more than a third, 35.7 %(103) of the respondents indicated that the practice is high, and only 6.1 %(18) indicated it to be very low. There is no use of condoms, because according to them, use of condoms is against their belief.

Conclusions

The study identified some risky social cultural, religous and economic practices that enhance vulnerability to HIV and AIDS which included, multiple sexual partners, poor and low levels of condom use, early marriages, extra marital relationships (Jaal na jaltoh), FGM, social ceremonies, traditional midwifery and surgery, alcohol and drug abuse and wife inheritance, commercial sex work, Garib and wearing of veils/*Niqab*.

Recommendations

a. To enhance awareness about HIV and AIDS the government and its partners need to intensify/step-up basic education and dissemination of information. Condom education, promotion and distribution should also be enhanced.
b. Community mobilization to eliminate socio-cultural and religious practices found enhancing vulnerability to HIV and AIDS should be initiated by the government and its partners. It should involve religious leaders and council of elders so as to be able to penetrate the community and achieve the desired results.
c. The government in conjunction with its partners should expand mobile VCT services to improve access, especially in rural areas and for pastoral and nomadic groups where VCT in a fixed site is not feasible.
d. Future interventions by the government and its partners should further seek to address contextual limitation (extrinsic factors) such as household poverty, inadequate support services, emancipation of women and literacy to be able to achieve and sustain the desired impact.

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THE ROLE OF RELGIOUS ORGANIZATIONS IN INSTITUTIONALIZATION OF CHILDREN IN WESTERN PROVINCE IN KENYA: THE NEED TO ENLIST RELIGIOUS LEADERS IN THE DEINSTITUTIONALIZATION CAMPAIGN

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Abstract

The number of children's institutions and population of institutionalized children in Kenya have greatly increased in recent years despite calls for deinstitutionalization. The purpose of this study was to establish the factors contributing to the increase in institutionalization of children in the province. The study sought to find out the parental status of children in institutions, types of organizations managing children institutions in the province, and involvement of authorized officers in facilitating movement to children to institutions. The study involved 22 persons in charge of institutions and 224 children selected by stratified sampling from 22 institutions. The data was obtained by use of questionnaires, and analyzed using descriptive statistics. The study found a large majority of children's institutions sampled to be operated by faith based organization, and low involvement of authorized officers in facilitating movement of children to institutions. It was recommended that religious leaders be sensitized on disadvantages of institutionalization of children for deinstitutionalization campaign to succeed in Western Province of Kenya.

INTRODUCTION

Use of residential institutions for caring for children has been traced back to practices that started in Europe during the industrial revolution and urbanization. Gudbrandsson (2004) postulates that industrial revolution brought about changes within family structures that set the stage for use of residential institutions. The changes that occurred during industrial revolution made parents to take on new roles, moving away from production within the household economy to production for an employer beyond the home. Gudbrandsson further notes that large-scale poverty and the resulting inability of families to care for their children created the need for residential institutions for children as a positive measure for vulnerable children all over Europe. On the other hand, Mulheir and Browne (2007) though agreeing to the role of industrialization, the associated long working hours, and breakdown of extended families for emergency of institutionalization of children, they however consider the drive towards collective and institutional forms of social care for children in Europe to be mostly associated with socialism.

Having emerged from Europe during the industrial revolution over the years different types of institutional arrangements evolved to care for children in different circumstances. These include emergency shelters, hospitals for specialist care, residential care homes (children's homes), special school and boarding schools. Others forms of institutions include transit centres for refugees and asylum seekers and secure units for children with anti-social behavior (Mulheir & Browne, 2007).

Institutionalization of children has been noted to have several disadvantages. It promotes dependency syndrome, deters proper socialization and creates identity crisis in institutionalized children. It also makes children lose trust and vision, preventing them from developing, life skills and coping mechanisms (Jebru, 2009). UNICEF (2004) notes

that children in institutions lack network of connections in the community, which makes them to experience a difficult time reintegrating into society. UNICEF further notes that institutionalized children, poorly prepared to integrate in community life and with little knowledge of potential risks and how to protect themselves, may feel hopeless, depressed and become involved in harmful activities.

On the basis of the difficulties of children from institutions to re-integrate in the community, in November 2001, UNAIDS committee of co-sponsoring organizations outlined strategies and principles to guide organizations helping children affected with HIV/AIDS. The first of these principles calls for strengthening and supporting the capacity of families to protect and care for orphans. UNAIDS committee argued that the safety and well being of orphaned children depend largely on the ability of relatives to protect and care for them, that there is no viable alternative. On the same premise, the Inter-agency Guiding Principles on Unaccompanied and Separated Children observes that even during emergencies, children need to be cared for within family set up. The guiding principles emphasize that institutions should be used as a last resort, only when children genuinely have no one to take care of them.

Yet, despite the guidelines and calls for deinstitutionalization, the number of institutionalized children has continued to increase. Mulheir and Browne (2007) quoting UNICEF reported that in 2002 there were 1,120,800 children in public care in 27 of the Central and Eastern Europe, Community of Independent States and Baltic countries, approximately 605,000 (54%) of whom were in residential facilities. Data for countries in the WHO European indicates that 43,842 children under 3 years resided in institutions within 46 countries. With an estimated total population of children under 3 being 30,521,197 in these countries, the overall rate of institutionalization was 14.4/10 000 (Browne et al 2006). Gudbrandsson, (2004) observed that Eastern and Central Europe countries had the largest institutions of the old Soviet time structure caring for as many as 100 to 300 children within one institution.

In Kenya, by September 2007, 667 charitable children's institutions were in operation, 195 of which had been registered, while 472 had not been registered (Director Children's Services, 2007). With increase in number of children's institutions, the number of children in charitable children's institutions grew from 13,810 in 2003 to 25,867 in 2007(Government of Kenya, 2007).

Several reasons for which children are institutionalized have been advanced by different authorities. Browne et al (2006) argued that children are institutionalized or live without their parents, either because their biological parents have died or abandoned them or because their parents do not have the means to care for them appropriately. On the other hand, Mulheir and Browne (2007) points out that the reasons for which children may be placed in residential institutions to include biological orphan, separation and neglect due to poverty, or stigmatization as unwanted child. Mulheir and Browne note incapacity of parents to care for children due to illness, alcohol or drug misuse or imprisonment, disability or illness requiring specialist care or education to be other reasons which contribute to institutionalization of children. Claudia (2006) on the other hand, noting that a rather small percentage of the children in orphanages are both motherless and fatherless, singled out the growing divorce rate, domestic violence, and street children as the three main reasons for institutionalization of children. It is in line with this that a study was carried out among children in institutions in Western province of Kenya to establish factors

contributing to increasing institutionalization of children in the province. Objectives of the Study were:

1) To investigate the factors which lead children to move from families to charitable children's institutions in Western Province of Kenya.
2) To find out the type of organizations managing charitable children's institutions in Western Province of Kenya.
3) To determine the involvement of authorized officers in facilitating institutionalization of initiate institutionalization of children.

METHODOLOGY

The respondents for the study were selected through a two stage multi-stage sampling method. In the first stage, 22 children's institutions were randomly sampled by a lottery method from a list of all children's institutions in Western province of Kenya. Within the sampled institutions, separate lists for male and female children in class seven and eight were made, from which stratified sampling was used to select 112 boys and 112 girls who were in classes seven and eight. All persons-in-charge of the institutions sampled also participated in the study.

Data for the study was obtained by use questionnaires. Information about the charitable children's institutions was obtained by use of Persons- in- charge of institution questionnaire, while the information about the children was obtained by use of the Children in charitable children's Institution questionnaire. The questionnaires were administered to Persons- in- charge of institutions, and to children respectively in 22 institutions between 3rd October 2009 and 3rd November 2009. The data obtained was analyzed using descriptive statistics.

RESULTS

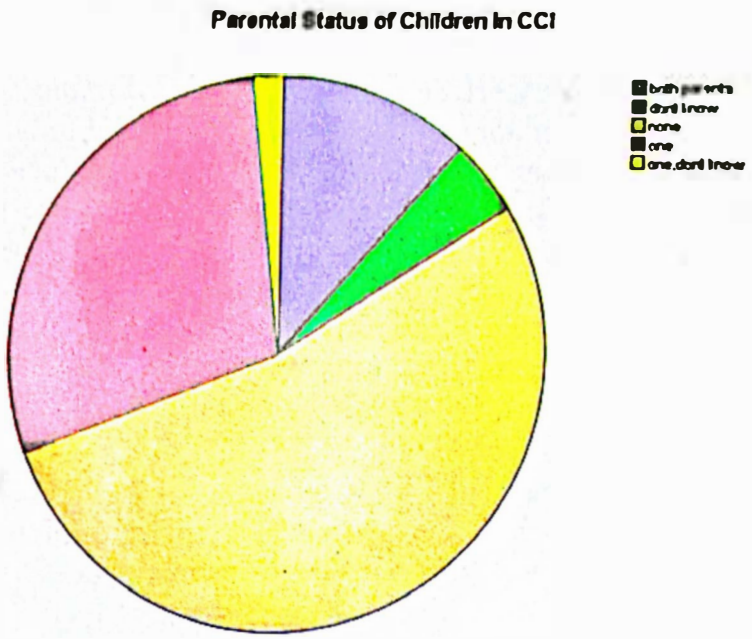
Most of the institutions sampled for the study (19 or 86.4%) were co- institutions, where both male and female children were housed. There were 2 institutions for male children (9.1%), compared to one (4.5%) for female children. The smallest institution sampled had a population of 8 children, while the largest had a population of 202 children. The total population of children in the institutions sampled was 1288, with an average of 59 children per institution. The total number of male children in the institutions was higher (664) than that of female children (607). Out of the 19 mixed institutions sampled, the population of male children was more than that of female children in 11(57.9%) institutions, while the population of female children was higher than that of male children in only 6 (27.3%) institutions. This was interpreted to mean that perhaps there were more male than female children in institutions in the area of study.

Most of the children in the institutions (1067, or 82.8%) were reported by persons-in-charge of institutions to be orphans. The other population of children in institutions were reported to be from extreme poverty backgrounds (83, or 6.4%), abandoned (47 or 3.6%), and abused children (18 or 1.4%). A total of 11(0.9%) children were reported to have been brought to the institutions due to disability, while 11(0.9%) more were brought to the institutions from streets. The lowest populations of children in the institutions were those brought in the institutions because of stigmatization for being borne out of parents of close relationship (8 or 0.6%).

On the other hand, slightly more than half (118 or 53.1%) of children sampled from the 22 institutions indicated they were complete orphans. A total of 56 (25%) children sampled in

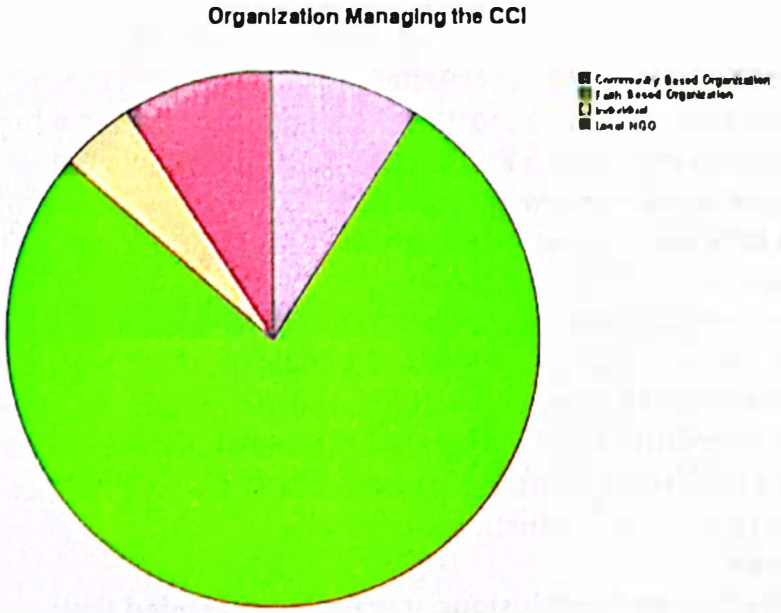
institutions were partial orphans, while 10 (4.5%) children indicated they did not know whether any of their parents were alive. Four children (1.8%) stated their fathers were alive, but did not know about their mothers, while nine children stated their mothers were alive, but did not know about their fathers. On the other hand, 26 children (11.6%) stated that both parents were alive.

Figure 1
A Pie Chart Showing Parental Status of Children in CCI in Western Province of Kenya



The second major finding of this study was that a large majority (17 or 77.3%) of children's institutions sampled were being run by Faith Based Organizations. Out of the 17 institutions which were under faith based organizations, evangelical churches were dominant, running 14 (63.6%) institutions. Out of the remaining 8 institutions, 2(9.1%) were under management of local Non Governmental Organizations, while two others (9.1%) were under Community Based Organizations. The Anglican Church of Kenya, the Catholic Church and the Friends Church each had one institution (4.5% each) under their management. There was one institution (4.5%) founded and being managed by an individual.

Figure 2
Pie Chart representing Organizations Operating Children's Institutions in Western Province of Kenya



The third key finding of the study was the highest number of children in institutions who reported their movement to institutions having been initiated by religious leaders (34 or 15.2%). Other children reported mother (29 or 12.9%), paternal aunt (23 or 10.3%), and paternal grandmother (18 or 8.0%) maternal grandmother (17 or 7.6%) father (16 or 7.1%) maternal uncle (15 or 6.7). The study found involvement of authorized officers in initiating movement of children to institutions to be low. Only few children in institutions indicated they were brought to institutions with authorized officers. Only nine children (4.0%) indicated they were brought to the institutions by children officers, four (1.8%) by a teacher, one (0.4%), assistant chief and one (0.4%) by a police officer d officer.

DISCUSSION

Reports from Persons-in-charge of children's institutions indicated a large majority of children in institutions sampled to be orphans. Similarly, more than half of children sampled from the institutions indicated they were complete orphans. This finding was inconsistent by the assertion by Claudia (2006) that a rather small percentage of the children in orphanages are both motherless and fatherless. The high percentage of children sampled indicating they were orphans was interpreted to mean that orphanhood was the main factor driving children in institutions in Western Province of Kenya. However, the study also found many children in institutions who reported they were partial orphans, or had both parents alive. This finding was interpreted to mean that there were many children in institutions who were not institutionalized as a last resort. They had parents who could care for them or who could be supported to bring them up in a family environment.

The study found that a large majority of children's institutions sampled were being operated by Faith Based Organizations. Further, the highest number of children sampled in institutions indicated they were brought to the institutions by religious leaders. This was interpreted to mean that perhaps religious organizations and religious leaders play a single most important role in growing number of institutionalized children in Western Province of Kenya. On the other hand, the low involvement of authorized officers in the movement of children into children's institutions was interpreted to mean there was little screaming in line with the Inter Agency guiding principles on treatment of unaccompanied and separated

children, and the draft policy on OVC in Kenya to ensure children are taken to institutions as a last resort.

Conclusion

From the findings of the study, it was concluded that:

1) Orphanhood was the single most important factor driving a big number of children in to institutions in Western Province of Kenya
2) A big number were not brought to the institutions as last resort. They had parents who could care for them or could be supported to take care of them within a family environment
3) Religious organizations and religious were most responsible for the growing number of institutionalized children in Western Province of Kenya, by playing a pivotal role establishing and operating most of children institutions in the province.
4) There was very little involvement of authorized officers in screening the children admitted to children's institutionalization in Western Province of Kenya to ensure children were admitted to institutions as a last resort.

Recommendations

From the findings and conclusions, it was recommended that:

1) Thorough vetting of organizations applying to operate children institutions be carried out to ensure those applying to open children's institutions have an in-depth understanding of guiding principle for treatment of OVC.
2) There is need to carry out an audit of the population of children in institutions in Western province of Kenya to establish the actual parental status of children in all institutions in the province. Those children with parents or close relatives should then be re-united with their parents or relatives to be brought up within a family environment.
3) Efforts should be made to enlist church leaders in the de-institutionalization campaign in the province. They play a leading role in institutionalization of children in Western Province of Kenya. Towards this end, resources should be set aside to sensitize religious leaders of harm of institutionalization on children. This could have a single most important impact of reducing institutionalization of children in the province.
4) Programmes to improve economic wellbeing of households with OVC be stepped up to avoid OVC running from impoverished caregivers to institutions due to poverty.

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premised on colour. According to Barth (1996b), the word race and tribe provided anthropologists (some of whom were sympathizers of colonialists) with grounds to classify human beings in terms of developed, civilized and vice versa. Critically then, the term "race" and "tribe" can be said to have been quite value laden and consequently, lacked the academic neutrality (objectivity) and hence, the word ethnic.

In common usage, the word ethnic group refers to an assembly of people or collectivities of persons who share some characteristics premised on primordialism, language, culture, geographical locality and common objectives. Rupesinghe (1996) asserts that an ethnic group is not a mere aggregate of people but a self-conscious collection of people united or closely related by shared experiences and a common history. This argument brings to the fore the debate of whether membership to an ethnic group is only attributable to shared commonalities. Assefa (1996) argues that there are situations in Africa where an aspect of culture commonality, like language and religion does not signify membership to the same ethnic group. Other scholars point out that membership to an ethnic group should not always be viewed in terms of shared characteristics. For instance, Eriksen (1973) observes that a person regardless of primordial commonality can become a member of an ethnic group if he or she feels and acts as a member, and is accepted as such by the group. Moreover, this view brings in consideration other factors like choice of an individual and marriage (which in many patriarchal cultures, especially in Africa transforms an individual's identity). Thus, membership to an ethnic group should be viewed from both ascription and achieved status.

CULTURAL DIVERSITY IN KENYA: HISTORICAL PERSPECTIVES

In the same way as in many other societies in the globe, Kenya is characterized by multi-ethnic populations. Often they have evolved into the condition they exist today over the course of centuries. Fundamental factors explaining creation and emergence of cultural diversity include specific adaptation to widely differing environmental conditions, migration, deliberate seclusion (consciously) of certain ethnic groups (for instance, Indians in Kenya) and more strongly, colonial machinations and conspiracy to invent tribes for ease of administration.

Ndege (1996: 67) observes that before the colonialists penetrated into the territories of Africans, the notion of borders was of no concern. First and foremost, the colonialists invented superficial nation-state of Kenya and people from different backgrounds and nationalities were brought under the geographical entity that came to be known as Kenya. Moreover, it has also been documented that before colonialism, people of different cultural backgrounds interacted in total devoid of ethnic conscience, while cultural limitations couched in stereotypes, prejudices and bigotry were totally non existent. Were (1967) and Ogot (1996) argue that there were no water tight ethnic categories between cultural groups in Kenya before colonial rule, while Muriuki (1974) demonstrates how various cultural groups in Eastern, Central and Rift Valley provinces in Kenya had intimate relations with each other in total disregard to ethnicity by the 18th and 19th centuries. This scenario changed after the East African region was declared a protectorate in 1895.

As a strategy to annihilate, control and subjugate the Africans, the colonialists established borders configured in line with language, and this satiated their Eurocentric desire to create "tribes". Ogot (1996:18) observes that the concept of "tribe" was therefore an

premised on colour. According to Barth (1996b), the word race and tribe provided anthropologists (some of whom were sympathizers of colonialists) with grounds to classify human beings in terms of developed, civilized and vice versa. Critically then, the term "race" and "tribe" can be said to have been quite value laden and consequently, lacked the academic neutrality (objectivity) and hence, the word ethnic.

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CULTURAL DIVERSITY IN KENYA: HISTORICAL PERSPECTIVES AND IMPLICATION TO DEVELOPMENT

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INTRODUCTION

Cultural diversity is a universal phenomenon. It permeates almost all human societies in the globe. In fact, most of the global societies are multi-cultural and this is more exemplified by the multi-ethnic nature of social systems, each with its own cultural orientations. Whereas the international system is made up of about 180 nation states, it is estimated that there are about 8,000 ethnic groups. Ogot(1996) observes that most countries are poly-ethnic nations or what Giddens (2006) refers to as cultural pluralism.

Cultural diversity is a condition existing whereby people with different cultural practices coexist within the same social and geo-political system. The condition is thus manifested in the variety of human societies or cultures in a specific region. The numerous societies or cultural groups not only do they exhibit the more obvious cultural differences that exist between people such as language, dress, morality and traditions but also, other significant variations in the way they organize themselves and in the ways they interact with their environment.

In the East African region, cultural diversity is an inevitable fact. Tanzania has around 125 ethnic groups, Uganda around 40, Rwanda and Burundi have two major groups (Tutsi and Hutu) and a minor group, the Twa Pygmies. On the other hand, Kenya has 42 documented ethnic groups. According to Atieno Odhiambo (1996), most Kenyans belong to the so called "tribe" or ethnic group before the nation. Each tribe lays claim to some kind of common language, culture and physical location. And as if to emulate Nazism, each ethnic group identifies itself with specific body shapes, types and skin color while social aesthetics in Kenya are culturally and ethnically configured.

In the endeavor to understand cultural diversity in Kenya, it is important to acknowledge that the entrenchment of ethnic groups into the socio-political and cultural organization of the country has aggravated the situation. The word ethnic appeared in anthropological writings in the 1960s after the realization of the distortion of meaning and subjectivity in the usage of terms race and tribe. Jenkins (1997), observes that by the 1960s, the notion of the "tribe" was beginning to be replaced by perhaps less embarrassing concept of "ethnic group". The event which most clearly marked the paradigm shift within the social anthropology from the study of tribal society to social constructionist model of ethnic groups was the publication of Barth's work "Ethnic groups and Boundaries" in 1969. The word tribe as utilized by anthropologists in early 20th century denoted primitivism, backwardness and non-Western. This was particularly in describing African and other cultures where European expansions tendency and colonization was prevalent. Most of the Anthropologists of the time can be classified to the functionalist school of thought who dominated the first half of 20th century. Similarly, the word race strongly subscribes to the notion of evolution which is hierarchical and places human kind in a diametrical pattern,

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ethnic support Haroun Ringera received in 2009 after reappointment by the president to head Kenya Anti-Corruption Commission and the eventual censure by parliament. Equally, the sacking of Kioko Mangeli in 2009 as head of Kenya Bureau of Standards drew similar ethnic overtones from Akamba politicians. Each of these politicians and technocrats retreated back to their ethnic groups to solicit for support in the guise of being targeted by their"political enemies". The current trend of retreat for ethnic support and recourse in times of threat to one's position, are a clear manifestation of the negative implications of cultural diversity.

The regimes of Kenyatta and Moi were highly identified with initiating selective and lopesided development. During Kenyatta's era, Central Kenya and its environs were the hub of good infrastructure, schools and hospitals. When Moi took over, there was a drastic shift of the development machinery to the Rift Valley and other well politically connected areas. Moi was popularly known for the slogan "Siasa mbaya, Maisha mbaya" translated to mean those outside KANU and not royal to him would be alienated from sharing the national cake. It was during his time when it was joked of how some tarmacked roads in the Rift valley were being used for drying harvests (Maize and beans) and for livestock to idle, while the rest of Kenya, especially areas perceived to harbour political enemies were in poor and unkempt infrastructure. Thus Moi's *modus operandi* was ethnic manipulation that set the stage for control of public resources without consideration to the whole society.

As Kenya gears up for a new constitution in 2010, ethnic sentiments appear to pervade the ongoing debate to adopt the harmonized draft. Initially, the rival Party of National Unity (PNU) and Orange Democratic Movement (ODM) groupings in the coalition government had developed pressure groups that appeared to take positions that reflected selfish and ethnic pattern. PNU was opposed to the creation of a post of a Prime Minister with executive powers for they thought it diluted president Kabaki's power and authority. ODM on the other hand supported transfer of executive powers to the Prime Minister - under illusion that the proposal bestowed power on Prime Minister Raila Odinga. This was a dangerous scenario since the political leaders and their hench men and women in constitutional debate did not realize that the constitution was not about Mr. Kibaki and Mr. Raila. This amounted to the promotion of mediocre, dogmatic and parochial observance to matters of national importance as well as being subjected to guided democracy, that is, a democracy that borders on authoritarianism and the perpetuation of the interests of the minority.

In spite the aforesaid negative implications of cultural diversity, there exists some positive aspects as well. First and foremost, there is an elaborate symbiotic relationship between the various cultural groups in Kenya. This relationship is in the form of what anthropologists would refer to as generalized reciprocity between groups. Indeed, what one cultural group produces is exchanged with what is found in another group but lacking locally. For instance, Livestock bred by the Cushites in North Eastern Kenya finds its root to Nairobi and Central province while vegetables and other manufactured goods find their way to many other parts of the country. The same applies for fish from Luo Nyanza which is exported to many parts of the country while those in Nyanza in turn acquire cereals and vegetables from other regions and, vice versa.

Further, certain cultural groups are a point of attraction to the tourists which earns revenue to the state. The Maasai people distinct culture has been an attractive feature for both

Kenya, the Rift valley and Coast region. For instance, before the multi-party elections in 1992, tribal clashes flared up in the rift valley culminating into the killing of around 2000 people and displacement of thousands of others (Tordoff, 1997). The main victims were the Kikuyu community. Similar ethnic strive and tension replayed again before the 1997 elections, this time in the South Coast. Those targeted were ethnic groups from upcountry, that is, "Watoka bara". Lives were lost and a lot of property torched down. The aftermath of this conflict was also felt in the decline in the tourism industry in Kenya which apparently had happened to be the main source of public revenue around that time.

The climax of ethnic conflict in Kenya was witnessed after the disputed presidential elections of 2007. The ethnic jinx played itself in a very wanton manner. The Kikuyu and Luo communities bore the brunt of this conflict. In the Rift Valley and Western Kenya, the Kikuyu community and their economic empire were highly decimated. In retaliation, a section of the Kikuyu "warriors" blockaded a section of Nairobi –Nakuru highway and its environs in Naivasha and physically targeted Luo people for physical assault. Luo men were humiliated with forceful physical circumcision, torching of their houses and killings. Same scenarios of conflict between the two protagonists were experienced in certain estates in Nairobi (Kibera, Kawangware, Kariobangi, Dandora).The post-election violence in 2008 led to the phenomenon of Internally Displaced persons(IDPS) of almost one million people, around 1,500 people lost their lives, thousands of women and young girls were raped while property worth billions of shillings were destroyed.

Cultural diversity in Kenya has systematically bred ethnicity. The word ethnicity first appeared in the Oxford English dictionary in 1972 and, is attributed to the American Sociologist David Reisman in 1953. He used it to refer to a shared (cultural) and perceived (psychological) group identity (Glazer and Moynihan, 1975:1). Further, within the American scholarship, the increasing use of "ethnicity" concept was part of a long term and gradual shift of analytical framework from "race" to "tribe" to "ethnicity" (Wolf, 1994).Anthropologist Fredrick Barth (1969b) played a key role in establishing the current anthropological understanding of ethnicity by associating the term with the conscious identity which individuals acquire for being members of a group. Clifford Geertz elegantly defined ethnicity as the "world of personal identity, collectively ratified and publicly expressed" and "socially ratified personal identity" (1973: 268, 309). Ethnicity can thus refer to a group identity, expressed behaviorally (by individuals or group) that emanates from membership to an ethnic group.

Ethnicity in Kenya has bred tribalism and nepotism in the employment sector. Patronage in job employment was strongly entrenched during Kenyatta's presidency while Moi and Kibaki perfected it. It is evident that those in power crave to employ those from their ethnic groups in the institutions they preside. The Kenya of the three subsequent presidents since independence has seen some government institutions such as universities, colleges, parastatals, ministries, security agencies and even private companies being the domain of certain ethnic groups. This kind of scenario has infested and inundated the Kenyan socio-political and economic environment with the culture of impunity, corruption and subservience. For instance, as politicians in the current Government get implicated in corruption, they appear to find recourse from their ethnic groups. This was demonstrated in the recent maize scandals (William Ruto, Minister for Agriculture), as well as in the noted errors in 2008/2009 supplementary budget which had been inflated into billions of Kenyan shillings (Uhuru Kenyatta, Minister for Finance). The same scenario was replayed with the

during Mwai Kibaki's rule (2002 to date). Casual observation into the socio-cultural and political organization of the country indicates that the balkanization of Kenyan regions into "tribal units" as happened during colonial times was highly rekindled in Kenyatta's, Moi's and presently, Kibaki's era.

During Kenyatta leadership (1963-1978), politics were personalized while Central province people were placed in strategic Government institutions and subsequently entrenched and perpetuated the Kikuyu hegemony. This set the stage for belligerence, alienation and suspicious relations between people of Central Kenya (read Kikuyu) and the other Kenyan ethnic groups. In a parallel manner, Daniel Arap Moi (August 1978-December 2002) presided over a Kenya inundated with politics of divide and rule, patronage and clientelism. The Kalenjin and other groups from the Rift Valley got embedded into the centre of power and by implication, this aggravated the notion of ethnic consciousness. Simatei (1996) points out that Moi embarked in dekikuyunization of institutions into the Kalenjinization of the same. This was compounded with national empowerment of ethnic chieftains (kingpins) hand picked by Moi to perpetuate his interests at various Kenyan ethnic levels. This kind of scenario played until Emilio Mwai Kibaki came into power in 2002. But to the disillusionment of many, Kenya witnessed the revival of the enigmatic "Mount Kenya Mafia" which rekindled memories of Kenyatta leadership. The Kikuyu and people from Central Province started getting appointments in plum jobs in the civil service and this further heightened ethnic divisiveness. Moreover, Kenya has also witnessed the emergence of tribal kingpins and ethnic alliances (recent Kikuyu ,Kalenjin and Kamba grouping popularly known as KKK fronted by Uhuru Kenyatta, William Ruto and Kalonzo Musyoka, respectively) championing the interests of their ethnic groups and for political aggrandizement. The consequence of this has been the creation of ethnic conscious societies which fortify cultural diversity.

IMPLICATIONS OF CULTURAL DIVERSITY IN KENYA

The tribal disparities aggravated before and after independence have had severe socio-cultural economic and physical ramification to the Kenyan society. First and foremost, it has become quite difficulty and an uphill task to build a national culture or character. Kenyans consciously first belong to a tribe before identifying with their country. This is manifested in their socio-political and religious organizations and affiliations as well as in their mother tongues. Fascinatingly, political party affiliations in Kenya demonstrate a regional and ethnic pattern. The same scenario is played in religious and other socio- cultural and recreational gatherings. This dividedness which militates against nationalism is further exhibited and exemplified in the mental entrenchment of ethnic stereotypes and prejudices amongst Kenya's ethnic groups. Ethnic stereotypes and prejudices are not conducive for amicable coexistence between groups. The assertions that Kikuyus are thieves, Luos are proud, Luhyas are good watchmen and cooks, Kambas are weak and cowards, Kisiis are temperamental, Kalenjins are war mongers amongst others have been detrimental to Kenya's unity and cohesiveness. Politicians have systematically used the prevailing stereotypes and prejudices to breed hatred and suspicion between groups culminating in ethnic rivalries, belligerence and conflicts. Indeed, the ethnic conflicts experienced in Kenya since independent to the most recent post election violence in 2008 suffice to demonstrate the negative effects of cultural diversity.

Kenya has witnessed politically and ethnically instigated conflicts before and after every presidential and general election held in 1992, 1997, 2002 and 2007, especially in Western

intellectual abstraction, conspiracy and a mental invention of the colonialists which was intended to convey or portray the picture of a people without government, without culture and without history, in order to justify colonialism. Borders (physical) were enacted to freeze movement and interaction – with fines and corporal punishment being imposed to deter movement from one locality to another. As a consequence, "tribal" uniqueness was very well formulated, while strategies for inter-tribal tension and conflicts were well enacted. Ndege (1996:67) points out that the colonial state emphasized the differences between the communities rather than the commonalities that existed among them. District names came to be attached to these various nationalities with a view to emphasizing their unique peculiarity within the colonial political, economic and social order .Emphasis on differences by the colonial state served the purpose of division and discord among the various communities that was resonance with the colonial states agenda of denying the local constituency of unity that would have constituted a formidable challenge to its dominance over society. The culmination of this was to divide and rule, in cahoots with colonial sympathizers (local chiefs and tribal headmen).

The process of balkanization of Kenyan African groups into tribal enclaves as strategized by the British colonialists succeeded and by 1920, indicators of ethnic consciousness among the Africans came in to the fore. Ethnic oriented pressure groups started cropping up and indeed, the struggle for independence involvement by Kenyans was inevitably ethicized. This assertion is exemplified by regional groups agitating for recognition and independence namely Kikuyu Central Association (KCA) and the "Piny Owacho" in Luo land in the 1920s. Later on, KCA transformed into Kenya African Union (KAU) in 1944. After the state of emergency was declared in Kenya in 1952, Africans were advised to go back to their ethnic regions.

Ndege (1996) observes that the emergence of such associations as the Nairobi District African Congress, the Mombasa African Democratic Union, the Kisii Highlands Abagusii Association, the Taita Democratic Union and the Nakuru African Progressive party is a manifestation of how barely a decade to independence the colonial state was still determined in localizing African politics. In 1957, the colonial government legalized the creation of parties by locals but such parties were to be confined to their own districts as opposed to national operations throughout Kenya. When later national parties were allowed, the Kenya African National Union (KANU) was the first to be formed in 1960 in circumstances that made it the natural heir to the Kenya African Union (KAU). KANU emerged as a party to cater for interests of the larger ethnic groups (Kikuyu and Luo), while Kenya African Democratic Union (KADU) was established for the concern of the so called "small tribes". Behind these political groupings, the ethnic conscience was quite prominent. Later on, KADU was absorbed into KANU after the independence of Kenya. Technically, Kenya became a defacto one party state, main idea being to perpetuate ethnic interests. Remember, Kikuyu Central Association (KCA) had transformed to Kenya African Union (KAU), and later evolved to become KANU.

The condition of cultural diversity and dividedness in Kenya further sustained itself even as Kenya gained independence from British rule in 1963. Successive Governments have demonstrated that ethnic diversity remains a fervent tool for political mobilization. Kioli (2010) observes that seeds of ethnic dividedness germinating during colonial rule got anchored in the independent Kenya during the first President of the nation Jomo Kenyatta, became perfected during the Daniel Arap Moi's era (1978-2002) and got reinvigorated

women to disasters is greater mainly because of the social values. The main aims of this paper are to highlight the importance of gender mainstreaming in disaster reduction policymaking and to discuss ways of mainstreaming gender. In order to make the path of achieving this aim clearer, this paper gives an account of the nature and types of disasters and the world's movement towards disaster reduction in its early sections. The next section characterizes and classifies disasters as a preface to the disaster reduction trend and practices, which are described later. The third section focuses on gender mainstreaming, its importance and proposed means of integrating it into disaster reduction policies and measures. This paper is based on a review of academic literature, papers and reports produced by the United Nations International Strategy for Disaster Reduction (UN/ISDR) and various other institutions.

The way disasters are seen

Defining disasters

Historically, disasters were known as acts of god, or events outside human control, which brought massive disruption to society McEntire, D.A. (2001). However, subsequently, with the expansion of scientific knowledge, disasters became synonymous with disaster agents or more specifically; they were seen as natural hazards McEntire, D.A. (2001). UN/ISDR defines a disaster as a serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses, which exceed the ability of the affected community or society to cope using its own resources]. However, disasters are interpreted in different ways by scholars and institutions. Weichselgartner [33] argues that natural disasters are social phenomena because the overall damage due to natural hazards is the result both of natural events that act as a "trigger" and a series of societal factors. According to Jaya Kumar, G.S. (2000)], the term is used to indicate a whole range of distress situations both individual and communal and that disasters are events in time, which have distinct phases of onset, climax and withdrawal. Ariyabandu and Wickramasinghe Ariyabandu, M.M. and Wickramasinghe, M. (2003) view disasters as sudden events, which require immediate, emergency relief. McEntire, D.A. (2001) puts forward a different perspective by indicating that disasters as the disruptive outcome or human-induced triggering agents when they interact with and are exacerbated by vulnerabilities from diverse but overlapping environments. Apropos, .indicates none of these definitions of disasters are universally accepted yet. The way that the disasters are explained varies according to the discipline in which they have been defined. Generally, there are four main bases for defining disasters as technical, sociological, political and medicinal Siriwardena, N.U., Haigh, R. and Ingirige, M.J.B. (2007). However, almost all the definitions describe a disaster as an event, which disturbs the social structure or the environment, causes a significant loss and needs external assistance in recovery.

Types of disasters

Disasters are often divided into two main categories - as natural or man-made according to their cause Shelf, I.M., Ahmadun F. and Said A.M. (2003)]. Figure 1 illustrates this. In addition to the two main categories of disaster, Shaluf, I.M., Ahmadun F. and Said A.M. (2003) and Shaluf, I. M. and Ahmadun, F. (2006) indicate that there can be a third category of disasters as hybrid disasters, which occur as a combination of natural and man-made disasters.

Further, Shaluf, I. M. and Ahmadun, F. (2006) show that natural and/or man-made disasters can trigger subsequent disasters as well. Disasters are classified into three groups by Jaya Kumar, G.S. (2000) referring to the spatial dimensions of disasters as small, localised or

THE ROLE OF GENDER MAINSTREAMING IN DISASTER MANAGEMENT IN KENYA: WAY FORWARD

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Abstract

In Kenya there have been significant losses in human life and livelihoods, the destruction of economic and social infrastructure and damage to the environment caused by disasters in the past decade has increased the necessity for proper disaster reduction and risk management strategies. A disaster is shown as a combination of a trigger agent and vulnerabilities. Since vulnerabilities are the dependant component of a disaster, they should be managed and minimized in order to reduce disasters. Disaster reduction policies and measures, which ensure a decrease in vulnerabilities, need to be formed and implemented to achieve a sustainable and consistent plan of disaster management. Since women are more vulnerable in a disaster, their needs and concerns should be widely integrated into risk reduction plans and procedures from both perspectives of women as beneficiaries and decision makers. Gender mainstreaming in Kenya is considered an important element in disaster reduction policy making to integrate a gender equality perspective in all policies at all levels. Gender mainstreaming in disaster reduction refers to promoting awareness about gender equity and equality, to help reduce the impact of disasters and to incorporate gender analysis in disaster management, risk reduction and sustainable development to decrease vulnerability. This paper reviews literature on disaster reduction and gender mainstreaming to emphasize why gender mainstreaming has become a necessity in disaster reduction attempts and to highlight the ways in which it can be achieved.

Keywords: Disaster reduction, Gender mainstreaming, Women.

INTRODUCTION

"Disasters, one of man's oldest concerns, reach back to periods of pre-history and myth, yet strangely enough, are hardly an area of critical scrutiny" Jaya Kumar, G.S. (2000). Disasters are known as sudden events, which bring serious disruption to society with massive human, material and environmental losses and these losses always go beyond the capacity of the affected society to cope with its own resources(Kelman, I. and Pooley, S. (eds.). (2004). According to McEntire, D.A. (2001), any disaster is a combination of a triggering agent and a set of vulnerabilities – and it is these vulnerabilities, the conditions, which affect the capacity of a society to respond to the triggering agent which is the controllable component of a disaster. Since disasters cause large-scale damage to human life, their livelihoods, economic and social infrastructure and environment (International Strategy for Disaster Reduction, (2002)) and these damages have shown a significant increase in the last one and a half decades Shaluf, I.M., Ahmadun F. and Said A.M. (2003)], the world is in serious need of a sustained and comprehensive disaster reduction strategy. In achieving this, the needs and concerns of all social groups such as poor, rich, men, women, young, old,indigenous or non-indigenous must be necessarily integrated into the disaster reduction policies and measures because the level of vulnerability depends on these social aspects International Strategy for Disaster Reduction, (2002)]. The Secretariat of the United Nations International Strategy for Disaster Reduction Inter-agency Secretariat for the International Strategy for Disaster Reduction, (2002)] emphasizes that the vulnerability of

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international and local tourists. Additionally, certain talents associated with some cultural groups are a source of not only individual wealth but also the country. The athletic endowment of the Kalenjin community suffice to elaborate the strength of cultural diversity.

CONCLUSION

Cultural diversity in Kenya manifests itself as a malady more than a strength. As a malady it has been very detrimental to the social and economic lives of Kenyans due to the negative offshoots associated with ethnicity, tribalism, cultural stereotypes and prejudices. Indeed, cultural diversity can be said to be Achilles heel upon which ethnic rivalry and tension, favoritism and unbalanced development can be explained, among others in Kenya. It is also important to note that politicians whip the offshoots of cultural diversity for political survival. This kind of scenario has systematically played a dangerous and harmful manifestation for the country. For Kenya to divorce itself from negative aspects of cultural diversity, there must be the desire to enact a government which has the interests of the nation and the entire diversity at heart, devoid of "tribal" under linings and sentiments. This calls for what Pinkney (1993) calls consociational democracy. The word is used to describe how a culturally diverse country like Kenya can ensure that all significant groups are incorporated in Government without alienation of "others". The system recognizes society as consisting of these distinctive groups, based on language, race or religious autonomy of one another and the state. Indeed, the object of consociational democracy is to seek consensus between the different groups through a political process that brings all leaders into a governmental process, through carefully tailored forms of proportional representation of federalism or by specifically reserving offices of state for members of the different groups. Moreover, there is need for a legislation to guard Kenyans against politicians who whip ethnic emotions for political survival and aggrandizement. The law must be very clear, with severe penalties and fines for those who violate such laws.

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efforts must be made to build the necessary capacities at the community and national levels to manage and reduce risk" International Strategy for Disaster Reduction, (2005)].

Disaster management in Kenya

The objective of early warning systems is to link the information provision to the response. The process allows a lead-time to access funding, expertise and equipment for the necessary intervention. Strategic food reserves, health and essential supplies such as non-food items remain an important component of disaster preparedness.

Another example of disaster preparedness activity is the comprehensive and continuous assessment of vulnerabilities and risks in order to understand threats of a hazard and to improve the targeting of Disaster Management programs. A comprehensive assessment of risks and vulnerabilities will, therefore, assist the targeting of disaster management programmes in Kenya.

The Government will facilitate the establishment of a comprehensive National Early Warning System that will encourage the involvement of all stakeholders. In addition baseline vulnerability analyses will be prepared on a continuous basis to assess the impact of the problem on the affected population. Based on the Early Warning System and the continuous analysis of vulnerabilities, response activities including the active use of strategic stockpiles of food and non-food items, will be undertaken in a manner that ensures that the most vulnerable groups are specifically targeted.

On institutional provisions, there is need for careful and selective strengthening, so that whereas DSGs are doing a commendable work in the ASAL districts, the DDCs and DDMCs in each district shall be strengthened to improve their capability for DM at district, division and lower levels, proactively and responsively.

Disaster Response.

Response involves interventions taken during or immediately after a disaster. Such actions are directed towards saving lives and livelihoods and dealing with the immediate damage caused by disaster.

Process to recovery

Following response and relief, the full disaster cycle has many phases leading to recovery. Rehabilitation is the restoration of the socio-economic institutions and structures of the affected society/community in readiness for reconstruction i.e. rebuilding of their life support systems and further development. It may be preceded by repatriation, followed by rehabilitation and reconstruction are intertwined with development; providing a bridge between a satisfaction of immediate needs and the implementation of comprehensive vulnerability reduction programmes. At the same time the recovery phase entails programmes designed to help communities to return to normalcy.The insurance industry will play a crucial role in mitigating the impact of disasters on the communities in both rural and urban areas. Insurance firms will be encouraged to develop affordable products that can be made available to the society in order to underwrite some of the disaster–related losses.

Gender mainstreaming and disaster reduction

McEntire, D.A. (2001) explains that vulnerability acts as the dependant component while the triggering agent stands as the independent component of a disaster. This dependant component is determined by the degree of risk, susceptibility, resistance and resilience McEntire, D.A. (2001)]. Therefore, vulnerabilities should be managed in order to mitigate disasters. McEntire, D.A. (2001)] shows invulnerable development or vulnerability management as a process whereby decisions and activities are intentionally designed and implemented to take into account and eliminate disaster to the fullest extent possible.

An overview of disaster reduction

Disaster preparedness through minimizing vulnerabilities has been identified as a better approach to face disasters than post-disaster responsiveness [9].[24]. According to Goodyear [6], creating a culture of prevention is essential to address everyday hazards and the consequences of a disaster. Disaster risk reduction is defined as the conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development [12]. Therefore, disaster risk reduction must be more decisively incorporated as an essential component of all development strategies, policies, programmes and investments for national and local governments [26]. In other words, disaster reduction incorporates taking measures in advance, addressing risk reduction, involving environmental protection, social equity and economic growth, the three cornerstones of sustainable development, to ensure that development efforts do not increase the vulnerability to hazards International Strategy for Disaster Reduction, (2002).

The United Nations International Strategy for Disaster Reduction (UN/ISDR) is a pioneer in disaster reduction movement in the international context. ISDR aims at building disaster resilient communities by promoting increased awareness of the importance of disaster reduction as an integral component of sustainable development and it promotes following four objectives for disaster reduction. Increase public awareness to understand risk, vulnerability and disaster reduction globally. Obtain commitment from public authorities to implement disaster reduction policies and actions.

Stimulate interdisciplinary and intersectoral partnerships, including the risk reduction networks. Improve scientific knowledge about disaster reduction.

A close inter-relationship is shown between disaster reduction and sustainable development in disaster management research. A number of development activities have a great responsibility and inter-relationship with disaster risk reduction because both development and disaster management are aimed at vulnerability reduction. Further, it is indicated that development can increase and/or decrease disaster vulnerability. It is essential, therefore, to take measures of disaster risk reduction into consideration in all development activities. The framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters states, "there is now international acknowledgement that efforts to reduce disaster risks must be systematically integrated into policies, plans and programmes for sustainable development and poverty reduction, and supported through bilateral, regional and international cooperation, including partnerships. Sustainable development, poverty reduction, good governance and disaster risk reduction are mutually supportive objectives. In order to meet the challenges ahead, accelerated

on the above explanation, the Working Group on climate change and disaster risk reduction of the Inter Agency Task Force on Disaster Reduction [34] illustrates the different dimensions of vulnerabilities as follows.

Physical vulnerability refers to susceptibilities of the built environment and may be described as "exposure".

Social factors of vulnerability include levels of literacy and education, health infrastructure, the existence of peace and security, access to basic human rights, systems of good governance, social equity, traditional values, customs and ideological beliefs and overall collective organizational systems.

Economic vulnerability characterizes people less privileged in class or caste, ethnic minorities, the very young and old, the disadvantaged, and often women who are primarily responsible for providing essential shelter and basic needs.

Environmental vulnerability refers to the extent of natural resource degradation. On the other hand, McEntire, D.A. (2001) categorizes the variables, which interact to produce a future of increased vulnerabilities under physical, social, cultural, political, economic, and technological headings as given in the following list. This classification splits the social vulnerability in the earlier categorization into three separate groups as social, cultural and political dimensions of vulnerabilities. In addition, the environmental dimensions are brought under the physical variables here in contrast to the earlier division.

Physical

The proximity of people and property to triggering agent's improper construction of buildings, inadequate foresight relating to the infrastructure and degradation of the environment.

Social

Limited education (including insufficient knowledge about disasters), inadequate routine and emergency health care, massive and unplanned migration to urban areas and marginalization of specific groups and individuals

Cultural

public apathy towards disaster, defiance of safety precautions and regulations, loss of traditional coping measures and o dependency and an absence of personal responsibility.

Political

minimal support for disaster programmes amongst elected officials, inability to enforce or encourage steps for mitigation,o over-centralization of decision making and isolated or weak disaster related institutions

Economic

growing divergence in the distribution of wealth, the pursuit of profit with little regard for consequences, failure to purchase insurance and sparse resources for disaster prevention, planning and management

Technological

lack of structural mitigation devices over-reliance upon or ineffective warning systems carelessness in industrial production lack of foresight regarding computer equipment/programmes

large and regional disasters. On the other hand, disasters can be categorized into two, based on their spatial and socio economic characteristics as exogenous disasters and endogenous disasters Jaya Kumar, G.S. (2000).

Exogenous disasters- which relates to an energy that is external to society and which injure, destroy and affect everyone trapped within the spatial or temporal dimension. This can be defined as an event concentrated in time and space in which a community or a society experiences and shares severe danger, injury and destruction or disruption of the social structure and essential function of the society.
Endogenous disasters- which emerge from forces within society and which injure one group while enrich other or which distress is suffered by one section of the community while material gains and social satisfaction accrue to another.

Occurrence of disasters

Initially, scholars and policy makers gave attention to disasters concentrating mainly on hazards giving an implication that the hazard agent was the disaster [19]. UN/ISDR International Strategy for Disaster Reduction, (2004) describes hazard as a potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Furthermore, hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydro-meteorological and biological) or induced by human processes (environmental degradation and technological hazards) International Strategy for Disaster Reduction, (2004)].
However, this initial perspective on disasters was problematic because natural occurrences such as tornados in uninhabited plains may not be seen as a disaster and some hazards such as floods and fires can even be beneficial for the environment (e.g. providing rich, fertile soils for farming and forest rejuvenation) [19]. Therefore, the subsequent viewpoint that all disasters irrespective of whether they are natural or manmade emerge as a combination of a triggering agent/hazard and vulnerabilities McEntire, D.A. (2001)] is more rational. With the establishment of the latter view, the emphasis on vulnerabilities in the context of disasters was raised gradually.

Disasters: Natural Earthquake, Landslides, Droughts, Floods, Storms, Tropical cyclones, Wildfires, Desertification, Environmental degradation, Volcanic eruptions.

Man-made/ Technological, Conflicts, Wars, Industrial accidents, Transport accidents, Terrorism,
Crowd accidents, Structural Failures, Slow onset Rapid Long term Sudden/Socio-technical

Vulnerabilities

Vulnerability is known as a set of conditions that affect the ability of countries, communities and individuals to prevent, mitigate, prepare for and respond to hazards [1]. It is seen that all individuals and communities are to varying degrees vulnerable to hazards and all have intrinsic capacities to reduce their vulnerability [34]. Apropos, vulnerability is given various definitions in disaster research since 1980 [33]. Similarly the disaster definitions vary according to the discipline they are based on and the way in which vulnerability is seen depends on the respective discipline [19]. UN/ISDR [12] defines vulnerability as the conditions determined by physical, social, economic, and environmental factors or processes which increase the susceptibility of a community to the impact of hazards. Based

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through considering the specific needs and interests of vulnerable women before, during and after disasters.

The United Nations International Strategy for Disaster Reduction International Strategy for Disaster Reduction, (2002) shows gender mainstreaming in disaster reduction as a parallel but inter-linked process to the mainstreaming of disaster reduction into sustainable development policies and activities while recommending integrating gender, development and environmental management and disaster risk reduction both in research and practice. It further recommends that efforts should be made to increase a gender balance in decision-making positions to deal with disaster risk management. There is a need for a focus on the disaster and sustainable development planning processes and ensures a participatory approach and involvement of non-traditional/non-conventional ideas and partners.

Conclusions

Disasters, which disrupt society with enormous damage to the human life, environment and economic resources, treat women and men differently. Women are more vulnerable to the consequences of disasters because of their social role. This emphasizes the need to achieve gender equality in disaster reduction and integrate a gendered perspective to all policies and measures implemented in disaster management context.

Gender mainstreaming in disaster reduction allows women to decrease their vulnerability

Through identifying their specific needs at the disaster management planning stage. Women are empowered by gender mainstreaming to reach equality in decision making roles in disaster reduction and to utilize their skills in planning and implementation of policies and measures.

After identifying the existing roles of men and women through gender analysis, gender

mainstreaming helps to achieve equality in disaster reduction by giving a comprehensive

Understanding of the possible effects of policies and measures developed for disaster reduction on gender roles. However, since disaster reduction and development have a close inter relationship, gender mainstreaming in disaster reduction is a parallel and inter-linked process to mainstreaming disaster reduction into sustainable development policies.

The way forward

This paper focused to give an account for the importance of gender mainstreaming in disaster reduction through a discussion of literature findings on disasters, the types of disasters, different categories of disaster vulnerabilities and gender mainstreaming and its role in disaster reduction process. Apropos, gender mainstreaming in disaster reduction facilitates non-traditional ideas and parties to participate in disaster reduction and sustainable development planning while empowering women to develop their leadership qualities and other special skills in the decision making process.

Therefore, the study which was the basis for this paper aims to continue researching in the future on: establishing a relationship among disaster reduction, construction and gender, demonstrating the importance of gender in the context of disaster reduction construction, understanding the need for mainstreaming women in construction in disaster reduction, identifying the ways of mainstreaming women in construction in the disaster reduction decision making process.

According to the Employment and European Social Fund [3], gender mainstreaming means a partnership between women and men to ensure both participate fully in society's development and benefit equally from society's resources. Gender mainstreaming covers the following aspects: Policy design; Decision-making; Access to resources; Procedures and practices; Methodology; Implementation and Monitoring and evaluation.

Therefore, gender mainstreaming is necessary to incorporate in the policies and programmes related to disaster reduction mainly because "gender shapes capacity and vulnerability to disasters" as discussed earlier. As the United Nations Office of the Special Adviser on Gender Issues and Advancement of Women Office of the Special Adviser on Gender Issues and Advancement of Women, (2001)explains, gender mainstreaming can promote gender equality and women's empowerment, particularly where there are glaring instances of persistent discrimination of women and inequality between women and men. Gender mainstreaming can be used as an effective tool to reduce the vulnerability of women, which arise due to various factors including less access to resources and to bring more women in to disaster reduction policy making process.

However, promoting gender mainstreaming is a long, slow process requiring inputs on many fronts over a long period of time, including advocacy, advice and support, competence development, development of methods and tools and vigilance in following up and evaluating progress Office of the Special Adviser on Gender Issues and Advancement of Women, (2001).

Gender mainstreaming in disaster reduction

According to the definition given by the International Labor Organization for gender mainstreaming, it is bringing the experience, knowledge, and interests of women and men to bear on the development agenda and identifying the need for changes in that agenda in a way which both women and men can influence, participate in, and benefit from development processes. Accordingly, mainstreaming gender perspectives into disaster risk reduction should concern women in development processes as equal partners to men as both decision makers and beneficiaries Ariyabandu, M.M. and Wickramasinghe, M. (2003).According to Carolyn Hannan, Director of the UN Division for the Advancement of Women , the following basic principles should be set up for mainstreaming gender.

Adequate accountability mechanisms for monitoring progress need to be established. The initial identification of issues and problems across all area(s) of activity should be such that gender differences and disparities can be diagnosed. Assumptions that issues or problems are neutral from a gender-equality perspective should never be made. Gender analysis should always be carried out.

Clear political will and allocation of adequate resources for mainstreaming, including additional financial and human resources if necessary, are important for translation of the concept into practice. Efforts to broaden women's equitable participation at all levels of decision-making should be taken. Therefore, mainstreaming gender in to disaster reduction policies and measures translates into identifying the ways in which women and men are positioned in society International Strategy for Disaster Reduction, (2002). In other words, in the context of disaster risk reduction, gender mainstreaming refers to fostering awareness about gender equity and equality, etc, to help reduce the impact of disasters, and to incorporate gender analysis in disaster management, risk reduction and sustainable development to decrease vulnerability International Strategy for Disaster Reduction, (2002). Gender mainstreaming can be used to bring equality into disaster management

capacities, needs and vulnerabilities" Ariyabandu, M.M. and Wickramasinghe, M. (2003). Inter-agency Secretariat for the International Strategy for Disaster Reduction, (2002)] indicates that women are more vulnerable in disasters and they are the most affected. The poor and predominantly female and elderly populations are characterized by higher economic vulnerability as they suffer proportionally larger losses in disasters and have limited capacity to recover]. Enarson, E. (2000) identifies the following points as the reasons for women's higher vulnerability in disasters. Women have less access to resources. Women are victims of the gendered division of labour.

They (women) are primarily responsible for domestic duties such as childcare and care for the elderly or disabled and they do not have the liberty of migrating to look for work following a disaster. As housing is often destroyed in the disaster, many families are forced to relocate to shelters. When women's economic resources are taken away, their bargaining position in the household is adversely affected.

In addition to the above factors, Emerson, E. (2000) points out that disasters themselves can increase women's vulnerability not only because they increase female headed households but sexual and domestic violence are also increased following a disaster.

According to, Emerson, E. (2000) and Keaton, H. (2003)], although women are at greater risk than men in disasters, it is the women who make it possible for the community to cope with disasters because their social role is central to the management of a disaster coping strategy. However, women's abilities to mitigate hazards and prevent disasters and to cope with and recover from the effects of disasters have not sufficiently been taken into account or developed Ariyabandu, M.M. and Wickramasinghe, M. (2003). As Ariyabandu, M.M. and Wickramasinghe, M. (2003) indicate, in current practice of disaster reduction women are seen as helpless victims and their capacities, knowledge and skills in each stage of the disaster cycle are not recognized. The gender differences in the disaster mitigation have been discussed primarily in the context of vulnerability or community involvement. The absence of women in decision making positions in emergency and recovery planning is not effectively addressed. Therefore, a gender perspective should be integrated into all disaster reduction policies and measures in order to decrease women's susceptibility in disasters. However, gender equality in disaster reduction requires empowering women to have an increasing role in leadership, management and decision making positions because women are not only victims of disasters but they can act as agents of change in disaster reduction planning International Strategy for Disaster Reduction, (2002)].

Gender mainstreaming

The Platform for Action (PfA) at the Fourth World Conference on Women in Beijing in 1995 brought up the concept of gender mainstreaming, the commitment to integrate gender perspective in all forms of development and political processes of governments . UN/ISDR International Strategy for Disaster Reduction, (2002) elaborates gender mainstreaming as the process of bringing a gendered perspective into the mainstream activities of governments at all levels, as a means of promoting the role of women in the field of development and integrating women's values into development work. Although, the ultimate aim of gender mainstreaming is to achieve gender equality, it is not for promoting equality to the implementation of specific measures to help women; it is to achieve equality in all general policies and measures by actively and openly taking the possible effects on the respective situation of men and women into account at the planning stage European Commission, (1996).

Nkrumah defined neo-colonialism as:

A process of handling independence even to African people with one hand only to take it away with the other hand," Clientele sovereignty, fake independence, the practice of granting a sort of independence by the metropolitan power, with concealed intention of making the liberated country a client-state and controlling it effectively by means other than political ones...The greatest danger at present facing Africa is neo-colonialism and its major instrument balkanization.---Under colonial imperialism there was something like public accountability but neo-colonial imperialism was the most irresponsible form of imperialism because of lack of inner constraint of accountability.

Wanaka (2000) observes that:

Colonialism's economic concerns led to the alienation of large tracts of land for agricultural exploitation--- in that enterprise, the colonial government embarked upon systematic imposition of English property law and a transformation of indigenous patterns of land tenure and use.

Nkrumah writes and explains the reasons for European conquest for African Kingdoms:

The imperial powers need the raw materials and cheap native labor of the colonies for their own capitalists industries. The problem of land ownership in colonies has risen because the colonial powers have legally /illegally seized valuable mining and plantation rights. The British are more careful than other imperialists to legitimize their seizure but even their semi-legal methods do not disguise the fact that they have no right to robe the native of his birth right

Nkrumah urged all Ghanaians to "seek ye first the political kingdom and all things will be added to it". The African states must actually follow- to the letter- the philosophy of Nkrumah in order to be effective and free from neocolonialism.

INTRODUCTION OF COLONIAL RULE IN KENYA AND RISE OF THE MAU- MAU

There was the creation of an all –European legislative council which was to make laws for the peace and good government of the protectorate in 1907.This was to introduce the English law as it existed on 12th August 1897.The imparted law was to be applied subject to the local conditions of inhabitants. This English law still applies today to our legal system.

Section (3) of The Judicature Act of the laws of Kenya states:

> *The Jurisdiction of High court, court of Appeal and subordinate courts shall be exercised with specific Acts of the parliament of the ? United Kingdom, India, Common Law, doctrine of Equity and English statutes of General application in force in England on 12th August 1897, the procedure and practice observed by courts of justice in England on same date.*

The legal system, legal practices and judges of the court are still the English models with extremely few modifications.

EDUCATION SYSTEM IN KENYA 1900-1963

African societies provided and transmitted their norms, value and belief systems through an informal education system. It was transmitted through generations by several methods, which were different from the European type. The missionaries brought schools and evangelization that were elitist in nature, creating a lot of inequality. The school system has been reformed several times to meet the challenges of the society. However, the English

According to the 1920 order-in-council, Kenya and the coastal ten-mile strip were legally recognized. The declaration of crown colony created several organs that still exist up to now. However, these systems have now been done away with by the passing of the new constitution.

Kenya was administered on two levels-- namely central and local government. The governor was appointed by the Queen as head of government while the Queen was the head of state. The governor had executive and legislative powers over the colony.

The provinces were divided into districts, which were further divided into divisions, locations and sub locations-- still the remnants of colonialism. The local units formed the basic areas of government and their day-to-day administration was the responsibility of the executive-- from provincial commissioners to district commissioners, district officers, chiefs and assistant chiefs. The provincial administration was in-charge of maintaining law and order in each province assisted by the above named officers. The central government, which was created in Nairobi, administered the departments. These departments were eventually changed to ministries.

These arrangements have remained to this day. The Courts of law were also established by the colonial government and were initially manned by officers of the provincial administration or judges and magistrates seconded from the colonial legal service. Kenya continued to have judges was until 1988, when the last one was dismissed because of incompetence and gross misconduct.

The land that belonged to Africans was alienated by several legislations in 1915 by The Crown Lands Ordinance, which stated:

> *All public land in the colony which are so for time being subject to the control of His majesty by virtue of any treaty, convention or agreement or by virtue of his majesty's protectorate and all lands which shall have been acquired by His majesty for the public service or otherwise however and shall include all lands occupied by Native tribes of the colony and all lands reserved for the use of members of any native tribes.*

The above ordinance vested all the land in the governor. The African communities now turned to be the tenants of the crown. The colonialists introduced the land tenure system, which is still held today for a period ranging from 99 years to 999 years. Section 5 of 1915 Crown Land Ordinance provides that:

> *Since land is a commercial commodity for economic purposes it must be distributed equitably among the citizens. The agricultural activities were geared towards production of cash crops for export neglecting the domestic crops. There were agricultural extension officers sent to the grassroots to intensify the production of cash crops to feed European industries. This is true even up to today where coffee, tea, cocoa among others commodities.*

The land has been commercialized, as any other commodity in a free market economy until now, and was the major cause of political rebellion in Kenya during the 2007/2008 post election violence.

NEOCOLONIALISM

Germany and Kenya to the British. The British chose to use the East African Company (later Imperial East Africa Trading Company), which was operating in the region as a vehicle to help expand British interests without investing any national resources.

The company established an administration with an armed security force in 1896 with fortified stations to protect its trading routes, trading centers, stocks and staff. The security personnel were largely acquired from the Indian police and watchmen, and were governed by Indian police statutes, giving the security force a quasi-police status. Towards the end of the 18th century, an additional security force was set up, which was employed to protect the building and maintenance of the Kenya –Uganda railway systems. This required centers at Kisumu and Nairobi, as well as Mombasa. The colonial presence was, thus, expanding.

During the 1880s, the British Colonial Office had increasingly taken over the administration of the region from the Imperial East African Company. The commissioner of the region was given the right to establish a police or other force for the defence of the protectorate and armed forces were established. There was opposition to the colonial outsiders and police force was needed to suppress this opposition.

The *Delimitation Agreement* of 1886 established the approximate boundary to the south, separating it from the German sphere of influence in Tanganyika. Buganda was already identified as a Kingdom. Its borders and neighbours in Uganda came under the nominal British control; following the Anglo-German Agreement of 1890.The Imperial British East Africa (IBEA) was chartered to administer the interior of the British sphere. IBEA continued with its expansionist policies until it reached Uganda in 1893 and eventually took over that country in 1895.

In 1902, the boundaries that were earlier fixed were redefined. The East African Protectorate was finally separated from the Uganda Protectorate. In June 1920, Britain formally annexed Kenya as crown colony with the same boundaries of 1902 East African Protectorate. This arrangement did not include the coastal region. The Kenyan coastal region was governed by another authority.

The East African coast had many inhabitants with a lot of trade that included slave trade. There were Greeks, Portuguese, Arabs, Persians, Italians, Indians and Turks who had introduced their cultures, languages and religions to the indigenous peoples. There still is a very strong influence from these foreign cultures in present day Kenya. For example the coastal region of Kenya has a strong Arabic influence. On 24th May 1887, the Sultan of Zanzibar granted the concession to Sir William Mackinnon on behalf of IBEA. In 1895, the Sultan of Zanzibar signed a treaty that declared the 10-miles coastal strip as belonging to the Sultan of Zanzibar.

The foregoing scenario lasted up to 1914. The First World War 1914-1958 played a significant part in forcing the pace of change among the African peoples. The British conscripted about 160,000 men from the East African Protectorate- among them Luo, Kikuyu, Libya, and Kama, to conquer German East Africa. When these people came back, they were demanding greater rights and freedoms as well as the land that they had left behind.

THE CROWN COLONY AND ITS INSTITUTIONS 1920-1963

PERSPECTIVES ON AFRICAN DECOLONIZATION AND DEVELOPMENT: THE CASE OF KENYA

By
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INTRODUCTION

Since 1960, African states have become independent and self-governing, with their own heads of states and governments, founded on the principles of their colonial masters. The states assumed that they were politically, socially, culturally and economically independent from their masters. The reality is that Africa is still colonized in many other spheres with her own consent. The present African states were colonized courtesy of the 1884-5 Berlin conference. Neither was the African people consulted nor did they consent to be colonized. African states have since gained independence; therefore, it is assumed in theory that the states would develop economically, socially, culturally and politically without the assistance of developed countries through provision of any kind of foreign aid. However, the paradigms of development advanced by the developed nations seem to have very little relevance in the African context, hence, the dependency and modernization theories advanced by classical economists and sociologists (Ado, 1987); do not seem hold water in the African context.

There are many reasons for this. The conditions are different from the developed states. The renaissance of China and the fall of Soviet Union have heralded a new dawn for African states. African states, with their own consent, are still "colonized" by the newly developed world in the political, economic, social and cultural spheres, and the states are struggling to emancipate themselves from neocolonization.

Kenya, for example, gained her independence from Britain in 1963 and it was declared a republic. Kenya was, and to a large extent is, governed by the Westminster constitution; she has just promulgated a new constitution which she is in the process of implementing. There are 42 communities in Kenya with different cultures and languages and economic activities. Kenya is a multilingual country with 42 languages being spoken there. The country has a population of about 40 million. The GDP is about 783 dollars. The economic growth is 1.2% per year. Kenya has seven public universities and about 15 private universities. It has 47 registered political parties that follow different political policies, some of which are western oriented and have little relevance. This paper looks at the perspectives of the African development vis a vis the principles advocated by Kwame Nkrumah and Pan Africanism. Development theories here have a significant role to play in explaining how Africa has failed in development.

THE HISTORICAL OVERVIEW OF KENYA

Through trading and settlements, for many centuries, East Africa experienced the imposition of alien restraints, initially by Arab and Persian states, and later by Europeans. Formal external control was imposed by the colonial powers of Europe in *The General Act Agreement Of 1885*, followed by the *Anglo- German Agreement of 1886*, which arbitrarily imposed boundaries on the region by allocating, for example, what is known as Tanzania to

which have long effect s of improving the people's wellbeing." This is a fund created to develop constituencies all over the country which is 2.5% of the Gross Domestic Production (GDP). This fund has made tremendous development at the grass roots level It needs to be understood that CDF is a home -grown concept unlike all the other World Bank programmers and Donor tailored programmers which have not taken Kenya anywhere for decades. This is the new mode of development strategy for the decade for Kenya. It is up to Kenyans to find out where the 97.5% of revenues collected have disappeared every financial year for over 40 years.

4. Local Government Transfer Fund

This fund has been a success story in development efforts of the government, in collaboration with the people. This is a fund made directly to the local authorities to help them deliver services to the residents of municipalities in the republic of Kenya. The fund incorporates the local people in identifying the projects that are a priority and which helps local people to find employment opportunities.

5 District Focus for Rural Development strategy

This strategy was introduced in 1971 and it was a precursor to the District Grant program of 1966 and rural development Fund, District Development Planning and District Focus for Rural Development 1983-4. The main argument for decentralization was to enhance the process and speed of development through the provision of social and economic services. Development must therefore mean enhancing the capacity of the society to cope with challenges and meet its needs.

CONCLUSION

From the foregoing discussion of development theories, we draw the conclusion that western based theories may not provide the ideal development paradigm for Africa. Instead they are a way of guiding development for their former colonies. There is, therefore, need for the search for appropriate theories that are uniquely African centred. While we must acknowledge the progress made by the Africans based on western development theories in the last few decades, the idea of developmental progress generally is a logical outgrowth of the consequences of scientific technology in the Western world. A distinction should be made between development and technology. When people talk of development they mistakenly identify it with the effects of scientific technology thereby committing the fallacy of *non-cause pro cause*. Development is all encompassing and it should be viewed as an enhancement of the capacity of societies to cope with their unique problems.

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financial resources towards productivity and growth. Their task is to follow the example of those air planes that have already taken off, perhaps not in detail but in broad measure."

Dependency Theory

This is the theory advanced by Theotonio Dos Santos (1988) when he puts it as a situation in which a certain group of countries have their economy conditioned by the development and expansion of another economy to which the former is subject. The relation of interdependence between two or more economies and between these and world trade assumes the form or dependence when some countries (the dominant) can expand and give impulse to their own development, while other countries (the dependent) can only develop as a reflection of this expansion. This can have positive and or/negative effects on their immediate development. In all cases, the basic situations of dependence lead to a global situation in dependent countries that situate them in backwardness and under the exploitation of the dominant countries. The dominant countries have had technological, commercial, capital resource and social-political dominance of some of these aspects in various historical While Europe and North America developed at the expense of slave trade, there was no Marshal plan to develop Africa after slave trade or World War I and II.

The above theories cannot be applicable to the Kenyan situation because of the conditions prevailing. Hence, Kenya has adopted new methods for development. These include:
The Harambee method:

- District Focus for Rural Development strategy
- Self-Help Groups
- Constituency Development Fund
- Local Government Transfer Fund
- The devolved funds under the new constitution

This paper will now analyze each of them in turn.

1) The Harambee method

Harambee is a Kiswahili term meaning "let us pull together or cooperate in carrying out individual groups or community improvement activities. This method has been used in Kenya extensively in raising funds for various projects in Kenya. These projects range from schools, hospitals, institutes of technology and raising fees for sending students overseas for further studies. There were massive contributions from politicians, companies and major state corporations towards achievement of a particular goal. However, Harambee became a den of corruption leading to forced contributions. There was a mass protest that led to abandonment of this method of development.

2) Self –Help Groups

These groups where either women groups who carry out self-improvement activities or youth groups for self-sustainability. It was in the form of merry-go round for buying utensils, paying school fees for member's children or youth groups fundraising for their respective members. Many self-help groups sprung up for the purpose of helping women in the society.

3. The Constituency Development Fund

This fund was created in the year 2003 with the following aim in its preamble: "Fight poverty at the grassroot level through the implementation of community- based projects

It is true that African states tried as much as possible to be independent politically yet they are colonized socially, economically, culturally and politically unlike the events that happened during the scramble for Africa when the African people did not participate.

THE DEVELOPMENT THEORY

The term "Development" has been looked at from several dimensions. While Rodney (1972) argues that "development in human society is a many-sided process. At the individual level, it implies increased skills and capacity, greater freedom, creativity self-discipline, responsibility and material well being." The Economic Argument, Todaro Michael (2002) notes:

> *Development has traditionally meant the capacity of a national economy, whose initial economic condition has been more or less static for a long time, to generate and sustain an annual increase in its gross national income (GNI) at the rate of 5% to 7 %. It is seen in terms of planned alteration of the structure of production and employment so that agriculture's share of both declines and of the manufacturing and service* industry increase.

Kenya gained its political independence in 1963 from Britain. It was to develop and match the colonial masters of the time. However the theories that were applicable at that time have failed to realize the required development. The modernization development theory does not explain underdevelopment in the third world, including Kenya. Underdevelopment is due to economic imperialism and consequent dependency.

The paper will now explain briefly the traditional theories of development and their limitations in explaining the failed development in the African context and social setting. When Kenya gained her political independence in the 1960's, the first priority the founding fathers undertook was to fight the three enemies of the Kenyan people namely eliminate poverty, disease and ignorance. This means that Kenya was to transform herself from poverty to a modern state through development programmes:

Several theories have been advanced to explain development theory namely modernization and dependency theory.

Modernization theory

This theory tries to explain the case of poverty in third world. The exponents of this theory state that society undergoes several stages before it is developed.

These stages were expounded by W.W. Rostow (1963) to constitute five stages namely, traditional society, the pre-conditions to take –off, take –off, drive to maturity and the age of high mass-consumption. It has been argued that Europe and North America passed through the stages many years ago, and it is reasonable and fair to give African states time to reach the levels they are now in development.

Isbister (2001) concedes and makes a passionate appeal for modern or advanced states to help the third world reach where they are and writes: "The challenge to modernize is one that faces each country separately, as it tries get its plane into the sky. What Britain, the United States and Japan did, Zimbabwe, Colombia and China can do. Their methods may differ somewhat, depending on national factors but in each case they may find a way to break away from tradition, to free the innovative spirit and direct their human, physical and

language as the language of instruction still remains as a reminder of colonialism in Kenya. The school system in Kenya changed slightly from racially segregated segments to cost element creating a different form of inequality. There were schools for Europeans, African, Arabs, and Indians with different curricula and examination systems. These have now been transformed to high cost schools for the super rich and low cost ones for the poor people. The two systems have different examinations and curricula. The current system was based on the Mackay Report, which removed the Advanced level and introduced the 8-4-4 system modeled on the Canadian Education system. However, it has maintained the colonial legacy of compulsory English language as a medium of instruction.

REPORTS THAT REFORMED THE EDUCATION SYSTEM:

- The Report of the Kenya Education Commission (1964). (The Opined Commission) sought to reform he inherited system in order to foster natural unity and creation of critical human capital for national development.
- The Gachathi Report (1976), aimed to foster national unity and fulfill the economic, social and cultural aspirations of the people.
- The Report of the Presidential Working Party on the Second University in Kenya (1981)
- The Mackay Report led to abolition of Advanced level and introduced 8-4-4, which was a Canadian schooling system, applicable even today.
- The Report of the Presidential Working Party on Education and Manpower Training for the next decade and beyond (Kamunge Report) introduced cost-sharing between government, parents and communities.
- The report of the Commission of Inquiry into the Education system of Kenya (2000) Koech Report.

The Kenyan Government has never introduced its own education system to suit the needs of its population.

POLITICAL SYSTEMS IN KENYA 1902-2010

The colonialists introduced a bicameral parliament to be represented by elected members of parliament to stand for constituencies, which is a colonial form of government. East Africa had kingdoms that were self-governing such as Buganda, Kingdom of Wanga, and Nandi. They introduced parties and multi-party systems of government. The introduction of many parties and tribal –based competition for power has led to bloodshed in Kenya every five years when the elections are held. The idea of giving a lot of freedom to communities who have not matured in terms of oneness and have not achieved social solidarity is a great mistake. The violence that erupted in 2007/2008 disputing elections was the result of too much freedom on the part of citizens. Mass media, respect for basic freedoms and freedom of expression fuelled the chaos. These indicators are said to be values of Western civilization.

China has managed to suppress the freedom of its citizens but has a very robust economy. China has colonized African states with their own consent. In a typical Kenyan household, everything is made in China. The Chinese government has introduced the Chinese Confucius Institute and Chinese Language Institute in University of Nairobi and Kenyatta University to boost her culture and trade by making it easy for businessmen to understand the language. Moreover, China has awarded Scholarships to Kenyan students to study in China. (Explain trade with India) This shows a radical shift of trade from the traditional partners of Britain, France, and Germany to China and India.

The role of the scenario in emergency planning

There is often a tendency to write emergency plans backwards, and thus to try to match the problem to be tackled to the resources available to tackle it, rather than the other way around. Such plans tend to be very vague about the nature of the emergency situations that they will be applied to. Many emergency plans either have no base scenario or make an uncritical, untested assumption that the last great event in the area covered by planning is exactly diagnostic of what to expect next time. In contrast, a well-constructed plan should be based on a thorough analysis of the kinds of event that it will eventually have to tackle. This requires the full-scale use of scenario modelling (Alexander, D. 2002).

A predictive scenario is an exploration of what is likely to happen under a particular set of circumstances. It asks the question "what if...?", but this should be backed up by scientific forecasting of hazards and strict logical investigation of the chains of consequences that may occur when a hazard strikes. According to Alexander, D. (2002), the aim is to draw out the most likely train of events, and reactions to them, in order to form a secure basis for planning. As the principal objectives of emergency planning are to reduce the gap between the resources that are needed and those that are available, and to apply the latter as effectively as possible to the urgent problems caused by disaster, it follows that the planner will need an accurate and detailed assessment of what is likely to happen.

The base scenario, or scenarios, used in emergency planning should be subject to logical evaluation. As they are a predictive tool, they will have to make a considerable number of assumptions about what is likely to happen under certain sets of conditions. This should not be an impossible task, or necessarily a daunting one if sufficient background research has been conducted. Such work should be based on the fundamental relationship (UNDRO 1982).hazard × vulnerability [× exposure] = risk --> impact

Hence, successive stages in the formulation of the scenario involve collecting information on the spatial and temporal distribution of hazards, assessing the vulnerability of populations and structures to these, deriving patterns of risk and considering how the risks are likely to materialize as impacts. As the best modern planning is generic (all hazards) According to Quarantelli, E.L. (1992) rather than restricted to single hazards or risks, this process should be carried out with a sufficient level of generalization and flexibility that it is unlikely to break down in the face of unexpected developments.

The relationship between emergency planning and urban and regional planning

One of the most remarkable aspects of emergency planning in the modern world is its lack of relationship with urban and regional planning. Disaster preparedness is not usually taught to students of planning, and trainee disaster managers are not usually given a grounding in land-use planning. Yet the links between the two disciplines ought to be self evident: they lie in the concept of the "hazardousness of place". (Hewitt, K. and I. Burton 1971).

One of the principal and most successful means of reducing the risks to life and property posed by natural and technological hazards is to restrict land uses in the most threatened places. In 1986 a petroleum tank explosion and fire claimed several lives and rendered 2600 people homeless in central Naples. In 1998 150 died in the towns of Sarno and Quindici in predictable mudflow disasters. Both of these represent cases in which an identifiable hazard did not simulate vulnerability reduction measures. The simplest, and often the cheapest of these, is to separate incompatible land uses. At the very least, this

the real problems of bringing aid to stricken populations? This essay will consider ten of the most salient issues in planning for and managing contemporary emergencies.

From the paper planning syndrome to the digital planning syndrome

Lack of real commitment to emergency preparedness can lead to the formulation of plans that are treated as static documents and deposited in archives without the necessary adaptation, testing and updating that would render them functional and efficient. This was long ago identified as the "paper planning syndrome", in which only the letter, and not the spirit, of civil protection regulations is honoured. Auf der Heide, E. (1989),in theory, the application of digital computing technology to emergency planning should make the syndrome a thing of the past, as computers offer a vastly greater degree of flexibility in how plans are devised, stored, displayed, communicated and utilized, as well as making it very easy to amend and update them. (Gruntfest, E. and M. Weber 1998) But has the digital revolution merely substituted one syndrome for another?

To begin with there is no absolute obligation to use computerized planning procedures any more effectively than their typewritten antecedents. Secondly, the use of computers and the Internet involves questions of balance. Possibly, products with superior marketing strategies are likely to accumulate the most followers regardless of their degree of usefulness. Moreover, the most vocal people and companies can flood the market with their views. Hence, digital technology can become a vehicle for diffusing, not only valuable advances in methodology, but also inaccurate information.

It has also been suggested that, by reducing the degree of personal interaction, computer use diminishes opportunities for non-verbal communication and introduces a sense of artificiality into emergency management, akin to that which prevails in modern aerial warfare, where screen-watching and button-pushing replace more direct action. (Quarantelli, E.L. 1997).

Unfortunately, most emergency preparedness courses do not include guidelines on how to make the best use of computerized technology and how to guard against problems such as artificiality and misuse of information. Indeed, as far as I know, no widely accepted guidelines exist: they should be formulated as a matter of urgency.

The interim solution is to use computer technology with a large dose of self-awareness and self-evaluation. No procedures should be implemented without considering their eventual effectiveness. No expenditures should be made without some form of cost-benefit analysis, and without specification of the criteria for identifying and judging benefits (which are often less easy to quantify than are costs).

Computers and associated communications technology have enormous potential for reducing the complexity of disasters to levels that are intelligible and manageable. (Tobin, R. and R. Tobin 1997) however, at the same time they introduce a new level of complexity--and vulnerability--into emergency preparedness. Systems therefore need to be robust, complemented by adequate redundancy and back-ups, and above all user-friendly. Both designers and users should contribute to the process of achieving such goals.

DISASTER PLANNING AND EMERGENCY MANAGEMENT IN KENYA

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ABSTRACT

Disaster management involves dealing with and avoiding risks. Disaster planning and emergency management involves preparing for disaster before it occurs, disaster response and supporting, and rebuilding society after natural or human-made disasters have occurred. In Kenya any Emergency management include actions taken depend in part on perceptions of risk of those exposed. In Kenya Effective emergency management relies on thorough integration of emergency plans at all levels of government and non-government involvement. Activities at each level (individual, group, community) affect the other levels. It is common to place the responsibility for governmental emergency management with the institutions for civil defense or within the conventional structure of the emergency services. However, emergency management actually starts at the lowest level and only increases to the next higher organizational level after the current levels resources have been exhausted. In the private sector, emergency management is sometimes referred to as business continuity planning.

Key Words: Disaster Planning, Emergency Management and Kenya

INTRODUCTION

In the 1990s, particular strategic and physical circumstances led to the definition of the "complex emergency" in developing countries affected by the lethal combination of warfare, socio-economic breakdown and natural disasters. (Duffield, M. 1996) A good example is the current situation in Eritrea and northern Ethiopia, where large-scale population displacements, insurgency, drought and the injuries caused by landmines combine to make each day a disaster for local people. However, in the debate over such events it has been pointed out that all emergencies are complex to a greater or lesser degree Kirkby, J., P. O'Keefe, I. Convery and D. Howell (1997) Therefore, emergency planning and management are first and foremost about making sense of complexity. In industrialized countries, disasters have not merely become more common and more destructive, but also more complex. For instance, it has been suggested that despite measures to protect Florence against floods, and manage such events effectively, a repeat of the 1966 event would lead to worse effects than those experienced 35 years ago. The relentless accumulation of physical capital and the presence of 10,000 vehicles in the city centre would significantly complicate emergency operations.(Alexander, D. 2000).

The hard part of the planning process is no longer the estimation of physical forces and their distribution--the where, when and how much of floods or earthquakes, for example--but the prediction of consequences for the socio-economic system: complex patterns of damage, lost production, medical costs, compensation and liability issues, etc.(Ellson, R.W., J.W. Milliman and R.B. Roberts 1984)

Fortunately, powerful new tools have been developed to reduce complexity in disaster to manageable levels. But are they sufficiently well understood to be used effectively? Do we have enough consensus, training, funding, expertise and experience to benefit from the tools, or do they merely complicate emergency preparedness and distract attention from

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Successful schemes for involving the public require first a certain selectivity about which groups to work with and secondly the collection of information on the effectiveness of projects--i.e. feedback from the users. Publicity needs to be designed carefully and its impact evaluated in terms of the results it produces and knowledge it diffuses. Awareness of results is critically important: in the past, schemes to increase the level of public awareness of hazards have sometimes led to the diffusion of misassumptions. At the very least, public indifference is indicative of a failed publicity program.

In the past public information programs have failed for the following reasons:warnings that have not resulted in disaster;information about what is likely to happen, but not what steps to take when it does;vagueness about hazards and warning signs;conflicting orders and information;failure to involve the public in decision making, so that decisions are resented by those people who feel they have had no say in them and failure to observe local cultural norms, patterns of activity and ways of communicating (Southern, R.L. 1995).

All of these pitfalls can be avoided by adequate attention to the local context of public education programs and careful monitoring of their impacts.

The mass media: friend or foe?

The news media are critically important to awareness campaigns both during disaster and at other times. Research has given split results about the role of the media in disasters. The balance probably leans towards regarding them as irresponsible and unreliable (Goltz, J.D. 1984). though some researchers have shown how the media can be a vital part of emergency management if journalists are properly engaged (Scanlon, J., S. Alldred, A. Farrell and A. Prawzick 1985). In either case, disaster managers ignore or mistreat representatives of the news media at their peril: they cannot stop reports being published or broadcast.

Mass media cannot be co-opted in disaster. The best that can be hoped for is that they can be engaged constructively and induced to collaborate in the diffusion of correct information and the discounting of incorrect news. Treated as responsible they will usually rise to the challenge and behave responsibly. They must, however, be given adequate representation and facilities in emergency operations. Attempts to drive them away will only lead to negative reporting about the quality of emergency operations, and possibly the diffusion of misassumptions. This can lead to reductions in the degree of public cooperation with emergency authorities. Hence, many of the best emergency plans include chapters on managing the news media and treat this aspect as vitally important, which indeed it is. A useful primer on news media liaison during emergencies can be found at the U.S. FEMA website http://www.fema.gov/media/.

Conclusion

In summary, a good emergency plan is: generic (all hazards) rather than restricted to single hazards, written on the basis of carefully compiled scenarios of hazard, vulnerability, risk and impact, integrated with plans made by other organizations and levels of government. A process and not an end in itself--i.e. constantly updated, revised and tested. Linked to urban planning with the objective of reducing the "hazardousness of place" by land use control

through failure to recognize its importance. Ensuring that "perishable" information is collected when it is available (usually during the early phase of disaster).Learning to discriminate rapidly between valid and invalid information, useful and useless data, appropriate and inappropriate material. Learning to cope with information overload. Avoiding overdependence on computer technology and situations in which the available hardware and software determine the solution, rather than letting it be governed by the nature of the problem itself and developing a critical ability to recognize what is useful learning to interpret data in human and operational terms (Quarantelli, E.L. 1997).

Recent major disasters have spawned as many as 20 web sites each, (Hanshin-Kobe earthquake in Japan (1995) ,but this has not guaranteed that the free availability of information over the Internet actually improved their management, especially as no control was exercised over the quality, accuracy and usefulness of the information posted.

Nevertheless, information has become a very valuable commodity and much of commerce, banking and industry is now dependent on its diffusion by electronic means. Emergency planning must thus be extended to ensuring that information is part of the solution rather than part of the problem. Communications breakdown can lead to huge losses if money cannot be transferred electronically, orders cannot be fulfilled and customers informed about what they need to know in order to purchase goods and services. Information loss is therefore not just a risk for emergency management but also a significant and growing part of general disaster losses to be mitigated by taking precautions before disaster strikes.(U.S. National Research Council 1996).

Political acumen of the disaster manager

Modern courses usually involve teaching aspects of management science and psychology to trainee disaster managers. However, it is clear that such people will not only have to direct people under their control but also hold their own in the political arena. The disaster manager is, above all, a facilitator, whose job is to obtain the consensus that is necessary in order to innovate in the field of emergency planning and management. This requires knowledge of the legal, social and political consequences of decisions taken in times of quiescence and during emergencies, and to communicate effectively so that political hierarchies are convinced of the need for better civil protection systems.

However, both during emergencies and in the intervening times, the disaster manager should have a perception of the prevailing situation that does not exceed his or her command of the available resources (Alexander, D.E. 1999). Obviously, realism is the key ingredient. In addition, command structures need to be free of equivocality.

The challenge of involving the public in disaster mitigation and creating a culture of risk mitigation

Recent trends in emergency preparedness have demonstrated the importance of democratizing the field. People will not relate to disaster prevention if efforts are not made to involve them in it. Conversely, they need to be empowered and given some responsibility for their own safety. The assumption that civil protection is a matter exclusively for experts is both widespread and dangerous.

It is time to devise better standards and norms for emergency training and eventual certification. These should specify a minimum number of hours of instruction and define the content of courses. They should also specify the appropriate balance between of learning between theory and accumulating practical experience.
The increasing complexity of disasters requires that emergency responders be acquainted with many different aspects of the problem. Some 30 different academic and applied disciplines are involved, as well as many practical skills. According to Alexander, D. (1993),in the absence of adequate guidelines about what to study and how to go about it, the best strategy is to supplement one's knowledge by reading widely among the materials that are internationally available. Several World Wide Web sites offer guided reading, for example, the U.S Emergency Management Institute site http://www.fema.gov/emi/.

Theory should not be treated as inferior to practical experience, as it is, in the words of one expert in the field, the "road map" that orientates the disaster manager in times of confusion and uncertainty. Successful learning is marked by the realization that theory and experience qualify one another and render one another intelligible. This aspect will be explored further in the next section.

The gap between research and practice: the need for dialogue

Few disaster managers are regular readers of academic literature and few academics write up their research with disaster managers in mind as their primary audience. Academic writing is often abstract and laced with jargon, which legitimizes it to the peer groups who are its main readership but makes it unreadable by others. In any case, much of it is hidden away in publications that are not easily accessible to disaster managers. As a result, many useful applied research results have failed to come to the notice of the very practitioners who could benefit from them.
At the world level, several institutions are actively trying to combat this state of affairs. Paramount among them is the Natural Hazards Centre at the University of Colorado at Boulder, USA. This institution offers a well-furnished web site (http://www.colorado.edu/hazards/), three periodicals in printed form and one in e-mail format. Likewise, the Emergency Preparedness Information Exchange at Simon Fraser University in Canada (http://hoshi.cic.sfu.ca/epix/) is an important academic resource for emergency responders. So is Emergency Management Australia (http://www.ema.gov.au) and the Canadian Centre for Emergency Preparedness (http://www.ccep.ca/).

Dialogue requires that both sides demonstrate willingness to interact. Disaster managers must make their research needs known and identify gaps in their knowledge. Researchers must learn to communicate, without lowering the tone of their discourse, in ways that non-specialists can understand and benefit from. Both groups need their horizons widening and both must learn to listen more effectively.

Information management in an age of superabundant data

The paradox of information technology is that it vastly increases the quantity of information available but does not necessarily improve its quality. Thus we all need to evolve a survival strategy in order to cope with information management. This means: avoiding dependence on sources of vital information that could fail at critical moments, ensuring that essential information does not become archived or destroyed and thus lost

requires a strong dialogue between emergency planners, who can formulate scenarios for future events, and municipal planners, who can institute measures to restrict development in hazardous areas.

A second aspect refers to the possible role of urban planning in improving conditions for emergency management. Roads may need to be straightened, widened and cleared of obstructions to ensure either that evacuees can get away quickly or that emergency vehicles can arrive in minimum time. Emergency scenarios should identify critical nodes, points in the urban system that are vitally important to operations in disaster. These include hospitals, fire stations, emergency operations centres, assembly points, and also places where disaster may strike, such as floodable areas, unstable slopes or warehouses stocking hazardous materials. Urban design can do much to facilitate emergency management if this is explicitly incorporated into it.

The solution is to integrate emergency plans with urban plans as much as possible. It requires dialogue and cooperation between both sorts of planner, who must appreciate each other's terms of reference and problems to be solved(Britton, N.R. and J. Lindsay 1995).

The vertical and horizontal integration of emergency plans

Another common fault of emergency plans is that they are often written in isolation from one another. In Italy the prevailing legislation is vague about the relationship between plans at the municipal, provincial, regional and national levels. Provinces and regions have coordinating roles, but these are poorly specified. At the same time, there is no guarantee that municipal emergency plans will mesh with plans for factories, hospitals, airports, and so on. As disaster planning becomes more common, this problem is set to grow. The result is a vast area of potential conflict between the objectives and procedures of overlapping plans. This could lead to duplication of effort, or failures of communication between organizations, or other forms of inefficiency. In Italy, a municipality that is the seat of a COM during a national disaster may have as many as 37 desks for 9-14 different support functions, if one takes into account national, prefectural and municipal operations centres. The more such desks there are, and the more duplication of functions occurs, the more opportunities there are for failures of coordination and communication.

Municipal emergency planners should act as catalysts to stimulate disaster planning in other organizations, such as hospitals and factories. But there needs to be a high degree of compatibility and interaction between the planners and their plans. This will enable tasks to be delegated and will ensure that communication is effective between the organizations during emergency situations (McLaughlin, D. 1985).

The achievement and recognition of adequate professional standards

the current consensus is that emergency preparedness is not quite a profession (Drabber, T.E. 1988). Typically, those who practice it also have other jobs, or come from unconnected fields, to which they may well be asked to return. No adequate professional standards exist and no widely accepted protocols govern the content of training courses. Few academic institutions offer courses or degrees in emergency planning and management and there is, in any case, little agreement about exactly what an emergency responder ought to know. Furthermore, what training courses exist offer an exceedingly heterogeneous mixture of information and usually impose no control on the quality of instruction. The first result of this is that the knowledge levels and capabilities of emergency managers vary enormously, and the second is that both interchange and ability to learn from others are hampered by lack of compatibility and an agreed body of common knowledge (Neal, D.M. 2000).

b) The education system was concrete and pragmatic. It was acquired through total involvement and active participation.

c) It was a comprehensive system of education that transmitted relevant skills, knowledge, values and attitudes for development of the individual and his/her society (Kwasi Wiredu, 1980: 70)

The modern (formal) education does not seem to inculcate certain important values to learners. Think of what happens to our various sectors of the government, most of these sectors are headed by learned people however, on papers they never acquired certain core values in their training we read frequently of misappropriation of government funds, talk of nepotism, tribalism, name it these are common features in Africa and specifically, in Kenyan institutions of higher learning. All these vices take place in these institutions because there is something wrong in our educational system so I believe? This is one of the indicators of moral bankruptcy.

The form of education in our institution of higher learning does not seem to prepare someone adequately to be accountable in his/her place of work, it does not prepare one adequately in required skills to manage his/her affairs independently. This partly explains why most of our graduates are unable to sustain themselves in society. Parents are forced to come in to support them even when they are working because the type of education they acquired did not help them to be themselves ie to be self-reliant (Nyerere J. 1967:18). Ethics or morality has been perceived in purely religious forms. The author of this paper considers ethics to be crucial in education in the sense that ethics as Bennaars rightly observes "should define the character of education" (Bennaars 1986: IX)

The formal education today in our institutions of higher learning was modelled on the foreign system because no education system is culture free. Its objective was to develop a western type society with great emphasis on replacing indigenous values with the western values.

My contention in this paper is that our education system should not only enable students to read and write but also and more importantly should enable students to tackle problems they may encounter in their day to day endeavours. It should enable them to tackle issues of dependence, poverty, ignorance and other roles which have make Africa to lag behind in many spheres. This is case because as already mentioned earlier on, knowledge for its own sake is of no use to anyone more so to the Africans and by extension, Kenyans.

IMPROPER UPGRADING OF LEARNERS

The educational system in Africa has merely intended to push children through schools without training them to think about their society. Our educational system should not only aim at producing scribes, but it should motivate the young and the old to contribute to the development of their society. The content and form of our educational system should be able to promote the change needed at all levels of socio-economic independence. In view of the present economic depression afflicting developing countries such as Kenya, it is important to examine the present educational system in order to determine appropriate strategies for socio-economic reliance and development. From an analytical point of view, the traditional system of education provided practical and theoretical training for the learners.

geared towards understanding the nature of education offered in institutions of higher learning. The author of this paper has a strong belief that education in University should lead to integrity of character in the sense that proper education should be directed towards truth in the sense of unfolding the potentialities within the students. This is as it should be because knowledge for its own sake is of no use to anyone. What matters and what is useful to those who pursue knowledge is the search for truth – in a way that improve the human condition.

DISCUSSION

In Traditional African Society, education was acquired through the total involvement of the learner in the process of learning. In other words, students learned by living and doing things together at home, on the farm or in the bush with elders. In this way, they acquired the knowledge, skills, norms, values and attitudes of the society. It was a deliberate effort to perpetuate and reinforce social solidarity, accountability and homogeneity by establishing in the student from an earlier age the spirit of responsibility, self-reliance and the essential norms which collective life demand. This is something the model of education in institutions of higher learning does not seem to offer ie African traditional education intended to develop the child's character physical and intellectual skills to provide vocational training and to promote a healthy attitude to work. It further sought to inculcate respect for elders and for those in authority to foster a source of socio-cultural belonging and participation. This resulted in education being an integrated experience to the African child wholesome ie this education was highly functional in character oriented towards everyday life in a particular community. It stressed thereby practicality and participatory action (Nyerere J; 1967; Bennars 9; 1986, 41)

Hence, the traditional system of education was not given in established schools, Universities and so on. Both the learners and instructors lived and worked together in the same social environment according to sex and age. As can be understood, the question of mentorship was addressed in this form of interaction. Though the reality of imparting education has greatly changed since the introduction of formal education, the question of proper mentorship should be taken seriously if we are to prepare students who are to be future leaders in the various areas.

Therefore, from an analytical point of view, the traditional system of education unlike formal education provided practical ad theoretical training for the learners. For instance, students learning farming, hunting and other required skills by working in the farm, going to hunt with their elders who gave them proper direction on how to go about all these activities. This is the kind of academic, social, moral and political guidance that students in one way or other lack currently in the University education. In our University education, we seem to be producing robots or puppets machine like creatures.

In agreement to Bennars, scholars such as Kwasi Wiredu, Paulin Hountoundji etc, note that the characteristic of the traditional educational system were:-

a) It was community oriented; the goal of such education was the full development of the individual into a useful and considerate member of his/her society. The kind of education offered today seems not to take into serious consideration some of these important ingredients of education.

THE CHALLENGES OF UNIVERSITY EDUCATION IN KENYA

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INTRODUCTION

The issue of the relevance of University education has been dealt with in many forums. However, there still remain some aspects that have not been addressed or rather have not been taken seriously by the various institutions of learning. The word education has been defined differently by different disciplines. Conventionally, various dictionaries have defined education in various ways. But the Webster's Dictionary seems to define education more comprehensively and in line with my conception of right way of understanding education in the institutions of higher learning. This definition incorporates training, acquisition of skills and character formation.

However, a good deal of education at our institutions of higher learning today consists of memorizing and reproduction of the lecturer's materials. The main difficulty with this model of education is that it lacks practical skills, character formation and relevant training for survival in the society. Equally this model of education lacks a profound ethical grounding in the sense that it does not instil positive values in the students.

The paper contends that education in the best sense of the word should never become "indoctrination" but rather a form of bringing out the self in touch with its potentialities and opening the way for actualizing those potentialities.

The author of this paper is of the view that philosophy and more specifically, ethics must in the final analysis define the proper character of education in Kenya. It is the contention of this paper that students in Kenyan Universities and most African Universities require more than factual information on education. They must be encourages to reflect on whatever they are taught since reflection is a worthwhile endeavour in the whole process of acquiring proper knowledge.

In conclusion, the paper contends that quite a number of University students in Kenya, meander like rivers in their pursuit of education because they lack proper academic guidance and proper mentors to give them direction in their educational pursuit. In my view, what matters and indeed, what is useful in the pursuit of knowledge is the search for truth in a way that improves the human condition holistically.

THE IRRELEVANCE OF EDUCATION OFFERED IN INSTITUTIONS OF HIGHER LEARNING IN KENYA

This paper is informed by the kind of education encountered in our institutions of higher learning. Our model of education as mentioned earlier, leaves a lot to be desired. This kind of education makes a reflective mind raise some fundamental questions. For instance, what is the purpose of education in Universities in Kenya? Does the system and the curriculum that is followed have a meaning to the existential situation of the Kenyan? What role does philosophy and more specifically ethics play in University education in Kenya? Are people ethical foundations really authentic? All these questions plus others unasked above are

processes. A good emergency planner is well versed in the applied hazards literature, well versed in the political and legal implications of his or her work, a person who facilitates rather than commands, able to appreciate the connections between different disciplines and methodologies and able to work effectively with the public and news media representatives.

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For example, the Hanshin-Kobe earthquake in Japan (1995) and Hurricane Mitch in central America (1998), both of which spawned up to 20 websites.

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what kind of new knowledge is acquired? Your guess is as good as mine – nil. In such a situation, those who dare provide answers outside the lecture notes are penalized while those who reproduce the lecturer's notes are highly rewarded. In other words, creativity and application of answers to live situation is avoided. This approach discourages students from using their brain, reading and researching beyond classroom interactions. This to some large extent explains the reason why there is no culture of reading among some students in the University. They are just robots. This results in learning or rather reading for examination and not for the acquisition of knowledge. This equally explains to some extent why university as an institution has failed to provide mentorship role. The recycling of notes clearly explains the bankruptcy of research skills in the lecturers.

In my view, the University environment and leadership should be a place to be emulated in the way they provide service to the students and the public in general. Everything from toilets, lecture rooms, hostels, library and internet access, current books, journals, magazines and even the dailies should be the best, otherwise why call a University a centre of excellence.

From the above argument, the importance of mentorship cannot be underestimated. The youth are looking everywhere for examples to emulate but they seem to be rare.

CONCLUSION AND RECOMMENDATION

In conclusion, the youth cannot accomplish what they are expected to do and how to behave unless they have committed mentors and examples to emulate. It is through the wisdom and guidance of mentors that youth receive appropriate guidance and counseling on how to mould their character as future academicians for a better life for themselves and others in the society. Only then will the youth be able to make the right decision that will stir them from being misused and jeopardizes their lives as was evident in the post election violence in Kenya and elsewhere in the world. We are living in a complex world with a lot of influences. If the youth are not given proper direction and guidance in education, then the future of this country is in danger.

Institutions of higher learning have a pivotal role to play in all this as centres of excellence. In their struggle to address the above irregularities, institutions of higher learning can learn from traditional education. They need to provide regular forums to staff and students. They need to comply to ISO standards to maintain quality and more fundamentally, to adhere to University ethics.

To be able to address the delicate situation surrounding our current model of education in institutions of higher learning, we recommend that the type of education offered in these institutions should be founded on what John Githogo terms as "the sure and certain foundation of a wholesome education that caters to the intellectual spiritual and social needs of the mind, body and soul" (David Lutz and Paul Mimbi 2004: 23).

Two, the students may be accused of being unethical in the way they conducted themselves during this hard moment of the post-election violence. All these makes the author question the value of University education as that which is expected to instil in youth important core ethical values such as integrity, objectivity and more so, respect for others, their property and self-discipline.

It is my thinking that Universities should be able to instil character education focused on ascertaining universal values that are valid for contemporary and traditional societies and at the same time values consistent with the findings of socio-scientific research as well as moral traditions. Would it be true that the university education as G. A Bennars and R. J. Njoroge hold has lost its absolute character and operates on a moral vacuum? R. J. Njoroge and G. A. Bennars (:185)

Guided instead by rules of science, technology and rationalized economy, modern education appears to be amoral enterprise, concerned with objective facts ie facts verifiable by appeal to experience only. Within this context, education is seen as a means to an end rather than an end in itself.

If I may advance this argument further, today things have taken a different course in the name of technological advancement and globalization. Many young people have been abandoned and their interests and needs are not fully catered for due to absenteeism of parents or shortage of time together. All parental responsibilities have been left to teachers and lecturers in various institutions who also find themselves in compromising position to serve as appropriate mentors for the youth. Since they are equally busy people in search more money.

The lack of an education system in Kenya that assists to instil good moral and thus acceptable character has added to the burdens faced by the youth, primary, secondary and tertiary institutions. As mentioned above, the teachers and lecturers w ho are expected to guide and provide the youth with good role models fail to do so. In other words, some of the adults among them parents, teachers, lecturers and leaders do not behave, speak, think and act responsibly to serve as role models. At times, students do not respect lecturers because some of these lecturers do bad things as students. On this regard, I may stress on the following issues: often we hear, or read on papers about the issues of amorous behaviour between lecturers and students, this to me is a bad indication in as far as the moral character of such personalities, is concern we hear a lot of complaints from some circles of students on the issue of "sex for marks" in which lecturers are said to give marks in exchange for sex. This complicates the issue of academic excellence as the academically weak may be rewarded while the bright students are unfairly punished. This same behaviour may be advanced to administrators who demand sex for employment. The whole moral fabric has collapsed when things are handled in this manner.

As if this is not enough crime, the other area of great concern is on the method of teaching. The methods of teaching in some universities and setting of examination has been highlighted as a borne of contention. Some lecturers use the same notes over and over for several years down the line. Indeed it is possible that the notes used by some lecturers is what they themselves copied during the undergraduate of postgraduate studies. At the same time as argued earlier, students are expected to reproduce the lecturer's notes during examination. The problem of memorization takes centre stage. In such kind of scenario,

The concept of education as a capital good is linked with the concept of human capital, which attaches a high premium to human skills as a factor of production in the development process. This human skill or productivity is just as important an input in the process of development as finance, natural wealth and physical plant. The very process of learning to read and write should not be an end in itself but an acquired skill to overcome limitations brought by ignorance for better agricultural output, better health, better housing, better clothing, accommodation, i.e. the content and form of educational system should be able to promote the change needed at all levels.

Hence, the shortcoming of the current University education is particular, "the paper certificate" needs to be corrected so as to have a system of education which is integral. What we should aim at in education is what whitehead calls "students who possess both culture and expert knowledge" (Whitehead, 1962: 3). This is because the valuable intellectual development is self-development. We need an education which is oriented to the real needs of the community, an educational system that discourages the attitude of graduates moving from rural areas to urban centres in search of wage employment. In the recent past, the Kenyan government has spent a substantial part of her GNP on education, but the contributions of the educational sector to national development have been quite minimal which somewhat explains the irrelevance of the model of education in Kenya.

In this debate on the ineffectiveness of the education model in our institutions of higher learning, we cannot forget the impact of globalization as a factor. Globalization and limited funding have affected the manner in which knowledge is produced and disseminated. Diminishing resources for the Universities and loss of value for academic qualification, merit, etc have also exacerbated opportunism, corruption, mediocrity and politicization in academic circles. Liberation of the education sector has seen the mushrooming of the fly-by-night universities and scholars whose commitment to knowledge is suspect. All these ventures in search of monetary gains have greatly watered down the quality of research conducted in institutions of higher learning. To this paper, research is at least as important as education; when we are considering the functions of universities in the life of humanity. New knowledge is the chief cause of progress and without it the world would soon become stationary and the pursuit of knowledge, if it is utilitarian in financial understanding is not self-sustaining. Utilitarian knowledge needs to be fructified by disinterested investigation, which has no motive beyond the desire to understand the world better. All the great advances are at first purely theoretical, and are only after words found to be capable of practical applications. As Russell Bertrand notes "Even if some splendid theory never has any practical use, it remains of value on its own account, for the understanding of the world is one of the ultimate goods" (Russell Bertrand, 1976: 203).

All these views are intended to show the significance of research in the process of importing and wholesome and informed knowledge. But with the current teaching in institutions of higher learning, one wonders whether lecturers/professors have quality time for research given the fact that they are itinerary professors who rarely have time for quality research leave alone attending conferences. In connection with this pathetic scenario, one wonders if these same lecturers have any regard for ethical conduct in their profession! As with everything else, there is a price to pay, it is not easy to go against such a strong trend and well entrenched tide that does not value ethical conduct, yet we all know from history that it does not take a multitude to make the changes that affect all human

This noble collective effort did not and could not in any possible way have come about short of the spirit of Neighbourly Love biologically inherent in those three scientists at Harvard University to rise up and do all that they did in order to save their Humanity faced with this real threat of polio disaster.

Also, motivated by the same spirit of compassion (Neighbourly Love) to assist his endanged man already besieged by the plight of polio menace, Dr. Jonas E. Salk[iv] of the University of Pittsburgh, USA developed in the year 1953 the first successful polio vaccine. And, in the year 1955 Dr. Albert E. Sabin[v] of the University of Cincinnati, USA, also followed suit in defence of our Humanity. But, using a different method from that of his counterpart, Dr. Salk, Dr. Sabin successfully put in place a polio vaccine that could be taken orally (by mouth) against polio menance.

Since the time these various efforts emerged from the Centres of Wisdom and Knowledge such as Harvard University, University of Pittsburgh and University of Concinnati (all based in USA) on the strength of this spirit of Neighbourly Love inherent in all mankind in order to save the same Mankind from the on-going scourge of polio that was terrorizing man, **significant positive results have been witnessed globally against** polio. In the United States where the disease had crippled to the tune of 57,879 victims in the year 1952, this figure has drastically dropped[vi].

However, before these centres of Wisdom and Knowledge, got into this action against polio disaster in the late 1940's and the early 1950's, the USA President Franklin D. Roosevelt[vii], in his capacity as a victim of this polio menance became so sympathetically concerned about this disease and the future security of Mankind and particularly his American Nation. In 1927, he consequently founded the first effort so far in the World against polio called ***Georgia Warm Springs Foundation***. This effort later led to the development of the national Foundation for Infantile Paralysis in the year 1938.

The data further confirms that none of the human efforts against insecurities of disaster has been able to emerge and succeed short of the motivation coming from the spirit of Neighhourly Love. It is this spirit characterized by the feeling of sympathy, empathy and compassion for one's endangered fellow man and woman that naturally motivates and leads one to engage in such efforts.

The same reality holds time in man's drive today against the scourge of HIV disease that has to-date led to millions of death casualties. On the strength of this spirit of Neighbourly Love, various centres of wisdom and knowledge have mushroomed to forge out necessary means and ways of curbing HIV disease menance. Otherwise, no such centres and efforts would have emerged by chance short of this spirit of Neighbourly Love.

On the strength of this spirit, no single centre of higher learning world-wide lacks a team of learned persons focusing on the study of this HIV Aids pendamic. In the absence of this spirit, obviously no one would have been bothered by another person's plight caused by this HIV Aids disease globally.

(4) NEIGHBOURLY LOVE AND NON-CENTRES OF WISDOM AND KNOWLEDGE

2. PURPOSE

In view of all these strikingly nagging questions, the purpose of this study is self-explanatory.

The study seeks to meticulously critically and systematically examine the actual root-cause of this flabbergasting behaviour in man that is always naturally exhibited during an accident or any other situation constituting a tragedy or disaster but which is never perceived in non-tragedy or disaster situations.

3. METHODOLOGY

The working hypothesis in this study is simply that unlike in all other members of the Animal Kingdom, in Mankind, man possesses a unique in-born ingredient called a "Neighbourly Love" governed by a biological constitution which psychologically motivates him/her to behave as sympathetic and empathic as he/she always does toward his/her fellow man/woman whenever the latter is found to be in an agony of a tragedy or disaster. And, that this ingredient is limited to Mankind alone. And, finally that on the strength of this biological ingredient naturally built in Mankind, every man and woman alike is naturally duty bound by their biological constitution to behave compassionate, sympathetic, empathetic, peaceful, cordial, righteous, just, etc towards his/her fellow man/woman in life.

Thus, the aim and roadmap of this study.

II. FINDINGS

Throughout the history of Mankind[i], the latter is a perpetually potential victim of various forms of insecurities. Often, some of these insecurities do develop into serious agonies of disasters. And, while some of these disasters may be limited affecting only afew victims; others are usually very massive affecting a large population in one or many countries.

Because of these potential dangers facing Mankind, man neither usually depends on himself nor on the uniformed Forces alone for security. Also, man depends on non-uniformed Forces. Particularly, he depends on the Centres of Wisdom and Knowledge for salvation. These Centres are expected to provide goods and services in terms of either cures or preventive mechanisms. For instance, when Mankind was faced with a real threat of polio disaster that was taking toll of human life in uncountable number of victims globally, man resorted to these Centres as a saviour. But these Centres also had to depend on a human biological spirit of compassion called "Neighbourly Love".

(1) NEIGHBOULY LOVE AND THE CENTRES OF WISDOM AND KNOWLEDGE

Motivated by this spirit to rise up and do all that had to be done in order to save Humanity from a total destruction by Polio, an Australian Nurse, Sister Elizabeth Kenny, rose up and developed in the 1930's a unique scientific method for treating polio victims using hot wooden packs to relieve the muscle spasms and pain[ii] Thereafter, in the year 1949, three Harvard University bacteriologists named Dr. John F. Enders, Dr. Frederick C. Robbins and Dr.. Thomas H. Weller, also rose up and collectively developed a practical method on how to actually grow polio virus outside a human body. This collective scientific work at Harvard University enabled mankind to get a method on how large quantities of virus could be scientifically produced to make vaccines needed to fight against polio menace to mankind[iii].

and bitter about the victim's situation that they may even be at a climax point of weeping, moaning and hurriedly doing all sorts of emergency things aimed at assisting the victim even though they may or may not be related or familiar at all with the victim(s).

In a tragedy arising from a road accident, house fire, armed robbery or simply from one falling down while walking due to heart-failure or any other cause, many people can be seen rushing to the scene from different directions to offer every emergency assistance one may possibly want to do so.

Similarly, in the International System, the same phenomenon also holds true. Whenever a country is reported to be in a disaster caused by a civil strife, famine, flood, earth quake, rain storm, and the like, foreign governments and non-governmental organizations, private individuals and the like are naturally seen to be very sympathetically concerned about the disaster. Though they may be psychologically perceived so, physically, they are also perceived being armed with every form of emergency assistance to that Country. This assistance could be in the form of food, medicines, evacuation means to remove the victims to a safe haven, and other assistance. This assistance could be unilateral, bilateral or multilateral. Also, it could be governmental, inter-governmental or simply non-governmental.

Another striking phenomenon in this episode of emergency humanitarian assistance in a disaster is that every participant always appears very empathetic and sorry for the victim. No one is ever seen in a joyful mood celebrating the disaster with a view to mocking or rejoicing at the victim's calamity.

Further, the participants are always found to be coming from all walks of life, gender, ethnicity, race, political affiliation, religious inclination, etc.

Thus, the participants to the tragedy are naturally a collection of a people from all walks of life and beliefs.

In this regard, the burning question is: Why does this happen so? Why do people of all walks of life love rushing to a scene of accident, tragedy or disaster with a view to not just enabling their eyes to enjoy the situation drama but with a view to providing an emergency humanitarian aid to the victims?

What does man have in himself that psychologically drives him to behave the way he does during an emergency situation such as an accident or any other form of a tragedy or disaster? And, why do foreigners in the form of nation-states, governments, non-governmental agencies or simply individuals feel so psychologically touched and concerned about tragedies and disasters of other countries and begin rushing emergency humanitarian aid to that Country in question? Does the same also happen to non-human beings? But, from empirical experience, this phenomenon is limited to Mankind alone. And, it is universal and spatio-temporal free. It is blind to race, gender, country, religion or socio-economic status.

In this regard, then, the nagging question is **why** does man behave the way he does during such a situation? And, why is it universal?

ROLE OF NEIGHBOURLY LOVE IN DISASTER MANAGEMENT

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ABSTRACT

Neighbourly Love is a spirit of Humanism (i.e *utu*!), brotherhood, sisterhood, good samaritanism, compassion, sympathy, empathy, partnership, association, cooperation and those various positive sentiments of love and association inherent in man/woman towards his/her fellow man/woman in all sectors of life. Though it varies from one individual to another, it is the natural engine biologically enshrined in mankind that drives one individual to seek and engage into inter-personal, inter-community and inter-national relations globally. It is the leading force that makes man a *homo societicus* (i.e, a social animal). And, in all circumstances, it is the engine that cannot and will never allow one to have a sound sleep whenever a neighbour is in distress of disaster. Because for this reason: and due to the fact that man is always faced with prevalent multi-insecurities globally that at times often lead to untold agonies of disaster to his life and environment, man usually depends on his fellow man's compassion in society for security. Consequently, man receives various forms of emergency humanitarian assistance from both uniformed and non-uniformed forces in society. But, in both cases, the fact is that man cannot receive such assistance by chance. He does so by virtue of a neighborly love spirit biologically inherent in man. It is by this spirit that each man and woman alike in society is motivated to assist his fellow man whenever and wherever the latter is faced with disaster. And it is by this spirit of compassion that various forms of uniformed and non-uniformed forces have mushroomed globally readily armed to wage war against every form of disaster. And while some are local others are international. But in the final analysis, each is motivated and guided by this natural spirit of neighborly love. None of them is motivated by the greed for wealth accrued from their intervention. Such sentiments or propensity would be totally inhuman lacking *utu*. Accordingly, this study establishes that Neighbourly Love is a unique spirit biologically endowed to Mankind by the latter's Maker to enhance friendliness, brotherliness, compassion and all other forms of mutual relations between and among individuals and nation-states alike in life. Guided and dictated by this biological constitution, Neighbourly Love, therefore, plays a significant natural role in Disaster Management as it is the one that naturally influences and leads one to exhibit a sense of compassion toward one's fellow man/woman whenever the latter is perceived to be faced with danger of a disaster. Also, it is the same natural ingredient in man and nation-states that influences and leads them to abstain from anarchy and instead live in a state of peaceful co-existence, Good Samaritanism and The Rule of Law and Justice as *homo societicus*.

INTRODUCTION

1. PROBLEM

In every culture, human community society or country, it is always a common practice for an individual or group of individuals to be seen rushing to a scene of accident, tragedy or disaster to immediately assist the victim(s). Some of these individuals may be so concerned

deemed international. Such property shall be used in common by every other nation state(s) both nearby and distant without any discrimination[xv]. And, in case of any disaster, each nation-state shall be deemed responsible to provide every needed aid possible.

Because of this legal provision by International Law, envisaged in such a property such as fishing, passage, etc is expected to be enjoyed in common on the spirit of this Neighbourly Love inherent in Mankind. This is why hthe East African Nation-States from where River Nile Waters comes are eagerly advising their African Sister Nation-State of Egypt to recognize this fact for a common interest so that each should cheerfully use the Nile River waters at ease without any element of monopoly that could likely lead to relative deprivation and eventually conflict.

III CONCLUSION

In the final analysis, Neighbourly Love Spirit is neither acquired nor made. It is inherent in every man, woman, community, nation-state, etc. It is the sole natural engine that guards and guides inter-personal, inter-group, inter-community, inter-ethnic, inter-racial, inter-gender, and al other inter-relations between and among humanbeings. It is spatio-temporal free. And, is totally blind on the question of race, gender, religion or religiosity, party politics, etc. It is totally immune to all the above in that it is a servant of all in all cases of disasters.

This is why during emergency situations such as The Rwanda Catastrophe of 1994, many governments and non-governmental organizations including individuals alike from both within and outside Africa lamented and moaned for Rwanda. And this is also why lots of various emergency humanitarian aid overflowed into Rwanda in a biggest way possible to assist the victims. All races participated in the Catastrophe with a view to giving whatever emergency aid they could afford to give, eg., blankets, clothings food, medicines, safe haven, etc.

The reason of all this successful noble humanitarian assistance to disaster victims was and is simply because of the presence of this Spirit of Neighbourly Love in Disaster Management globally.

Without it, nothing of the sort could be seen in life. Man and Nation-States alike would be living in a state of anarchy, self-seeking, etc without any sense of compassion to each other during emergency situations of disaster. It is the Mother of all Human Co-operations and partnerships in programmes such as Disaster Management Programme in that it is the womb in which all such programmes are conceived and born for the benefit of Mankind globally.

FOOTNOTES

[1] See for example, T. Walter Wallbank, Alastair M. Taylor and Nels M. Bailkey, Civilization: Past and Present, Chicago: Scott and Company, 1962; Diana W. Darst, Western Civilization To 1648, New York; McGraw-Hill Publishing Company, 1990; and Agola Auma-Osolo, Cause-

mandated to police over World Peace and Order enshrined in this Spirit of Neighbourly Love. And, in 1948, it also led to the creation of The Universal Declaration of Human Rights reinforcing The UN Charter's vision and mission against War disasters.

Both The Preamble of The UN Charter and the latter's Principles and Articles are an embodiment of this Spirit of Neighbourly Love in the sense of their vision and mission for the United nations vis a vis conflicts and other causes of disasters to Mankind and the Environment. But, by the end of the War, Europe, which had been the real centre of the battles, was so extensively devastated and faced with poverty and inflation caused by the impact of the War, that the American People, on the strength of this spirit of Neighbourly Love, could not afford to sit back at home and leave Europe starve to death! Inasmuchas they had been forced by this Neighbourly Love spirit to intervene in the War and save Europe from a total destruction, similarly, they were also forced by the same compassion to intervene and save Europe further with all kinds of emergency humanitarian assistance that would lead to European Recovery. To do so, they cut down on their domestic spending in order to use the savings on this assistance. But, since the War victims' needs were now so intensive and extensive that a mere petty assistance programme could not have managed, a comprehensive Marshall Plan was put in place for the reconstruction and rehabilitation of Europe. It consisted of both immediate and long term recurrent and development humanitarian assistance; and was systematically managed using all necessary means including airlift where other transportation means had proved logistically difficult.

All this was neither being done by chance nor for political or ideological ends. It was done on the strength of this concept of Neighbourly Love inherent in all Mankind. Other than this, all other factors would be spurious.

But the Spirit of Neighbourly Love does not only serve in those situations highlighted above. It is also alive in all other situations of disasters, both globally and nationally.

It serves in situations of terrorism[xiv] whereby victims are either chosen randomly as targets of opportunity or chosen selectively as representative or symbolic targets to serve as message generators to the general public locally or globally on behalf of the terrorist(s). In this, the Spirit is also very active indeed.

In the 1998 Nairobi and Der-es-Salaam bomb blasts by terrorists, Neighbourly Love triggered everybody both locally and globally to condemn the action and to seek every ways and means of providing Emergency Humanitarian Assistance to the victims.

The same public outcry and Emergency Humanitarian Assistance were also experienced during the September II 2001 Terrorist Attack on The USA territory seriously damaging The Twin Tower and The Pentagon and causing lots of death toll and injuries.

Obviously such public outcry from both at home and the International Community could not have been possible short of the role of The Spirit of Neighbourly Love inherent in all Mankind without discrimination.

Further, by virtue of the significance of the role of this Spirit in Mankind, International Law emphasizes that all air space, territory, sea, oceans, rivers, straights, Lakes, hills or mountains, islands, etc that are not within a nation-state's territorial jurisdiction(s) shall be

This Treaty is a living testimony of the significance of this Spirit of Neighbourly Love in International Relations as a motivating ingredient in Mankind toward peaceful co-existence and avoidance of conflicts that usually lead men and nation-states alike into disasterious effect to man and the environment. It is the foundation of all peace treaties, pacts and agreements we have today in the International Community. Had it not been due to the role of the Spirit of Neighbourly Love in Mankind, obviously, neither of the two parties to the Treaty could have thought of entering into this Treaty. And, a as result of the significance of this Spirit of Neighbourly Love's presence in Mankind, every war or conflict that arises in the International System always triggers the attention and concern of the International Community demanding ceasation of hostility and willingness of the parties to come to a round-table peace talks for settlement.

This reality manifests itself in various cases since the time of the Thirty Years War among the European Communities that was settled by The Peace Treaty of Westphalia in 1648 leading to the birth of the present nature of nation-states constituting our International Community.

After this Peace Treaty of Westaphalia, the same Spirit of Neighbourly Love also led to the settlement for another likelihood of conflict among European nation-states scrambling for colonial and territorial occupation of Africa. By virtue of this Spirit of Neighbourly Love which had led them to come to a Westphalia Peace Treaty after their Thirty Years War, the same Spirit also led them to settle their differences peacefully. They consequently agreed to do so using a Berlin Conference for the Scramble for Africa in which they all mutually agreed to divide Africa among themselves by The Berlin General Act of March 1985 in lieu of shedding blood among themselves.

After this evidence, we also come across the situation of The First World War that started in 1914 among the same European nation-states due to their mutual disagreement among themselves arising from Prussia-German's dissatisfaction with the decision of The Peace Treaty of Westphalia on who should own Alssacre Lorraine District whether France or Prussia-Germany.

Again this Neighbourly Love Spirit did play a very significant role by motivating all parties in Europe to this War to come to a peace settlement in 1918. And by 1919, a Treaty of Paris also known as The Peace Treaty of Versailles was constructed embracing this Spirit of Neighbourly Love in the Covenant of The League of Nations. This was immediately followed by The Brian-Kellogg Peace Pact of 1928 reinforcing The League Covenant's vision and mission founded on this Spirit of Neighbourly Love against War disasters.

But since this Treaty had not solved fully the pending issue of the Alsaccre Lorraine which had been the root-cause of World War 1, the same again became the root-cause of World War II that erupted in 1938 by the initiation of the same Germany.

Again, on the strength of the presence of this Neighbourly Love Spirit inherent in Mankind globally, the United Sates of America had to now intervene and force the belligerents to end the War most particularly Germany and the latter's partners (Japan and Italy).

On the strength of this Spirit, the War was finally brought to an end by The Treaty of San Francisco in 1945 that also led to the creation of The United Nations as a World Body

for the victims of War disaster and because of the impact of the roll of this Spirit of Neighbourly Love in Mankind, various other relief entities have equally emerged at global, regional and national levels to cater for victims of both man-made and natural disasters.

In Kenya for example, we have The Kenya Red Cross whose offices are strategically situated in each region of the Country and have been confirmed doing a very significant humane job caring for the wounded during the 1982 Arbortive Military Coup d'etat and the recent 2007 Post-Election Violence.

And, in the East Africa Region, we also have various regional relief agencies to provide emergency protection to the Region. These agencies include, for example, Desert Locust Control Organization for Eastern Africa (DLCO-EA) whose mandate is to control the rise and spread of crop pets viz desert locust, army worm and quelea quelea ; Inter-Governmental Authority on Development (IGAD) whose mandate is to provide mechanisms for conflict disaster management wherever and whenever a conflict arises; and East African Community whose mandate is to facilitate peace and econo-political integration as a peaceful means of containing man-made disasters in the Region.

But becaue man-made disaster is not limited to conflict situations, more rules have also been formulated and put in place by various states to regulate man's activities toward natural environment such as water, air and forests during war time[xi]. The most prominent one is the Kyoto Protocal formulated to regulate emission of dangerous green gas by major industrial states.

Although some major powers such as the United States of America have been reluctant in signing it, most nation-states have already done so. These major powers still appear reluctant simply because they are worried of the future of their industrial stakeholders and the labourforce involved in those industries lest the latter are forced by the protocol to shut down and wind up their businesses due to pollution caused by their green house gases.

But by virtue of also being concerned for the survival of one's neighbour, all these super powrs who have not yet signed the Kyoto Protocol against industrial pollution, are also caught up in a dilemma of whether to sign or not. And, if they cannot do so, whether they are able to respect their dignity and total conscience.

Another most paramount evidence of the significance of Neighbourly Love Spirit in Mankind is manifested in the area of International Relations whereby, the data shows very vividly the manner in which each nation-state, as primary actor in the International System is not only expected by International Law to act **humanely** toward each other as moral human beings but also how they all actually do so on the strength of the Neighbourly Love Spirit inherent in Mankind globally[xii].

The data further shows that by virtue of this Spirit, the Hittite Regime based in Babylon during the Ancient Age was motivated to rescind its war of aggression against its neighbour, Ancient Egypt in the year 1284 BC. Consequently, the two regimes entered into a bilateral peace agreement, Egypto-Hittite Treaty of Non-Aggression, in 1284 BC encouraging the two to continue living in a peaceful co-existence as good neighbours for their mutual future[xiii].

Effects of Modern African Nationalism on The World Market, University Press for America, Lanham, 1983, Chapter II

[ii] The World Book Encyclopedia, Vol. 15, Chicago: Field Enterprises Educational Corporation, 1973, pp. 552-553.

[iii] Idem

[iv] Idem

[v] Idem

[vi] Idem

[vii] Idem

[viii] See: The International Committee of The Red Cross: What it is, What it Does, Geneva: ICRC Publications, Sep. 1993

[ix] Frederic Maurice and Jean de Courten, ICRC Activities For Refugees and Displaced Civilians, International Review of THE RED CROSS, Geneva, January-February, 1991, p. 13.

[x] The International Committee of The Red Cross: What It is, What It Does, op.cit. n.8, p.8

[xi] Michelle Schwartz "Preliminary Report on Legal and Institutional Aspects of the Relationship between Human Rights and the Environment", Geneva, August, 1991, p. 11 and Antoine Bouvier, "Protection of the Natural Environment in Time of Armed Conflict", International Review of The Red Cross, November-December 1991, p. 567.

[xii] L. Oppenheim, International Law: A Treatise edited by H. Lauterpacht, NewYork, David McKay Compaq Inc., 8th Ed., 1967., pp. 451-635.

[xiii] Diane W. Darst, op.cit., note no. 1, pp. 28-29.

[xiv] To-date, a number of both Political and other Social Scientists have successfully managed to explain the genesis, tools, weapons, dynamics and impact of terrorism, on Humanity and the Environment: how the phenomenon is skillfully planned and executed; how it flabbergasts and traumatizes a targeted population with bloodshed; and how it immediately attracts sympathizers from all corners of the World to rush to the scene and humanely assist the victims. Unfortunately, this biological agent inherent in mankind, "Neighbourly Love", and which is actually the very one primarily responsible for man's humanitarian rush to victims' scene of disaster, has always evaded, their recognition. But for an in-dept understanding of the cause-effects of the phenomenon, see for example: Bruce Hoffman, Inside Terrorism, New York: Columbia University Press (1988); Alex P. Schmid, Definition of Terrorism, New York: Columbia University Press (1988); David Rapopport, "Fear and Trembling: Terrorism in Three Religious Traditions", American Political Science Review, Vol. 78, No. 2 (Sept., 1984) pp. 668-672; Walter Laqueur, The New Terrorism: Fanaticism and Arms of Mass Destruction, New York: oxford University Press (1999).

[xv] See for example, Hugo Grotius 'treatise, Marc Liberum (1608), and its full account on this issue in L. Oppenheim, op.cit. note no. 12, pp. 584-585. In defence of this Neighbourly Love spirit inherit in International Community, International Law experts have emerged overtime clarifying the rights and duties of both nearby and distant neighbours to engage in mutual trade and commerce with each other for their national interest(s) without any restriction(s) by another or other country(ies). The forerunner of this noble crusade was Hugo Grotius who in 1608 saved Humanity from War disasters arising from the absence of an International Law clarifying this situation. In his Marc Liberum (1608), he clarified the illegality of claims such as Spain's and Portugal's intended monopoly maritime sovereignty claim over the Pacific and Indian Oceans respectively which Spain had in 1580 angered Queen Elizabeth of England so much that her Country was forced to retaliate against Spain leading to the famous Armada War of 1588 in which England was able to permanently contain both Spain and Portugal from such maritime sovereignty monopoly tendencies.