THE ROLE PLAYED BY PRINT MEDIA IN LAW ENACTMENT: A CASE STUDY OF THE BIOSAFETY LAW IN KENYA

BY

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DECLARATION

I, **WANDERA OJANJI,** do hereby declare that this project is my original work and has not been presented for a degree award in any other university.

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K50/72204/2008

Signature.....

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This project has been submitted with my approval as the University Supervisor

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DEDICATION

I dedicate this project to my family, particularly so, my beloved children, mother, father and friends who have always been there for me.

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I am very grateful to my Supervisor, Dr Peter Onyango, for his continuous guidance and direction throughout the writing of this thesis. Special thanks to Dr Hezron Mogambi who tirelessly and patiently offered guidance and identified my supervisor, after passing on of Dr Peter Oriare (may God rest his soul in Peace) with whom we started off with my project.

CONTENTS

ABBREVIATIONS AND ACRONYMS

ABSF : African Biotechnology Stakeholders Forum

AG : Attorney-General

CIC : Commission on Implementation of the Constitution

CBD : Convention on Biological Diversity

COP : Conference of the Parties

ELM : Elaboration Likelihood Model

GDP : Gross Domestic Product

GMOs : Genetically modified organisms

GoK : Government of Kenya

HDI : Human Development Index

KLRC : Kenya Law Reform Commission

NCST : National Council for Science and Technology

UNEP : United Nations Environmental Programme

ABSTRACT

The Biosafety Act 2009 is an Act of Parliament that regulates activities on genetically modified organisms (GMOs), facilitates responsible research and commerce in genetically modified products through a transparent science-based and predictable process.The Act is a fundamentalinstrument to comply with requirements of the Cartagena Protocol on Biosafety and safeguards Kenyans against unintended use of GMOs. This study investigated the role the print media played in the enactment of the biosafety law in Kenya. In particular, it sought to establish whether the print media fulfilled its obligation to delivering to the citizen full, complete and accurate information on, and interpretation of biotechnology, the Biosafety Bill and the process of enacting the Biosafety law. The study objectives were to: determine print media coverage of biotechnology in Kenya before the enactment of the bill; and determine the role the print media played in enacting the Biosafety Act. In order to determine the role of the print media in enacting the Biosafety Law in Kenya, this study analyzed quantitatively and qualitatively the coverage of biotechnology issues by the Nation Newspapers (*Daily Nation, Saturday Nation* and *Sunday Nation*), its sister weekly newspaper, the *EastAfrican* and The Standard (including Saturday and Sunday editions) over a period of 12 months from 1 November, 2006 to 30 November, 2007. Biotechnology articles were identified, counted, measured, read and categorized. The unit of observation and analysis was the published article in the papers. The articles were analyzed for prominence (area and placement), kind of story (whether hard news, features, commentary, opinion, analysis) and content of the story (balanced, fairness, and accuracy). The study reveals that the print media in Kenya contributed to the enactment of the Biosafety Act. It played a significant role in shaping public opinion and trust in biotechnology. It was instrumental in defining what the general public understands about the technology, and at the same time provided the environment by which public opinion was formed about what is oftenperceived as controversial if not contentious issue. Through the news articles, the print media served an important source of informal learning and contributed to how citizens and the legislators reached judgments about the complexities of science and technology and policy debates.

CHAPTER 1: INTRODUCTION

1.1 Background Information

Kenya: an overview

The Republic of Kenya is a sovereign state in East Africa. Kenya lies on the equator with the Indian Ocean to the south-east, Tanzania to the south, Uganda to the west, South Sudan to the north-west, Ethiopia to the north and Somalia to the north-east. Kenya covers 581,309 km^2 and has a population of about 44 million by July 2012.Kenya's climate varies from tropical along the coast, to temperate inland, to arid in the north and northeast parts of the country.The country has two rain seasons: long rains season that occurs from March/April to May/June and the short rains season that occurs from October to November/December.

Although Kenya is the biggest and most advanced economy in east and central Africa, it is still a developing country with a Human Development Index (HDI) of 0.519 (World Bank), putting the country at position 145 out of 186 – one of the lowest in the world with about 38 percent of Kenyans living in absolute poverty.

The agriculture sector

The agricultural sector is the mainstay of the Kenya's economy. The sector directly contributes 24 percent of the Gross Domestic Product (GDP) and 27 percent of GDP indirectly through linkages with manufacturing, distribution and other service related sectors. Approximately, 45 percent of Government revenue is derived from agriculture, which contributes over 75 percent of industrial raw materials and more than 50 percent of the export earnings. The sector is the largest employer in the economy, accounting for 60 percent of the total employment. Over 80 percent of the population, especially living in rural areas derives

their livelihoods mainly from agricultural related activities. Due to these reasons the Government of Kenya (GoK) has continued to give agriculture a high priority as an important tool for promoting national development.

Application of modern biotechnology in Kenya

Although Kenya has not yet commercialized genetically modified organisms (GMOs), research on development of GM crops is at an advanced stage.It is worth noting that Kenyan farmers have increasingly adopted tissue culture-derived products, while plant breeders are using molecular breeding techniques to develop improved varieties of crops and animals. Research and development on crop biotechnology has been on-going in public research institutions with encouraging results. And it is only a matter of time before the crops or products are on the market with the enactment of the Biosafety law and the gazettment of the subsequent regulations governing the handling of GMOs in the country.

Resolving risk using law: Challenges and risks that support/necessitated the enactment of the Biosafety Act

The expanded use of agricultural biotechnology, however, has been met with considerable debate. Consumers, public interest groups, the news media, producers of organic or specialty products, and other stakeholders have voiced concern about possible environmental, human health, animal health, and food safety risks associated with genetically modified organisms. These concerns have translated into increased pressure on regulatory agencies worldwide to ensure the safety of crops and animals generated through biotechnology with regards to the environment, human health, and biological diversity (USDA/NIFA, 2013).

The Biosafety Act 2009 is an Act of Parliament that regulates activities in genetically modified organisms, facilitate responsible research and commerce in GM products through a transparent science-based and predictable process.The Act is a fundamentalinstrument to

comply with requirements of the Cartagena Protocol on Biosafety and safeguard Kenyans against unintended use of genetically modified organisms (GMOs) especially transboundary movements.

Specifically, the objectives of the Act are to:

a. Facilitate responsible research into, and minimize the risks that might be posed by genetically modified organisms;
b. Ensure adequate level of protection for the safe transfer, handling and use of genetically modified organisms that might have an adverse effect on the health of the people and the environment; and
c. Establish a science-based and predictable process of reviewing and making decisions on the transfer, handling, and theuse of genetically modified organisms and related activities.

Kenya's obligations under international treaties

The origin of biosafety laws in the world can be traced back to 1996 when the Convention on Biological Diversity (CBD) established an Open-ended Ad Hoc Working Group on Biosafety to develop a draft protocol on biosafety, specifically focusing on transboundary movement of any living modified organism resulting from modern biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.

On 29 January 2000, the Conference of the Parties (COP) to the CBD adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. The Protocol protects biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. The Protocol entered into force on 11 September 2003.

However, the roadmap to the protocol could be traced back to 1970s when the idea of a law to regulate the biodiversity was mooted, after it was established that genetically modified foods were inevitable if the world was to tackle the food problems. From late 1980s and the beginning of 1990s a global framework was developed, with the negotiation process for a biodiversity convention taking place between 1989 and 1992. Finally, the Convention on Biological Diversity was adopted in May 1992 in Nairobi and was opened for signature in Rio de Janeiro on June 5 the same year at the United Nations Conference on Environmental Development. It entered into force on December 29 1992.

In 2002, Kenya made history by becoming the first country in the world to sign the Cartagena Protocol on Biosafety. It subsequently ratified the Protocol in 2003. With the ratification, Kenya had agreed to be legally bound by provisions of the Protocol and had to comply with obligations stipulated in the instrument.

Consequently, Kenya was required to enact a biosafety law and develop implementing regulations in order to fulfill and comply with the objectives of the Cartagena Protocol on Biosafety. It is envisaged that a comprehensive biosafety legal framework strikes a balance amongst ensuring the development of biotechnology, protection of the environment and safeguarding the interests of consumers. Potential risks associated with application of modern biotechnology are minimized while facilitating the beneficial application of the technology in areas of agriculture, health, environment and industry. Appropriate legislation and a strong regulatory framework are also important in developing public confidence in biotechnology as a technological option.

Media in Kenya

There are more than 90 FM stations, more than 15 TV stations, and an unconfirmed number of print newspapers and magazines in Kenya. There are five major Newspaper publishing houses in Kenya: Nation Media Group that publishes *Daily Nation, Sunday Nation, Saturday Nation, the EastAfrican, Taifa Leo,* and *Taifa Jumapili;* The Standard Group that publishes *The Standard, Sunday Standard, Saturday Standard,* and *County Weekly;* Mediamax that publishes *The People,* and *Sunday People;* and Radio Africa Group that publishes *The Star.*

Role of media in development in Kenya

During the debate on nationalization of Kenya Broadcasting Corporation in 1964, the government acknowledged the role of the media in development. Achieng' Oneko, the then Minister for Information, Broadcasting and Tourism stated, "We want to use them [media] to educate our people, to popularize government programs, and our people's activities, and generally, to keep the people of this nation adequately informed." Tom Mboya, the then minister for Justice and Constitutional Affairs added, "The government intends to use the Voice of Kenya for the purposes of building, strengthening, educating and consolidating the new nation of Kenya and educating its citizens to understand their duties, their responsibilities, their privileges, their opportunities, and the role that they can play in making that nation what we want it all to be."(Makali 2003: 90).

Alluding to the power of the media to educate and inform, Makali (2003: 18) argues that it is a folly to expect ignorant citizens to govern themselves, or uninformed people to protect their own rights. It is a right to be informed because it is from collective wisdom that people govern themselves intelligently.

1.2 Problem statement

Onyango (2010: 32) notes thatthe role of the media in Africa is something that has not been ascertained. He argues that while the media has been integral to political, economic and cultural processes in the western world, it has not been the case in Africa for the following reasons: poorly developed, small circulation reaching mostly urban populations, low literacy levels, and undercapitalization of media systems.

Onyango (2010: 33) further argues that contrary to the desires of the media and development advocates, the media in Africa is used more for its entertainment value than its ability to inform or to teach people how to improve their living standards. He argues that most mainstream media, which are dominant in Africa, hardly contain the so-called development programs. Instead they carry promises of development by politicians and threats against "elements bent on destabilizing the nation." He warns that the insufficient attention to the role of the media in the African development process causes an act of oppression and restrictions that render media less influential in the sub-Saharan region.

1.3 General objective

This study therefore investigated the role the print media played in the enactment of the biosafety law in Kenya. In particular, it aims to establish whether the print media fulfilled its obligation to deliver to the citizen, full, complete and accurate information, and interpretation of biotechnology, and the Biosafety Bill and the process of enacting the Biosafety law.

1.4 Specific objectives

i. Determine print media coverage of biotechnology in Kenya before the enactment of the bill.

ii. Determine the role the print media played in enacting the Biosafety Act.

1.5 Rationale and justification of the study

The diverse scientific, political, economic, ethical, cultural, and even religious viewpoints have made agricultural biotechnology a recurring and contentious public issue. Such a scenario has polarized interested publics or stakeholders of agricultural biotechnology resulting in confusion of mixed messages from scientists, academics, activists, industry and consumers. Conflicting ideas and opinions have brought into focus different technological and social dimensions that divide, not only stakeholders but countries as well.

The media, as Makali (2003: 29) argues, has the power to control and direct people's attitudes. He notes that there are two kinds of influences to consider: direct appeals (like propaganda), and the more general impact of the media as they circulate daily among the people. Sometimes, the influence of the media may lie not in the content but in what they leave out and in the attitudes that they adopt on dubious and sometimes hypocritical grounds. The media may not pronounce a profound propagandist effect but they can applaud a set of stereotyped opinions and prejudices that hinder or promote the process of opinion shaping.

Makali further argues that if the citizen has the responsibility to inform herself or himself of the merits of current issues, the Press has the responsibility, as do other media of mass communication, of informing the citizens and making available to him such materials as willmake him arrive at sound and rational conclusions on public affairs.

As Pheroze Nowrojee aptly puts it in his forward in Media Law and Practice (2003: ix), the Media can be a double-edged sword, strengthening or weakening the infrastructure of ideas.

It is therefore important to determine the media influence in the process of enacting the biosafety law in Kenya.

Lack of or negative publicity can jeopardize projects in the public sector that respond to specific local demands and destined for local markets. It is indeed widely acknowledged that responsible adoption of modern biotechnology can be hampered by lack of accurate, reliable information, knowledge and awareness at all levels of society. Knowledge sharing initiatives allow policy makers and key stakeholders to make informed decisions for enhancing the acceptance of and use of modern biotechnology.

Public support is crucial if a technology is to be accepted and adopted by those who stand to benefit from it. Hence, media reporting is an important component of the technology generation and utilization continuum.

By processing and synthesizing the lessons learnt, it is possible to generate principles that can be used to improve media strategies as well as better understand the societal environment favorable for passing legislation of similar technological innovations. These experiences are useful for predicting parliamentary systems behavior, analyzing communication problems and identifying appropriate strategies for effective lobbying of science and technology bills.

1.6 Definition of key terms

Article

A story published in the print media

Bill

A proposed law yet to be debated and passed in parliament

Biotechnology

Broadly defined, biotechnology is a collection of scientific methods that use living things to make useful products, improve plants or animals or develop micro-organisms for specific uses. Scientifically, the Convention of Biological Diversity defines biotechnology as: *any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use*.

Biosafety

This is the avoidance of risk to human health and safety, and to the conservation of the environment, from the use for research and commercialization of GMOs.

Gene

A segment of the chromosome and the unit of heredity transmitted from generation to generation during sexual or asexual reproduction.

Genetic engineering

Also known as genetic modification, genetic engineering is a technique of identifying and extracting genes from an organism and inserting into another unrelated living organism to give it useful and desired characteristics or traits.

Genetically modified organisms (GMOs)

Any living organism that has a gene or genes inserted or added in it through genetic modification.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Awareness and understanding of biotechnology

Few subjects get more attention in agricultural circles these days than genetic engineering – the technique of removing, modifying or adding genes from one unrelated organism to a plant variety for the purposes of conferring desired traits in the genetically modified organism (GMO).

Genetic engineering has indeed divided opinions not only in Kenya but globally. There are those who see genetic engineering as a biological revolution – the agricultural equivalent of "Star Wars" - with untold potential benefits for agriculture and society as a whole.

Proponents of modern biotechnology argue that genetic engineering has the capability to resolve or mitigate many of the most critical problems facing agriculture: conservation of natural resources, enhanced productivity to maintain the profitability and competitiveness agriculture in world markets, amelioration of environmental pollution resulting from high-tech production systems, elimination of plant diseases, insect control, new product development, and many more (Farrel, 1987: 2).

Navarro et al (2011: 1) believe that of the many agricultural technologies, biotechnology has the greatest potential in contributing solutions to problems facing agriculture today and in the next decades. They argue that biotechnology applications have resulted in the development of new crop varieties with better adaptation, improved traits, and tremendous impact on production systems. The broad applications of biotechnology in agriculture, specifically in

crops, include the development of disease diagnostic kits, biofertilizers and biopesticides, use of molecular markers, tissue culture, and genetic engineering for varietal development.

Navarro et al (2011: 2) further note that with molecular breeding and genomics and the ability to mine these for important traits or parental lines, there is still a lot of possibilities and options in developing varieties that will significantly allow greater productivity and address the various challenges in crop production given the current constraints in land and water resources for agriculture.

Biotech crops are fastest adopted crop technology in recent history. The global area under biotech crops increased 100-fold from 1.7 million hectares in 1996 to over 175 million hectares in 2012 (James 2013: 1).

However, those opposed to genetic engineering see it as more evolutionary than revolutionary. They argue that the plants and animals that constitute agricultural system are genetically complex and are not amenable to rapid, intrusive changes. Whatever changes biotechnology brings about are therefore likely to occur at a pace that permits farmers and consumers to adapt to them just as they have to conventional technological achievements in the past.

It is a debate that has continued to fire up mainly because public awareness and understanding of genetic engineering is painfully low. As Kimera and Mboyah (2007: 47) point out, awareness of modern biotechnology in Eastern Africa is relatively low and in some circles it is regarded as an elitist subject matter.

The existence of a widespread lack of knowledge about biotechnology and genetic engineering in particular has led to apprehension, fear, and moral indignation that have been pivoted on "tampering with nature."Farrell (1987: 2) warns that this lack of understanding is not just a matter of passing academic interest: it can seriously undermine our ability to develop and put to practical use the products of biotechnology.

In some countries, opponents of biotechnology (suffering from this lack of understanding) have attacked facilities used for testing, research, or production. Public concern can affect the feasibility or timing of government approvals of GMO. Even after approvals are granted, public concern may lead to increased regulation or legislation, which may impact farmers' adoption of the technology.

A survey by the Los Angeles Times revealed that four out of every five Americans could neither define genetic engineering nor grasp enough about the science to understand the moral and ethical issues involved. It is not only in America. In a survey of public opinion on biotechnology among residents of Nairobi that was conducted in September 2001 by the African Biotechnology Stakeholders Forum (ABSF) found that only 8 percent of the people interviewed had knowledge about GMOs.

2.2 The legal process of enacting the Biosafety Law in Kenya

The law making process (also known as the policy process) refers to the series of stages/steps that policy must go through in order to become law. Various State organs and other stakeholders are engaged in this process.

The National Council for Science and Technology (NCST) led the process of drafting the Biosafety Law in Kenya. The process involved: the review and consolidation of all existing legislation related to biotechnology; and producing a report in 1998 dubbed, *the Regulations and Guidelines for Biosafety and Biotechnology in Kenya*. The reportrecommended the creationof the National Biosafety Committee and the Institutional Biosafety Committee – institutions that coordinated and facilitated the process of drafting the biosafety policy, and Biosafety Bill, the national biosafety strategy. The official drafting of the bill started in 2001. A team of experts comprising lawyers, regulators and scientists were put together to work with the State Law Office and the NCST to produce the first draft. This was the first of the nine stages in the process of enacting laws in Kenya (CIC, 2008).

Under this stage, a layman's or Raw Draft Bill emanates from the line Ministry, Government Department or any Institutions mandated with the generation of Bills. Under Article 10 of the Constitution, on public participation, the generating institution is required to obtain the views of the public before preparing the policy and bill. Often, Kenya Law Reform Commission (KLRC) and Attorney-General (AG) work with the line ministries and state departments in the generation of these Bills. The drafts are then released to the bodies mandated with drafting of bills - KLRC and AG's office (CIC, 2008).

The team of experts came up with the first draft Bill in 2002, which was circulated among the various stakeholders for comments and inputs. This was followed by a formal meeting in March 2003, where a detailed review of the draft was conducted to produce a fine-tuned version. In April 2003, a week-long stakeholders meeting was convened to deliberate on the refined draft. However, it was not until 2005 that another assembled team of legal experts and scientists reviewed and finalized on the Bill before being presented to Cabinet, which

approved it in 2006. This paved the way for the Ministry of Science and Technology to forward the Bill to the Attorney General for publishing in the Kenya Gazette. This would also give the public 21 days to comment on the Bill (before being tabled in parliament for debate) as stipulated in the Constitution.

The Bill was tabled in Parliament on October 2, 2007 but only went two of the four key stages, First Reading and Second Reading. It did not make it to the Committee Stage nor the Third Reading. Kenya went into general elections in 2007. The Bill was reintroduced in Parliament December 2008 as the Biosafety Bill 2008, making it through the four Parliamentary stages with the President assenting to the Bill on February 12, 2009.

2.3 The Biosafety Law in Kenya

The government of Kenya approved a National Biotechnology Development Policy in 2006. In December 2008, Parliament approved the Biosafety Bill 2008. The President signed it into law – the Biosafety Act 2009 - when he assented to it on February 12, 2009.

The origins of this law can be traced back to the provisions of the Convention on Biological Diversity (CBD), an international instrument developed under the leadership of the United Nations Environmental Programme (UNEP). When crafting the convention, governments recognized that modern biotechnology has the potential to contribute to sustainable development as long as it is developed and used in a safe and responsible manner. Article 19 of the CBD called for establishment of a protocol that would address handling of biotechnology and derived products. Paragraph three of the article states: "Parties shall consider the need for and modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer,

handling and use of living modified organisms resulting from modern biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity."

Pursuant to the paragraph, the Conference of Parties, meeting in Montreal Canada in 2009, adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. The objective of the protocol is to contribute to ensuring an adequate level of protection in the field of safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movement.

Kenya made history by becoming the first country to sign the Biosafety Protocol in May 2000 and consequently ratified the document in 2003. The ratification meant that Kenya bound itself to the provisions of the Protocol. Article 2 of the protocol states: "Each Party shall take the necessary and appropriate legal, administrative and other measures to implement its obligations under the protocol." The enactment of the Biosafety Law in February 2009 was therefore in fulfillment of Kenya's international obligation as a party to the protocol.

2.4 Role of media in campaigns

The mass media has evolved over time to become a critical campaign tool. Campaigns are lost and won through the mass media. For many people, the information in the mass media becomes the only contact with the issues under discussion or debate. The pledges, promises, and rhetoric encapsulated in the news stories constitute much of the information upon which

a voting decision has to be made. What most people know comes to them second or thirdfrom the mass media or from other people who also might have got it from the mass media.

Ideally, the media are expected to serve as watchdogs or "guardians of the public interest" who champion truth, pluralism, objectivity, balance, and accuracy. Under this ideal condition, media moderates and contributes to a more intelligent policy- and decision-making. However, journalists have more narrative license to mix facts and analysis and build story reports around their own interpretative themes and therefore drivingor championing a particular course or debate. In turn, they purposely seek to cap the range of policy information and alternatives in an attempt to control public opinion.

McCombs and Shaw (1972: 177) emphasize how the media shapes public opinion on any issue: "In choosing and displaying news, editors, newsroom staff, and broadcasters play an important part in shaping political reality. Readers learn not only about a given issue, but also how much importance to attach to the issue from the amount of information in a news story and its position. In reflecting what candidates are saying during a campaign, the mass media may as well determine the important issues – that is the media may set the agenda of the campaign."

The market-based environment in which the media operate places them alongside other strategic actors in theirattempts to redefine and alter political rhetoric. Thus, the role that the media play is more complex than that of other actors. That is, the media simultaneously may act as constructors of unique frames as well as a conduit for the public communiqués of others. By selectively choosing to cover one side or both sides of an issue, putting forth their own interpretation, simplifying events or stories, or by simply allocating greater coverage to

one issue over another, the media act as gatekeepers, advocates, and interpreters of political themes and information.

Journalists and editors draw maps or internal story patterns for their readers, and these maps or frames cognitively serve to structure the public debate, influence readers' level of information, and attribute policy responsibility.

Lang and Lang (1966: 68) state: "The mass media force attention to certain issues. They are constantly presenting objects suggesting what individuals in the mass should think about, have feelings about."

Bias in reporting events depends on unfolding events and scientific and risk management controversies.News stories offer the public definitions of social reality where an occurrence is turned into anewsworthy event, a newsworthy event into a story, which is then communicated to the public. As Navarro (2011: 1) points out that mass media coverage thus has the potential to strongly influence public opinionparticularly during critical peak coverage.

2.5 Theories on media influence

2.5.1 Agenda-Setting Theory

Agenda setting describes a very powerful influence of the media –the creation of what the public thinks is important. As far back as 1922, the newspaper columnist Walter Lippman was concerned that the media had the power to present images to the public. McCombs and Shaw investigated presidential campaigns in 1968, 1972 and 1976. In the research done in 1968 they focused on two elements: awareness and information. Investigating the agenda-setting function of the mass media, they attempted to assess the relationship between what voters in one community said were important issues and the actual content of the media

messages used during the campaign. McCombs and Shaw (1972: 177) concluded that the mass media exerted a significant influence on what voters considered to be the major issues of the campaign.

Two basic assumptions underlie most research on agenda-setting: (1) the press and the media do not reflect reality; they filter and shape it; (2) media concentration on a few issues and subjects leads the public to perceive those issues as more important than other issues. One of the most critical aspects in the concept of an agenda-setting role of mass communication is the time frame for this phenomenon. In addition, different media have different agenda-setting potential. Agenda-setting theory seems quite appropriate to help us understand the pervasive role of the media (University of Twente).

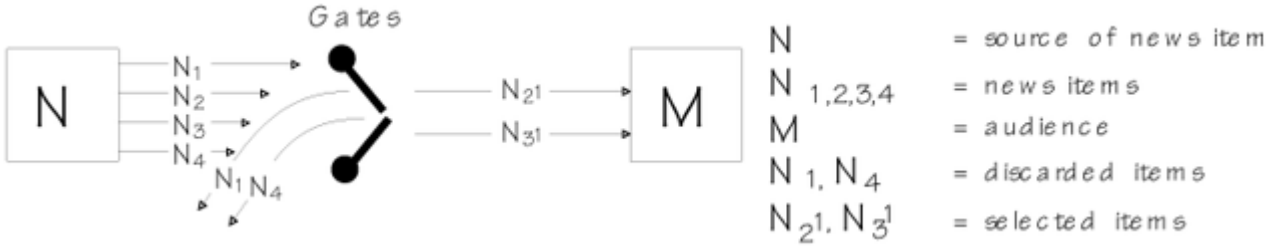
2.5.2 Gatekeeping Theory

Kurt Lewin was apparently the first one to use the term "gatekeeping," which he used to describe a wife or mother as the person who decides which foods end up on the family's dinner table. The gatekeeper is the person who decides what shall pass through each gate section, of which, in any process, there are several. Although he applied it originally to the food chain, he then added that the gating process can include a news item winding through communication channels in a group. This is the point from which most gatekeeper studies in communication are launched. In the 1970s McCombs and Shaw took a different direction when they looked at the effects of gatekeepers' decisions. They found the audience learns how much importance to attach to a news item from the emphasis the media place on it. McCombs and Shaw pointed out that the gatekeeping concept is related to the newer concept, agenda-setting(University of Twente).

Key assumption of this theory is that the gatekeeper decides which information will go forward, and which will not. In other words a gatekeeper in a social system decides which of a certain commodity – materials, goods, and information – may enter the system. Important to realize is that gatekeepers are able to control the public's knowledge of the actual events by letting some stories pass through the system but keeping others out. Gatekeepers can also be seen as institutions or organizations. In a political system there are gatekeepers, individuals or institutions which control access to positions of power and regulate the flow of information and political influence. Gatekeepers exist in many jobs, and their choices hold the potential to color mental pictures that are subsequently created in people's understanding of what is happening in the world around them. Media gatekeeping showed that decision making is based on principles of news values, organizational routines, input structure and common sense. Gatekeeping is vital in communication planning and almost all communication planning roles include some aspect of gatekeeping.

The gatekeeper's choices are a complex web of influences, preferences, motives and common values. Gatekeeping is inevitable and in some circumstances it can be useful. Gatekeeping can also be dangerous, since it can lead to an abuse of power by deciding what information to discard and what to let pass.

Conceptual Model



Source (University of Twente)

2.5.3 Framing Theory

The concept of framing is related to the agenda-setting tradition but expands the research by focusing on the essence of the issues at hand rather than on a particular topic. The basis of framing theory is that the media focuses attention on certain events and then places them within a field of meaning. Framing is an important topic since it can have a big influence and therefore the concept of framing expanded to organizations as well.

The core assumptions of the theory are that the media draws the public attention to certain topics, it decides where people think about, the journalists select the topics. This is the original agenda setting 'thought'. In news items occurs more than only bringing up certain topics. The way in which the news is brought, the frame in which the news is presented, is also a choice made by journalists. Thus, a frame refers to the way media and media gatekeepers organize and present the events and issues they cover, and the way audiences interpret what they are provided. Frames are abstract notions that serve to organize or structure social meanings. Frames influence the perception of the news of the audience, this form of agenda-setting not only tells what to think about, but also how to think about it.

2.5.4 Cognitive Dissonance Theory

Cognitive dissonance is a communication theory adopted from social psychology. It is about attitude formation and change. Cognitive is thinking or the mind; and dissonance is inconsistency or conflict. Cognitive dissonance is the psychological conflict from holding two or more incompatible beliefs simultaneously. Cognitive dissonance is a relatively straightforward social psychology theory that has enjoyed wide acceptance in a variety of disciplines including communication. The theory replaces previous conditioning or reinforcement theories by viewing individuals as more purposeful decision makers; they

strive for balance in their beliefs. If presented with decisions or information that create dissonance, they use dissonance-reduction strategies to regain equilibrium, especially if the dissonance affects their self-esteem. The theory suggests that 1) dissonance is psychologically uncomfortable enough to motivate people to achieve consonance, and 2) in a state of dissonance, people will avoid information and situations that might increase the dissonance. How dissonance arises is easy to imagine: It may be unavoidable in an information rich-society. How people deal with it is more difficult.

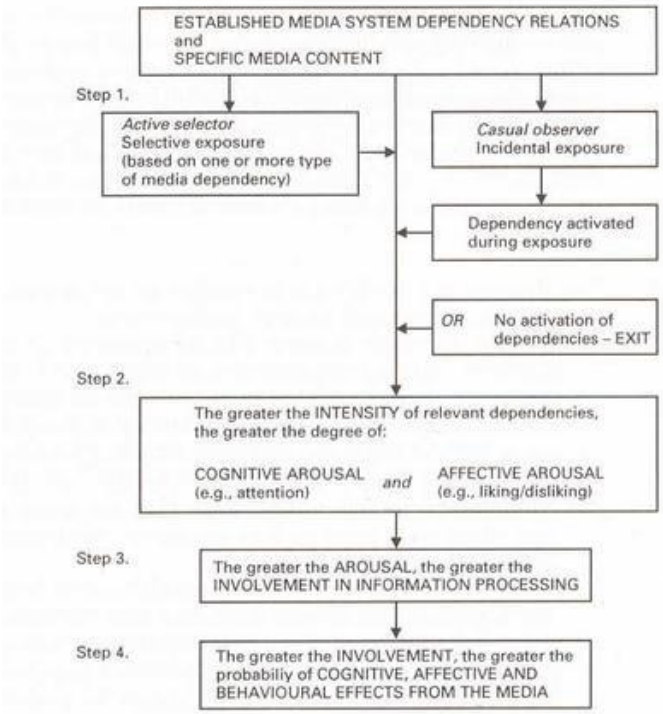
2.5.5 (Media System) Dependency Theory

Dependency theory proposes an integral relationship among audiences, media and the larger social system. This theory predicts that you depend on media information to meet certain needs and achieve certain goals, like uses-and-gratifications theory. But you do not depend on all media equally. Two factors influence the degree of media dependence. First, you will become more dependent on media that meet a number of your needs than on media that provide just a few. The second source of dependency is social stability. When social change and conflict are high, established institutions, beliefs, and practices are challenged, forcing you to reevaluate and make new choices. At such times your reliance on the media for information will increase. At other, more stable times your dependency on media may reduce.

One's needs are not always strictly personal but may be shaped by the culture or by various social conditions. In other words, individuals' needs, motives, and uses of media are contingent on outside factors that may not be in the individuals' control. These outside factors act as constraints on what and how media can be used and on the availability of other non-media alternatives. Furthermore, the more alternatives and individual had for gratifying needs, the less dependent he or she will become on any single medium. The number of

functional alternatives, however, is not just a matter of individual choice or even of psychological traits but is limited also by factors such as availability of certain media.

Conceptual Model



This model is more elaborated and shows more specific effects of the dependency theory.
Source(University of Twente)

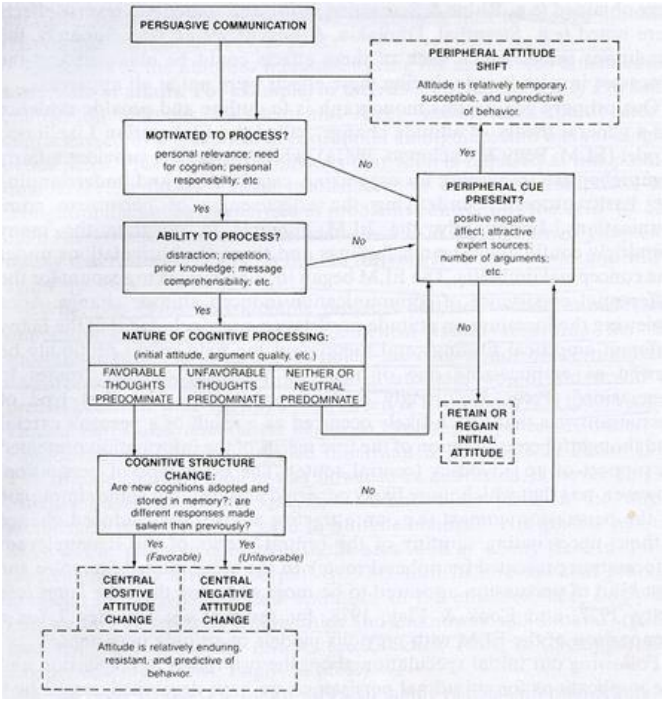
2.5.6 Elaboration Likelihood Model

The Elaboration Likelihood (ELM) is based on the idea that attitudes are important because attitudes guide decisions and other behaviors. While attitudes can result from a number of things, persuasion is a primary source. The model features two routes of persuasive influence: central and peripheral. The ELM accounts for the differences in persuasive impact produced by arguments that contain ample information and cogent reasons as compared to messages that rely on simplistic associations of negative and positive attributes to some object, action or situation. The key variable in this process is involvement, the extent to which an individual is willing and able to 'think' about the position advocated and its supporting materials. When people are motivated and able to think about the content of the message, elaboration is high.

Elaboration involves cognitive processes such as evaluation, recall, critical judgment, and inferential judgment. When elaboration is high, the central persuasive route is likely to occur; conversely, the peripheral route is the likely result of low elaboration. Persuasion may also occur with low elaboration. The receiver is not guided by his or her assessment of the message, as in the case of the central route, but the receiver decides to follow a principle or a decision-rule which is derived from the persuasion situation.

ELM is promising because it integrates an array of variables into a single explanation of persuasion. It addresses factors that explain why and when messages and self-motivated efforts are more or less likely to lead to attitude formation.

Conceptual Model



Elaboration Likelihood Model: Source (University of Twente)

2.5.7 Two-Step Flow Theory

The two-step flow of communication hypothesis was first introduced by Paul Lazarsfeld, Bernard Berelson, and Hazel Gaudet in The People's Choice, a 1944 study focused on the process of decision-making during a Presidential election campaign. These researchers

expected to find empirical support for the direct influence of media messages on voting intentions. They were surprised to discover, however, that informal, personal contacts were mentioned far more frequently than exposure to radio or newspaper as sources of influence on voting behavior. Armed with this data, Katz and Lazarsfeld developed the two-step flow theory of mass communication.

This theory asserts that information from the media moves in two distinct stages. First, individuals (opinion leaders) who pay close attention to the mass media and its messages receive the information. Opinion leaders pass on their own interpretations in addition to the actual media content. The term ‘personal influence’ was coined to refer to the process intervening between the media’s direct message and the audience’s ultimate reaction to that message. Opinion leaders are quite influential in getting people to change their attitudes and behaviors and are quite similar to those they influence. The two-step flow theory has improved our understanding of how the mass media influence decision making. The theory refined the ability to predict the influence of media messages on audience behavior, and it helped explain why certain media campaigns may have failed to alter audience attitudes and behavior. The two-step flow theory gave way to the multi-step flow theory of mass communication or diffusion of innovation theory.

2.5.8 Hypodermic Needle Theory

The "Hypodermic Needle Theory" or “Magic Bullet Theory” implied mass media had a direct, immediate and powerful effect on its audiences. The mass media in the 1940s and 1950s were perceived as a powerful influence on behavior change.Several factors contributed to this "strong effects" theory of communication, including:the fast rise and popularization of radio and television; the emergence of the persuasion industries, such as advertising and

propaganda; the Payne Fund studies of the 1930s, which focused on the impact of motion pictures on children; andHitler's monopolization of the mass media during WWII to unify the German public behind the Nazi party.The theory suggests that the mass media could influence a very large group of people directly and uniformly by ‘shooting’ or ‘injecting’ them with appropriate messages designed to trigger a desired response.

Both images used to express this theory (a bullet and a needle) suggest a powerful and direct flow of information from the sender to the receiver. The bullet theory graphically suggests that the message is a bullet, fired from the "media gun" into the viewer's "head". With similarly emotive imagery the hypodermic needle model suggests that media messages are injected straight into a passive audience which is immediately influenced by the message. They express the view that the media is a dangerous means of communicating an idea because the receiver or audience is powerless to resist the impact of the message. There is no escape from the effect of the message in these models. The population is seen as a sitting duck. People are seen as passive and are seen as having a lot media material "shot" at them. People end up thinking what they are told because there is no other source of information.

New assessments that the Magic Bullet Theory was not accurate came out of election studies in "The People's Choice," (Lazarsfeld, Berelson and Gaudet, 1944/1968). The project was conducted during the election of Franklin D. Roosevelt in 1940 to determine voting patterns and the relationship between the media and political behavior. The majority of people remained untouched by the propaganda; interpersonal outlets brought more influence than the media. The effects of the campaign were not all-powerful to where they persuaded helpless audiences uniformly and directly, which is the very definition of what the magic bullet theory does. As focus group testing, questionnaires, and other methods of marketing effectiveness

testing came into widespread use; and as more interactive forms of media (e.g. internet, radio call-in shows, etc.) became available, the magic bullet theory was replaced by a variety of other, more instrumental models, like the two step of flow theory and diffusion of innovations theory.

2.5.9 Accumulation Theory

The theory postulates that the impact of any one message on any specific person may be minimal, but consistent, persistent, and corroborated (between media) messages result in minor changes among audiences that gradually add up over time to produce significant changes in society or culture.The propositions are that:

- The mass media begin to focus their attention on and transmit messages about a specific topic (some problem, situation, or issue).
- Over an extended period, they continue to do in a relatively consistent and persistent way and their presentations corroborate each other.
- Individual members of the public increasingly become aware of these messages and, on a person-by-person basis, a growing comprehension develops of the interpretations of the topic presented by the media.
- Increasing comprehension of the messages regarding the topic supplied by the media begins to form (or modify) the meanings, beliefs, and attitudes that serve as guides to behavior for members of the audience.
- Thus, minor individual-by-individual changes accumulate and new beliefs and attitudes slowly emerge to provide significant changes in norms of appropriate behavior related to the topic.

CHAPTER 3: RESEARCH METHODOLOGY

In order to determine the role of the print media in enacting the Biosafety Law in Kenya, this study analyzed quantitatively and qualitatively the coverage of biotechnology issues by the Nation Newspapers (the *Daily Nation*, *Saturday Nation* and *Sunday Nation*), its sister weekly newspaper, the *EastAfrican* and *The Standard* (including the Saturday and Sunday editions) over a period of 12 months from 1 November, 2006 to 30 November, 2007. This was a very important period in the enactment of the Biosafety Law: both the draft National Biotechnology Development Policy and Biosafety Bill were approved by Cabinet in September 2006, making it possible for the Attorney-General to publish the Bill in the Kenya Gazette, which he did in September 2007. This period also gave the public 21 days to respond to it as stipulated in the Constitution. It is at this point that one would expect the media to inform and educate the public not only on the contents, but also on implications of the Bill, and also prioritize the issues under discussion in its agenda setting role. It was also expected at this point in time that all interest groups – government, scientists, pro-and anti-GMO activities, politicians, and the media - purposely sought to cap the range of policy information and alternatives, and therefore attempt to control public opinion and more importantly, opinion of Members of Parliament on the Bill and biotechnology in general. The media was expected to achieve this due to the nature and changes in the news business itself where journalists now have more narrative license to mix facts and analysis and build story reports around their own interpretative themes.

3.1 Study design

The research design is process and outcome evaluation using sample surveys to gather both qualitative and quantitative data. The main research tool was a code sheet (Appendix). The study sample design was deliberate sampling, also known as purposive or non-probability sampling.

3.2 Data collection

The entire 365 issues of each of the Nation Newspapers (the *Daily Nation, Saturday Nation* and *Sunday Nation*) and *The Standard* newspapers and the entire 52 editions of the *EastAfrican* were examined for coverage of biotechnology issues. Biotechnology articles were identified, counted (to determine frequency of coverage), measured (to determine area in cm^2), and read (to determine type of story – hard news, features, opinion/commentary, analysis, editorial, letter to editor, Q&A, excerpts - author, tone, accuracy, fairness, and balance). Under this study, an article refers to news, features, commentary/opinion, an analysis, editorial and letters to the editor. Advertisements and supplements were not covered under this study because they were paid for by the source and might not reflect or prove an own initiative by the paper. They may not necessarily reflect the editorial policy of the paper.

3.3 Data analysis

The unit of observation and analysis was the published article in the papers. There were eight units of analysis for each article: Frequency, type of story (whether hard news, features, commentary, opinion, analysis), prominence (placement), Length (area cm^2), content of the story (balanced, fairness, and accuracy), author and source (local or foreign). The data collected from the questionnaires was edited, coded into categories, classified into homogenous groups and tabulated for analysis using MS Word and MS Excel.

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

4.1 Print media coverage of biotechnology issues in Kenya

4.1.1 Frequency of coverage of biotechnology

A total of 140 articles were published by the three newspapers under review between November1, 2006 and November 30, 2007. The Nation Newspapers (*Daily Nation, Saturday Nation* and *Sunday Nation*) published a total of 30 articles on biotechnology with its sister weekly Newspaper, the *EastAfrican* publishing a total of 15 articles on biotechnology. Within the same period, The Standard (including Saturday and Sunday editions) published a total of 95 articles on biotechnology (Table 1).

For the two dailies – Nation and Standard – *The Standard* carried more articles (95) than Nation's 30 and even a much bigger area (41,127.6 cm2), more than three times the area of articles in the Nation (13,935.2 cm2), despite that fact that the Nation papers have much more pagination or area than The Standard (Table 1 & Figure 1). The frequency of biotechnology articles in general appears much lower than non-biotech articles, for these only accounted for a 0.14 percent editorial space for the 12 months under study (Table 1).

Table1. Frequency & volume of biotechnology articles published

	Frequency	**Volume (cm^2)**	**Total Volume***	**percent Volume**
Nation	30	13,935.2	24,557,200	0.1
EastAfrican	15	8,116	2,654,080	0.3
Standard	95	41,127.6	18,502,580	0.2
Total	**140**	**63,178.8**	**45,713,860**	**0.14**

*(Biotech & non-biotech articles over the period)

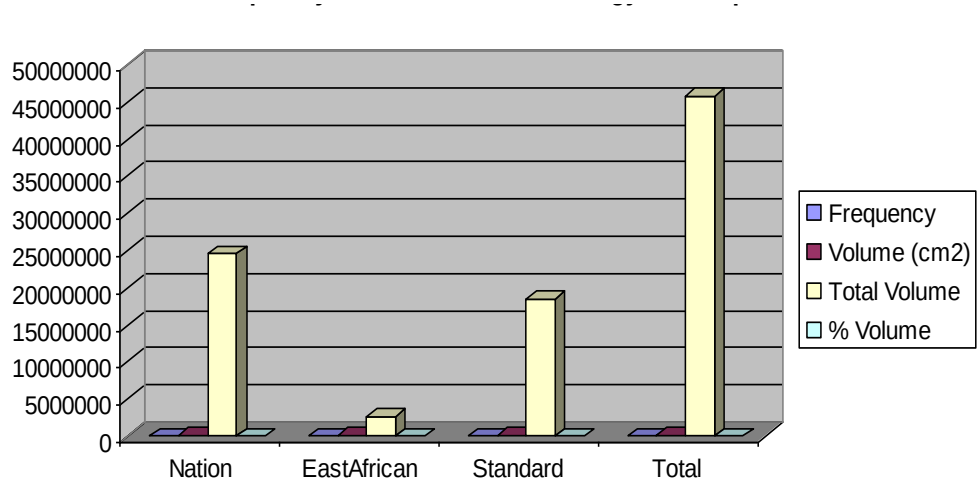


Figure 1: Frequency & volume of biotechnology stories published.

Frequency of coverage of any issue is determined by various factors among them, the frequency of occurrence of event being covered, the ability of the reporters to comprehend and make news out of the issue, the willingness of the people or institutions involved to openly give out information but more importantly, the perception by the gatekeepers, the editors on whether the issue or event is newsworthy.

Could it be that there was no critical mass of reporters with capacity to cover biotechnology issues? That is possible considering that four journalists accounted for the bulk of articles carried in the Newspapers, mainly Gatonye Gathura and Boniface Mwangi of the *Nation*, John Mbaria of *EastAfrican* and Wandera Ojanji for *The Standard* (Table 2). Wandera accounted for 48.4 percent of all articles on biotechnology published in the Standard, while Mbaria accounted for 66.7 percent of all articles published in the *EastAfrican*. Gatonye Gathura and Boniface Mwangi accounted for 16.2 and 19.4 percent respectively of all articles published in the Nation over the study period.

It is worth noting that media coverage in Kenya is dominated by politics and entertainment. Whilst other themes such as politics, business, finance, health, and shipping have regular

columns, biotechnology news did not have any specified or regular column in the Nation and the *EastAfrican*. Indeed, the relatively high number of biotechnology articles published by *The Standard* is due to the fact that the paper had a regular column on biotechnology that appeared every Sunday during the study period.

An analysis of journalists that wrote the articles showed a core of science writers that consistently write about biotechnology: Wandera, Gatonye and Mbaria. Wandera in particular has been given awards for biotech writing andscience writing.

And although it might not be as high on agenda as the political and entertainment events, the coverage was sustained and the high number of articles published (140) helped bring attention to or generate interest on biotechnology. In its agenda-setting role, the print media made biotechnology an important subject for discussion and public debate.

Table 2: Writers who published more than one article over the study period

	Author	**Publication**	**No. of Published articles**	**percent of total articles published**
1.	Wandera Ojanji	Standard	46	48.4
2.	Samuel Otieno	Standard	4	4.2
3.	Elizabeth Mwai	Standard	3	3.2
4.	Judy Oguttu	Standard	3	3.2
5.	DannOkoth	Standard	2	2.1
6.	MaoreIthula	Standard	2	2.1
7.	Author Not Mentioned	Standard	15	15.8
8.	Foreign/Agencies	Standard	7	7.4
9.	Boniface Mwangi	Nation	6	20
10.	GatonyeGathura	Nation	5	16.7
11.	Isaiah Esipisu	Nation	3	10
12.	Bob Odalo	Nation	3	10
13.	Kennedy Senelwa	Nation	2	6.7
14.	Foreign/Agencies	Nation	6	20
15.	John Mbaria	EastAfrican	10	66.7
16.	Esther Nakkazi	EastAfrican	2	13.3
17.	Foreign/Agencies	EastAfrican	2	13.3

That the three papers published 140 articles on biotechnology, is indeed commendable considering that public awareness and understanding of the subject is painfully lowand regarded in some circles it is as an elitist subject matter (Kimera and Mboyah, 2007: 47). It can therefore be argued that the print media contributed to creating awareness, informing and educating Kenyans on biotechnology.

Nevertheless, it is worth noting that comparedwith the media coverage on agricultural biotechnology in other countries, the Kenyan media did a commendable job: the London Times and Washington Post from1990 to 2001, never published over 80 articles a year on the subject, the highest coverage being 80 articles in 2001 while the highest coverage attained by Philippine print media during the same time period was 212 articles per year (Navarro et al, 2011: 5).

4.1.2 Sources of articles on biotechnology

The Study also looked at the origin of the articles, that is, if local or foreign. Because the *EastAfrican* is a regional paper, authors from Tanzania and Uganda were considered local. Foreign articles accounted for only 7.1 percent of all articles on biotechnology published by the three newspapers (Table 3, Figure 2). This was a very encouraging trend from the media houses as it helped nationalize biotechnology issues. By nationalizing biotechnology issues, the print media helped policy and decision makers to internalize it as a national issue rather than an international debate with little relevance to Kenyans.

Table 3. Sources of articles published

	Nation		*EastAfrican*		*Standard*		Total	
	No	%	**No**	**%**	**No**	**%**	**No**	**%**
Local	26	91	13	86.7	91	95.8	130	92.9
Foreign	4	7	2	13.3	4	4.2	10	7.1
Total	**30**	**100**	**15**	**100**	**95**	**100**	**140**	**100**

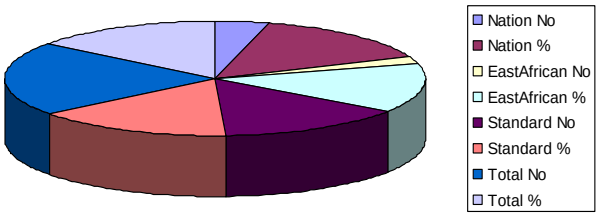


Figure 2: Sources of articles published

4.1.3 Type of articles published

It can be argued that the editorials and feature articles are the best persuasive, educational and informative tools of newspapers. Indeed, issues are best articulated through the editorials and features. Features have more room to develop why and how something is occurring, explaining in more detail what is happening and how it is happening or even why it is happening. They provide more perspective. It is therefore commendable that news features - which dealtmore in detail about the technology- were the most published articles accounting for 51.1 percent (Table 4, Figure 3) followed by hard news articles accounting for 40.4 percent of all the biotechnology articles published by the three newspapers over the study period.

However, for the entire 12 months under review, none of the newspapers carried any editorial on biotechnology. Equally disappointing were letters to the editor, through which the public express their views on any topic. *The Standard* published only two letters, but just like in the

case of editorials, *Nation* and *EastAfrican* did not carry any letters to the editor on biotechnology.

Table 4. Type of articles

Type of Article	*Nation*		*EastAfrican*		*Standard*		Total	
	No.	percent	No.	percent	No.	percent	No.	**percent**
Hard News	5	16.6	2	13.3	50	40.6	57	**40.7**
News features	24	80	9	60.0	39	35.9	72	**51.4**
Opinion/Commentary/ Analysis	1	3.3	0	0	4	18.8	5	**3.6**
Editorials	0	0	0	0	0	0	0	**0**
Letters to Editor	0	0	0	0	2	1.6	1	**0.7**
Q&A	0	0	3	20	1	1.6	4	**2.9**
Excerpts	0	0	1	6.7	0	0	1	**0.7**
Total	**30**	**100**	**15**	**100**	**95**	**100**	**140**	**100**

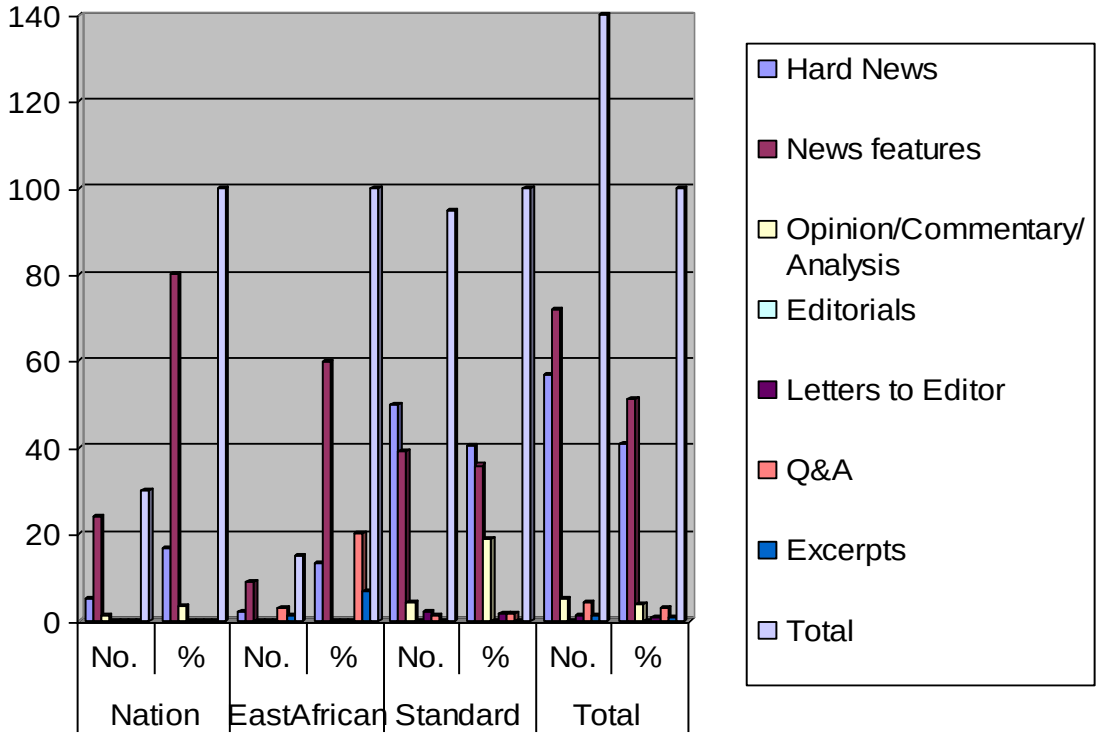


Figure 3: Type of articles

4.1.4 Prominence of biotechnology articles

Length and placement of stories are indicators of prominence placed on a story. Articles placed on front page, two, three and back page of a newspaper are considered prominent. This is sometimes determined by the perceived importance or prominence by the editors, the availability of other perceived important stories, the editorial policy of the paper and commercial or advertising interests. However, only two articles made it to the prominent pages of the *EastAfrican*. *Nation* and *Standard* had no single story on biotechnology that received such prominence – never made it to front or back pages (Table 5, Figure 4).

Table 5. Placement of articles

Placement	**Front Page (1-3)**		**Inside Pages**		**Back page**	
	No.	percent	No.	Percent	No.	percent
Nation	0	0	30		0	0
EastAfrican	2	13.3	13	86.7	0	0
Standard	0	0	95	100	0	0
Total	2	1.4	138	98.6	0	0

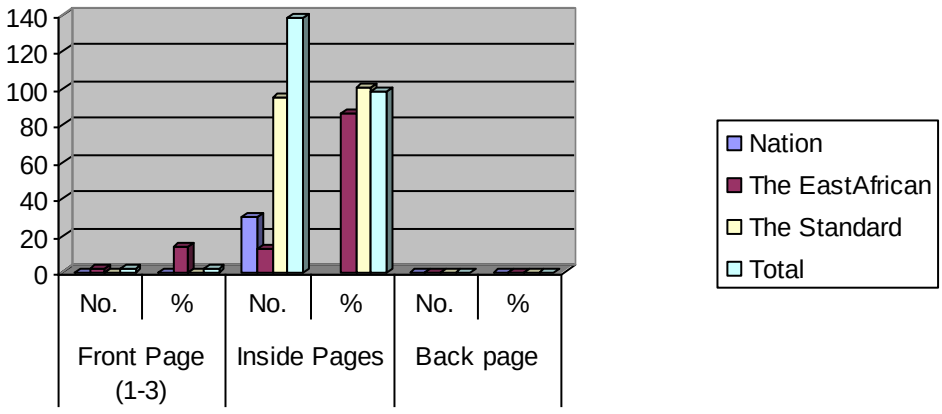


Figure 4: Placement of articles

On individual story treatment, editors of the publication tended to give big space to the biotechnology articles, whenever they were published in line with the Gatekeeping and Agenda-Setting theories. For instance, of the 140 articles, only 40 articles (35 percent) were

allocated space below 300 cm^2. Six of the articles were allocated an average of 700 cm^2. This shows that whereas the percentage of biotechnology articles is low (Table 6, Figure 5), individual articles received a much higher prominence in terms of individual space allocation.

Table 6. Distribution of articles by length (cm^2)

	Standard		Nation		EastAfrican		Total	
	No.	percent	No.	percent	No.	percent	No.	percent
Less than 100	5	5.3	1	3.3	0	0	6	4.3
101-300	35	36.8	6	19.4	2	13.3	43	30.5
301-600	28	29.5	18	61.3	8	53.3	55	39.0
Over 600	27	28.4	5	16.1	5	33.3	37	26.2
Total	95	100	30	100	15	100	140	100

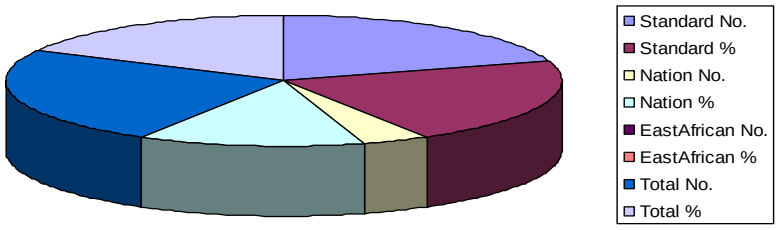


Figure 5: Distribution of articles by length (cm^2)

4.1.5 Accuracy, fairness and balance of published biotechnology articles

A balanced article is one that gives both sides of an issue and especially so if the issue is conflict or controversial in nature. Even if not, the pros and cons of the issue are to be given. An article on biotechnology was considered balanced if it reported on the situation or issue, identified the factors to the present status quo, gave out implications of effects of the said state of affairs and suggested solutions to the particular issue or topic being addressed, citing multiple sources, and crediting representatives of major and credible institutions who in turn have the power to define and articulate key issues. Indeed, when government sources, for instance, Departments of Agricultureand Science and Technology, NCST, Kenya Agricultural Research Institute, Food and Agricultural Organization of the United Nation, the

African Union were cited articles tend to be positive and neutral while negative articlescited environmental and civil society groups (Greenpeace, Friends of the Earth, Kenya Biodiversity Coalition, Participatory Ecological Land-Use management). It is therefore encouraging that 93.6 percent of all stories published on biotechnology by the three newspapers qualified as balanced, fair and accurate based on the above criteria (Table 7).

Table 7. Accuracy/Balance/Fairness of articles

	No. of articles Accurate/Balanced/Fair		**No. of articles Not Accurate/Balanced/Fair**	
	No.	percent	No.	percent
Nation	29	96.7	1	3.3
EastAfrican	11	73.3	4	26.7
Standard	91	85.8	4	4.2
Total	131	93.6	9	6.4

It is noteworthy that most of the accurate, balanced and fair articles dwelt on the benefits of the technology, potential scenarios for the technology, and government and scientific support. However, those that focused mainly health issues such as the technology allegedly causing sickness, cancer, and even mentalretardation tended to be the negative, inaccurate and unbalanced.

It can be argued that this positive trend in print media coverage contributed to influencing the key decision makers in accepting the technology and consequently passing the Biosafety Bill. The print media built the legislators', other policy makers and the general public's trust in the technology. Losing trust in this instance would have had far-reaching consequences such that people would have becomecynical about their government's ability to regulate a new technology, an argument supported by the Framing Theory which postulates that media focuses attention on certain events and then places them within a field of meaning.

That the articles were positive and neutral is also a positive sign as it shows that journalists are takingtime to present sides of an issue giving readers enough facts and information to make their own decisionabout the technology. Balanced reporting indicates a level of neutrality with journalists deliberately nottaking sides on the issue and including various information sources to validate claims and counterclaims.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The role of the media in development and in particular in influencing and determining the outcome of a particular agenda in Kenya and Africa in general is something that has not been ascertained. This study therefore sought to investigate the role the print media played in the enactment of the biosafety law in Kenya. In particular, it sought to establish whether the print media fulfilled its obligation to deliver to the citizen, full, complete and accurate information, and interpretation of biotechnology, and the Biosafety Bill and the process of enacting the Biosafety law.

The objectives of the study were two-fold:

1. Determine print media coverage of biotechnology in Kenya before the enactment of the bill.
2. Determine the role the print media played in enacting the Biosafety Act.

The study was carried out on key assumptions that the media provided informative, educative and accurate information to policy makers that informed their decision to pass the Biosafety Bill 2008. Lack of or negative publicity can jeopardize projects in the public sector that respond to specific local demands and destined for local markets. It is indeed widely acknowledged that responsible adoption of modern biotechnology can be hampered by lack of accurate, reliable information, knowledge and awareness at all levels of society. Knowledge sharing initiatives allow policy makers and key stakeholders to make informed decisions for enhancing the acceptance of and use of modern biotechnology.

Public support is crucial if a technology is to be accepted and adopted by those who stand to benefit from it. Hence, media reporting is an important component of the technology generation and utilization continuum.

By processing and synthesizing the lessons learnt, it is possible to generate principles that can be used to improve media strategies as well as better understand the societal environment favorable for passing legislation of similar technological innovations. These experiences are useful for predicting parliamentary systems behavior, analyzing communication problems and identifying appropriate strategies for effective lobbying of science and technology bills.

The following media theories formed the theoretical framework for this study:

1. *Agenda setting theory* that describes a very powerful influence of the media – the creation of what the public thinks is important.
2. *Gatekeeping theory*which postulates that the gatekeeper decides which information will go forward, and which will not, that gatekeepers (the media) are able to control the public's knowledge of the actual events by letting some stories pass through the system but keeping others out.
3. *Framing theory*whose underlying basis is that the media focuses attention on certain events and then places them within a field of meaning.
4. *Cognitive Dissonance theory*which focusses on attitude formation and change and suggests that 1) dissonance is psychologically uncomfortable enough to motivate people to achieve consonance, and 2) in a state of dissonance, people will avoid information and situations that might increase the dissonance.

5. *Dependency theory* proposes an integral relationship among audiences, media and the larger social system and predicts that you depend on media information to meet certain needs and achieve certain goals.
6. *Elaboration Likelihood theory*that is based on the idea that attitudes are important because attitudes guide decisions and other behaviors.
7. *Two-Step Flow theory* which asserts that information from the media moves in two distinct stages: individuals (opinion leaders) who pay close attention to the mass media and its messages receive the information; and then pass on their own interpretations in addition to the actual media content.
8. *Hypodermic Needle theory*that implies mass media has a direct, immediate and powerful effect on its audiences.
9. *Accumulation theory* which postulates that the impact of any one message on any specific person may be minimal, but consistent, persistent, and corroborated (between media) messages result in minor changes among audiences that gradually add up over time to produce significant changes in society or culture.

5.2 Conclusions

The print media in Kenya played a significant role in shaping public opinion and trust in biotechnology. It was instrumental in defining what the general public understands about the technology, and at the same time provided the environment by which public opinion was formed about what is oftenperceived as controversial if not contentious issue. Media sets the agenda and tone for what the publicwill deem interesting or important. Through the news articles, the print media served an important source of informallearning and contributed to how citizens and the legislators reached judgments about the complexities of science andtechnology and policy debates.

That 93.6 percent of all stories published on biotechnology by the three newspapers were balanced, fair and accurate demonstrates the positive influence of the print media on key decision makers in accepting the technology and consequently passing the Biosafety Bill. That the articles were positive and neutral is also a positive sign as it shows that journalists are takingtime to present sides of an issue giving readers enough facts and information to make their own decisionabout the technology. Balanced reporting indicates a level of neutrality with journalists deliberately nottaking sides on the issue and including various information sources to validate claims and counterclaims.Losing trust in this instance would have had far-reaching consequences such that people would have becomecynical about their government's ability to regulate a new technology.

Although biotechnology news was not high in the media agenda as compared to political events, coverage was sustained and helped bring attention to and or generate interest on the topic. The Kenyan print media, therefore, was a contributing factor to the generally favorable perception of the technology in the country and the enactment of the Biosafety Law.With opinions being formed on the basis of little information, the role of newspapers is crucial in the communication and better understanding of science.

5.3 Recommendations

It is widely acknowledged that the mass media provide the most effective channel to reach out to various stakeholders with biotechnology information. It is also widely acknowledged that the mass media are the main source of information for the majority of stakeholders and opinion leaders. By the very nature of having the power to shape public opinion, the media have the power to determine whether a campaign will be won or lost. It is therefore

imperative that advocates or stakeholders of any campaign enlist media support right from the beginning. Any initiative on law enactment and any other campaign should therefore have an elaborate media strategy. Journalists should be provided with up-to-date information that is factual as reaching out to the media with biotechnology information can generate positive impacts, especially in influencing informed decision-making on legislation. It is also important to train journalists on biotechnology and reporting on biotechnology to enhance their capacity to effectively and authoritatively report on the subject. This is important as a well-informed mass media are essential elements of a diffusion process of innovation.

It is important to understand how media works - the frames that media use to communicate issues, the sources they use which influence how stories are framed, and the amount of space allotted to science topics, among others.

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APPENDIX

Article Code Sheet

Date	Title	Author	Type of article								Placement (page)			Size (cm^2)	Accuracy/ Balanced/Fair
			News	Features	Opinion/ Commentary	Analysis	Editorial	Letters to Editor	Q & A	Excerpts	1-3	Inside	Back		