Source affiliations and framing of the GMO debate by East Africa's Nation Media Group

Rebecca Randall

A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Arts in International Studies

University of Washington

2014

Committee:

Ben Gardner

Patricia Moy

Program Authorized to Offer Degree:

Jackson School of International Studies

University of Washington

Abstract

Source affiliations and framing of the

GMO debate by East Africa's Nation Media Group

Rebecca Randall

Chair of the Supervisory Committee:

Ben Gardner, Chair of Africa Studies Program and Assistant Professor, Interdisciplinary Arts

Jackson School of International Studies and University of Washington at Bothell

A content analysis of the East African Nation Media Group newspapers' framing of the GMO debate from 2010-2013 adds to the global studies literature on the transatlantic debate on GMOs. The GMO debate has been described as polarized between European and U.S. political approaches and further as influencing the way that Africans respond to this inherited debate. However, newspapers in Kenya, Uganda and Tanzania have unique approaches to reporting on GMO adoption and regulation that do not ignore transnational influences but does not necessarily correspond with characterizations of an "inherited" debate. In journalists' reporting on GMOs in Kenya, Uganda and Tanzania, they encounter transnational networks of donors, foundations, governments, researchers, farmers and others spanning from the Global North to East Africa. Each approach is described as benevolent—a panacea for hunger and malnutrition or a preservation of Africa's biodiversity and traditional indigenous agricultural practices. This misses the skewed power balance in these transnational networks, which privilege experiences in the Global North and outline the socioeconomic conditions that have led to poverty in sub-Saharan Africa in the first place. This work describes how journalists at the *Nation*, the *Monitor* and the *Citizen* frame this debate and contributes to understanding how East African journalists deal with transnational forces in their reporting.

CHAPTER 1

INTRODUCTION

Food is integral to all of us no matter where we are from. In the Global North, consumers struggle to understand the role of science in their food, clashing over two approaches. The first values productivity and efficiency—embracing scientific advancements that can achieve those ends. The second prefers more natural farming—celebrating organic methods and emphasizing concern for the environment and health.

As these values collide in developed countries, elite rhetoric over how these ideas should look in developing countries becomes related dialogue. As the first approach paraded all their tools out in the Green Revolution, during which genetically modified crops and industrial farming techniques were successfully adopted in Asia and Latin America, a new push for extending that development to Africa has critics bemoaning the failures of the first Green Revolution while others argue for increased aid and support to spur a Green Revolution in Africa, now being pursued in research labs and test fields in Uganda, Kenya and Tanzania.

The discourse has become a competition for public trust in which politicians, NGOs, science and industry seek the support of consumers and farmers in the Global North while using the African story (Bernauer and Aerni 2007). The polarized sides portray different stories each framed to further their cause: preserving Africa's biodiversity and indigenous agricultural tradition versus a panacea for malnutrition and hunger.

The issue is often framed to appear benevolent no matter which position one prefers, but the discourse often fails to frame those benevolent acts (which could also be seen as transfers of capital) as coming from the centers of power in the Global North. This misses the importance of the power balance in the relationships of stakeholders in the agricultural biotechnology debate. No less than a case study of globalization, the GMO debate highlights how experiences in Africa

and the Global North can differ greatly, even though the same transnational forces are at work in both. Transnational connections through donors, foundation, NGOs, multinational corporations, nation states and international governing institutions all play a role in African national development; thus Kenya, Uganda and Tanzania are not just sites of poverty and cannot be understood isolated from these relationships. Transnational forces shape privileged experiences in the Global North while outlining the socioeconomic conditions that have led to poverty and malnutrition in sub-Saharan Africa and then offering solutions for Africa's poorest.

I look at how this transnational debate on GMOs in East Africa is explained by the media as well as which actors or stakeholders—domestic or foreign—are most prominent in the media. My study strives to contribute to the question of how East Africans view the debate on food and farming preferences and show how discourse in elite newspapers should not be viewed simplistically as an inherited, polarized debate.

My research question was: Whose voices do reporters at the *Nation*, the *Monitor* and the *Citizen* include in their framing of an international debate over the use of biotechnology in farming? A first set of sub-questions was: How is this debate framed in the East African media? How does the content fit into the transnational debate? A second set of sub-questions was: To whom do newspaper reporters turn to as sources? What are the sources' affiliations—both geographically and institutionally (i.e. international NGOs and activist networks, African or Global North researchers, local farmer groups, politicians, etc.)?

To answer this, I looked at newspaper content in Kenya, Uganda, and Tanzania—three historically connected countries. The three countries are heavily reliant on agriculture and have current or recent legislation and/or policy making about either the research of genetically modified crops or the sale and importation of genetically modified seeds and foods. Additionally,

the researchers and politicians in East Africa view this as a regional issue. Genetically modified seeds are not easily confined to borders due to cross-pollination and illegal trade, while plant pests and disease challenge farmers' productivity across an entire region. Partnerships exist across the region, including research collaboration and efforts to harmonize policies on trade.

My sample included articles posted to the Nation Media Group newspaper websites based in all three countries—the *Daily Nation* in Kenya, the *Daily Monitor* in Uganda and the *Citizen* in Tanzania. I analyze the framing describing content and how it fits into the international debate, and I look at which sources reporters used to present prominent frames. I specifically pay attention to how transnational or foreign sources are used within the frames.

While I use communication research methods to structure the content analysis, my study will primarily be of interest to global studies scholar and specifically those interested in agricultural biotechnology. However, due to the nature of the methodology and also the lack of research on the African media, it may also be of interest to communication scholars.

CHAPTER 2

LITERATURE REVIEW

In this literature review, I will provide a summary of agricultural biotechnology in Africa, political theorists' explanations of transatlantic influence on GMO discourse in Africa and its relation to transnational networks, a theoretical framework for media framing and the polarization of complex issues, as well as an overview of the types of newspaper analysis that have been conducted on biotechnology in general. I will further explain how my research will fit into existing literature.

Agricultural biotechnology in Africa

Agricultural biotechnology is the science of biologically altering seeds with the intent of improving yield through the increase of pest, drought or chemical resistance or by improving the nutritional makeup of the seed. Biotech tools include genetic engineering, the application of molecular markers, and tissue culture methods (Ayele et al 2006).

Africa's first GM crop was Bt cotton cultivated in South Africa by resource-poor smallholder farmers in the Makhathini Flats area in 1999. The area previously could not grow cotton. Success of this adoption is debated in studies, as there are both positives and negatives. A study by Bennett et al. (2006) of the first four seasons of cultivating Bt cotton revealed higher yields, lower pesticide use, less labor for pesticide application, and substantially higher gross margins per hectare.

However, Schnurr (2012) argues that Makhathini was a project selected for the geographic, institutional and historical realities in which Bt cotton adoption in South Africa was most likely guaranteed to be a success story and further to be a showroom for the rest of the world. Bernauer and Aerni (2007) also argue that foreign actors promote GMO development in Africa due to economic and political motivations, including gaining the public trust of Western

consumers and voters. After Makhathini's supposed "success," politicians, university lecturers, government workers and journalists from Kenya and Uganda were flown to South Africa by pro-GMO organizations as part of a pitch to accelerate GM adoption (Schnurr 2012). One such trip is included in my sample. Complementing this work, Glover (2010) shows how Monsanto has competed for public trust via a pro-poor public relations strategy.

By 2010, South Africa ranked eighth out of 25 in the world for amount of land under GMO cultivation (Birhanu 2010b). South Africa's University of Cape Town developed the continent's first locally researched GM crop, virus-resistant maize, in 2007 (Sinah 2007). Today, the South African government stands alone on the continent as the one country that has completely embraced the technology. Only two others—Egypt and Burkina Faso—have begun minimal commercialization of GM crops (Okeno 2013). While Kenya's leaders indicated interest in biotechnology in the 90s with research beginning in 2000 (Birhnau 2010b), the rest of East Africa did not address the technology in a substantial way until more recently.

Some researchers have expressed a lack of bottom-up demand in the development of GMOs in Africa (Ayele at al. 2006, Muraguri 2010, Kingiri 2010, Ezezika et al. 2012). Though some African countries are now responding in a more comprehensive way with their own approaches to biotechnology regulation, some researchers attempt to explain how Africa's political institutions have faced pressure to do so from transnational networks.

Transnational networks are defined as "networks of activists, distinguishable largely by the centrality of principled ideas or values in motivating their formation" (Keck and Sikkink 1998). They leverage international resources to local actors in domestic political and social struggles and often look to change institutions in addition to policies. The networks extend from the developed world to the developing world and across many different experiences. Actors can

include (but are not always present in each network): international and domestic NGOs, local social movements, foundations, the media, churches, trade unions, consumer organizations and intellectuals, parts of regional and international intergovernmental organizations and parts of the executive and/or parliamentary branches of government.

These networks underscore Ferguson's (2006) point that in Africa "'the top' is not the state… Africa is ruled by transnational organizations that are not the government but work with powerful First World states within a global system of nation-sates." He argues that the transnational nature of the state and civil society in Africa leaves the state unempowered while NGOs and transnational organizations are "not as NG as they might wish us to believe." Not considering the transnational nature of the GMO debate and the actors in it veils relations that link impoverished nations to the international order. Additionally, unlike in the western world, experiences of capital flows are unequal as capital skips over undesirable parts of Africa leaving an uneven experience of globalization.

Within this kind of transnational "empire" as Miller (2004) calls it, the organization of knowledge production and validation raises questions of who has a voice, who has a right to review research, and what counts as legitimate knowledge.

The media are a stakeholder in transnational networks and arguably important links in these systems as they give voice to different actors, spread each network's message, and also contribute their own answers to those questions. Additionally, the media play a role in how individuals discover information about emerging science and technology (Priest et al. 2003).

The global debate on GMOs in the developed world mostly preceded local debate in Africa and is largely polarized in either pro-GMO or anti-GMO positions. Internationally, the political winds shifted toward resistance against GMOs when the European Union placed a

moratorium on GMO imports in 1998 until more research could be done. In the years that followed, the US lost $300 million per year in sales of maize to Europe (Clapp 2007).

International regulations regarding the governance of biosafety were being debated at the Convention of Biological Diversity through the 90s and culminating with the adoption of the Cartagena Protocol in 2000. The convention was heavily lobbied by environmental NGOs who attempted to influence developing countries making them aware of the potentially negative consequences of GMOs, particularly for their biodiversity, traditional agriculture, and indigenous people (Arts and Mack 2007). Corporate interests responded with their own lobbying groups and the language in the protocol ended up watered down compared to original goals of the environmental groups (Clapp 2007b). However, the environmental groups were successful in influencing a precautionary approach to the regulation of GMOs (Arts and Mack 2007).

To date, forty-five African nations have ratified the Cartagena Protocol, including Kenya, Uganda and Tanzania. Later the African Union passed legislation to provide a model framework for implementing "access and benefit sharing laws" that goes beyond work of the Convention on Biological Diversity (Birhanu 2010), though there is wide variation of actual application of this model in the biosaftey laws of African countries (Birhanu 2010b).

Meanwhile, shortly before the Cartagena Protocol went into effect in 2003, there was a famine in Southern Africa during the summer of 2002. In response, the US sent food aid that was 75 percent GM whole kernel corn. Zimbabwe and Zambia refused to accept it; Mozambique, Swaziland and Lesotho said they would receive it if milled first; and Malawi accepted it with strict monitoring of their farmers to ensure it was not planted. The US refused to spend the money to mill the grain and said it was impossible to separate GMO from non-GMO (Clapp 2007).

Zambia's agriculture minister said that it was afraid of cross-pollination with its non-GMO maize, some of which was grown for import to Europe. The US began to worry about the impact of EU policy in the developing world, as most corn and soy products grown in the US are genetically modified. By the end of 2002, the European Union had passed a law requiring labeling of GM foods (Mitchell 2003).

In early 2003, the US along with Argentina and Canada launched a World Trade Organization complaint over Europe's ban and its impact on other countries. It argued that Europe was hindering agricultural progress in Africa that could combat food insecurity (Clapp 2007).

Subsequently, the two clearly polarized differences in agricultural biotechnology regulation in the US and Europe have affected approaches taken in sub-Saharan Africa with many countries taking a cautionary approach. The World Bank, the EU, bilateral aid programs and the UN Environmental Program have all offered funding for capacity building, which can mean training activists in mechanisms for tightening regulations of GMOs (Paarlberg 2008). Some stakeholders within the network have also funded local protest campaigns and promoted organic agriculture initiatives (Bernauer and Aerni 2007).

However, recent legislation in Kenya and Uganda, as well as academic pursuit in East Africa, suggest an opposite push for GMOs to address food insecurity. A new emphasis situates GMO adoption within rhetoric on finding the appropriate application of the technology to Africa within a space that protects indigenous knowledge and natural resources.

In 2007, a high-level African Panel on Modern Biotechnology, appointed by the AU commission chair, produced a draft report "The Freedom to Innovate: Biotechnology in Africa's Development" (Juma and Serageldin). This new emphasis was on Africa's failure to reap any

benefits from biotechnology, and the extensive use of biotech was advocated with science-based risk-assessment. It stands in contrast with the earlier African Model Law (Birhanu 2010b). For African countries with more favorable political environments for GMOs this requires more sophisticated systems of governance than may yet exist, and a few are responding with legislation and new government agencies to address that gap.

Birhanu (2010b) describes Kenya and Uganda as having little biotech capacity but aspiring to more, and Okeno et al. (2013) agrees, providing evidence showing positive political will. Kenya received funds from international donors to develop their policies as early as 1996 and passed a less comprehensive Biotechnology Policy at the end of 2006. Though Kenya Agricultural Research Institute has researched different genetically modified varieties of sweet potato, maize, cotton and sorghum, Kenya's Biosafety Bill did not pass until 2009. Though delays are a possibility, Kenya's commercialization commencement is planned for 2014 with GM cotton, which would make it the fourth African country to commercialize GM crops after South Africa, Egypt and Burkina Faso (Sinah 2007).

Uganda is a fifth country (along with Nigeria) that is close to passing legislation to regulate the commercialization of GMOs (Okeno et al 2013). The first policy on biotechnology and biosafety regulation was developed by the Uganda National Council for Science and Technology (UNCST) about three years before it was modified and approved by the Presidential Cabinet in 2008. The Parliament tabled a more robust bill to replace the original draft policy in 2013. Uganda's National Agricultural Research Organization first launched a project in 2005 in collaboration with partners to engineer the East African highland banana. The first trial was in 2007 and since then there have been five more including versions of the banana that are fungal

resistant, bacteria resistant and even fortified, as well as different varieties of cotton, cassava and maize (Sinah 2007).

Birhanu describes Tanzania as defensive and restrictive of the technology based on his analysis of the regulatory structure of GMOs (Birhanu 2010b), though GMOs are not outright banned, and in fact research of GMOs has been conducted within the country. Tanzania's government approved Biosafety Regulations in 2009, which allowed researchers to begin lab study of genetically modified crops but not to plant them in field trials.

A lack of private firm involvement in partnerships in Kenya has led to investment in R&D that is often driven from the top down with donors looking for countries that have a track record of being easy to work with, rather than bottom up with consumers seeking solutions for agricultural problems, according to a study by Ayele et al (2006). The study maps partnerships in Kenya, which include donating foundations and governments, receiving foundations and governments, activist groups and to a lesser degree, private firms. The authors claim that these patterns are similar for other sub-Saharan African countries, specifically Uganda and Tanzania.

Kingri and Hall (2012) also conducted interviews with six different organizations in Kenya and analyzed their ability to act as a neutral policy broker within an already polarized debate, showing how most of the organizations, both local and international, receive funding and support from the Global North and already have a position on biotechnology. They emphasized a need for local brokerage and demand-driven, client-oriented approaches in agricultural development.

An example of private investment in agricultural biotechnology research in the region is the Water Efficient Maize for Africa project, which operates in Kenya, Uganda and Tanzania, as well as Mozambique and South Africa. The project is funded by the Gates Foundation and the

Buffet Foundation and uses royalty-free technology from Monsanto. It aims to produce drought-tolerant and insect-resistant maize using conventional breeding, marker-assisted breeding, and biotechnology (WEMA 2013). Additionally, Kenya and Tanzania are a part of the New Alliance for Food Security and Nutrition, which invites private investment in agriculture from both local and transnational businesses (NAFSN 2013).

According to Okeno et al (2013), while countries like Kenya and Uganda have provided support for local research and development of biotechnology through national institutes, public spending is low. The authors were unable to find year-to-year data for each country, but say that the regulatory framework in these countries attracts financial support from international organizations and foundations.

Muraguri (2010) echoes the need for bottom-up approaches to development as she tries to answer why public-private partnerships are not more successful in Kenya. She describes how projects are introduced by donors, development agencies and private foundations and are often not linked with national development goals. Projects are generally science-led and private companies involved are usually multinationals rather than local agribusinesses. She analyzes four Kenyan policies for their inclusion of partnerships and concludes that a lack of framework for how public-private partnerships should operate in Kenya leaves a power dispersal biased against the government.

Framing of GMOs

While the concept of framing was first used by Goffman (1974), who used it to describe how individuals construct experiences, it has been borrowed for media studies ever since. Scheufle (1999) tried to operationalize the use of framing as a media analysis, saying that previously use of the concept was fractured because some research on the influence of framing

has examined different activities. He attempts to clarify by describing "frame building" and "frame setting" as two different processes. Frame building, as borrowed from agenda setting research, means to describe *how* issues are framed by journalists. Frame setting is the process in which the media determines what issues are more salient for an audience.

Crawley (2007) describes frame setting as the practice of providing a specific news angle to characterize events or issues (ex. Frankenfoods vs. a tool for fighting hunger and disease). Science journalists often view their job as taking abstract ideas and reframing them in a way the general public can understand (Marks et al. 2007). Most studies on biotechnology look at frame setting and its influence on public opinion (Marks et al. 2007, Lee et al. 2008).

There are many media content analysis studies on biotechnology, but they vary in scope, and none yet exist on African media's framing of biotechnology. A seminal study by Gaskell et al. (2002) compared newspaper coverage of biotechnology between 1984-1996 in the U.S. and 12 European countries. Other studies contrast medical and agricultural biotech (Marks et al. 2007); others focus only on medical biotech, such as Nisbet et al.'s (2003) study on stem cell research, or only on agricultural biotech (Crawley 2007, Bothelo and Kurtz 2008). Additionally, some of these look either at UK media, US media or compare and contrast coverage in both countries (Marks et al. 2007, Bothelo and Kurtz 2008).

Research on the types of sources journalists use has been largely based on western conceptions of journalism; however, this work does provide a basis from which to think about newsmaking in East Africa.

A number of studies look at the impact of media framing of a political competition, showing that it can go hand in hand with idea dualism. Idea dualism is a journalistic practice of portraying two sides to an issue (often missing any middle ground) (Lee et al. 2008). This

compliments Bernauer and Aerni's (2007) idea of polarization, which they describe as a process in which groups competing for public trust create an exclusionary dichotomy (trust us, not them) and become less likely to compromise. Any political bargain with another group becomes much harder to make because it is at the risk of losing public trust. Nisbet et al. (2003) adds to this saying that once an issue is framed by the media, it is difficult to shift the image of the issue.

Typically, power to influence frames lies with the political elite, however "...while less-dominant groups may not have the economic power to dominate news frames, for some groups 'on the fringe,' their skill lies in their knowledge of journalistic practices and in their awareness of what makes an issue newsworthy." (Crawley 2007)

Herring (2010), a sociologist, looked at the framing of GMOs in the public sphere by whom he calls epistemic brokers—people who the public trusts to be authoritative. Epistemic brokers select, contextualize, authenticate, sometimes theorize, and always disseminate knowledge about transgenic crops. Additionally, "the distance of the discourse from ordinary experience necessitates epistemic brokerage; if nothing else, information costs for most of us are very high."

African media systems

In considering media coverage of GMOs, it is also important to consider work that contributes to an understanding of African media systems. However, these works usually generalize journalism in Africa, draw largely on African history and less on contemporary contexts and are few in number. In the last several years, communication scholars specializing in African media have set their work within the larger body of research on media systems of various countries, most notably that of Hallin and Mancini (2004).

The political context of independent journalism in parts of Africa through the years has sometimes meant competing with state-, government- or party-connected newspapers, and has also been met with hostile attitudes. Though Shaw (2009) describes repression of African media after independence, saying that Anglophone African media has the freest press with the most experienced journalists absorbing British free press tradition, repression has often been experienced with the added leverage of colonial-era press laws (Acayo and Mnjama 2007). This has been the case in Kenya, Uganda and Tanzania (Loughran 2010, Kambanga 2013 and 2010).

Shaw (2009) and Skjerdal (2012) have laid foundational work for describing journalism across the continent. These descriptions generally try to distinguish African journalism from other models, such as those in the U.S. or Great Britain, and they draw on African history, culture and politics, to describe the context within which African journalists work. Additionally, they discuss professional rhetoric and practices of work by journalists.

Scholars of African journalism also seek to point out characteristics that are unique to African journalism that aren't easily measured using the same variables given in theoretical work on western models of journalism. Skjerdal (2012) specifically identifies cultural essentialism and interventionism as two better variables with which to analyze African journalism.

Attention to oral discourse as a cultural style is given. Before written journalism existed in Africa, oral discourse through storytellers, musicians, poets and dancers constructed reality largely in the narrative form and was defined by concepts of civil society and the public sphere that are not unlike western conceptions. Further, the Southern African concept of *ubuntu* is often used to explain the values of the oral tradition, which had a strong group orientation (Shaw 2009).

A version of interventionism is development journalism, which reports on economic and

social development issues and works independently from the government, though also sees itself as nation building alongside the state. Ujamaa journalism as promoted by Tanzania's first president Julius Nyerere, was used to advocate African socialism. Nyerere's ujamaa journalism model was systematically introduced in education and media practice, together with a national communication scheme based on collectivism (Skjerdal 2012).

In Uganda, peace journalism, which "employ[s] the media in peace efforts by challenging the conflict orientation of traditional news journalism," could be considered another version of interventionism. Studies have been done on radio involvement in the end to the 25-year civil war in the north (Goretti 2007, Acayo and Mnjama 2007, Brisset-Foucault 2013). Interestingly, Brisset-Foucault's (2013) study notes a difference in practice between the radio journalists in the north from their print counterparts based in Kampala, who tended to scoff at the subjectivity of their radio brothers.

Ultimately, Shaw (2009) says there is strong evidence for features of the western liberal model described by Hallin and Mancini (2004) in today's African journalism existing alongside pre-colonial traditions of oral discourse that emphasized community rather than the individual (Shaw 2009).

Awareness of these differences and the continued conversation in the literature about how to describe African journalism are important layers in the context about how discourse on agricultural biotechnology adoption and regulation takes place in the public sphere.

While no work specifically analyzes framing of biotechnology in the African media, Outram (2010) looks at the capacity of science communication in Africa given what he sees as a debate handed down to them from the Global North. He furthers the understanding of the communication between journalists and elite stakeholders, in a qualitative study by interviews

with African journalists, public information specialists and researchers/scientists primarily in Kenya and South Africa.

Outram (2010) said that the atmosphere in Europe, which has strongly polarized views on the issue with little room for middle ground, has negatively affected African discussion of the topic because the issue has already been framed, when the appropriate arguments in Europe may not be the same in Africa, where there is great need for better health and food security. Many respondents said that the polemic discussion in the media has forced them to take sides on the subject rather than engage in a more meaningful discussion.

Outram (2010) identifies a mistrust of local science journalists by African researchers and scientists that causes them to talk more to non-African journalists, thereby missing the opportunity to communicate information that can be relayed to an African public. Additionally, African journalists stated their frustration, saying that scientists rarely get back to them, so they end up either dropping the story or calling an expert in the US, Europe or Japan to fill the void instead of having African experts in the story.

Conclusions

While some literature attempts to explain how the two approaches to agriculture as played out in the policies of the European Union and the United States impact the policies of African countries (Bernauer and Aerni 2007, Paarlberg 2008), the work often leans toward either one side or the other side of the GMO debate and begins its questioning in the Global North, failing to consider how this might reproduce privilege for certain actors.

Noticeably missing in the literature on adoption of GMOs in Africa is a bottom-up perspective. Scholars have analyzed the international political economy by looking at food aid distribution, NGO influence at the Cartagena Protocol conferences and Monsanto's public

relations angle—all of which primarily begin by researching big actors in the Global North. Though some research points out the need for engagement from the bottom by analyzing institutional networks in East Africa (Ayele et al 2006 and Kingri and Hall 2012), it still doesn't provide insight into local farming or consumer preferences or knowledge. Like Miller (2005) critiques in his piece on international governing institutions, much of the literature adopts research methods that privilege the international.

While my research will not engage local farmers or consumers, it will attempt to describe the issue from the perspective of epistemic brokers, to borrow the concept from Herring (2010) in East Africa. Additionally, it will show whom the local media privileges within the discussion. My research will also contribute to understandings of African media, of which there are few. Additionally, though existing work lays a framework for future research of African media, it often generalizes for the whole continent and does little to gather specific cases (either individual countries or certain types of media such as print or radio) to illustrate its points.

Finally, the study's inclusion of rich content description is meant to provide broader understanding of the political, economic, and cultural context in which the discussion about agricultural biotechnology adoption takes place.

CHAPTER 3

METHODOLOGY

I conducted an analysis of reporters' framing setting of agricultural biotechnology coverage in East African elite online newspapers between 2010 and 2013, as well as an analysis of the affiliations of the sources presented within each article.

I chose to analyze content in the Nairobi-based Nation Media Group's newspapers in Kenya (the *Daily Nation*), Uganda (the *Daily Monitor*) and Tanzania (the *Citizen*). This allows me to look at three historically connected countries, as well as three historically connected newspapers.

The Nation Media Group has had a regional vision since it was founded in 1960 at the cusp of independence by the fourth Aga Khan, the Prince Karim Al Husseini. The Aga Khan first bought the Kiswahili paper *Taifa* (now *Taifa Leo*) and decided to build a sister English-language newspaper called the *Nation* that would support Kenyan independence. Its views were in contrast with the *Standard*, which published primarily for the white settler community (Loughran 2010).

The Nation Media Group's early regional ambitions led to the establishment of editorial offices in Dar es Salaam and Kampala, and its inaugural issue even expressed the regional focus of its mission: "To do our utmost to help Kenya and the other East African territories make the perilous transition to African majority rule and full independence as peacefully and constructively as possible." The paper directed most of its attention on exploring publishing opportunities in Uganda and Tanganyika; though its early efforts to expand failed (Loughran 2010).

After the *Nation*'s regional newspapers folded, its reach into Uganda and Tanzania was through its bureaus in those countries. Small distribution of the *Nation*'s paper containing

regional news was done when political conditions allowed. During the regimes of Milton Obote and Idi Amin, Uganda's border was frequently closed causing erratic supplies from Kenya. Additionally, much of that exchange stopped when the East African Community fell apart in 1977 and did not resume until the early 90s when the Nation decided that official attitude toward independent media was less hostile. During this time, *The EastAfrican* was launched covering all three countries again (Loughran 2010).

In Uganda, the state owned paper the *New Vision* had no serious competitors until media liberalization in 1983 (Goretti 2005). The *Daily Monitor* was founded in 1994 as the alternative. During the same time period the government liberalized the economy, enabling the *Daily Monitor* to eventually attract the investment of the Nation Media Group in Nairobi, Kenya, which acquired about 60 percent of its shares in March 2000 (Wasswa 2005, Loughran 2010).

Next, the *Nation* began looking for expansion opportunities in Tanzania at the request of President Benjamin Mkapa, who had actually sought work with the *Nation* group in the past. The Nation bought 60 percent shares in the existing Mwananchi Communications, Ltd, which had a daily Kiswahli paper called *Mwananchi*. The Nation Media Group launched *The Citizen* as the English–language counterpart (Loughran 2010).

Including these Nation Media Group newspapers in the study also avoids looking at the state-owned papers in Uganda (*New Vision*—60 percent state owned) and Tanzania (*Daily News*) and instead focuses only on commercially connected private media.

I also decided to look at elite newspapers due to the higher likelihood that they are read by political actors. Additionally other research has suggested that discussion of agricultural biotechnology may be more established in elite newspapers. Interviews of stakeholders in GM technology adoption in Sub-Saharan Africa by Ezezika et al. (2012) found that modes of

communication used to promote GM are "elitist" and not at the grassroots level where the common farmer can understand it.

This study also looks at newspapers with wide circulation and reach, as opposed to newspapers or Internet-based alternative media that are more local and rural. Actual readership data was difficult to find without paying for access to marketing surveys. Annual reports from the Nation Media Group only showed revenue rather than circulation of each newspaper. Circulation numbers can be tricky in East Africa, and sources say that as many as 10 people share a copy of one newspaper (Nyabuga and Booker 2013).

In Kenya, the *Daily Nation* has a circulation of 150,000, while the *Sunday Nation* has a circulation of 250,000 (Matende 2012). According to an Open Society Foundation report, overall, daily newspaper readership in Kenya is about 3 million while weekend readership is at about 5 million, and the *Nation* is the most widely read newspaper. Figures from 2011 show that 92 percent of newspaper readers read the *Nation* at least once a week. Overall, about 20 percent of people in Kenya read the newspaper at least once a week, while about 15 percent access the Internet (Nyabuga and Booker 2013).

The Open Society Foundation does not have reports on Uganda or Tanzania, and readership for the *Monitor* and the *Citizen* was difficult to find. The IREX cites the *Monitor*'s circulation at 15,000, putting it behind its main competitors the *New Vision* and its Lugandan counterpart *Bukedde*; however, informal sources have put the circulation much higher. The IREX does not cite readership for the *Citizen*, however, its sister Kiswahili paper *Mwananchi* has a circulation of 45,000, while figures for Tanzania's English newspapers were difficult to find as figures were reported only for the top three newspapers, which are in Kiswahili. Additionally,

Internet usage in Uganda and Tanzania is much lower than in Kenya according to the IREX Media Sustainability Index (Kambenga 2012 and Kabooza 2012).

I chose to begin the study in 2010, which is the first year that all three countries showed coverage of GMOs. The earliest coverage of GMOs in these papers was in 1998 in Kenya's *Daily Nation* with the start of the Cartagena Protocol talks. It includes the research of Bt cotton begun in Kenya in 2004. Coverage culminates with the introduction of the Biosafety Bill in 2007, which was eventually passed in 2009. Uganda's *Daily Monitor* picked up on the topic in 2007, which coincides with the year it began its first field trial of the East Highland banana produced using biotechnology despite the fact that a legal framework was not yet in place, while the *Citizen* did not write anything until 2010, which is the year after Tanzania's first biotechnology policy allowed research to begin in the country.

I used the search terms, "GM," "GMO," "GMOs," "genetically modified," "biotech," "biotechnology," and "biosafety" to search the archives of all three newspapers. Articles containing a search term, but focusing on another issue overall were cut from the sample. Additionally, I removed editorials, guest columns and letters to the editor that were clearly labeled.

Table 3.1

News article sample from online newspapers in Kenya, Uganda and Tanzania, 2010-2013

	2013	2012	2011	2010	TOTAL
Kenya	21	20	47	21	108
Uganda	32	11	27	40	110
Tanzania	26	8	4	2	40
TOTAL	58	19	31	42	258

My final sample included a total of 258 articles (See Appendix A for full sample). A total of 38 articles (about 15 percent) were coded by myself and one other coder for inter-coder reliability.

Each article was coded for three things: type of article, framing, and source affiliation.

News type

First, each article was coded for type: news or news wire. Any news or feature article written by a staff member with a newspaper email address was coded as "news." Additionally, any writer with the title of reporter or correspondent was included as news. Any news or feature story labeled as a press agency story was coded as "news wire." The category "other/unsure" was reserved for articles that did not fit these categories but were clearly not opinion pieces.

Framing

Initially, I had wanted to see how a variety of themes were used within each article, and so I began coding for each one. If more than one theme was present, the paragraph was coded for multiple themes. After coding the entire article, an overall article frame was assigned using the most frequently used by paragraph. Realizing this still did not really capture what an overall impression of the articles might, I took the advice of a committee member and repeated the process of coding the stories along with another coder trying to capture what reporters wanted readers to understand after finishing each article. This helped in ensuring that I felt better about the quantitative results reflecting what my initial intuition was. While this second reading resulted in some shifts in the data, the original process of coding by paragraph was not in vain. It was instrumental in establishing agreed upon definitions of the frames by two coders.

Overall, definitions changed quite a bit from the beginning of the process to the end. The frames were developed beginning with definitions from past research (Botelho and Kurtz 2008) and then through a process of discussion with one other coder. After coding a small number of articles, coders discussed disagreements and redefined frames before trying to code more articles. This continued with the goal of coders reaching agreement of .70 Cohen kappa. Then, I coded the remainder of the sample on my own.

The sample was coded for seven frames: Research, economic, food security, environmental, regulatory, public opinion and farming. Botelho and Kurtz's (2008) frames were used as a starting point, borrowing eleven frames with description and key content from a study they conducted of two British and two US newspapers. These frames had also been adapted from Gaskell et al.'s seminal 1999 study on biotechnology coverage in the US and 12 European countries. Some changes were necessary due to the differences between biotechnology adoption in Africa and western countries.

Most of the frames were adapted considerably to include issues that came up in the African context, such as food aid, drought, malnutrition and smallholder farming. While in some cases, the frames changed to include more current issues, modifications were also made to exclude past issues that may have been more relevant during a specific time period (i.e. Starlink scare). Additionally, some renaming and consolidating of frames was done in an effort to be more descriptive of the information presented in the sample and to remain concise.

For example, the "public accountability," "labeling," and "moratorium/ ban" frames originally described by Bothell and Kurtz were redefined and categorized as "regulatory." Additionally, an "other" code was initially used to capture content that was framed in a way not yet described by the original list of frames. An inductive approach was taken for these paragraphs, and each one was reviewed by the two coders and discussed together in order to identify emerging frames. The only one we agreed to apply going forward was "farming." There were a few other outlier articles that did not fit in any frame and these were coded "other." See Table 3.2 to see a comparison of Bothelo and Kurtz' frame definitions next to the definitions developed for this study.

Table 3.2

Bothelo and Kurtz (2008) Definitions			Definitions Identified in the Nation Media Group Newspapers		
FRAME	**FRAME CONTENT**	**KEY TERMS**	**FRAME**	**FRAME CONTENT**	**KEY TERMS**
Discovery	Scientific breakthrough; new discovery; progress; paradigm shift; new direction for history	Breakthrough; development; future; progress	Research	Scientific breakthrough or new discovery; research at an institute; stages of research (i.e. identifying genes, naming viruses; field trials); scientific explanation	Development; future; progress; field trials
Economic implications	Economic potential; economic gain/loss; increase/decrease yield; investment opportunity	Cost; economic; marketplace; price; profit; yield	Economic	Economic potential; economic gain/loss; increase/decrease yield; investment opportunity; productivity; internation-al trade; competitive advantage; sustainable income; access to credit or markets; lack of resources; value chains; smuggling or grain cartels	Cost; economic; price; profit; yield; trade; import; export; smuggling
Ethical issues	Professional ethics, moral arguments, playing god, definition of risk, call for ethical involvement	Ethic; god; nature; professional; risk	N/A		
Food security	Contamination of food supply; having enough food; keeping up with rising food demand	Contamination; food; starlink; supply	Food security	Contamination of food supply; having enough food; hunger or malnutrition; food aid; biofortification with micronutrients such as vitamin A	Contamination; food supply; hunger; food aid; biofortification,
Globalization	Global perspective; creation of new feudalism due to patent rights; trade dispute before WTO; implications for lesser developed countries	Africa; biosafety; global; national; WTO;	N/A		
Environ-mental issues	Actual/potential environmental impacts; unintended consequences; testing location safety; environmental testing	Biodiversity; bt; butterfly; ecological; environment; geneflow; monarch;	Environ-mental	Actual/potential environmental impacts; unintended consequen-ces; testing location safety; environmental testing; pests and disease; chemical use; bio-diversity; biosafety;	Biodiversity; biosafety; ecological; environment; climate change; pests; drought; organic

				climate change; drought; organic	
Health implications	Safety of human health; allergenicity; health trials; potential/actual health impacts; nutrition	Allergens; cancer; Pusztai; health; safety; vitamin;	N/A		
Public accountability	Regulatory mechanisms; public involvement; transparency; trust in government	Accountability; FDA; framework; government; regulatory; transparency; treaty	Regulatory	Regulatory mechanisms; transparency; trust in government; GMO testing/inspections; required labeling, moratorium or ban; framework; Cartegena Protocol	Accountability; framework; government; regulatory; transparency; Cartegena Protocol; ban, label
Labeling	EU-required labeling; consumer awareness of GM products; labeling of ingredients	Free; ingredients; label			
Moratorium	EU moratorium on imports of GM food; ban on commercial growth	Ban; moratorium			
Public Opinion/Consumer concern	Public opinion on GM food; polls	Concern; consumer; poll; public	Public opinion	Public opinion on GM food; preference for traditional farming practices; vague or otherwise unlisted declarations of one's position or opinions indirectly related to GM adoption (i.e. taste, lack of awareness on GM, misconceptions, myths, etc.) including opinions of civil society organizations	Concern; consumer; public; protest
N/A			Farming	Farming practices (harvest, irrigation); smallholder versus commercial farming; modernization/industrialization of farming; use of traditional or indigenous seeds; farming extension services/advice;	Smallholder; advise; Kilimo Kwanza; Green Revolution
N/A			Other	Content not described by any other frame	

Affiliation

Source affiliation codes have been coded inductively by recording organizational affiliation for each source. This also measures multiple occurrences of each affiliation within the

sample. These were then sorted into defined categories, such as political, non-governmental, farmer, consumer, etc. The origin refers only to the origin of the organization, business or group with which the source is affiliated rather than the source's citizenship or origin. This could include institutions clearly defined as either East African or foreign or institutions with blurry distinctions that are international or transnational in nature (i.e. Greenpeace, UN Food and Agriculture Organization). East Africa refers to the countries included in this study—Kenya, Uganda and Tanzania—or mentions of the East African Community. This did not include reporters' characterization of organizations or businesses in non-speaking roles without content attributed to them as the source.

Direction

Initially, I also tried to capture pro or con direction within the articles but intercoder reliability was only about .50 Cohen kappa, and I didn't feel confident that we had identified the direction of the articles correctly. Direction is tricky to understand because the readers bring their backgrounds to the story, which can play a role in what sort of impression the article leaves. Given that the background of the coders is not East African, this is possibly even trickier.

Analysis

Once frames and affiliation results were organized, content within the frames was analyzed for each newspaper highlighting the most occurring frames and describing the content within current context of each country. Additionally, content was analyzed by the affiliations of sources journalists used in the sample, looking specifically at transnational affiliations.

CHAPTER 4

RESULTS

The sample of articles covers different moments in the GMO debate in all three countries, as Kenya is the only one that has passed a Biosafety Bill and is working on implementing the bill, which will control the commercialization of GM seeds during this timeframe including imports and the local sale of GM seeds. Uganda's coverage focuses on the research phase including GMO field trials, which are approved by the government, while GM seeds have yet to be released to farmers. In Tanzania, there is a regulation governing the research of GMOs, but researchers are constrained from testing their products in the field. The government has yet to further review any regulations that would enable commercialization of GMOs in Tanzania. The sample of articles is also not equivalent in all three countries, with coverage being significantly less in Tanzania's *Citizen* until 2013, the last year of the study. These events are likely one factor impacting the framing of the articles and the institutional affiliations of sources chosen by reporters.

First I report inter-coder reliability, which was completed on a sample size of 38 articles or about 15 percent of the total sample. Then, I report the type of articles that were coded: news, news wire, or other/unsure, followed by the framing of the articles by newspaper. Lastly I show the affiliation results, which are broken down by institution and categorized either as East African or foreign by newspaper.

Intercoder reliability

Intercoder reliability is reported for framing, as this is the only variable with potential for considerable disagreement. News type has almost 100 percent agreement and most variability in the coding has been determined to be human error rather than disagreement. Specific affiliation of each source was coded inductively rather than deductively; therefore there is no need for

measuring agreement.

Table 4.1

Inter-coder Reliability of Article Framing

Sample size = 38

	Coder 1	Coder 2	Match	Cohen's K	Krippendorf's α
Economic	6	4	3	0.43	0.54
Environmental	1	3	1	0.33	0.48
Regulatory	9	8	8	0.89	0.92
Research	7	9	6	0.60	0.68
Food security	4	2	1	0.20	0.29
Public Opinion	6	6	6	1.00	1.00
Farming	4	5	3	0.50	0.62
Other	1	1	1	1.00	1.00
TOTAL	38	38	29	0.66	0.73

Table 4.2

Inter-coder Reliability of Themes found in East African Newspapers

Sample size = 35

	Cohen's K	Krippendorf's α
Economic	0.73	0.76
Environmental	0.70	0.75
Regulatory	0.76	0.82
Research	0.66	0.73
Food security	0.64	0.76
Public opinion	0.68	0.80
Farming	1.00	1.00
Other	1.00	1.00
TOTAL	0.77	0.83

Cohen's *kappa* and Krippendorf's *alpha* were used to calculate intercoder reliability (Neuendorf 2002). ICR results are given for the coding of article framing, as well as paragraph-by-paragraph coding for themes, which was used to help determine the overall article frame (see tables 4.1 and 4.2). On the article-level framing, most of the categories have lower agreement than the goal of a .70 Cohen's *kappa* for agreement. However, the sample size was quite low, which brings down the *kappa*. Therefore, inter-coder reliability for paragraph-by-paragraph themes is also reported to show that the definitions that coders established earlier in the research obtained higher agreement within a bigger sample. Coders also attempted to define "globalization" and "health" but did not achieve high enough ICR, so these variables were dropped before coding the remainder of the sample. "Globalization" proved to be tricky to achieve agreement despite attempts to re-define it in a more current, East African context, so it was dropped completely

from the sample. The related concept of transnational connections can be better covered by a more inductive approach to the source analysis by considering connections of the affiliations, which were coded as they appeared in the text, as well as by addressing globalization in the analysis. While not the same, this still allows for the highlighting of the global aspect of the GMO and biotechnology debate. Additionally, the economic function of globalization was defined under the frame "economic" by including trade and liberalization in the definition.

"Health" also did not get high inter-coder reliability due to confusion over the definition for "food security," which included hunger, while "health" included malnutrition. Instead, "food security" was redefined to include both hunger and malnutrition, and all other references to health were moved to the "other" category.

The ICR sample is also compared to the remaining sample to show that the ICR sample was fairly representative of the whole (see table 4.3).

Table 4.3

Comparison of Coder 1's Article Framing Codes in the ICR Sample to the Whole Sample

	ICR Sample		Non-ICR Sample	
	# of Article Frames	% of Article Frames	# of Article Frames	% of Article Frames
Economic	6	0.16	42	0.19
Environmental	1	0.03	14	0.06
Regulatory	9	0.24	69	0.32
Research	7	0.18	42	0.19
Food security	4	0.10	20	0.09
Public opinion	6	0.16	16	0.07
Farming	4	0.10	15	0.07
Other	1	0.03	2	0.01
TOTAL	38	1.00	220	1.00

Framing

A tally of dominant frames by article is shown for the entire sample of all three newspapers and is additionally broken down by newspapers.

It should be noted that the framing results represent articles written by staff writers or freelancers as well as news wire stories selected by the newspaper staff (see Table 4.4). However, approximately 94 percent of the frames do represent articles written by the *Nation*,

Monitor and *Citizen* staff and their freelancers, with only a few exceptions. There were three articles written by American freelancers—two for the *Nation* and one for the *Citizen*—that were categorized as news.

News wire stories included stories from Reuters (international news agency based in London), Xinhua (state press agency of China), and Agence France-Presse (France). Stories marked "unsure" included two stories in the *Citizen* that were not clearly marked but appeared to be wire stories since the content was entirely foreign news. The *Nation* also ran one piece directly from the Presidential Press Service of Kenya.

Table 4.4

Article type

	#	%
News	244	0.95
News wire	11	0.04
Unsure	3	0.01
TOTAL	258	1.00

Framing within the whole sample of Nation Media Group newspapers was not consistent with a breakdown of the framing by newspaper (see Table 4.5). Data presented is from the second reading and is considered the final results. Each newspaper had different dominant frames. In the whole sample, the "regulatory" frame received the most attention within the coverage of GMOs. The "research" and "economic" frames received nearly equal coverage, followed by the "food security" and "public opinion" frames. The next least occurring frames were "farming" and "environmental." The "other" category included outlier articles that did not fit into any other frame. Some outlier themes included bioterrorism, land grabbing, and health concerns.

Table 4.5

Framing of GMO Coverage in the Nation Media Group's Online Newspapers by %

Frames	***Daily Nation***	***Daily Monitor***	***Citizen***
Regulatory	.44	.20	.20
Economic	.17	.17	.25
Research	.11	.32	.07
Environmental	.04	.07	.07
Food Security	.11	.06	.10
Public Opinion	.07	.05	.23
Farming	.05	.11	.08
Other	.01	.02	-
TOTAL %	**1.00**	**1.00**	**1.00**
TOTAL # of articles	**108**	**110**	**40**

Kenya's *Daily Nation*

primarily framed articles about GMOs as regulatory, while Uganda's *Daily Monitor* published more stories with research frames. Tanzania's *Citizen*

reporters did not have one frame that dominated its relatively small sample, though economic, public opinion, and regulatory were used most frequently. The results of the first reading also put regulatory as the most dominant in the *Nation* and research in the *Monitor*; however the frequency of both of these frames was more pronounced on the second reading. In the *Citizen*, initially, the economic frame was most dominant, while a second reading brought the public opinion frame to equal standing with the economic frame.

Affiliation of sources

A total of nearly 250 specific affiliations (see Appendix B for a full list of affiliations and how they were categorized) were coded by article. This represents the types of sources that journalists in the *Nation*, the *Monitor* and the *Citizen* approached for interviews or used as source material (i.e. statistics from the UN Food and Agriculture Organization). It also includes the source affiliations of news wire stories.

Sources were broken down by geographic location (i.e. East Africa, foreign) as well as by similar institutional affiliation (i.e. researchers/ academics). Affiliation categories were then further broken down (i.e. researchers/academics split into subcategories for public agricultural institutions, public universities, and development/policy scholars) (See Table 4.6).

Also, note that East Africa as a category does not include regional organizations of which Kenya, Uganda or Tanzania are member states since other African states are also members. The East African Community, the Common Market for Eastern and Southern Africa, Southern African Development Community, and the African Union are included in the "Political – Intergovernmental" category.

Table 4.6

% of Institutional Affiliations Included in GMO Coverage by Geographic Origin

	Daily Nation **(Kenya)**	***Daily Monitor*** **(Uganda)**	***Citizen*** **(Tanzania)**
Political – East Africa	.37	.19	.25
Political – Foreign	.02	.04	.04
Political – Intergovernmental	.03	.04	.06
Research/Academic – East Africa	.16	.36	.18
Research/Academic – Foreign	.09	.07	.08
Non-profit/Civil Society – East Africa	.08	.08	.04
Non-profit/Civil Society – Foreign	.04	.07	.11
Industry – East Africa	.08	.04	.08
Industry – Foreign	.01	-	.02
Farmer – East Africa	.06	.09	.07
Farmer – Foreign	.01	-	.01
Other	.05	.02	.06
TOTAL %	1.00	1.00	1.00

Within the "NGO/civil society" category for East Africa, many of the organizations listed under the "regional" are the more prominent voices within that category of "NGO/civil society." While they operate in more than one country in sub-Saharan Africa, most have a main office in Nairobi such as Africa Harvest, African Agricultural Technology Foundation and Africa Biotechnology Stakeholders Forum.

Industry players did not frequently appear in the news article; however, they most often occurred in the *Nation* surrounding the issue of whether to import and export maize during a famine. Reporters frequently turned to the Millers' Association or the Cereal Growers Association for input. In the *Monitor*, industry tended to be seed companies or nurseries, and even included Uganda's first private agro-biotechnology firm that uses the tissue culture method to propagate a variety of products. The most occurring multinational companies were Monsanto and Syngenta. However, in Monsanto's case, the business occasionally appeared in stories but did not often have a voice.

Within each category, there is a line for "other" (if warranted), which captures vague affiliations with a particular group when reporters did not name a specific person (i.e. "researchers," "parliament members"). However, if the given affiliation was too vague (i.e. "an expert"), it was not coded. The most frequently listed affiliation without a formally named institution was "farmer." There are, however, a number of formally organized institutions within the "farmer" category, including a few larger estates with business names in Kenya and a variety of farming associations in all three countries.

Additionally, the category "non-profit/civil society" includes both formally registered non-profits as well as looser East African grassroots groups and individuals (primarily foreigners from the Global North) speaking out about GMOs that did not have a specific institutional affiliation. These are mostly well-known figures within the debate, such as Bill Gates, Mark Lynas and Vandana Shiva. One local activist is Gen. Caleb Akandwanaho, Ugandan President Yoweri Museveni's brother, which activists tried to mobilize against the GMO bill.

The "other" category is the combination of the lowest three occurring institutional affiliations: church leadership, teachers and consumers.

The majority of sources in all three newspapers are East African sources. In Kenya's *Daily Nation*, 82 percent of sources reporters used had institutional affiliations that were East African; in Uganda's *Daily Monitor*, 78 percent were East African; in Tanzania's *Citizen*, only 68 percent of affiliations were East African.

In all three newspapers, foreign researchers received a significant amount of attention compared to other foreign institutional affiliations—9 percent overall in the *Nation*, 7 percent in the *Monitor* and 8 percent in the *Citizen*. However, in the *Citizen*, foreign or transnational NGOs and civil society groups accounted for the most attention (11 percent overall) as the sources

reporters used. The second most used foreign sources were political, though the institutions have been divided between "intergovernmental" and "foreign nations" to provide more insight. Again, reporters at the *Citizen* turned to foreign nations (4 percent) or intergovernmental agencies (6 percent) more often within their stories. The Monitor reporters used foreign political sources next most frequently (7 percent total), while the Nation reporters used foreign sources a total of 5 percent of the time. Both the *Nation* and the *Citizen* also used a small number of foreign industry and foreign farmer sources while the *Monitor* did not.

CHAPTER 5

ANALYSIS

Online coverage of biotechnology in the *Daily Nation*, the *Daily Monitor* and the *Citizen* newspapers was either scant or nonexistent in the early 2000s; meanwhile, Gaskell et. al. (2002) conducted their seminal study on media coverage of the topic in the US, Canada and 12 European countries between 1973-1996. Their study did not focus on agriculture. However, in East Africa the debate has largely been about the adoption of genetically modified crops.

This debate over whether to use biotechnology in agricultural development has often been described as being already polarized in the Global North (Bernauer and Aerni 2007) and "inherited" in Africa (Outram 2010). Discourse in the Nation Media Group is not necessarily polarized, however, even though positive and negative arguments are given within the discussion. Journalists' situating of those arguments is more nuanced than is described in the literature about Africa's understanding of using biotechnology for agricultural development.

This is best understood by employing the concept of ideal dualism (Lee et al. 2008) and is most clearly illustrated by an article in the sample that was reported by an American journalist and published in the *Citizen*. The article was funded by the Pulitzer Center for Crisis Reporting and reported as a part of a series of articles done by the writer and five Tanzanian journalists (none on staff at the *Citizen*). Some of the stories also appeared in the *Des Moines Register*. The journalist is clearly attempting to portray two sides to an issue.

The article, "GMO fight gathers pace in Tanzania," which was framed economic, began with a vividly described scene of starving school children before explaining that these children are in the middle of a "global ideological war" about adopting genetically modified crops, like drought-tolerant corn. The writer first relates the history of genetically modified crops in the US

and explains Tanzania's current regulatory approach. The writer then organizes the remainder of the article under two headings: "The influence of Europe" and "US groups make their mark," giving equal space to each section.

This style fits the concept of ideal dualism (Lee et al. 2008) and is not typical of how Nation Media Group reporters represented the issue in their writing. Two sides were rarely positioned parallel to each other within the sample's content; however, I do point out a few occasions in which Nation Media Group reporters do touch on the global debate in a similar way later in my analysis. But considering the sample size, these occurrences are rare.

For my analysis, I turn back to my research questions dividing the chapter into two sections. My research question was: Whose voices do reporters at the *Nation*, the *Monitor* and the *Citizen* include in their framing of an international debate over the use of biotechnology in farming? My first set of sub-questions was: How is this debate framed in the East African media? How does the content fit into the transnational debate? I explain the framing of the stories in each newspaper during the 2010-2013 timeframe, showing what frames get the most attention. The majority of the space will be given to describing the content of the frames, but I also consider how the content fits within the transnational discourse about GMOs. I describe the historic context of early reporting on the GMO debate in the *Daily Nation* and the *Daily Monitor* (the sample covers the beginning of the *Citizen*'s online coverage), as well as the context of local regulatory and research capacity in each country during this timeframe. Due to the different contexts and capacities in each country, a direct comparison of the three newspapers' coverage is difficult. However, given the newspapers' and the region's historical connection, considering the three newspapers' coverage alongside the others is helpful. Therefore, I make an effort to consider how each country's newspaper, given its context, has chosen to report on the issue.

Then, I turn to my second set of sub-questions: To whom do newspaper reporters turn to as sources? What are the sources' affiliations—both geographically and institutionally? My goal here is to consider the information with a second perspective, focusing on how prevalent transnational and foreign sources are within the newspaper sample as well as how they are used by reporters, though I also touch on East African sources. Then, I consider transnational and foreign institutions as non-speaking characters as these are often included but are not counted in the data as sources, as well as transnational connections to speaking sources within the sample.

While I recognize the relationship between a reporter and his or her sources, there is much more at play than simply the reporters' privileging one source over another. This assumes the reporter has access to multiple sources. Additionally, the social standing of reporters in East Africa is important to understand in order to know how stakeholders, such as politicians, researchers, and civil society actors view journalists and who pursues who for inclusion in the news. This study cannot answer questions of the nature of that relationship. However, it is clear that there is some connection between sources and framing. Therefore, within the framing section, I point out some source choices that reporters in each newspaper made to set the frames. Inclusion of this discussion should be seen as a starting point to understanding the relationship between sources and reporters in East Africa. However, I chose to keep the main discussion of sources separate in a fourth section on affiliations.

FRAMING

The *Daily Nation* in Kenya

The *Daily Nation* stories largely do not use idea dualism (Lee et. al. 2008) by portraying two sides to the issue, thus while Bernauer and Aerni (2007) might describe the GMO debate as "polarized" within an international public sphere, idea dualism, which might be seen as one

aspect of polarization, is not the representation of the majority of the *Nation*'s stories. The stories contextualize the issue for Kenyans, but the emphasis generally does not showcase both the merits and demerits of GMOs within one story.

In Kenya, *Daily Nation* reporters set the GMO debate within a context of political mistrust and uncertainty over the capacity of regulators to do their job. Kenya faces recurrent food shortages, and the *Daily Nation* reporters look for reasons for these problems often turning to stories of regulatory failure. Thus 44 percent of stories are framed regulatory while 17 percent are economic frames followed by 11 percent food security. I also briefly describe the less frequent use of research (11 percent), public opinion (7 percent) and environmental (4 percent) frames.

The Biosafety Bill came into force in mid-2010, and regulators began building the capacity to issue permits for importers and strengthen laboratory ability to test for GMOs at ports. While researchers were allowed to conduct field trials, permits had not yet been issued for commercialization of their products. Reporters kept a close eye on the process of implementing regulations for the importation and eventual planting of GMOs in Kenya. *Daily Nation* reporters generally framed these articles as "regulatory," though sometimes the frame was "economic," as the content is also often about the trade of GMOs or "food security," as the content considered national food shortages. Set within the context of food shortages, grain cartels, farmer subsidies and regulatory agencies, the GMO discourse in Kenya's *Nation* is much more nuanced than simply considering whether or not to bring them into the country.

The *Nation* religiously covered the political struggle throughout the timeframe turning to a number of different events in the framing of regulatory issues. Politically, the fight against genetically modified foods in Kenya has been led by John Mututho, the chair of the

Parliamentary committee on agriculture and eventually also by Beth Mugo, Public Health and Sanitation minister, while the Kenya Plant Health Inspectorate Service and the less frequently mentioned Kenya Bureau of Standards are often included regarding their capacity to test imports of GMOs at the ports.

In 2010, Kenya rejected GM imports from South Africa after environmental activists protested at the Mombasa ports. In a regulatory frame, the *Nation* reported that Mututho accused Kenya Bureau of Standards of allowing the unapproved imports and aimed to investigate who was responsible:

> Mr Mututho said about 3 million bags of GM maize was imported a few weeks ago from South Africa. "The maize is bad for human consumption, and we are questioning different bodies, which might be involved in the secret importation and selling of the product," Mr Mututho said. (*Daily Nation*, "House team probes GM maize import," 13 April 2010)

The alleged GM maize was set against the backdrop of a larger scheme going back at least to 2008 that involved unscrupulous deals between Kenyan government officials and the South African company, Afgri Trading Pty. Ltd., which cost Kenyan taxpayers millions of shillings. The full story of Afgri Trading was reported in the *Daily Nation* only a month later on May 8, 2010 under the headline, "How Kenya lost millions in suspect maize supply deals," a story which did not make it into the sample as it doesn't discuss whether the maize was genetically modified.

Later that summer, MPs Kiema Kilonzo and Nuh Nassir Abdi accused the government of causing the 2010 food shortage in the first place when it waited too long to buy maize from farmers. The maize, now contaminated with aflatoxin, may have intentionally been allowed to go bad, they speculated, in order to make room for the South African imports (*Daily Nation*, "MPs urge farmers not to sell bad maize," 2 June 10). The story was framed economic because the MPs urge farmers not to sell their maize but to wait for fairer government subsidies.

In 2011, corruption was still a concern. Agriculture Minister Sally Kosgei and Special Programmes Minister Esther Murugi told the *Nation* that she was troubled that cartels were benefiting from Kenya's food shortages. Reporters framed it as economic:

> According to the minister, officers in the Agriculture and Special Programmes dockets should know the agents and those that are "making a killing" out of the drought and hunger situation in Kenya
>
> …In last year's incident, senior government officials are said to have awarded a South African company, Afgri Trading Pty Ltd, a tender to supply 75,000 metric tons of maize in a deal riddled with irregularities (*Daily Nation*, "Grain cartels set to cash in on hunger facing Kenya," 21 January 2011).

By summer of 2011, the *Daily Nation* reported another food shortage employing an economic frame and interviewing the Millers' Association chairman Diamond Lalji, who said that GM maize was needed to supplement what other non-GM growing southern Africa trading partners could provide:

> "There is no scientific evidence that has cast a spell on GMOs. The crops are as good as naturally grown crops. The resistance to them has more to do with negative perceptions and unnecessary doubts rather than facts," Dr Lalji said (*Daily Nation*, "Millers brush off claims of GMO cereal imports," 4 July 2011).

Within the week, a *Nation* reporter wrote a regulatory-framed story announcing that the government had finished writing regulations for the importation of genetically modified foods. Imports would legally be allowed by licensed millers, who must only sell milled grain so that seeds would not be planted by farmers. Additionally, the product had to be labeled. Millers caught violating the rules would face harsh punishments, including fines of 20 million shillings or 10 years in jail (*Daily Nation*, "Stern warning to GMO importers," 5 July 2011).

The *Daily Nation* reporters wrote two environmentally framed stories published three days later in response to the new regulation—one to highlight MP Muthuto's opposition to the ruling and another to include Greenpeace and Africa Bio-diversity Network:

> "The decision by the Kenyan Government is short-sighted and irresponsible." Ms Olivia Langhoff (of Greenpeace) added: "The government should invest in ecological farming and support local farmers, especially small-scale ones." (*Daily Nation*, "House team opposes GM food imports," 8

July 2011)

> Anne Maina of the African Bio-diversity Network says the introduction of patented seeds and related chemicals into Kenya's farming systems threatens the country's agricultural practices, its livelihoods, the environment, "and undermines our seed sovereignty". (*Daily Nation*, "Greenpeace faults Kenya on GMO maize imports," 8 July 2010)

But letters and opinion pieces (not included in the sample), also followed for most of July, many supporting the government's decision on the grounds that importing the GM maize would ease the food shortage. The *Nation* added to that chorus with a food security-framed story interviewing the farmer's lobby as well as residents from drought-stricken areas:

> Although most residents do not have clear information about GM crops, they were not concerned with the outcry from activists and politicians castigating its importation.
>
> They praised the Cabinet for approving the importation, saying, it was better to risk eating GM food than starve to death (*Daily Nation*, "Farmers' lobby backs GM maize imports," 18 July 2011).

Meanwhile, the *Nation* also continued to report politicians' opposition to the technology, most especially Mututho's, while also seeking expertise from local professors and researchers, as well as Harvard professor Calestous Juma, a Kenyan.

The *Nation* reporters wrote more regulatory frames with the political drama of Mututho's accusation against government importation of GM maize in 2009 before guidelines were in place to do so (*Daily Nation*, "Kenya imported GMO maize, House told," 3 August, 2011). A few weeks later, the *Nation* also reported another regulatory slip-up when the National Biosafety Authority chief executive was fired over sneaking in a World Food Programme shipment from the US without testing it. It was alleged that this wasn't the only time, though the World Food Programme denied any wrongdoing on their part (*Daily Nation*, "Biosafety boss sacked in import row," 24 August 2011).

The regulatory-framed articles quieted down for the remainder of 2011, and for the first five months of 2012, reporters used mostly a food security frame to talk about domestic food

shortage issues. But in June, the *Daily Nation* checked in on the permitting of importers wishing to bring GM maize into the country, reporting that traders were hesitant to import even though they had the green light:

> "Labelling of GM foods alarms and turns away consumers by creating a sense of panic among them," CMA (Cereal Millers Association) executive director Paloma Fernandes told a press conference in Nairobi on Thursday. "We are alarmed that the country could slump into a food crisis and at the same time most millers are now shying away from importing maize because of the punitive law," said Ms Paloma. (*Daily Nation*, "Millers want GM food rule dropped," 28 June 2012).

By the end of the year, Kenya Minister of Health Beth Mugo completely banned the importation of GM foods, clarifying a few days later that GM food relief could continue. The ban was a reaction to a study published in the *Journal of Food and Toxicology*, which claimed that rats fed transgenic maize had an increased risk of cancer. Interestingly, the *Nation* ran an editorial (not included in the sample) asking the government to consider the study before it reported Mugo's ban within a regulatory frame (*Daily Nation*, "GMOs banned as cancer fears grow," 21 November 2012).

The *Nation* again played out a political struggle with another regulatory-framed story interviewing the National Biosafety Authority, which felt that Mugo was out of line in calling for a ban, as the NBA is supposed to be the lead agency for GMO regulation (*Daily Nation*, "Ban on GM foods was political, says Kiome," 1 May 2013). At the end of 2013, the *Nation* reported the retraction of the French study by *Journal of Food and Toxicology*, but Kenyan medical scientists had still not released their own report on the matter (*Daily Nation*, "Study on GMOs withdrawn," 29 November 2013). At the end of the sample timeframe, the ban was still in effect.

Reporters also covered a variety of issues that did not fit within the dominant regulatory frame's narrative of politicians and regulators setting guidelines for importation of GMOs. Related but not always explicitly connected to regulations, the food security frame often argued

for the importation of GMOs to relieve food shortages, including a number of stories during the summer of 2011's food shortage ("Hunger crisis rekindles debate over GM maize," 21 July 2011 and "Two have died of hunger, Mutua told," 29 July 2011). A few also draw on international sources to make the argument that GMOs will address food security. August 13, 2011's headline, "US urges long-term food aid for Kenya," included quotes from US Secretary of State Hillary Clinton pledging continued support of biotechnology application in the region and praising Kenya's efforts thus far.

The research frame, accounting for only 11 percent of the articles, was generally disconnected from the majority of stories on GMOs. Usually these stories were event-driven content of the research, highlighting new discoveries or research projects (*Daily Nation*, "Gene from Japan for local maize," 29 May 2010; *Daily Nation*, "Centre for quality seeds launched," 3 December 2013; *Daily Nation*, "Scientists discover wonder rice gene," 3 December 2013).

Occasionally the research frame was used to critique GMO safety, such as in (*Daily Nation*, "Banana technology safety queried," 6 June 2011) or the story about the study in the *Journal of Food and Toxicology*, (*Daily Nation*, "Study on GMOs withdrawn," 29 November 2013). Sometimes research themes were included in environmental frames ("Agriculture ministry to release report on virulent maize disease," *Daily Nation*, 21 July 2013) or in farming frames ("Pickup technology or stay hungry, say farming experts," *Daily Nation*, 28 April 2010).

Curiously, Nation reporters do not set research frames as often as Monitor reporters, even though Kenya also has a number of research projects being carried out locally. Instead, *Nation* reporters seem to prefer focusing attention on regulators and politicians.

Only two stories seem to be an attempt to draw together a variety of opinions in one article, as is described by idea dualism, and both draw extensively from outside Kenya: "The

shocking reality about GMOs," (*Daily Nation*, 11 July 2011) and "The propaganda, facts and the grey areas of GMO foods," (*Daily Nation*, 23 July 2012).

The first story is right after Kenya permitted GMO imports for the first time. The article includes web-based sources, such as a blogger, who presented a study by Sherbrook University Hospital in Quebec; Wikipedia; general comments from Monsanto; a story in the UK's *Daily Mail*; as well as interviews with Africa Biodiversity Network, Kenyan professors and the National Biosafety Authority.

The second story starts with politicians, who have historically been vocal about GMOs—MP Mututho and Health Minister Mugo, and also includes Harvard professor Calestous Juma's testimony before a US House of Representatives sub-committee. Then it harkens back to the *Daily Mail*'s coverage quoting Prince Charles and draws from the *Daily Telegraph*, quoting Indian scientist and environmental activist Vandana Shiva. It also includes Africa Biodiversity Network and public comments made by Bill Gates.

These two stories, which are framed public opinion, were the most similar to the concept of idea dualism (Lee et. al. 2008) within the sample of the *Daily Nation*. However, it does not appear that the reporter's goal was to share each side's opinions equally but rather to present a spectrum of opinion and different aspects of the debate rather than looking at simple pro and con arguments. For example, the reporter of the second article characterizes the fears of "conspiracy theorists" by questioning the connections between Bill Gates and Monsanto and critiquing the power balance between industrialized nations and developing countries but then ultimately denounces these theories as a "sideshow" to the debate.

The *Daily Monitor* in Uganda

In the *Daily Monitor*, reporters focused on research frames 32 percent of the time and paid almost equal attention to regulation (20 percent) and economic (17 percent) frames. Reporters set frames for farming 11 percent of the time, food security 6 percent and environmental 7 percent. Reporting in the *Daily Monitor* heavily relied on researchers, scientists or professors as sources or was done within the context of research-based forums and workshops.

Overall, the Monitor's reporting does not reflect a polarized debate in its framing, rarely expressing opposite viewpoints within the same article.

Within the research frame, *Monitor* reporters write stories on field trials and partnerships with researchers from other countries, producing a steady stream of updates on persistent problems that research is trying to address. Research-framed stories also aimed to be explanatory. For example:

> "We have collected some varieties that are resistant to diseases, virus and pests, from the International Institute for Tropical Agriculture based in Nigeria which we cross to those varieties we have here. We mostly use the flowers for crossing exercise," Mr (Martin) Orao said.
>
> He explains that before the crossing exercise, they are planted in the green house and after germinating and shading flowers, the crossing exercise begins. To carry out this exercise, the researchers remove the petals to establish both the male and female parts of the plant in the evening and culture them in the mornings hours when the stigma is active.
>
> "We use the male pollen and brass it to the female part and if the end result aborts it means there could be contamination in the stigma. But if we see the pod maturing within a few days, it means the exercise is successful," Mr Orao said.
>
> His team has so far selected nine varieties from the exercise with three colours including black, brown and white. They will continue planting and selecting the best variety after going through the same exercise for about four times. Once they obtain a table variety free from virus, the team will then take them to farmers fields for further testing. If the result from that is good, the product will be submitted to the National Relief Committee, Ministry of Agriculture for approval (*Daily Monitor*, "Scientists learn from Niger's BT cow peas," 3 November 2011).

The research world is often the setting of *Monitor* stories—through written description or a photo, even when reporters framed the story in different ways, such as, employing regulatory, economic or environmental frames. When stories were framed as regulatory, *Daily Monitor* journalists set politicians in the research world rather than the Parliamentary floor or in

government offices. Political sources are often quoted from research labs or fields or from public comments given at workshops held by biotechnology stakeholder groups, such as the Open Forum for Biotechnology, which government officials attend.

Though it should be noted that reporters were limited from covering regulations without a tabled bill and instead draw on impatient scientists lobbying to finalize a law that would govern biotechnology development as the regulatory frame. It is possible that more political activity in the legislature will lead reporters to set more regulatory frames. However, unlike the *Nation*, the *Monitor* doesn't report about politicians or regulatory officials addressing food shortages, GM imports or food aid within the sample.

In 2011, the *Monitor* reported the founding of the Uganda Biotechnology and Biosafety Consortium, which is a lobbying group of like-minded scientists and other stakeholders to push for the passing of the biosafety law (*Daily Monitor*, "Scientists join lobby for biotechnology law," 7 September 2011). Five months later, the *Monitor* covered the consortium's workshops held at the National Crops Resource Research Institute, in which parliament members were invited to participate:

> "Scientists have products on shelves but they can't release them because of the absence of the law. My greatest fear is that our scientist will disappear with the products and sell the technology to other countries once we delay the law," Erostus Nsubuga, Uganda Biotechnology and Biosafety Consortium chairperson (*Daily Monitor*, "MPs tell scientists to petition House over biotech bill," 20 February 2012).

The article continues with Parliament members speaking up at the workshop asking scientists for more information and involvement in the lawmaking process.

When the Biosafety Bill 2012 is finally introduced in Parliament in February 2013, the *Monitor*'s coverage is thorough and is reported by a journalist who heavily covered the issue during the timeframe by following closely the research developments. The story appears largely written from the reporter's own expertise on the topic with much summarized content and only

contains quotes from a state attorney who attended workshops held by the research community (*Daily Monitor*, "Biotechnology and biosafety laws: How will farmers and stakeholders benefit?" 20 February 2013).

Within the context of the Biosafety Bill being currently debated at Parliament, the *Monitor* then begins including other stakeholders such as the Kenya Biodiversity Network in "Expert warns MPs against law on GMOs" (*Daily Monitor*, 21 March 2013) and the Uganda Joint Christian Council's Christmas message included a story titled, "Consult on GMOs, government told" (*Daily Monitor*, 25 December 2013).

Toward the end of the year, reporters begin to use more legislators in their stories. A November 25, 2013 story reports that the controlling party, the National Resistance Movement, is about to review the bill. Then, in a dramatic end to the year, the Monitor reports that House Speaker Rebecca Kadaga has ordered an investigation of some Parliament members for the taking of bribes to vote in favor of the Biosafety Bill (*Daily Monitor*, "Kadaga orders House inquiry into genetically modified organisms bill," 12 December 2013).

Other regulatory frames reported in the *Daily Monitor* can be explained as either stories about regional or international regulations ("Comesa wants biotech policies harmonized," 10 September, 2010; "US unfazed by opposition to genetic crops," 22 March 2011), a version of a *Nation* story ("Kenyans have been consuming GMO maize," 2 September 2011) or wire stories ("Commission seeks compromise on GMO foods," 18 February 2011, from AFP).

Monitor reporters also use a research context to tell the economic frame. A January 27, 2010, piece discusses cotton's former place as the second most important cash crop and its economic decline due challenges of pests, diseases, drought and international market prices. Again, the piece is told within a visit to the National Semi-Arid Research Center; however, two

politicians join the reporter—one MP and one district chairman—both describing how the cotton industry used to employ their families and give them enough income to afford school fees and medical bills. The *Monitor* then presents biotechnology as a way to improve crop productivity (*Daily Monitor*, "Farm trends: The biotech factor," 27 January 2010).

In another example of the economic frame, the *Monitor* uses an interview with National Crop Resources Research Institute researcher Yona Baguma which advises farmers to begin adopting improved seeds:

> "Over 85 per cent of Ugandans live in rural areas meaning all their engagement is all about agriculture. This therefore calls for improved methods of cultivation as well as use of improved crop varieties to meet required labour market and demand for the agricultural products in the growing market," Dr Baguma said (*Daily Monitor*, 13 March 2012).

The fourth most employed frame, which reporters set 11 percent of the time, is the farming frame, and it is also often used within the research context. Within this frame, reporters describe farming practices, especially changing from traditional farming to using new technologies. For example, crop scientists at the National Semi-Arid Research Center told reporters that costs will go down for farmers adopting the Ht or Bt cotton being tested because they would spend less on pesticides (*Daily Monitor*, "Farmers should take advantage of biotechnology," 27 January 2010).

Also, the Monitor often runs stories on tissue-culture bananas, which is a type of biotechnology that propagates plantlets in the lab until they are ready to be planted in the field. This is a way to prevent the spread of diseases, and articles generally encourage farmers to take up the new technology (*Daily Monitor*, "Scientist roots for new technology in banana farming," 5 May 2010).

In one article, the reporter includes a farmer alongside a researcher by showcasing him as an example of successfully using tissue culture bananas in his farming:

> Mr Godfrey Kizito, a prominent commercial farmer in Kiwugu village, Kangulumira sub-county, Kayunga district who has embraced growing of Fhia 17 alongside other indigenous banana varieties, says since he started growing the hybrid banana in 2005, he has registered a tremendous boost in the income he gets from selling his bananas."The Fhia 17 bunches are big compared to the indigenous banana varieties so they fetch me a lot of money," Mr Kizito says.

Additionally, reporters do write farming stories outside of the research context, such as profiles of successful farming associations, small nurseries or farming businesses.

Monitor reporters also favor the research context for its environmental frames, which were used about 7 percent of the time. When the environmental frame was employed, reporters often portray biotechnology as addressing environmental threats to farming in Africa rather than as being the environmental threat, such as proclaiming biotechnology as beneficial as a climate change response:

> Dr Africano Kangire, head of the Coffee Research Centre, Kituza says, if as predicted, temperatures increase by two degrees centigrade, it will strain the crop past its margins… "It will reduce Uganda's coffee production by 80 per cent… But more adoptive research is needed and this time using biotechnology to develop varieties more resistant to climate extremes, pests and diseases." (*Daily Monitor*, "Climate change threatens to wipe out Uganda coffee," 6 October 2010).

In one environmental-framed story, researchers attempt to convince farmers to switch to genetically modified crops. The JENGA Community Development Association told the *Monitor* that it preferred organic farming and did not want to grow GMOs:

> "What we are lacking is the skill to manage the control of these pests and diseases. We also need to train our farmers on soil conservation especially those living on the slopes of Mt. Elgon so that they can observe better farming methods and continue growing organic crops," Mr. (Anthony) Namunane said. (*Daily Monitor*, 22 June 2011)

Food security frames were also used 7 percent of the time, again, often within a research context. Sometimes reporters explicitly use the concept of "food security" (*Daily Monitor*, "Researchers advocate for biotechnology to improve food security in Africa," 7 October 2010). Other times, reporters writing doesn't clearly use the term "food security" but discusses hunger or malnutrition, such as writing about how genetic modification can address nutritional

deficiencies, hence improving food security (*Daily Nation*, "Vitamin A-rich millet to be developed by researchers," 14 November 2012).

Overall, Ugandan journalists for the *Daily Monitor* seem largely to have already chosen a position on GMOs and use the newspaper as a way to promote biotechnology adoption or at least to promote a certain type of agricultural development. The *Monitor* seems to be promoting agricultural development in general, as many of the stories actually appear in their Farming magazine, which reads like an extension service newsletter. Stories in this magazine are about irrigation schemes, use of pesticide and fertilizer, and commercial farming, in addition to coverage on Uganda's research of genetically modified crops. One column in the Farming section (not included in the sample) often advocates very frankly for farmers to support the use of genetically modified seeds. This leads to questions about how journalists view their role in Uganda. It seems likely that there is a relationship between the way *Monitor* reporters view their professional role and how (or if) their writing will reflect a polarized global debate.

The *Citizen* in Tanzania

The *Citizen*'s initial reporting is less frequent than *Monitor* and *Nation* articles, so it is difficult to analyze without considering that a bigger sample might have given more insights. However, in the last year of the sample, *Citizen* reporters wrote about GMOs more frequently, so it might be fair to assume that reporting on GMOs may continue at that pace while legislation is considered as well as while agricultural development and investment is pursued.

While some frames are used more often, reporters at the *Citizen* did not heavily favor one frame over another. Therefore, I describe how reporters used a variety of frames to write externally focused stories with much of the discussion being around Tanzania's place in the international world of donors, multinational corporations and foreign trade. Reporters used the

economic frame 25 percent of the time, to describe the ways foreign investment and local government has launched called Kilimo Kwana, or "Transforming Agriculture" in Kiswahili, which launched in 2006. Kilimo Kwanza aims to modernize agriculture by using modern farm machinery, irrigation projects, improved seeds and fertilizers and transitioning to large-scale farming. The public opinion frame was also employed by reporters 23 percent of the time to describe a variety of viewpoints, which are elaborated within longer thematic pieces on the global aspect of the technology and whether Tanzania should be a part of this kind of agricultural development. The regulatory frame, which is used 20 percent of the time, considered Parliament's role in either enacting looser regulations so that researchers could begin planting GMOs in field trials or in legislators continuing to restrict or further restricting the commercialization of GMOs.

Covering the agricultural budget proposal in Parliament, a *Citizen* reporter highlighted comments by MP Halima Mdee, within a regulatory frame. Mdee called for an end to the government's relationship with the multinational corporation Monsanto while also calling for more public investment in agriculture.

> "It is frustrating that a programme like Sagcot (Southern Agricultural Growth Corridor of Tanzania), which was seen as a liberator of small-scale farmers has started to marginalise them in favour of big companies which have a bad track records like Monsanto," Halima Mdee (*Citizen*, "Ban giant US seed company, MP tells govt," 23 April 2013).

Mdee even insinuated that the company had a tendency to "use financial muscle to compromise government leaders."

Shadow Agriculture Minister Rose Kamili backed her by sharing the story of Indian farmers who committed suicide after acquiring a debt from purchasing Monsanto's seeds that they could not pay off.

As a follow-up, a different *Citizen* reporter framed Mdee's comments on Monsanto with a public opinion frame by writing about the global protest against Monsanto, writing a story that timed with May 2013's March Against Monsanto even though the protest was not held in Tanzania. More news analysis than news, the reporter attempts to allay fears that the company, which portrays itself as supportive of farmers' interests worldwide, is forcing their GM seeds on Tanzania (*Citizen*, "Tanzania avoids global campaign to ban US firm," 22 May 2013).

The article gave Agriculture Minister Adam Malima a chance to respond to Mdee, saying that Monsanto was not "imposing" anything but that the government controlled what seeds it would allow to be planted in Tanzania. The reporter then summarizes him, "Malima admitted, however, saying allowing Monsanto's genetically modified seed will turn all the farmers into slaves of the company." The reporter then described lobbying by Monsanto and the US government in other African countries to pass legislation favorable to genetically modified seeds, and further iterated failed projects of Monsanto in Africa.

The same reporter quoted Malima again five months later in a public opinion frame, seemingly using his speech from the World Food Prize ceremony in Des Moines, Iowa, in which he sounds more comfortable with the idea of adopting genetically modified seeds. Again summarizing, the reporter said, "In what could be termed as a nod to the new technology that has won accolades worldwide, Mr Malima said Tanzania should not lag behind in adopting the new technology which would ensure food security" (*Citizen*, "Politicians faulted over GMO stance," 21 November 2013).

He then quoted Malima:

> "As a country, we should do what is best for the future generations, lest we become a serious importer of food from other nations in the continent that have adopted the technology despite having vast land," he said.

The reporter again turned to his older reporting about Monsanto's role in biotechnology development globally and its unpopularity in other countries. However, he never references Malima's May comments, in which he distanced himself from Monsanto and its seeds.

In another story, the *Citizen* again reports on agricultural modernization with a broad global lens employing the economic frame:

> As world leaders gather at the high profile 'Hunger Summit' in London this week to endorse initiatives to 'modernise' African agriculture, 57 farmer and civil society organisations from 37 countries across the continent have slammed these efforts as 'a new wave of colonialism'.
>
> According to the farmers and civil society groups, the G8 initiatives to "modernise" African agriculture is a drive to open markets and creates space for multinationals to secure profits (Citizen, "African farmers reject G8's blue print on hunger," 10 June 2013).

The reporter quotes the Algerian NGO, Association de Réflexion, d´Echanges et d´Actions pour l´Environnement et le Développement; the Alliance for Food Sovereignty in Africa, a pan-African network; a spokesman representing both Inades-Formation and the West African farmers' organization Copagen; Kenya's Eastern and Southern African Farmers Forum, and a Zimbabwean with Via Campesina Africa.

Other *Citizen* stories are not about Tanzania and illustrate an external orientation. Using the regulatory frame, once they use an AFP story on Poland banning GMOs, while twice they use version of stories published in the *Daily Monitor* on the introduction of the Biosafety Bill in Uganda.

Even when reporters turn to writing about specific programs in Tanzania, foreign institutions remain non-speaking characters in the story (a point I will elaborate on further in the next section). In a story on August 1, 2013, a reporter takes the opportunity to interview the executive director of Mviwata, the Network of Farmers' Groups in Tanzania, during its 20th anniversary celebration in Morogoro. In the interview the director addresses the organization's views on GMOs, saying it is not yet relevant to Tanzanian farmers, as well as foreign investment

in agriculture. He told the reporter, "Frankly speaking, most initiatives like the Southern Agricultural Growth Corridor of Tanzania, or SAGCOT, target large-scale farmers and probably profit-oriented foreign companies operating in the country. Smallholder farmers are always losers in most government initiatives." Ultimately, it's the director's comments on SAGCOT that led to the writer's title: "Smallholder farmers lose in most govt programs."

The story "How Africa is entangled in US-Europe's GMO politics" (*Citizen*, 28 November 2012) is most closely reflective of the polarized nature of the GMO debate in the global public sphere. The reporter, who is the same one keen on news analysis pieces, sets a public opinion frame. The reporter articulates positions of each side and includes interviews with foreign scientists encouraging GMO adoption as well as capacity building efforts to restrict GMO foods or crops by Germany's international aid agency and the UN Environmental Programme. He states that the Tanzanian government is not ready to adopt GMOs, using Parliament's debate of the recently approved Plant Breeders' Rights Act 2012 to make his point. The debate pitted fears that the new act would create too much space for multinationals to develop genetically modified seeds against efforts to give scientists more space to research improved seeds but not genetically modified ones. The approved act also gives local scientists more rights over their products by introducing royalties and copyrights.

The reporter gives the majority of the space to explaining how Europe and the UN are limiting progress in Africa rather than quoting pro-GM stances and also discusses the effect international markets have on African agriculture and ultimately on their shunning of GMOs. The account is certainly similar to accounts by Paarlberg (2008) of the GMO debate; however little space or consideration is given to how the US influences policies despite the article's title.

Ultimately, it is the most similar to idea dualism concept described by Lee et al. (2008). The sample of the *Citizen*'s articles is not necessarily polarized in and of itself, and the overall tone toward GMOs is perhaps best described as skepticism. The *Citizen*'s articles are broader, longer and contain more analysis than articles in the *Nation* or the *Monitor*.

If one considers the whole sample of articles in the Nation Media Group, it could possibly be described as polarized as both pro and con viewpoints are suggested within the whole. However, individual articles rarely attempt to capture a range of opinions at once. Additionally, each newspaper has unique preferences in how to report about GMO adoption, which leads to different frames and arguably different directions.

AFFILIATIONS

While transnational affiliations of sources used by the Nation Media Group reporters are actually fewer than the number of local sources that are used, I focus my analysis on the transnational sources due to the global nature of researching, regulating, and commercializing GM foods and crops in East Africa. Additionally considering the international order, which privileges the Global North, it is important to pay attention to how Nation Media Group reporters included sources especially from the Global North.

I also wanted to point out that the data does not completely capture the importance of these institutions within the GMO debate, and I highlight some ways reporters make connections to them without actually interviewing these sources. I focus on those sources most often used within the sample timeframe: those with political affiliations, researchers or academics, and NGO/civil society spokespeople.

The US government was the foreign national government affiliation most often used as a source by reporters; however, while in the *Nation* and in the *Monitor* reporters draw from

sources representing the US government, *Citizen* reporters did not use the US government as a source during the sample timeframe.

In the *Daily Nation*, reporters had two articles using US government sources written during its 2011 food shortage. The first article quotes Secretary of State Hillary Clinton encouraging researchers at Kenya Agricultural Research Institute in their work and urging government action:

> Kenya must do more, however, Mrs Clinton said, pointing to development of free trade in grain imports and exports and the "need to welcome new technologies to bolster drought tolerance, disease resistance and crop yields" (*Daily Nation*, "US urges long term food aid for Kenya," (13 August 2011).

The second article "US hand in embracing genetic products" (*Daily Nation*, 24 August 2011) connects Kenya's completion of its biosafety regulations, which allowed for importation of GMOs for the first time, with a toast offered by Clinton from Washington, D.C. The reporter then investigated how the US government had pushed for the passing of Kenya's Biosafety Bill with the help of Wikileaks. Wikileaks released a cable from the US ambassador to Clinton telling how "financial and technical support helped to speed up and overcome opposition to the Bill."

What's interesting to note about the *Nation*'s coverage of the US involvement in the Biosafety Bill passage is that it does not interview local Parliament members to address the Wikileaks but instead includes only past comments from government officials. This despite that in the overall sample *Nation* reporters turn to Kenyan Parliament members more often than any other local government sources. Thirty-seven percent of articles included local politicians or government officials, most of which were Parliament members being quoted directly or indirectly.

The *Monitor* reporters only gave a few paragraphs to the US government position on the issue titled, "US unfazed by opposition to genetic crops," (*Monitor*, 22 March 2011), in which

the US ambassador to the UN agencies in Rome spoke in a teleconference to African journalists. It reported:

> The US, the world's largest user of genetically modified seeds, says it will continue working with farmers from countries that are still reluctant to adopt genetically modified crops.

I discuss other articles mentioning the US government later in the analysis.

Instead of the US government, the Citizen journalists chose to run a story from India on the government's process of adopting the Bt brinjal (eggplant) (*Citizen*, "GM eggplant debate consumes India," 10 March 2010). The story included nervous consumers and quotes from both Greenpeace and Monsanto. Citizen journalists also ran an AFP story on Poland and France's ban of a certain strain of GM maize (*Citizen*, "Poland imposes ban on growing GM maize," 9 April 2012).

The UN was the intergovernmental affiliation of sources most frequently used by reporters. All newspapers used the Food and Agriculture Organization as a source, using its statistics or reports rather than an interview. For example, the *Citizen* reporters ran a food security-framed article that used statistics from the FAO's State of Food Insecurity in the World report alongside statistics from Tanzania's Ministry of Agriculture and comments from Tanzanian government officials around World Food Day celebrations. However, only one *Monitor* reporter used a quote from an official for the FAO in a food security-framed story:

> "If government does not invest heavily in agriculture, research and advisory services to increase food production, then we are likely to have a figure of hungry people that I am unable to predict," says Ms Rachel Nandelenga, the spokesperson of FAO Uganda said. (*Monitor*, "Rising population a great threat to food security, 1 March 2011).

Reporters for the *Citizen* called upon foreign civil society groups or actors for perspectives more frequently than reporters for the *Monitor* or the *Nation*, which have bigger samples. Foreign or transnational NGOs were sources in *Citizen* reporters' articles 18 times, which is equivalent to the number of times they were sourced in the *Daily Nation*'s sample.

However, for both the *Monitor* and the *Nation*, the spokesman from the International Service for the Acquisition of Agrobiotechnology Applications was the most frequently quoted foreign source. *Monitor* reporters picked up the annual report of the ISAAA every year of the sample, while *Nation* reporters used the annual report as well as quotes from the chairman. However, *Nation* reporters had access to press conferences held by the ISAAA, which has an *Afri*Center office in Nairobi.

Monitor reporters also used the USAID-funded Programme for Biosafety Systems in eight stories, while other quoted organizations by both the *Nation* and the *Monitor* were Greenpeace and the African Centre for Biosafety based in South Africa.

The *Citizen*'s NGO/civil society sources were more varied and were more diverse; only one source is used more than once. To name a few, they include Biodiversity International, Coalition for the Protection of African Genetic Heritage (West Africa), the Community Trust for Development and Technology (Zimbabwe), and the German NGO Forum on Environment and Development.

Researchers were also a prominent foreign source in all three newspapers. In the *Daily Monitor*, in particular, researchers were a dominant source with 36 percent of all sources being East African researchers (mostly plant breeders) and 7 percent being foreign researchers, which could include economic development scholars. This is interesting considering Outram's (2010) account of relationships between journalists and researchers, which suggests that African researchers do not like to be interviewed. However, his research included mostly South African and Kenyan journalists.

Another factor that could partially explain the attention that the *Monitor*'s reporters give to researchers could be simply the attention that Uganda's researchers have given to journalists.

In 2010, the National Agricultural Research Organization offered journalism awards in science-biotech coverage awarding its top two prizes to *Daily Monitor* reporters. Third prize was taken by a *New Vision* reporter, while the Nation Media Group's *East African* newspaper received a prize for regional coverage. The awards were jointly sponsored by African Agricultural Technology Foundation, Africa Harvest and Science Foundation for Livelihoods and Development (*Daily Monitor*, "Monitor journalists top agriculture reporting awards," 23 December 2010).

Additionally, since Outram's research came out in 2010, effort has been given to encouraging science journalism for agricultural development, such as the UK-based Biosciences for Farming in Africa organization that has conducted training for journalists in Uganda, Tanzania, Nigeria and Ghana. Some of the *Monitor* reporters participated during 2012, while a *Citizen* reporter, whose work is also included in the sample, participated in 2013.

However, it should be noted that even when local researchers were used as sources that reporters did not always reveal transnational connections of the research work. At times, reporters are explicit about connections to foreign funders or research partners, as in a *Monitor* article on October 31, 2011, "US donates Sh50 billion to boost agricultural research." This story stands alone in quoting USAID statements to explain the donation and what it is supposed to do for Uganda. Generally, when foreign institutions are mentioned as funders it is just in a short paragraph without actually citing the institution's reports or interviewing a spokesperson. This happens in all three newspapers. For example:

"Is this the end of cassava varieties?" (*Citizen*, October 7, 2013):

> Preserving native cassava varieties was, among other issues, raised during a 3-day science workshop organised by the International Institute of Tropical Agriculture (IITA) in collaboration with Global Cassava Partnership for 21 Century (GCP21) funded by the Bill and Mellinda Gates Foundation (BMGF) and held in the city in June this year.

"Kenya's hope of fixing maize shortage crisis" (*Nation*, 17 December 2011):

> This is the second phase of field trials under the Water Efficient Maize for Africa (Wema) project which started in March 2008 in five African countries.
>
> The project funded by the Bill and Melinda Gates Foundation is also being undertaken in Uganda, Tanzania, Mozambique and South Africa.

"Search for resistant cassava types still on" (*Monitor*, February 2, 2011):

> The research work that has been going on since 2005 is an initiative of a United State research based centre, the Donald Danforth Plant Science Centre in collaboration with USAID and Uganda government.

These transnational and foreign institutions as non-speaking characters were not counted in the data as sources, but I felt it was important to point these out. Otherwise, the affiliation data could be deceiving because it does not show these institutional affiliations or map the connections between the institutions. Though I show that sometimes journalists explain to readers how research is funded, generally the speaking source in the story is a local researcher. For example the story, "Scientists learn from Nigeria's cow peas," interviews a National Semi-Arid Research Resource Institute scientist. The NaSARRI is using technology it received from the International Institute for Tropical Agriculture in Nigeria and receiving funding from the African Agricultural Technology Foundation, which in turn is funded by the Alliance for a Green Revolution in Africa, which in turn is funded by the Gates Foundation. The article mentions the first part of the chain of funding but fails to mention the last. My point is that this focus is generally on the speaker (a local) but even the way non-speaking funding institutions are included (short paragraphs focusing on their benevolence) obscures the actual prominence of those institutions in the debate over using biotechnology in African agriculture.

First of all, these long chains of capital transfers underscore Ferguson's point that Africa is ruled by transnational organizations (2006). Secondly, considering the world that Ferguson (2008) describes, journalists should perhaps be following NGOs rather than governments.

However, the way in which transnational networks connect in long chains of capital transfers that often end in offices on the other side of the world makes this a very difficult task. Reporters of the Nation Media Group have not completely ignored these chains but have dealt with it by simply listing organization names, which unfortunately simplifies the issue too much.

CHAPTER 6

CONCLUSIONS

As concerned consumers in the Global North formulate opinions on GMOs in our food, it is important to examine the power differential between the Global North and the Global South in GMO adoption. Considering the transnational connections between consumers in the Global North and farmers in the Global South has more profound implications than simply considering a food or farming preference. The world is connected both economically through trade (or food aid) and also environmentally through shared ecosystems. This study attempts to understand these connections through the lens of local reporters in East Africa, where the debate is articulated differently amidst varied political contexts.

This study shows how reporters explain transnationalism, through the sources they interview or cite, and additionally how they choose to frame GMO adoption. The way the debate unfolds on the pages of the *Monitor*, the *Nation* and the *Citizen* is more than just an inheritance (Outram 2010) of a polarized debate from the Global North (Bernauer and Aerni 2007). Reporters rearticulate the debate in a way that is more nuanced in some ways and rarely practice idea dualism, the practice of portray two opposing sides within one story (Lee et al. 2008). Often when reporters do practice the similar value of including multiple viewpoints in the story, opinions are drawn from the broader world in addition to including opinions of local elites. Additionally, arguments are not necessarily organized into two obvious poles but rather opinions are shared in a way that direction is sometimes difficult to determine.

However, rather than practicing idea dualism, the majority of journalist's work appears to already have a position. This could perhaps be understood through theoretical concepts given by Skjerdal (2012) to describe African journalism, specifically the concept of interventionism. Additionally, the *Nation*'s founding as an opposition to the colonial government could explain its

historical approach to reporting on government. The *Nation* journalists' reporting reflects skepticism with the regulatory capacity of the Kenyan government to properly manage the importation and trade of genetically modified food and seed. The *Monitor* reporters consistently return to research-based stories, reflecting a hope in the technology's potential. The *Citizen* reporting often questions the inclusion of GMOs in Tanzania's agricultural development and includes many opinions, often from beyond Tanzania's borders.

Blending quantitative and the qualitative analysis was difficult to do within the timeframe that I had; however, I wanted to wed the usefulness of a framing study, which is good at organizing the content of the newspaper reporting, with the insightfulness of a qualitative study. I also wanted the study to reflect an interdisciplinary approach, which is why I included a variety of literature from political science, economics, sociology, Africa studies, and communication. I recognize that this may not be palatable for everyone, but hope that there is something useful about this study for a variety of scholars. This study furthered understanding of contemporary journalism in East Africa by considering newspaper reporting of a politically contentious global issue. Additionally, the study aimed to describe the debate using local news reporting and explain how it is being articulated in East Africa, especially as the media is often a character in the literature on GMOs in Africa while their work is not often described.

Additionally, considering two variables—the article frame and the source affiliations with each article—was a helpful way to get at the transnational nature of the GMO debate. A much richer discussion is needed to tie the two variables together, but the study opens the door for further research in this area. While reporters use sources to construct frames, the relationship between reporters and their sources needs to be better understood both as a journalistic practice and also within the African context. The case of the Monitor reporters' interviewing of

researchers brings questions over the role of the source in reporters' framing, which was most often framed research. The same could be said of the way that reporters at all three newspapers approach or do not approach politicians. While I attempt to give some possible reasons for the focus on researchers in the affiliations, more research would need to be done to fully understand that relationship.

The relationship between journalists and sources is not straightforward; the interaction involves power relations as well as personal agendas. This dynamic between sources and journalists contributes to the final representation that is relayed to the public. However, the journalist ultimately makes the decision on how to frame a story. The reasons a journalist makes that decision, however, can be found in that dynamic. For example, throughout the study I found myself often asking how journalists decided to interview x person over y person or if they even had access to x person or why they did not ask x question, etc. These are questions that could not be answered without a fuller understanding of the relationship between Nation Media Group reporters and their sources. A future study could interview the journalists covering GMOs at the Nation Media Group newspapers to try to answer those questions.

Additional research could also attempt to explain the way that journalists in East Africa view their role in society and how this informs or contradicts their practices. More understanding of what East African journalists see as newsworthy would greatly aid this discussion, as journalists at all three newspapers picked up different aspects of the GMO issue even though the three countries have some commonalities.

While this work analyzes the Nation Media Group's reporting, it is also not clear how that reporting fits into the total media landscape in East Africa. For example, are newspapers read on the radio of their affiliate stations? If so, does it reach farmers? Do radio journalists

discuss GMOs or agricultural development? Also, future studies could include alternative media, such as blogs, that might also contribute to the media landscape in East Africa.

Media researchers who study Africa should also contemplate the power balance that exists in the world in which African journalists must navigate, describe, and question. But instead of asking whether African media has western influences (a question which starts in the Global North), perhaps questions about African media should start within journalists' own experiences of the international order and then consider how they navigate through it. The global power landscape contributes to a different political context for African journalists than the context of western journalists, whose lived experience of globalization is not equivalent.

Overall this study illustrates how East African reporters view the debate and gives a broader picture, showing that the polarized GMO debate is not simply "inherited" from the Global North but is recontextualized and rewritten by East African journalists in unique ways.

REFERENCES

Acayo, C., and N. Mnjama. "The Print Media and Conflict Resolution in Northern Uganda." *African Journal on Conflict Resolution* 4, no. 1 (September 21, 2007): 27–43.

Arts, Bas, and Sandra Mack. "NGO Strategies and Influence in the Biosafety Arena: 1992-2000." In *The International Politics of Genetically Modified Food: Diplomacy, Trade and Law*, 48–64. New York: Palgrave Macmillan, 2007.

Ayele, S., J. Chataway, and D. Wield. "Partnerships in African Crop Biotech." *Nature Biotechnology* 24, no. 6 (2006): 619–21.

Bennett, Richard, Stephen Morse, and Yousouf Ismael. "The Economic Impact of Genetically Modified Cotton on South African Smallholders: Yield, Profit and Health Effects." *Journal of Development Studies* 42, no. 4 (2006): 662–277.

Bernauer, Thomas, and Philipp Aerni. "Competition for Public Trust: Causes and Consequences of Extending the Transatlantic Biotech Conflict to Developing Countries." In *The International Politics of Genetically Modified Food: Diplomacy, Trade and Law*, 138–154. New York: Palgrave Macmillan, 2007.

Birhanu, Fikremarkos. "Challenges and Prospects of Implementing the Access and Benefit Sharing Regime of the Convention on Biological Diversity in Africa: The Case of Ethiopia." *International Environmental Agreements: Politics, Law and Economics* 10, no. 3 (2010): 249–266.

———. "Genetically Modified Organisms in Africa: Regulating a Threat or an Opportunity?" In *The Regulation of Genetically Modified Organisms: Comparatives Approaches*, 227–253. New York: Oxford University Press, 2010.

Botelho, David, and Hilda Kurtz. “The Introduction of Genetically Modified Food in the United States and the United Kingdom: A News Analysis.” *Social Science Journal* 45, no. 1 (2008).

Brisset-Foucault, Florence. “Radio, Mobile Phones, Elite Formation and Sociability: The Case of Uganda’s ‘Serial Callers.’” *Journal of African Media Studies* 3, no. 2 (2011).

Clapp, Jennifer. “The Political Economy of Food Aid in an Era of Agricultural Biotechnology.” In *The International Politics of Genetically Modified Food: Diplomacy, Trade and Law*, 85–99. New York: Palgrave Macmillan, 2007.

———. “Transnational Corporate Interests in International Biosafety Negotiations.” In *The International Politics of Genetically Modified Food: Diplomacy, Trade and Law*, 34–47. New York: Palgrave Macmillan, 2007.

Crawley, Catherine. “Localized Debates of Agricultural Biotechnology in Community Newspapers.” *Science Communication* 28, no. 3 (2007): 314–346.

Ezezika, O.C., A.S. Daar, K. Barber, J. Mabeya, F. Thomas, J. Deadman, D. Wang, and P.A. Singer. “Factors Influencing Agbiotech Adoption and Development in Sub-Saharan Africa.” *Nature Biotechnology* 30, no. 1 (2012): 38–40.

Ferguson, James. *Global Shadows: Africa in the Neoliberal World Order*. Durham and London: Duke University Press, 2006.

Gaskell, George, Paul Thompson, and Nick Allum. “Worlds Apart? Public Opinion in Europe and the USA.” In *Biotechnology: The Making of a Global Controversy*, 351–375. Cambridge, United Kingdom: Cambridge University Press, 2002.

Glover, Dominic. “The Corporate Shaping of GM Crops as a Technology for the Poor.” *Journal of Peasant Studies* 37, no. 1 (2010): 67–90.

Goffman, Erving. *Frame Analysis: An Essay on the Organization of Experience*. Cambridge, Mass.: Harvard University Press, 1974.

Goretti, Linda Nassanga. "Peace Journalism Applied: An Assessment of Media Coverage of the Conflict in Northern Uganda." *Conflict and Communication Online* 6, no. 2 (2007).

Hallin, Daniel C, and Paolo Mancini. *Comparing Media Systems*. Cambridge, UK: Cambridge University Press, 2004.

Herring, Ronald J. "Framing the GMO: Epistemic Brokers, Authoritative Knowledge, and Diffusion of Opposition to Biotechnology." In *The Diffusion of Social Movements: Actors, Mechanisms, and Political Effects*, edited by Rebecca Kolins Givan, Kenneth M Roberts, and Sarah Anne Soule. Cambridge; New York: Cambridge University Press, 2010.

Juma, Calestous, and Ismail Serageldin. "Freedom to Innovate: Biotechnology in Africa's Development ; Report of the High-Level African Panel on Modern Biotechnology." African Union, New Partnership for Africa's Development, 2007.

Kakooza, Muwanga. *Uganda*. Media Sustainability Index—Africa. IREX, 2012. http://www.irex.org/project/media-sustainability-index-msi-africa.

Kambenga, Godfrey. *Tanzania*. Media Sustainability Index—Africa. IREX, 2012. http://www.irex.org/project/media-sustainability-index-msi-africa.

———. *Tanzania*. Media Sustainability Index—Africa. IREX, 2010. http://www.irex.org/project/media-sustainability-index-msi-africa.

Keck, Margaret E., and Kathryn Sikkink. *Activists beyond Borders: Advocacy Networks in International Politics*. Ithaca, N.Y: Cornell University Press, 1998.

Kingiri A.N, and Hall A. "The Role of Policy Brokers: The Case of Biotechnology in Kenya." *Review of Policy Research* 29, no. 4 (2012): 492–522.

Lee N.-J, McLeod D.M, and Shah D.V. "Framing Policy Debates: Issue Dualism, Journalistic Frames, and Opinions on Controversial Policy Issues." *Communication Research* 35, no. 5 (2008): 695–718.

Loughran, Gerard. *Birth of a Nation*. London; New York: I.B.Tauria & Co Ltd, 2010.

Marks, Leonie, Nicholas Kalaitzandonakes, Lee Wilkins, and Ludmila Zakharova. "Mass Media Framing of Biotechnology News." *Public Understanding of Science* 16, no. 2 (2007): 183–203.

Matende, David. *Kenya*. Media Sustainability Index—Africa. IREX, 2012. http://www.irex.org/project/media-sustainability-index-msi-africa.

Mitchell, Peter. "Europe Angers US with Strict GM Labeling." *Nature Biotechnology* 21, no. 1 (January 2003): 6.

Miller, Clark A. "Resisting Empire: Globalism, Relocalization, and the Politics of Knowledge," In *Earthly Politics: Local and Global in Environmental Governance.* 2004. Massachusetts: The MIT Press, p. 55-102.

Muraguri, Lois. "Unplugged!: An Analysis of Agricultural Biotechnology PPPs in Kenya." *Journal of International Development* 22, no. 3 (2010): 289–307.

New Alliance for Food Security and Nutrition, 2013 Progress Report. London, UK, 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/205885/New_Alliance_progress_report_May_2013.pdf.

Nisbet, Matthew. Dominique Brossard and Adrienne Kroepsch. “Framing Science: The Stem Cell Controversy in an Age of Press/Politics.” *Harvard International Journal of Press/Politics*, 8, no. 2 (April 1, 2003): 36-70.

Nyabuga, George, and Nancy Booker. *Kenya, Country Report*. Mapping Digital Media. Open Societies Foundation, February 5, 2013. http://www.opensocietyfoundations.org/.

Okeno, James A., Jeffrey D. Wolt, Manjit K. Misra, and Lulu Rodriguez. “Africa’s Inevitable Walk to Genetically Modified (GM) Crops: Opportunities and Challenges for Commercialization.” *New Biotechnology* 30, no. 2 (January 25, 2013): 124–130.

Outram, Simon M. “Science Communication in Sub-Saharan Africa: The Case of GMOs.” *Journal of International Development* 22, no. 3 (April 2010): 341–351.

Paarlberg, Robert L. *Starved for Science: How Biotechnology Is Being Kept out of Africa*. Cambridge, Mass.: Harvard University Press, 2008.

Priest, Susanna Hornig, Heinz Bonfadelli, and Maria Rusanen. “The ‘Trust Gap’ Hypothesis: Predicting Support for Biotechnology Across National Cultures as a Function of Trust in Actors.” *RISA Risk Analysis* 23, no. 4 (2003): 751–766.

Scheufele, Dietram A. “Framing as a Theory of Media Effects.” *Journal of Communication* 49, no. 1 (1999): 103–22.

Schnurr, Matthew A. “Inventing Makhathini: Creating a Prototype for the Dissemination of Genetically Modified Crops into Africa.” *Space, Contestation and the Political* 43, no. 4 (June 2012): 784–792.

Sinha, G. “Agbiotech. GM Technology Develops in the Developing World.” *Science* 315, no. 5809 (2007): 182–3.

Shaw, Ibrahim. “Towards an African Journalism Model.” *International Communication Gazette* 71, no. 6 (2009): 491–510.

Skjerdal, Terje S. “The Three Alternative Journalisms of Africa.” *International Communication Gazette* 74, no. 7 (2012).

Wasswa, John Baptist. “The Exploration of the Impact of State Ownership on Uganda’s New Vision Newspaper’s Social Role.” (PhD diss., Rhodes University, 2005).

“Water Efficient Maize for Africa (WEMA).” Accessed January 31, 2014. http://wema.aatf-africa.org/about-wema-project.

APPENDIX A

The Daily Nation - Kenya

2010	Title
12-Feb	Team to question Raila on scandal
13-Feb	PM's senior staff plan to quit
3-Mar	GM maize trials to start soon
8-Apr	Kenya rejects S.Africa's GM maize exports: report
12-Apr	Team probes GM maize imports
13-Apr	Agents in SA probe import of GM maize
13-Apr	House team probes GM maize import
14-Apr	Puzzle of GM maize imports
17-Apr	Lack of rules hinders use of biotech seeds
19-Apr	A shot in the arm for cotton
19-Apr	Kenya 'aware that maize was GMO'
20-Apr	GM maize 'eaten for three years'
25-Apr	Move to shield Kenyans from GM maize
26-Apr	SA defends gene modified maize exports to Kenya
28-Apr	Pickup technology or stay hungry, say farming experts
11-May	MP demands talks on maize
29-May	Gene from Japan for local maize
31-May	Turning textile into a multi-billion industry
2-Jun	MPs urge farmers not to sell bad maize
23-Jun	GMO law to go live
12-Oct	150 states back Kenya on GMOs

2011	Title
21-Jan	Grain cartels set to cash in on hunger facing Kenya
28-Feb	Kenya to start planting biotech crops
13-Mar	US pushed for passing of Biosafety Act
28-Mar	Study faults new banana technology
29-Apr	Tax waiver to bring down price of flour
6-Jun	Banana technology safety queried
4-Jul	Maputo maize probe travel plans scrapped
4-Jul	Millers brush off claims of GMO cereal imports
5-Jul	Stern warning to GMO importers
5-Jul	Treasury throws open importation of maize
6-Jul	House team opposes GM food imports
8-Jul	Imports of GM maize opposed
8-Jul	Greenpeace faults Kenya on GMO maize imports
11-Jul	GMOs, GEOs: 'Africa is not the place for these things'
11-Jul	The shocking reality about GMOs
13-Jul	House team warns of school food riots
13-Jul	Minister denies GM maize imports cleared
14-Jul	Cabinet clears GM maize imports
14-Jul	Unga prices to come down next month

14-Jul	Kenya approves import of GMO maize
17-Jul	Leaders split on bid to import GM maize
18-Jul	Farmers' lobby backs GM maize imports
18-Jul	Publishing rules on GMO imports starts
19-Jul	Advice on gene maize ignored
21-Jul	Hunger crisis rekindles debate over GM maize
22-Jul	I have eaten GM food, says minister
23-Jul	The propaganda, facts and the grey areas on GM foods
27-Jul	New hybrid non-GMO seed ready
29-Jul	Two have died of hunger, Mutua told
2-Aug	Raila ordered to speak on GM maize allegation
3-Aug	Kenya imported GMO maize, House told
8-Aug	Agency lacks capacity to test GMOs
9-Aug	Cabinet approves four key Bills
10-Aug	Ministers clash over sacking
10-Aug	Scholars in bid to put GM food fears to rest
12-Aug	Agency 'lacks power to vet GM imports'
13-Aug	US urges long-term food aid for Kenya
14-Aug	GM maize imports are now legal
24-Aug	Biosafety boss sacked in import row
24-Aug	US hand in embracing genetic products
31-Aug	Kenya 'imported 3m bags of GMO maize'
31-Aug	Maize prices too high, say millers
11-Sep	MPs visit port to probe maize scam
20-Sep	Ministry pushes for more maize imports
6-Oct	Land of leading women scientists
3-Nov	The maize debate
17-Dec	Kenya's hope of fixing maize shortage crisis

2012	**Title**
21-Jan	Fresh row over maize import window phase
4-Feb	Teach about GMO in schools, say educators
12-Feb	Kenya eyes GM crops to ensure food security
19-Feb	Embrace GM food, minister tells Kenyans
23-Feb	Genetic maize seeds set for Kenyan market
27-Feb	GM cotton to be in farms by 2012: Kari
29-Feb	Maize farmers told to go for certified seeds
26-Mar	Biotechnology is a solution to our perennial hunger but ....
18-Apr	Kenya edges closer to GM foods
7-May	Maize shortage starts to bite
11-May	Warm up to GM maize meal by 2012
28-Jun	Millers want GM food rule dropped
21-Jul	Agriculture ministry to release report on virulent maize disease
30-Aug	Approved GM products are not on sale, says authority
21-Oct	California to vote on GM food labelling
8-Nov	Bill seeks to legitimise 'come we stay' unions

21-Nov	GMOs banned as cancer fears grow
22-Nov	GMOs ban to hit relief food efforts
25-Nov	GM food not approved for sale, says regulator
28-Nov	Mututho drops Nakuru governor bid

2013	**Title**
14-Mar	Poor nations ahead in GM crop farming
6-Apr	Genetically modified food imports to be screened with new kit
1-May	Ban on GM foods was political, says Kiome
2-May	Woman's greenhouse venture bears profit
20-May	Legal status of GMO probe team queried
15-Jul	Ban on genetic foods is illegal, claim MPs
26-Jul	Lift ban on GM foods, says group
26-Aug	Let African farmers be, scientists say on GMO
9-Sep	New wheat seed breed offers hope
21-Oct	Poor data on GMOs hampers adoption
8-Nov	Experts dig in for small farmers
10-Nov	Scientists want ban on GM foods lifted
12-Nov	Maize shortage signals price increase
29-Nov	Study on GMOs withdrawn
29-Nov	How city farmer mints over Sh350,000 every month on an acre plot
3-Dec	Warning against GMO ban lift
3-Dec	Centre for quality seeds launched
3-Dec	Plant breeding academy launched
4-Dec	Scientists discover wonder rice gene
7-Dec	Looming maize shortage rekindles talk on genetic foods

The Daily Nation - Uganda

2010	**Title**
3-Jan	Farmers shun biotechnology as hunger bites on
27-Jan	FARM TRENDS: The biotech factor
27-Jan	Farmers should take advantage of biotechnology
24-Feb	Progress on improved sorghum varieties
3-Mar	Uganda to host agro-biotechnology meeting
10-Mar	RESEARCH: Developing drought-resistant coffee
12-Mar	Agricutural budget set to increase
19-Mar	Uganda seeks to benefit from improved crops
7-Apr	Scientists say low adoption of agro-technology hurts farmers
27-Apr	Future of GM crops uncertain
1-May	Maize prices fall due to high yields
5-May	Scientist roots for new technology in banana farming
12-May	Regional scientists, farmers labour to stamp out food insecurity
19-May	A cure for black sigatoka in banana found
26-May	Scientists give names to new cassava diseases
2-Jun	Lessons from growing biotech crops
9-Jun	Striga resistant varieties to boost sorghum yields

23-Jun	Scientists write biosafety rules
21-Jul	Researchers in a bid to eradicate White flies
4-Aug	Drought tolerant maize trials approved
18-Aug	Banana bacterial disease remedy found
24-Aug	Govt discourages farmers from growing organic cotton
25-Aug	Farmers resort to productive banana variety for better yields
1-Sep	Search for pest resistant cotton continues
8-Sep	Virus resistant cassava for field trials
15-Sep	Comesa wants biotech policies harmonised
15-Sep	Scientists release disease free sweet potato varieties
21-Sep	Comesa roots for harmonised GMO policy
22-Sep	Agricultural experts optimistic about three cassava varieties
29-Sep	Uganda and Nigeria conduct biotech rice research
6-Oct	Scientists claim GM cowpea could generate more income
6-Oct	Climate change threatens to wipe out Uganda coffee
13-Oct	Trials on drought tolerant maize to start in November
19-Oct	Comesa countries to finalise GM policy, regulation in 2011
20-Oct	Farmers to benefit from conventional maize research work
27-Oct	Researchers advocate for biotechnology to improve food security in Africa
27-Oct	More funding needed for innovations
3-Nov	Scientists learn from Nigeria's BT cow peas
10-Dec	GM foods, a blessing or curse?
15-Dec	Finding a solution to banana wilting

2011	**Title**
19-Jan	Processing drought tolerant maize
2-Feb	Search for resistant cassava types still on
9-Feb	Vitamin A and iron-enriched bananas show promising signs
16-Feb	Commission seeks compromise on GM foods
1-Mar	Rising population a great threat to food security
8-Mar	Ugandan scientists get permit to process GM Cotton lint
9-Mar	Research on improved maize and cotton shows promising signs
16-Mar	Progressing through a farmers' association
21-Mar	The Ugandan on Obama's commission
22-Mar	US unfazed by opposition to genetic crops
29-Mar	GM crops global value reaches $11.2billion
6-Apr	Farmers to benefit from grants
25-May	Farmers reject genetically engineered seed
25-May	Using genetic technology to produce more matooke
7-Jun	Scientists and farmers team up for food quality
22-Jun	Ugandan Farmers reject genetically modified crops
22-Jun	Scientists link up to introduce West African yams in Uganda
22-Jun	Regional scientists develop quick-growing, weed-resistant sorghum
21-Jul	Seed traders map ways to higher profit growth
27-Jul	Farmers' show not up to today's challenges
25-Aug	Kenya to import GMOs

2-Sep	Kenyans have been consuming GMO maize
7-Sep	Scientists join lobby for biotechnology law
21-Sep	Inflation forces Kasese farmers to raise prices
26-Oct	Farmers to benefit from improved sweet potatoes improved Sweet potato variety
31-Oct	US donates Shs50 billion to boost agricultural research
27-Nov	Wilt-resistant banana plant now available, says Museveni

2012	**Title**
8-Feb	Brazil to lead world in biotech crops: association
15-Feb	Scientists rejuvenating indigenous cassava species
20-Feb	MPs tell scientists to petition House over biotech Bill
24-Feb	Microsoft founder urges digital revolution against hunger
13-Mar	Grow bio-tech crops to earn more - scientists
5-May	Incubation to benefit small scale farmers
27-Jun	Cassava farmers advised to use fertilisers for better yields
4-Jul	Increasing banana yields by using tissue culture method
21-Aug	Curb graft to achieve middle income status; official
9-Oct	Kenya urged to reduce dependency on agriculture
14-Nov	Vitamin A-rich millet to be developed by researchers

2013	**Title**
20-Feb	Biotechnology and Biosafety Laws: How will farmers and stakeholders benefit?
13-Mar	Scientists develop maize and rice that grow in soils with less nutrients and no fertiliser
21-Mar	Expert warns MPs against law on GMOs
30-Mar	Christians caution against brutal arrests, land fights
2-Apr	Finding ways to deal with banana pests
10-Apr	GM crops or not? Farmers undecided as the debate on biotech bill heats up
1-May	Researchers tackle new pest challenge in maize breeding
15-May	Is Uganda missing out on the global market for biotech crops?
3-Jun	Don't rush biotechnology Bill, MPs told
5-Jun	Civil society denounces GM foods
5-Jun	Waste in food chain hurting environment, experts say
12-Jun	Saving food could improve food security
19-Jun	Uganda, Kenya set to release new non-GM maize varieties for the market
2-Jul	Uganda at risk of hazardous GM foods, expert warns
10-Jul	Improving green gram, pigeonpea and cowpea varieties to perform better
24-Jul	Growing rice was the best decision he ever made
3-Aug	Ugandans hate me, says General Saleh
21-Aug	Searching for a resistant cassava variety
28-Aug	Scientists develop better sorghum and millet to withstand emerging threats
11-Sep	Seeking solutions as cassava variety is struck by the brown streak virus
2-Oct	Naro sets up one-stop biotech data centre
14-Oct	Experts, MPs back proposed GMO Bill
16-Oct	MPs sensitised on biotech
10-Nov	Iguru asks cultural leaders to preserve traditional crops
17-Nov	Parliament Watch: Tales of lazy legislators and stalled GMO Bill

20-Nov	Tissue culture: An option for farmers to get clean banana planting materials
25-Nov	NRM caucus convenes to debate GMO Bill
27-Nov	Scientists breed pests to test new maize varieties
12-Dec	Kadaga orders House inquiry into genetically modified organisms Bill
15-Dec	Umeme scam rocks House as Madiba is remembered
18-Dec	Why the push for biotech should be fair
25-Dec	Consult on GMOs, government told

The Citizen - Tanzania

2010	**Title**
10-Mar	GM eggplant debate consumes India
25-Mar	EAC boss advocates GM food

2011	**Title**
2-Mar	Strict bio-safety law stalls GM maize trials
6-Mar	Banana disease with strange symptoms hits the Lake Zone
19-Apr	Experts embark on Kilimo Kwanza
1-May	Activists challenge Kilimo Kwanza drive

2012	**Title**
6-Feb	GMOs hold key to gains in farming sector - govt
9-Apr	Poland to impose ban on growing GM maize
8-May	Arusha set for agribusiness exhibition
23-Aug	Transparency is crucial for agri-business project: call
18-Nov	Experts stress biotechnology for agricultural development
28-Nov	How Africa is entangled in US, Europe's GMOs politics
6-Dec	Tough laws stand in the way of GMO research
10-Dec	Opinions divided over introduction of GMOs

2013	**Title**
20-Mar	Africa needs to review biosafety, plants deals lest its farmers get duped by western multinationals
9-Apr	Tanzania sets sights on GM crops
17-Apr	Ways given to adopt GM technology
18-Apr	Farmers: New pact spells doom for smallholders
23-Apr	Ban giant US seed company, MP tells govt
6-May	High-tech: The best solution to take farming to the next level
22-May	Tanzania avoids global campaign to ban US firm
27-May	Adoption of crop biotech is crucial
7-Jun	Experts worried over dying native cassava
10-Jun	African farmers reject G8's blue print on hunger
1-Jul	TZ to adopt new pineapple variety
5-Jul	Fungi offer new way to enhance food production
1-Aug	Smallholder farmers lose in most govt programmes
3-Aug	Adopt gmo says reformed activist
7-Aug	Awareness on GMOs low, says Costech
17-Aug	Insight: Let farmers in Africa decide on GMOs, experts urge

14-Sep	Insight: Scientists not helping us, say local farmers
7-Oct	Is this end of cassava varieties?
9-Oct	GMO fight gathers pace in Tanzania
15-Oct	Experts, Ugandan lawmakers back proposed GMO Bill
26-Oct	Ineffective use of biotech set to affect food security
21-Nov	Politicians faulted over GMO stance
23-Nov	INSIGHT: Biotechnology ideal for high crop yield
24-Nov	Why Dar should embrace GMOs
24-Nov	Millions in Tanzania at risk of famine
26-Nov	Ugandan ruling party caucus to debate GMO Bill

APPENDIX B

Institutional Affiliations of Sources per Article

Political - East Africa	Nation	Monitor	Citizen	TOTAL
Kenyan government				
Kenya Parliament	31	3	0	**34**
National Biosafety Authority	24	4	1	**29**
Kenya Ministry of Agriculture	19	1	0	**20**
Kenya Plant Health Inspectorate Service	14	0	1	**15**
Kenya Ministry of Public Health	11	0	1	**12**
Kenyan Cabinet	8	0	0	**8**
Kenya Biosafety Act, document	4	0	0	**4**
Kenya Ministry of Higher Education, Science and Technology	4	0	0	**4**
President Mwai Kibaki	4	0	0	**4**
Kenya Ministry of Education	2	0	0	**2**
Prime Minister Raila Odinga	2	0	0	**2**
Kenya Treasury	2	0	0	**2**
Kenya Bureau of Standards	2	0	0	**2**
National Planning and Vision 2030	1	0	0	**1**
Kenya National Archives	1	0	0	**1**
Kenya Ministry for Trade and Industry	0	1	0	**1**
Kenya Meteorological Department	1	0	0	**1**
Agriculture Development Survey	1	0	0	**1**
Kenya agriculture extension	1	0	0	**1**
Presidential Press Service	1	0	0	**1**
Kenya National Academy of Science	0	0	1	**1**
Agriculture Sector Development Strategy, document	1	0	0	**1**
Kenya Cotton Development Authority	1	0	0	**1**
Kenyan government, general	4	0	0	**4**
Ugandan government				
Uganda Parliament	0	14	0	**14**
Uganda National Council of Science and Technology	0	5	0	**5**
Uganda Ministry of Agriculture	0	4	0	**4**
Uganda National Agricultural Advisory Service (Naads)	0	4	0	**4**
National Biosafety Committee	0	3	0	**3**
Uganda Cotton Development Organization	0	3	0	**3**
President Yoweri Museveni	0	2	0	**2**
Uganda Coffee Development Authority	0	2	0	**2**
National Environment Management Authority	0	2	0	**2**
Uganda Ministry of Information	0	1	0	**1**
Uganda Ministry of Finance	0	1	0	**1**
Biosafety Bill, document	0	1	0	**1**
Uganda Ministry of Justice and Constitutional Affairs	0	1	0	**1**
Uganda local government	0	1	0	**1**
Office of the Prime Minister	0	1	0	**1**

Uganda Women's Parliamentary Association	0	1	0	**1**
Peer Review Survey of 2010, document	0	1	0	**1**
Uganda People's Defence Forces	0	1	0	**1**
Tanzanian government				
Tanzania Ministry for Agriculture Food Security and Cooperatives	0	0	9	**9**
Tanzania Parliament	0	0	5	**5**
Tanzania Commission for Science and Technology	0	0	4	**4**
Tanzania Ministry of State	0	0	3	**3**
President Jakaya Kikwete	0	0	2	**2**
Tanzania local government	0	0	2	**2**
Environmental Management Biosafety Regulations of 2009	0	0	2	**2**
Bank of Tanzania	0	0	1	**1**
National Council for Science and Technology	0	0	1	**1**
Tanzania Ministry of Lands, Housing and Human Settlements Development	0	0	1	**1**
Southern Agricultural Growth Corridor	0	0	1	**1**
Vice President Mohamed Gharib Bilal	0	0	1	**1**
Other	11	4	6	**21**

Political - Foreign States				
United States government				
US ambassador	2	2	0	**4**
US Secretary of State Hilary Clinton	2	1	0	**3**
USAID	0	1	0	**1**
US Bioethics Committee	0	1	0	**1**
US Vice President	0	1	0	**1**
US trade commission	0	1	0	**1**
Other	0	1	0	**1**
South African government				
South Africa Department of Agriculture, Forestry and Fisheries	1	1	0	**2**
Biosafety South Africa	0	0	1	**1**
South Africa Parliament	1	0	0	**1**
Other	2	0	0	**2**
United Kingdom government				
UK Department for Business, Innovation and Skills	0	1	0	**1**
Prince Charles	1	0	0	**1**
Indian government				
India Environment Minister	0	0	1	**1**
India Parliament	0	0	1	**1**
India's Genetic Engineering Approval Committee	0	0	1	**1**
Swedish government				
Swedish embassy	0	1	0	**1**
French government	**0**	**0**	**1**	**1**
Polish government	**0**	**0**	**1**	**1**
Austrian government	**0**	**1**	**0**	**1**
Other/General	**1**	**1**	**0**	**2**

Political - Intergovernmental				
United Nations (and its programs)				
Food and Agriculture Organization	2	5	4	**11**
World Food Programme	2	0	0	**2**
World Bank	0	1	0	**1**
International Atomic Energy Agency	1	0	0	**1**
UN Office of Coordination of Humanitarian Affairs	1	0	0	**1**
UN Intergovernmental Panel on Climate Change	0	1	0	**1**
UN Conference on Trade and Development	0	0	1	**1**
UN Environmental Programme (International Assessment of Agricultural Knowledge, Science and Technology for Development)	0	0	1	**1**
Other	1	0	1	**2**
African intergovernmental				
Common Market for East and Southern Africa (Comesa)	2	3	0	**5**
African Union	2	1	0	**3**
Southern African Development Community	0	0	2	**2**
East African Community	0	0	1	**1**
European Union (EU)	0	2	1	**3**
Codex Alimentarius Commission	1	0	0	**1**
Research/Academia - East Africa				
Agricultural research				
National Crops Resource Research Institute (Uganda)	0	26	1	**27**
National Agricultural Research Organization (Uganda)	1	23	0	**24**
Kenya Agricultural Research Institute (KARI)	14	5	0	**19**
Water Efficient Maize for Africa (Regional)	5	8	1	**14**
University of Nairobi (Kenya)	12	0	0	**12**
Mikocheni Research Institute (Tanzania)	1	1	8	**10**
National Semi-Arid Resource Resource Institute (Uganda)	0	9	0	**9**
Association for Strengthening Agriculture Research in East and Central Africa	1	6	0	**7**
Makere University (Uganda)	0	6	0	**6**
Egerton University and Tegemeo Institute at Egerton (Kenya)	5	0	0	**5**
Moi University (Kenya)	3	0	0	**3**
Kenyatta Universtiy (Kenya)	3	0	0	**3**
Lake Zone Agricultural Research Development Institute at Ukiriguru	0	0	3	**3**
Coffee Research Centre (Uganda)	0	2	0	**2**
University of Dar es Salaam (Tanzania)	0	0	2	**2**
Sokoine University of Agriculture (Tanzania)	0	0	2	**2**
Bio-resources Innovation Network for Eastern Africa Development	1	1	0	**2**
Biosciences Eastern and Central Africa	0	1	0	**1**
Maseno University (Kenya)	1	0	0	**1**
University of Eldoret (Kenya)	1	0	0	**1**
National Forestry Institute (Uganda)	0	1	0	**1**
Tropical Pesticides Research Institute	0	0	1	**1**
Naliendele Research Institute (Tanzania)	0	0	1	**1**

Selian Research Institute (Tanzania)	0	0	1	**1**
Nsigotec Tissue Culture Laboratory (see Scifode)	0	1	0	**1**
Regional Universities Forum for Capacity Building in Agriculture (Pan-African)	1	0	0	**1**
Development and policy scholars				
Kenya Institute for Public Policy Research and Analysis	1	1	0	**2**
REPOA: Policy Research for Development	0	0	1	**1**
Other	16	25	9	**50**
Researcher - Foreign or Transnational				
International agriculture institutes				
Consultative Group on International Agricultural Research	0	0	1	**1**
International Institute of Tropical Agriculture	1	7	2	**10**
International Maize and Wheat Improvement Center	1	1	0	**2**
World Agroforestry Center	2	0	0	**2**
African Rice Center	0	1	0	**1**
International Rice Research Institute	1	0	0	**1**
Other agricultural research				
Donald Danforth Plant Science Centre in US	0	2	2	**4**
Sheda Science and Technology in Abuja (Nigeria)	0	3	0	**3**
Wageningen University (Netherlands)	2	0	0	**2**
John Innes Centre (UK)	2	0	0	**2**
University of California - Davis (US)	2	0	0	**2**
University of Washington (US)	0	0	1	**1**
Malaysian Research Institute	0	0	1	**1**
Institute for Agricultural Research at Ahmadu Bello University (Nigeria)	0	1	0	**1**
University of Oxford (UK)	0	0	1	**1**
University of Sussex (UK)	1	0	0	**1**
Katholek University of Leuven (Belgium)	0	1	0	**1**
Texas A&M University (US)	0	1	0	**1**
Development and policy scholars				
Harvard University (US)	3	0	1	**4**
Imperial College (UK)	3	0	0	**3**
Institute for Food and Development Policy (US)	2	0	0	**2**
Econexus (UK)	0	1	0	**1**
International Food Policy Research Institute (US)	1	0	0	**1**
Foundation for Advanced Studies on International Development (Japan)	1	0	0	**1**
National Graduate Institute of Policy Studies (Japan)	1	0	0	**1**
University of Cambridge (UK)	1	0	0	**1**
Brookings Institute (US)	0	0	1	**1**
Open University (UK)	1	0	0	**1**
Scientist associations and scientific journals				
Journal of Food and Chemical Toxicology (English-language)	3	0	0	**3**
Federation of German Scientists	0	1	1	**2**
European Academies Science Advisory Council	0	0	1	**1**

Sherbrooke University Hospital (Canada)	1	0	0	**1**
Science Journal of Environmental Engineering Research (English-language)	0	1	0	**1**
American Association for the Advancement of Science	0	0	1	**1**
Other	6	1	1	**8**
Non-profit/Civil Society - East Africa				
African Agricultural Technology Foundation	8	5	1	**14**
Kenyan Biodiversity Coalition	8	0	0	**8**
Science Foundation for Livelihood and Development (Uganda)	0	7	1	**8**
Africa Biotechnology Stakeholders Forum (Kenya)	4	1	0	**5**
African Biodiversity Network (Kenya)	4	0	0	**4**
Africa Harvest (Regional)	3	1	0	**4**
Uganda Biotechnology and Biosafety Consortium	0	2	0	**2**
Food Right Alliance (Uganda)	0	2	0	**2**
Kenya Consumer Information Network	1	0	0	**1**
Kenya Organic Agricultural Network	1	0	0	**1**
Lake Victoria Environment Management Project Civil Society Watch Project (Kenya)	0	1	0	**1**
Kenya Biodiversity Network	0	1	0	**1**
National Economic Social Council (Kenya)	1	0	0	**1**
Nature Kenya	1	0	0	**1**
Uganda Cultural Leaders' Forum	0	1	0	**1**
National Association of Professional Environmentalists (Uganda)	0	1	0	**1**
Pro-Biodiversity Conservationists (Uganda)	0	1	0	**1**
Pelum Uganda	0	1	0	**1**
Tanzania Alliance for Biodiversity	0	0	1	**1**
Tanzania Gender Networking Programme	0	0	1	**1**
Tanganyika Law Society	0	0	1	**1**
Open Forum on Agricultural Biotechnology in Africa (Kenya, Uganda, Nigeria)	0	1	0	**1**
Other	**0**	**0**	**2**	**2**
Non-profit/Civil Society - Transnational or Foreign				
International Service for the Acquisition of Agri-biotech Applications (ISAAA)	7	6	1	**14**
Programme for Biosafety Systems (US)	0	8	0	**8**
Greenpeace	3	1	1	**5**
African Centre for Biosafety (South Africa)	2	2	1	**5**
Famine Early Warning Systems Network	0	0	2	**2**
African Orphan Crops Consortium	2	0	0	**2**
World Food Prize (US)	1	1	0	**2**
Biodiversity International	0	0	1	**1**
Via Campesina Africa	0	0	1	**1**
Rockefeller Foundation (US)	1	0	0	**1**
Alliance for Food Sovereignty in Africa	0	0	1	**1**
GMWatch	1	0	0	**1**

Coalition for the Protection of African Genetic Heritage (West Africa)	0	0	1	**1**
Bill and Melinda Gates Foundation (US)	0	0	1	**1**
Friends of the Earth (UK)	0	1	0	**1**
Third World Network	0	1	0	**1**
Inades-Formation	0	0	1	**1**
Population Reference Bureau	0	0	1	**1**
Oxfam	0	1	0	**1**
Pesticide Action Network	0	1	0	**1**
Yes to Prop 37 (US)	1	0	0	**1**
Community Trust for Development and Technology (Zimbabwe)	0	0	1	**1**
Foundation for Biotechnology Awareness & Education (India)	0	0	1	**1**
Association de Refexion d'Echanges et d'Actions pour l'Environnement et le Developpement (Algeria)	0	0	1	**1**
German NGO Forum on Environment and Development	0	0	1	**1**
Other	0	1	2	**3**
Industry - East Africa				
Kenya Millers Association	11	0	0	**11**
Kenya Cereal Growers Association	4	0	0	**4**
African Seed Trade Association	1	0	3	**4**
National Cereals and Produce Board (Kenya)	3	0	0	**3**
Eastern African Grain Council	1	0	1	**2**
Kenya Seed	1	0	0	**1**
Africa Cotton & Textile Industries Federation (Kenya)	1	0	0	**1**
Rivatex (Kenya)	1	0	0	**1**
Seed Trade Association (Kenya)	1	0	0	**1**
Orion East Africa (Kenya)	1	0	0	**1**
Mt. Elgon Seeds (Uganda)	0	1	0	**1**
Trinity Organic Projects Initiative (Uganda)	0	1	0	**1**
Agro Genetic Technologies (Uganda)	0	1	0	**1**
Uganda Export Promotion	0	1	0	**1**
Victoria Seeds Company (Uganda)	0	1	0	**1**
Fica Seed Company (Uganda)	0	1	0	**1**
Uganda Seed Traders Association	0	1	0	**1**
Cropbiotech Solutions Ltd (Tanzania)	0	0	1	**1**
Tanzania Exporters Association	0	0	1	**1**
Tanzania Seeds Trade Association	0	0	1	**1**
Property and Business Formalization Programme (Mkurabita) (Tanzania)	0	0	1	**1**
Kibaigwa Maize Market (Tanzania)	0	0	1	**1**
Research, Community and Organizational Development, firm (Tanzania)	0	0	1	**1**
Bio Sustain-Organic Cotton (Tanzania)	0	0	1	**1**
Universal Group Company (Tanzania)	0	0	1	**1**
Other	6	4	1	**11**
Industry - Foreign				

Mulinational				
Monsanto	1	1	1	**3**
Syngenta	2	0	1	**3**
International Seed Federation	0	0	1	**1**
Farmer - East Africa				
network of small scale farmers of Tanzania (MVIWATA)	0	0	4	**4**
Kenya Farmers Association	3	0	0	**3**
Eastern and Southern Africa Small Scale Farmers Forum (Tanzania)	0	0	3	**3**
Bura Irrigation Scheme (Kenya)	2	0	0	**2**
Toro Farm (Kenya)	1	0	0	**1**
Wehoya Farm (Kenya)	1	0	0	**1**
Basajjakweyamba Cooperative Society: Mubuku Irrigation Scheme Ltd. (Uganda)	0	1	0	**1**
Bukusekamajja Farmers' Development Association (Uganda)	0	1	0	**1**
JENGA Community Development Association (Uganda)	1	0	0	**1**
Uganda National Farmers' Federation	0	1	0	**1**
Agricultural Non-State Actors Forum (Tanzania)	0	0	1	**1**
Other	16	23	3	**42**
Farmer - Foreign				
Other	2	0	2	**4**
Activists - East Africa				
Unga Revolution (Kenya)	2	0	0	**2**
Bunge La Mwananchi (Kenya)	1	0	0	**1**
Gen Caleb Akandwanaho (Uganda)	0	1	0	**1**
Other	0	0	1	**1**
Activsists - Foreign				
Mark Lynas (UK environmental writer)	1	0	2	**3**
Bill Gates (US philathropist)	0	1	0	**1**
Vandana Shiva (India)	1	0	0	**1**
Jeffrey Smith (US blogger)	1	0	0	**1**
Other - East Africa				
Consumers	3	0	2	**5**
Uganda Joint Christian Council	0	2	0	**2**
Vice-Chanellors' Committee (Kenya)	1	0	0	**1**
Teachers (Kenya)	1	0	0	**1**
Pontifican Council for Justice and Peace (Catholic Church)	0	1	0	**1**
Other	1	1	0	**2**
Other - Foreign/transnational				
Consumers	2	0	2	**4**
Daily Mail (South Africa)	2	0	0	**2**

Wikipedia	1	0	1	**2**
Noseweek	1	0	0	**1**
New Scientist magazine	0	0	1	**1**
Scientific American	0	0	1	**1**