African Union Commission

Public Participation in African Biosafety Regulations and Policies

September 2010

Bundesministerium für
wirtschaftliche Zusammenarbeit
und Entwicklung

gtz

The publication is part of the AU-German Cooperation Project "Support for the African Union on Issues of Biosafety", which is being implemented jointly between the Commission of the African Union and the German Tecnical Cooperation (GTZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). Views expressed in this publication do not necessarely reflect those of BMZ and GTZ.

Public Participation in African Biosafety Regulations and Policies

African Union Commission
Depertment of Human Resources, Science and Technology

Editors
Bather Kone, Mahlet Teshome and Hartmut Meyer

This paper was commissioned to and prepared by:
Mercy Wambui Kamara
Department of Communication, Business and Information Technologies, Roskilde University, Roskilde, Denmark

Contents

Tables

Abstract

This one-month desk study was commissioned by the African Union to examine the status of public participation in African Biosafety policies and to help the African Union, African governments, and policy-makers implement the African Union Model Law on Safety of Biotechnology and Article 23 of the Cartagena Protocol on Biosafety.

The paper draws on peer-reviewed literature on the political economy of Africa, and public participation in environmental, and science-and-technology policies. Additionally, it draws on published policy papers and reports and accumulated experiences of the consultant on public participation in GMO and Biosafety policies in Africa and Northern Europe. The executive summary recaps key findings, opportunities, challenges, and possible ways forward. Section one defines terms used throughout this paper. Section two summarises the current African political economic context under which public participation in African Biosafety policies will take place, including challenges and opportunities. Section three summarises six conceptual frameworks that ground the principle of public participation as one of the critical tools in science and technological policies, including GMOs and Biosafety policies. Section four maps international Biosafety policy developments and explains how forerunning Northern and African countries have adopted or are adopting and implementing the principle of public participation in GMOs and Biosafety policies. Thus, this section is divided into four parts. Part one reviews two dimensions of public participation in science and technology policies: the hard and the soft dimensions. Part two reviews how the hard dimension of public participation has evolved in forerunning Northern countries. Part three reviews how the hard dimension has evolved in forerunning African countries. Drawing on experiences from forerunning African and Northern countries, part four reviews the soft albeit powerful dimension of public participation. On the basis of this review, section five summarises the status of public participation in African Biosafety regulations and policies to date. Finally, section six makes some recommendations and proposes possible ways forward.

Executive Summary

Public participation is a cardinal democratic virtue.

Public participation is globally recognized as one of the important tools for furthering sustainable economic growth, well-being, development, and security.

Public participation in environmental, Biosafety and controversial science and technology policies is a necessity and not a choice. Most practice-based and theory-based accounts—most notably, sustainable development; late lessons from early warnings; substantive; normative; instrumental and rhetorical perspectives—have come to this conclusion.

The right to public participation in GMO and Biosafety policies was recognized and invoked by scientists, governments, public or civil society organizations as far back as 1977, possibly earlier.

Since 1978, EU countries have conducted surveys of the public's perceptions of GMOs or gene technologies.

The right to public participation in Biosafety policies was acknowledged and invoked by one of the world's leading biotechnology corporation, Novo Nordic A/S, as far back as 1985.

Globally, the first legally binding provisions for public participation in GMO and Biosafety policies were provided in 1986, in Denmark.

There are two interrelated ways of adopting and implementing the principle of public participation in environmental or science and technology policies: the hard and soft dimensions.

The hard dimension of public participation: This dimension involves putting in place tangible and material instruments or resources for furthering public participation. Instruments for implementing the hard dimension are:

1) Policy statements and enactment of legal directives,
2) Establishment of structural infrastructure,
3) Disbursement of funds, and
4) Executing actual public participation activities or practices.

The soft dimension of public participation: It imparts, inculcates or debates on knowledge claims, values, interests, assumptions, commitments, and justifications for policy decisions. Also, it involves elicitation of knowledge, needs, values, concerns, and interests. This dimension of public participation is constituted by institutionalised practices; or articulated in governments', agencies' or corporations' declarations, action plans, white papers or reports. Over the last decades, this dimension has evolved from a deficit approach to a dialogic approach:

1) The scientific knowledge deficit model (that further a one way top-down approach);

2) The attitude deficit model (that further a one way, indeed, a social engineering approach);

3) The trust and dialogue deficit model (that further a two way albeit spin-doctored or manipulative approach); and

4) An authentic and robust dialogic model (that further a two way virtuous approach).

Laudable milestones in African Biosafety policies:

- Most governments have pronounced that they recognize the principle of public participation;
- Most governments have endorsed the Rio Declaration;
- An increasing number of African governments have put in place laws and legislations that provides for public access to information;
- An increasing number of African governments have put in place environmental acts that provides for public access to environmental information, public consultation and participation in environmental decision-making;
- 28 countries have ratified the Cartagena Protocol on Biosafety;
- Seven African governments have enacted Biosafety legislations that provide legally binding rights to information, consultation, and participation. Others have their Biosafety bills under way, which also include provisions for public participation;
- Most African countries, including laggard countries, provide non-legally binding provisions for public information, consultation and participation in their National Biosafety Frameworks;
- There are wider stakeholders' information and consultation that suggest there are opportunities for further development.

Challenges for Public Participation in African Biosafety Policies:
Public participation in African Biosafety policies will be influenced and shaped by the current political-economic realities and contexts, which include the following:

- Policy provisions and conditions provided by donor countries;
- Power imbalances and struggles between donor countries and African governments;

- Unbalanced financial, technical, scientific, rhetorical, and communication capitals between donor countries and African governments;
- Donor agencies' use of public participation to further their values and interests;
- Lack of donor coordination and harmonisation;
- Donor countries' competition and efforts to assume certain territorial control;
- Donor countries' policy culture and shifting political-economic regimes;
- Local political-economic factors;
- Regional political-economic factors;
- African governments' and policy-makers' use of participation as a tool for legitimizing pre-existing policies or furthering their own values and interests;
- Anti-resource-poor bias;
- Ethnic and gender bias;
- Policy of patrimony;
- Culture of secrecy;
- Pro-western science, scientific experts, and multi-national corporation bias;
- Lack of balanced, disinterested, or non-partisan public education and information infrastructure;
- Poor technical communication infrastructure;
- Public exclusion in actual policy decisions and implementation processes;
- Public and civil society distrust of governments, policy-makers, and expertise.

More particularly, current forms of public participation in African Biosafety policies face various challenges and limitations:

- The African public were not informed or consulted or did not participate in decisions to develop and deploy GMOs as a solution to hunger or food security;
- Pro-GMO scientists, the GMO industry, and powerful donor agencies use public information, consultation, and participation as an instrument for furthering or engineering GMO acceptance, rather than as an instrument for genuine GMO deliberations or authentic public participation;
- African governments do not have scientific and technical resources needed to provide balanced and non-partisan information;
- Selected stakeholders have been consulted by government, industry, and donors. However, their consultation is used to legitimize decisions that have already been made, and their input is not integrated in policy decisions and implementations;
- Stakeholders and partisan groups' participation is misrepresented as an all-inclusive and as public participation;
- Small-scale farmers, the resource-poor in urban and rural areas, and important NGOs have not been represented and consulted in the Biosafety process;
- In some African countries, since 2001, the public have been exposed to GMOs through GMO food aid with no awareness, information, consultation, and participation in the decision to import, consume or release GMOs.

Opportunities and the Way Forward:

Challenges are setbacks to be overcome. They signal we should work harder. They are opportunities for aiming for greater heights and peak performance. If confronted, well thought through and handled, the above described challenges may offer opportunities and open-up possibilities that we can only begin to imagine.

Public participation is not a choice. It is a necessity. Irrespective of the current challenges, the African Union, African governments or responsible policy makers must strongly cultivate the now agreed-upon belief that public participation can promote responsible Biosafety policies, sustainable science and technological innovations more generally, and that public input furthers national welfare, economic growth, and development.

There are opportunities for cultivating and developing authentic and robust public participation in African Biosafety policy:

- Open up, expand, question, and (openly and transparently) deliberate scientific knowledge claims and expertise;
- Open up, question, and (openly and transparently) deliberate the notions of progress, development, knowledge-based innovations or knowledge-based economy;
- Bring into the open how diverse social, political, donor, and industrial needs, values, and interests influence and shape knowledge claims;
- Explicitly define public engagements, public communication, consultation, and participation in legal stipulations;
- Provide legally binding stipulations for incorporating public input and for shaping policy implementation in practice;
- Support non-partisan civil society organizations at all levels;
- Draw-up an African convention similar to the Aarhus Convention on public participation or adopt the Aarhus Convention.
- Respect the lay African public.
- Recognize that lay African publics have immense capabilities, indeed, can grow and develop their understanding and ability to discuss any emergent complex scientific and technical issue—if they are given balanced information, time and space; indeed, if we create the conditions within which the lay African people will motivate themselves.

Section one: Conceptual Definitions

Modern Biotechnology

Biotechnology can mean any technological application that uses biological systems, living organisms, or derivatives thereof to make or modify products or processes for specific use. For the purposes of this report, modern biotechnology will be understood as defined in the Cartagena Protocol on Biosafety, namely, as the application of (a*) in vitro* nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or (b) fusion of cells beyond the taxonomic family that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection. This report focuses on the subset of agricultural modern biotechnologies that generate ―living modified organisms" as defined by the Cartagena Protocol but, in addition, also covers products made out of ―living modified organisms," for example, food stuff. The report will use the more common but exchangeable terminology: GMOs or GM foods or crops.

Public

Throughout this paper, *public* will denote the ordinary and non-partisan individual citizen—with his or her values, interests, concerns, needs, experiential and contextual knowledge, worldview, and so forth—as a non-partisan individual citizen. Citizen engagement does not presuppose what is at stake, and opportunity for individual citizen engagement will be understood as readily providing balanced information, as well as room and space for listening to, eliciting, learning and taking into account diverse individual citizens' values, interests, concerns, needs, worldviews, contextual knowledge, and contextual social representations of GMOs.

Stakeholders

A *stakeholder* (or a stake seeker) is one of a group of people who share and agree concerning what is at stake and join together to form a stakeholder group to lobby and further their interests, values, and concerns. Therefore, it is important to note that to confuse stakeholder groups with individual public citizens is to reduce the scope of democratic governance. What stakeholder groups such as Bio US, EuropaBio, AfricaBio, professional scientific organizations, environmental organizations, women organizations, or farmers' organizations consider to be at stake may not be universal and may not represent the stakes or the views of *all* (farmers for the latter), let alone the public at large.

Section two: Background and Context

There is a general consensus within democratic theories and societies that the principle of public participation is both a basic right and a cardinal virtue of democracy. Thus, although democracy is one of the most disputed ideas in northern and southern countries, the idea that democracy is a form of governance characterised by substantial levels of popular sovereignty and collective decision-making remains largely unchallenged. Accordingly, procedural, liberal, and social democracies all underscore the principle of public participation—as a cardinal virtue (Landman & Dellepine, 2008).

In modern Western thought, development and democracy are intrinsically interlinked. Thus, while the causes and consequences of democracy have long been a subject of scholarly and public debate, there is a consensus that democracy is both an end and a means to development (Landman & Dellepine, 2008).

Most commentators would agree that, due to the histories of most African countries as former colonies, young nations of post-colonial Africa adopted Western notions of development and democracy. This development was a consequence of complex pre-colonial and post-colonial interactions and relations with the West that, following national independence, became valued Northern partners. So, even though the African society did not necessarily discard and disregard traditional African ideologies, Western ideas and assumptions of democracy and development have influenced and shaped post-colonial Africa (Keeley & Scoones, 2003). A good example of this ideological import is Bretton Woods' inspired notions of development, namely, as involving national economic growth and development through import substitution, export promotion, or both. Another is the belief in scientific and technological innovations, as well as the privatization of public services in the 1980s and 1990s and commoditization of public goods. These policies were, originally, enforced in Europe and North America during the Thatcher-Reagan regime, as engines and drivers of national economic growth and development. A recent example of this ideological import is North American and European ~~"n~~ew modes of governance", indeed, the on-going global race to __become the most competitive and dynamic knowledge-based economy in the world'' (Bruno 2009:262). Donor states' policy regimes or shifts shape African development policies through provisions of intermediating institutions, most notably, the International Monetary Fund and the World Bank (Storey, 2000).

Public participation in public policies and decision-making processes is a good example of how Western notions of democracy have influenced and shaped governance in Africa (referred hereafter as Africa). It is worth noting here that traditional forms of public consultation, communication, and participation have existed in most African countries—in the form of village or community meetings or gatherings—summoned by traditional village chiefs, elders, or leaders. However, there is a consensus in the development community and theory that modern forms of public participation in public policies and decision-making processes have been promoted by major Western international donors.

This participation has occurred through bilateral relations or via the International Monetary Fund, the United Nations, the World Bank, or Northern donor states—hereafter referred to as Northern partners (Resnick & Birner, 2008).

Most observers would agree that the impetus for modern forms of public participation in public policies and decision-making processes has been driven by various factors (Resnick & Birner, 2008). First were the 1970s development models that questioned centralised forms of governance, in particular, African governments, for failing to take into account the views and experiences of resource-poor constituents. Second, there was an expanding democratization process in Africa during the late 1980s and early 1990s. This process generated the recognition that the principle of public participation is a potent tool for policy-making, good governance, and national economic growth. Third was the founding and coming of age of non-governmental organizations (referred to hereafter as NGOs or civic society groups). This development—in addition to an emphasis on federalism and decentralization of public policies since the 1990s—exerted unprecedented pressure on politicians and governments. All these factors, among others, furthered laudable milestones in public engagement across Africa, which include stipulations of non-legally binding policy statements, enactment of legally binding acts of parliament, and indeed, increased public information and consultations in agricultural, development, or environmental management policies (Resnick & Birner, 2008; Schwarte, 2008; Smith, 2004).

Despite these laudable developments, in Africa as elsewhere, modern forms of public participation in public policies and decision-making processes have faced a number of challenges. Studies indicate that Northern partners have promoted weak forms of participation. In particular, they note that participation in the initiation and setting up of development agendas, actual decision-making, and implementation processes has not been broad and inclusive enough to involve all interested, active, or affected constituents in Africa. Especially, observers stress that the Northern partners have failed, in robust and meaningful ways, to involve women and the resource poor: the powerless. In addition, observers argue that Northern partners have been using the idea of public participation to promote their own values and interests instead of the values and interests of the people of Africa, especially the resource poor. Furthermore, critics argue that Northern partners‘ use of the concept of participation is vague and vacuous and that their actual practices undermine the cardinal principle of public participation. Also, Northern partners do not acknowledge the inherently political nature of public participation. In particular, critics point at how the participatory methods applied by Northern partners, methods informed by the expert-model of policy-making, tilts the power balance and relations in policy-making and decision-making. Further, the expert model is accompanied by the inherently unbalanced economic, social, scientific, rhetorical, and political capitals possessed by Northern partners, who come to enjoy enormous influence over the process. Accordingly, observers have asserted that Northern partners refuse to accept or recognize that power imbalance creates a barrier that hinders authentic and robust public participation and furthers exclusion (Resnick & Birner, 2008).

Most critics and observers would agree that the role of NGOs and the general public in African development, agricultural, or environmental policies have reached impressive milestones. However, critics have noted that there are large gaps among agenda initiation, agenda setting, agenda deliberation, decision-making, and the actual policy implementation process. They observe that, although there are increasing public consultation activities, there is little evidence of the effectiveness and actual impact of elicited public views, interests, and knowledge during policy implementation (Bryant 2008; Resnick & Birner, 2008). Thus, although critics note promising increase in the enactment of legally binding rights of access to information, greater public consultation, and participation, they indicate that, in policy implementation processes, the public and civil society meet a ~~"c~~ulture of secrecy" (Schwarte, 2008: 9, 13), a need for ~~"p~~ersonal back-door inroads" (Harsh, 2005: 672), ~~"p~~ersonality-driven processes", ~~"l~~arge-players vested interests", (Smith 2004: x), or ~~"p~~atronage networks [that have] a strong ethnic and gender element in their composition and operation," which block their inclusion and their efforts to shape policies (Smith, 2004: 10).

Further, observers have indicated that ruling African governments face the following additional challenges:

- Seeing public participation as a tool for legitimizing pre-existing government agendas and interests. For this reason, African governments fail to incorporate elicited NGOs and lay-public interests or knowledge;
- Facing external and internal political-economic pressures that hamper actual policy implementation;
- Lacking financial, infrastructural, technical or scientific capacity and resources;
- Setting goals, visions, expectations or promises that are beyond their financial, technical capacity, and resources;
- Lack of cross-ministerial policy coordination and harmonisations;
- Confused paradigms and policy narratives (Smith, 2004; Resnick & Birner, 2008; Schwarte, 2008).

In addition, the expert community indicate that the general lay public can be typified as follows:

- They are not informed or aware of their legal rights to demand or be provided balanced information or their legal rights to participation;
- They are not scientifically engaged or activated;
- They lack power, basic knowledge and competences so as to be empowered and, thus, be meaningfully involved in the decision-making processes;
- They lack basic communication infrastructures (electricity grid, broadband Internet, radio, TV, and so on, especially in the rural areas);
- They are easy to misinform, in fact, lack the ability ~~"t~~o distinguish between information and propaganda" (Schwarte, 2008:12);
- They lack real social, economic, political, and cognitive capitals that would enable them to influence the decision-making processes, especially, the implementation process (Resnick & Birner, 2008; Schwarte, 2008).

These are the context and conditions under which public participation in African Biosafety policy will take place. On the one hand, the current legal and policy contexts show promising developments towards greater public engagement, an obvious window of opportunity. On the other hand, there are real challenges and barriers that may threaten efforts to further an authentic and robust public participation in African Biosafety policies, as it does in advanced democracies. Challenges are setbacks to be overcome. They signal we should work harder. They are opportunities for aiming for greater heights and peak performance. If confronted, thought through and well handled, challenges may offer opportunities and open-up possibilities that we can only begin to imagine. In the following pages, this paper will explore key conceptual frameworks that inform the necessity for furthering greater public participation in science and technological policies, including modern agricultural biotechnology and Biosafety policies. Next, it will review selected experiences from forerunning European and African countries. In the final section, it will draw some conclusions and make recommendations.

Section three: Framework: Public participation in science and technology policies

There is a general consensus within environmental social science, public understanding of science, science communication, or science-and-technology-policy community that the call for public participation in science and technology policy is informed by a number of conceptual frameworks, most notably, the sustainable development framework; the late lessons from early warnings framework; substantive, normative, instrumental, and rhetorical frameworks.

Sustainable development framework

Sustainable development is perhaps the best known framework for promoting public participation in science and technology policy. The 1972 United Nations Stockholm Conference was the first milestone in appealing to the world to recognise and mitigate harmful environmental effects that may accompany science and technological developments. This conference ushered in the era of environmentalism, including public awareness of the need to protect the environment (Baylis & Smith, 2005). The second milestone was the work of the International Union for the Conservation of Nature, which, in cooperation with three international NGOs, conceived the idea of and an agenda for ~~"s~~ustainable development," as indicated in its *World Conservation Strategy* (IUCN/UNEP/WWF, 1980). In 1987, the sustainable development idea gained international recognition, when the UN World Commission of Environment and Development (WCED) published *Our Common Future* (commonly known as the Brundtland report). The Brundtland report defined sustainable development as follows:

- Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two concepts:

- The concept of ~~"n~~needs," in particular the essential needs of the world's poor, to which overriding priority should be given; and

- The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.

- The goals of economic and social development must be defined in terms of sustainability in all countries - developed or developing, market-oriented or centrally planned. Interpretations will vary, but must share certain general features and must flow from a consensus on the basic concept of sustainable development and on a broad strategic framework (WCED 1987, p. 43)

Thus, the Brundtland report put (equal) emphasis on ecological, social, and economic developments. The basic normative and ethical ideas of sustainable development as defined by the Brundtland report are listed in Table 1 below.

Table 1: Normative and Ethical Ideas behind the Sustainability Concept in Our Common Future Report

1) **Meeting needs**: Present society should take care of the *needs* of the poor and future generations and respect their rights to a human existence based on reasonable standards of welfare. Security of food, work, energy, water, and health care are major concerns.
2) **Social fairness**: A fair distribution of resources like money, information, health, etc., within global populations is important in itself, as well as for the development of environmental sustainability.
3) **Maintenance of natural resources and nature**: Scarcity of natural resources and nature set *limits* to the exploitation of resources and nature. Care should be taken not to disrupt the regenerative capacity of nature. Biodiversity should be preserved and the use of renewable energy enhanced.
4) **Sustainable economy**: Revitalisation of economic growth based on new qualities, like fair distribution and producing more with less uses of resources, is paramount to fighting poverty and environmental degradation.

(Source: Kamara et al., 2006)

What was revolutionary about the Brundtland report was that it questioned the classical European idea of development founded on a belief in limitless economic growth, national well-being, competitiveness, and security through the powers of science and technology. The Brundtland report's idea of sustainable development was recognized during the 1992 United Nations' Rio Earth Summit, where the Rio Declaration was endorsed[1]. Both the Brundtland report and the Rio Declaration conveyed the clear message that the adoption and implementation of precautionary and public participation principles were crucial tools for achieving sustainable development. Principle 10 of the Rio Declaration invokes participation of all concerned and affected citizens in the handling of environmental issues, effectively recognizing the limits of science and technology as the only tools for development and progress. Since then, the idea of sustainable development has been welcomed and represented globally (Kamara 2009b).

Late lessons from early warnings framework

The late lesson from early warning is the second framework. In fact, the recognition of the limits of science and technology in the early 1970s and 1980s, which led to the Brundtland report and Rio Declaration, was described by a European Environment Agency (EEA) report as *Late Lessons from Early Warnings.* In the seminal report of the same title, EEA analysed 14 cases of late lessons from early warning, which included chlorofluorocarbons (CFCs) that contribute to the ozone hole, asbestos, mad cow disease (BSE), and so on. The report appealed to scientists, scientific expertise, and policy-makers to acknowledge and respond to scientific uncertainty and scientific ignorance. In particular, the report pointed to various dimensions of scientific uncertainty and ignorance confused by policy-makers (illustrated in Tables 2 and 3).

[1] http://www.unep.org/Documents.Multilingual/Default.asp?documentID=78&articleID=1163

Table 2: Different Kinds of Uncertainty

- **Risk** : Know the probabilities, as well as consequences
- **Uncertainty**: Know the possible consequences, but don't know the probabilities
- **Ignorance**: Don't know the possible consequences (don't know if we are asking the right questions)
- **Indeterminacy**: Processes not subject to consistent, predictable outcomes from ~~"s~~ame" (do we know?) initial conditions
- **Ambiguity**: Differences of meaning, and thus of which questions; which dimensions; which actors; and which variables are *salient*
- **Disagreements**: There are as many scientific rigors as there are relevant scientific communities, disciplines, sub-disciplines, diverse schools of thoughts. For GMOs, these include geneticists; genomicists; classical physiologists; evolutionary biologists; biochemists; cell-biologists; bioinformaticists; weed, soil, pathogen, seed, plant, crop, microbial, or pest scientists; taxonomists; epigeneticists; functional ecologists; conservational ecologists; system theorists; etc.)

(Developed from Wynne, 2006)

Table 3: Dimensions of our Limits of Knowledge

- **1st dimension: knowledge (or awareness) of non-knowledge**
  fully recognised ↔ completely unrecognised
- **2nd dimension: intentionality of non-knowledge**
  unintended ↔ consciously refused
- **3rd dimension: temporal stability (or reducibility) of non-knowledge**
  not yet known ↔ entirely unknowable

(Source: Boschen et al., 2006)

Most public and industrial scientists would agree that scientific uncertainty and ignorance are endemic in all scientific endeavours (Shapin, 2008: 132). However, the seminal work of the English physicist, now a sociologist of science, Brian Wynne (1992a, 1992b, and 2006a) charts different qualities of uncertainty. The first is risk, in which we know the probabilities as well as consequences of a defined harmful event. The second is uncertainty, in which we know the possible consequences but do not know the probabilities. The third is ignorance, in which we do not know the possible consequences (do not know whether we are asking the right questions). Fourth is indeterminacy, which involves processes not subject to consistent, predictable outcomes from the ~~"s~~ame" initial conditions (though it is questionable whether we can know that the conditions are the same). Fifth is ambiguity, that is, differences of meaning among scientists, giving rise to the issues of which questions to ask, which dimensions to take into considerations, by which scientists, which scientific discipline or sub-discipline, which theory, which institution, and so forth. It also involves the question of which evidence, whose evidence, why the evidence is to be taken into consideration in risk assessment and management and under what conditions, and questions of which variables are to be taken into consideration and are salient in risk assessment, management, and decision-making (Wynne, 1992a, 1992b, and 2006a).

One of these dimensions of scientific ignorance is the knowledge (or awareness) of non-knowledge. This dimension ranges between our full awareness of non-knowledge—"we know what we don't know" —and complete unawareness—"we do not know what we do not know" (i.e., "unknown unknowns"). The second dimension involves the intentionality of non-knowledge. It ranges from unintended non-knowledge to the conscious refusal to acknowledge certain or other valid knowledge. The third dimension is temporal stability (or reducibility) of non-knowledge. It ranges from that which is not yet known but (presumably) does not present any substantial difficulties to cognition to the entirely "unknowable" and, therefore, uncontrollable (Boschen et al., 2006: 297; Wynne, 1992a, 1992b, and 2006a).

Once scientists, scientific expertise, and policy-makers recognise scientific ignorance, how scientific innovations open up new uncertainties and ignorance, and how norms and values permeate scientific theories and claims, it becomes extremely clear why the principle of public participation is one of the important tools for promoting sustainable science and technological decisions. As well, we can start to understand and appreciate why the public is demanding or offered a seat at science and technological decision-making table, environmental decision-making table or Biosafety decision-making table, etc.

Table 4: Public Participation Milestones
(Kravchenko 2007; Kamara 2006)

Public Participation (PP): International Milestones

1. 1987: Brundtland report -- "Sustainable development requires a political system that secures effective citizen participation in decision making" (WCED, 1987: p. 65)
2. 1992: Rio Declaration—principle 10 of the Rio Declaration, and Agenda 21 invokes PP
3. 2000: The Cartagena Protocol on Biosafety–article 23 invokes PP
4. 1998: The UNECE Aarhus Convention on PP

Public Participation (PP): Growing Regional Milestones:

1. 1991: Espoo Convention on Environmental Impact Assessment in Trans-boundary Context;
2. 2001: EU Directive 2001/42/EC of 27 June 2001 on the assessment of certain plans and program on the environment;
3. 2001: African Model Law on Biosafety;
4. 2003: The Kiev protocol on strategic environmental impact assessment;
5. 2003: EU Directive 2003/4/EC on Public Access to Environmental Information;
6. 2003: EU Directive 2003/35/EC on Public Participation in respect of the drawing up of certain plans and programs relating to the environment;
7. EU countries national GMO laws ;
8. 2006: EU Regulation (EC) No 1367/2006 of the European Parliament and of the Council on the application of the provisions of the Aarhus Convention;
9. Many Environmental, EIA and SEA laws worldwide, including many African countries provides for PP;
10. Kenyan, Mali, Zambian, Ethiopian, Namibian, Cameroonian & Tanzanian Biosafety Acts provides for PP;

Substantive framework

The promotion and support of public participation as a tool for environmental, science, and technological policies is informed by a third framework, a substantive one.

Enough empirical evidence indicates that public judgements and experiences can be as sound as or more sound than those of experts. A seminal case in point is lay understanding of environmental effects that accompanied the Chernobyl radioactive fallout. This seminal work of Brian Wynne (1992b) examined the response of hill sheep farmers in the Lake District of Northern England to scientific advice about soil contamination. A work that equally examined how farmers responded to the UK government's sheep sale and movement restrictions demonstrated that sheep farmers had a better, more subtle and nuanced understanding—in fact, rational reflection and responses to assessments and solutions—than were provided by scientific experts. In the US, research data have provided evidence of cases in which lay public conducted their own research and experiments on the causal relationship between toxic waste and leukaemia (Brown & Mikkelsen, 1990), lay experiments that generated insights that had been missed by diagnostic and preventive epidemiological methods of scientific experts. In Africa or other southern countries, research has shown evidence of how indigenous people's knowledge about their immediate forest, soil, or water was sometimes better and more nuanced, generating richer knowledge that had been missed or ignored by reports or surveys produced by national or international scientific experts. Probably the best known example of richer knowledge held by lay people is indigenous people's nutritional and medicinal knowledge. For years, such knowledge has been taken, repackaged, renamed, patented, or "stored" in international "banks" and networks that profit from this knowledge without acknowledging or sharing the benefits with its real and original owners (Leach et al., 2005: 19).

Normative framework

The fourth framework for appealing to public participation in science and technology policy is a normative one, which sees expert-based decision-making processes as conflicting with democratic ideals. According to this framework, closed expert-based decisions do not merely ignore the value dimension of science and policy analysis. Such processes deprive citizens of the right and the vote that, in democratic societies, ought to control all decision-making processes. According to the normative framework, public vote is even more important in environmental or science-and-technology risk analysis and decision-making in light of the fact that many of these technologies pose irreversible health, ecological, or environmental risks to present and future generations. Accordingly, the normative framework recognises, as a moral virtue, that citizens are the best judge of their own needs, interests, and values. To be a citizen is to have the power to influence and shape decisions and actions that may affect and concern a person and his or her community. In democratic societies, it is a human right to be able to influence and shape decisions that may have a detrimental effect on a citizen, a right that is intrinsically good in and by itself, even if a citizen as a person may decide not to invoke or use that right (Fiorino, 1990; Leach et al., 2005; Pellizzoni, 2001).

Instrumental framework

The fifth framework is an instrumental one, which holds that effective lay participation in environmental science-and-technology decisions makes decisions more effective and legitimate in addition to providing a governance virtue. In the EU, public resistance to chemical use in agriculture, nuclear power plants, or GMOs indicated that the public was unwilling to delegate critical decisions to policy and scientific experts simply because these issues were scientific and technological in nature. Equally, in southern countries, local people have resisted technologies or scientific advice they considered foreign or inappropriate, even when Northern partners or experts insisted that these technologies were safe or superior. These and other examples are clear evidence that citizens, both in northern and southern countries, are unwilling to entrust to scientific, local or foreign experts and administrative authorities critical resolutions that affect them simply because resolutions are claimed to be scientific and technical in nature. Thus, the instrumental framework sees greater public participation as playing an important role in bringing about robust and meaningful decision-making processes, by integrating and weighing an expansive collection of values, assumptions, and interests in decisions. It is this mix that may decrease the likelihood of making mistakes while sharing responsibilities (Fiorino, 1990; Leach et al., 2005; Pellizzoni, 2001; Scott, 2005).

Rhetorical framework

The sixth framework is a rhetorical one, which holds that a robust and meaningful public participation brings the public into contact with new ways of seeing or understanding an issue. This encounter mobilizes, provokes, or appeals to the public. More often than not, such encounters may break deadlocks or clear misunderstanding, thereby causing mobilization to help change people's worldviews and ways of doing things or to move the public into action. It is this ability to mobilize and move people to action that leaves citizens more informed and open to myriad ways of seeing and doing things. Such action may set something new in motion, encouraging people to assume responsibilities they may not have assumed before, establishing new relationships or unexpected ways of seeing things and understanding and making connections, even when the involved public do not agree (Lezaun & Soneryd, 2007; Blok, 2007; Scott et al., 2005).

Section four: Policy developments: Public participation in GMOs and Biosafety policies

Scientists, scientific experts, industrial groups, and policy-makers acknowledged the principle of public participation in GMO and Biosafety policies as early as 1984, in such countries as Germany, Denmark, and Sweden. For example, in Germany, a Parliamentarian Commission of Enquiry was formed as early as 1984 to look at the risks that may accompany GMO release, while NGOs and the Green Party mobilized public consultation and engagement in Germany's GMO and Biosafety policy (Hampel et al., 1998; Kamara, 1999). In Sweden, as far back as 1977, the Swedish media played an important role in educating and informing the public about modern biotechnology, and lay representations of modern biotechnology were elicited through public perception surveys carried out as early as 1978 (Fjaelsted et al., 1998).

A key international milestone is the 1998 UNECE Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention). The Aarhus Convention is considered to be one of the most significant elaborations of Principle 10 of the Rio Declaration. The Convention links human well-being and human rights to environmental protection and emphasises the need for public and stakeholders involvement to achieve sustainable development. The 1998 version of the Aarhus Convention did not provide for public participation in GMO releases and commercialization. However, the 2005 Aarhus Convention Amendments, commonly known as the Almaty Amendments, provided legally binding provisions for public information and participation in GMO releases and commercialization[2]. The Aarhus convention sets out specific rights of public and interested individuals' access to information, public participation, and access to justice. Article 3.7 commits parties to "Promote the application of the principles of this Convention in international environmental decision-making processes and within the framework of international organizations in matters relating to the environment"[3]. The Convention provide clear guidelines for adequate public notice, adequate procedures for written or oral comments, and careful consideration of comments that the public or NGOs may make. Members are required to take into account comments, proposals, knowledge or concerns elicited from NGOs and lay citizens. The Compliance Committee and Meeting of the Parties state that governments may not require NGOs or citizens requesting information to provide a reason for their request (Kravchenko 2007:5). As well, it states that governments must provide clear guidance to public authorities (EU EcoForum, 2006; UNECE, 2005). Thus, the Convention provides legal status for NGOs and interested individuals. According to Kofi Annan, "Although regional in scope, the significance of the Aarhus Convention is global. It is by far the most impressive elaboration of principle 10 of the Rio Declaration" (Quoted on UNECE website: http://www.unece.org/env/pp/).

[2] http://www.unece.org/env/documents/2005/pp/ece/ece.mp.pp.2005.2.add.2.e.pdf
[3] http://www.unece.org/env/pp/documents/cep43e.pdf

Table 5: Article 23 of the Cartagena Protocol

PUBLIC AWARENESS AND PARTICIPATION

1. The Parties shall:

(a) Promote and facilitate public awareness, education and participation concerning the safe transfer, handling and use of living modified organisms in relation to the conservation and sustainable use of biological diversity, taking also into account risks to human health. In doing so, the Parties shall cooperate, as appropriate, with other States and international bodies;

(b) Endeavour to ensure that public awareness and education encompass access to information on living modified organisms identified in accordance with this Protocol that may be imported.

2. The Parties shall, in accordance with their respective laws and regulations, consult the public in the decision-making process regarding living modified organisms and shall make the results of such decisions available to the public, while respecting confidential information in accordance with Article 21.

3. Each Party shall endeavour to inform its public about the means of public access to the Biosafety Clearing-House.

Table 6: The UNECE Aarhus Convention

The Convention provides for action in three areas:

- ensuring public access to environmental information held by the public authorities;
- fostering public participation in decision-making which affects the environment;
- extending the conditions of access to justice in environmental matters.

The Community institutions are covered by the definition of a public authority within the meaning of the Convention, on the same footing as national or local authorities.

The parties to the Convention undertake to apply the listed provisions, and must therefore:

- take the necessary legislative, regulatory and other measures;
- enable public officials and authorities to help and advise the public on access to information, participation in decision-making and access to justice;
- promote environmental education and environmental awareness among the public;
- provides for recognition of and support to associations, organisations or groups promoting environmental protection."

"The Aarhus Convention is a new kind of environmental agreement.

- The Convention links environmental rights and human rights
  - acknowledges that we owe an obligation to future generations
  - establishes that sustainable development can be achieved only through the involvement of all stakeholders
  - links government accountability and environmental protection
  - focuses on interactions between the public and public authorities in a democratic context.
- The subject of the Convention goes to the heart of the relationship between people and governments. The Convention is not only an environmental agreement; it is also a Convention about government accountability, transparency and responsiveness.
- The Aarhus Convention grants the public rights and imposes on Parties and public authorities' obligations regarding access to information and public participation and access to justice.
- The Aarhus Convention is also forging a new process for public participation in the negotiation and implementation of international agreements."

Source: The EU Commission. http://europa.eu/legislation_summaries/environment/general_provisions/l28056_en.htm; and United Nations Economic Commission for Europe. http://www.unece.org/env/pp/

In Africa and at the international level more generally, the Cartagena Protocol on Biosafety (hereafter the Protocol) is considered to be the single most important milestone and tool for adopting Principle 10 of the Rio Declaration (Kleinman & Kinchy, 2007). The Protocol was adopted in January 2000. Article 23 mandates the right to public participation. Ratifiers to the Protocol have an obligation to adopt and enforce Article 23. As parties and ratifiers to the Protocol, African governments must enact policies that promote and facilitate public awareness, education, and participation in GMOs and Biosafety regulations and policies. The protocol mandates signatory members to consult the public in GMO decision-making processes and to make the results of such decisions available to the public. Thus, the Protocol sends a clear signal that work towards sustainable development depends not just on science and technology but also on citizens having right and access to information, enabling citizens to exercise reasoned arguments and judgement and to influence and shape GMO and Biosafety decisions. However, Article 23.2 clarifies that the Protocol does not set international standards for public participation in decision-making, but leaves this at the discretion of the member states according to their respective national laws.

In Africa, the African Union's Model Law is a key milestone. In May 2001, the OAU Assembly of Heads of State and Government endorsed the draft "African Model Law on Safety in Biotechnology." It came into force in July 2003. The goal of the Model Law is to promote the development of a common position on Biosafety regulation throughout Africa. Articles 3(2) f, 5, 6 (3), 10 (1) b, 12 (3), 14 (3), and 16 (6) of the 2003 Model Law provides for public information, participation, or community protection. The Model Law has been undergoing revision, and the draft Model Law was released in August 2007. By the time of this paper's writing, the model law is under negotiation. Articles 3 (2) e, (3), 2f, and 5 of the August 2007 draft provides for public information, consultation, and participation in the decision-making.

Biotechnology proponents have expressed their concerns with the original Model Law. For example, AfricaBio noted that "The OAU Model deviates significantly from the Protocol and extends well beyond its provisions . . . [indeed, that] [r]equiring all information to be made available to the public (Art. 5) will stall all import/export transactions while awaiting public consultation. Engaging public opinion on individual applications/transactions is impractical" (Africa Bio 2001). In the same way, "the revised Model Law is seen as even more so [impractical and restrictive]" by industry or GMO proponents (Swanby 2009:8).

However, African civic organizations have welcomed the original Law and the revised Model Law. Furthermore, the African civil society described the Model Law as a "piece of Legislation drafted by Africans for Africa, taking into account the unique circumstances of the context" (Pamela, 2006: 1365) and encourages their respective national governments to use this law. Thus, in Africa, the Model Law is the most impressive elaboration of Principle 10 of the Rio Declaration. However, the Model Law does not define *the public*, *public information*, *consultation*, or *participation*. As well, the African Union does not have the authority to legislate on behalf of its members. Thus, the

OAU can only promote the Model Law as a framework for individual countries to use as they develop their own legislations and to promote regional harmonisation.

Table 7: AU Model Law's Article 7: Public Awareness and Participation

1. The Competent Authority shall, upon receipt of the information referred to under Article 4(3) and Article 4(4), make available the said information to the public and relevant government authorities.
2. The Competent Authority shall take measures to provide for open and transparent consultation with the public, including the holding of public hearings in order to solicit the views of the public in regard to any matter dealt with in this law.
3. The Competent Authority shall make available to the public:
    i. Information on any genetically modified organism or a product of a genetically modified organism, which has been granted or denied approval for making, import, contained use, release or placing on the market; and
    ii. Any risk assessment report with respect to the genetically modified organism or the product of a genetically modified organism.
4. The Competent Authority shall promote awareness and education of the public and those conducting activities on genetically modified organisms or products of genetically modified organisms subject to the law concerning biosafety matters through the publication and dissemination of this law, as well as guidance documents and other materials aimed at improving the understanding of biosafety and related authorization and notification requirements.
5. The Competent Authority shall establish a mechanism of public participation and shall arrange for a public consultation and/or public hearing with regard to any proposed making, import, contained use, release or placing on the market of a genetically modified organism or a product of a genetically modified organism, this fact shall be announced nationally not less than 30 days before the decision is made shall be given for consultation without prejudice to Article 12(1).
6. The public may make comments within such a period and in such a manner as may be specified by the Competent Authority.
7. The Competent Authority shall, in making or reviewing its decision, take into account the views and concerns of the public expressed in accordance with paragraphs (2) and (3) of this Article.

Source: Draft Revised African Model Law on Biosafety-January 2008

Part one: Dimensions of public participation in Biosafety policies

The adoption and implementation of the principle of public participation in GMO decision-making processes has been examined extensively in policy and social sciences. Most observers agree that the line between formal mechanisms of public participation or engagement with informal NGO activities has no clear and obvious line. Many of the formalised mechanisms of public engagement, both in southern and northern countries, are spin-offs of the more radical and informal activities initiated by civic organisations or interest groups (Einsiedel & Kamara, 2006; Kleinman & Kinchy, 2007).

There are two interrelated ways of adopting and implementing the principle of public participation. In this paper, these two different ways are defined as the hard and soft dimensions of public participation.

The hard dimension involves putting in place tangible and observable instruments and resources for furthering public participation. Instruments for enacting the hard dimension are:

1) Policy statements and enactment of legal directives,
2) Establishment of structural infrastructures,
3) Disbursement of funds, and
4) Executing actual public participation activities or practices.

The soft dimension of public participation imparts, inculcates or debates on knowledge, values, interests, assumptions, commitments, and justifications for policy decisions. Also, it involves elicitation of knowledge, needs, values, and interests (Felt et al., 2007; Wilsdon et al., 2005). This dimension of public participation is constituted by institutionalised practices; or articulated in governments‘, agencies‘ or corporations‘ declarations, action plans, white papers or reports. Over the last decades, this dimension has evolved from a deficit approach to a dialogic approach:

1) the scientific knowledge deficit model (that further a one way top-down approach);
2) the attitude deficit model (that further a one way, indeed, a social engineering approach);
3) the trust and dialogue deficit model (that further a two way albeit spin-doctored or manipulative approach); or
4) an authentic and robust dialogic model (that further a two way virtuous approach).

The hard and soft dimensions of public participation are illustrated in Table 8. In the following section, the paper will examine how the hard dimension of public participation has evolved using selected forerunning Western countries' experiences. Using the same framework, the next section will review how the hard dimension of public participation is unfolding in nine selected African countries: Cameroon, Ghana, Kenya, Mali, Namibia, Tanzania, South Africa, Uganda and Zambia. These countries have been selected because they are, relatively speaking, African forerunners at legislating laws that provide citizens' rights and access to information, consultation, and participation in environmental and Biosafety policies. Drawing insight from both Western and African countries, the following section will examine the soft dimension of public participation. Thus, it will examine the shift from deficit models of public engagement to a dialogic model. In particular, it will outline the assumptions behind these models of public engagements and their limitations. On the basis of this review, the paper will draw a conclusion that summarises the status of public participation in African Biosafety policies to date. Finally, it will make some recommendations and propose possible ways forward.

Part two: The hard dimension—the Northern forerunners

The hard dimension of public participation is the tangible tools, actions or resources put in place, formally, by national governments or international regimes. Instruments for enacting the hard dimension of public participation include concrete policy statements and enactment of legal directives, establishment of structural agencies, disbursement of funds, and execution of actual public engagement practices.

Policy statements - legal developments

Policy statements or legal developments are explicit signs of intent or political willingness to engage the public. More often than not, they lead to actual legal, structural, and substantial initiatives, for example, enactment of laws that provides for public engagement and establishment of governmental bodies with legal mandate to translate policy statements into practice.

DENMARK: Research investigating the adoption of the principle of public participation in GMO and Biosafety policies has argued that Denmark was the first country in the world to invoke, through an act of parliament, the principles of sustainable development, public participation, and precaution in GMO regulations. This invocation was triggered by public unease that accompanied the application for releasing the GE microorganism to produce insulin and human growth hormone in contained use by two Danish companies, Novo and Nordisk Gentofte. Thus, in 1984, public opinion against GMOs was expressed for the first time. NOAH, the leading environmental NGO in the Danish GMO debate, initiated a petition against the Novo and Nordisk Gentofte application and plans, and a significant number of people signed the petition. These events signalled that public opinion was going to be an important factor in the political decision-making about GMOs. In 1985, Novo and Nordisk Gentofte invited NOAH for a public debate about GMOs. This initiative moved GMO technology assessment into the public sphere, as

NGOs and the general public came to be involved in the GMO risk assessment and management process. NOAH's activities played an active role in shaping the world's first law on Gene Technology and Environment in 1986 (Jelsoe et al., 1998). The 1986 Danish Act on Environment and Gene Technology provided individual citizens or NGOs rights to petition against GMO release and commercialisation applications, the right to inform the Danish public about any release applications, public access to application documents, and an open parliamentary deliberation process. Further, the Danish 1986 gene act invoked sustainable development, public participation, and precautionary principles in GMOs and bio-safety governance. It was this Danish move that triggered reactive enactment of GMO statements or policies across the EU and internationally. Revised provisions for public information, consultation, and participation were made when Denmark implemented EU Directive 90/220 and its subsequent revisions, and when it ratified and implemented the 1998 Aarhus Convention and its subsequent amendment.

GERMANY: Denmark was not the only country where NGOs played a leading role in shaping the European GMO policies. In Germany, since 1984, strong civic and environmental organizations, trade unions, and rural organizations played a key role in promoting public debates and influencing GMO research and development. These groups organized public lectures, seminars, and hearings. They supplied schools with information about GMOs. They exerted pressure on industry, government, and pro-GMO scientists. They sought and pursued deliberate release applications; examined applications closely; and put pressure on the government, the competent authority, GMO scientists, and industry. Furthermore, they informed the public about their views of the applications at various lectures held across the country. It is worth noting here that, as in Denmark, the GMO industry or deliberate-release applicants informed the public and NGOs because "the applicants too had a high interest in increasing the public acceptance of their work" (Meyer, 1994: 35). However, in Germany as in Denmark, it was the pressure and activities of civic and environmental groups that forced the German government to provide for public information, consultation and participation. Thus, in Germany, in line with its tradition of public debates and influence in decisions concerning high-risk science and technologies, the German 1990 law granted the German public the right to information on, consultation in, and engagement in GMO release and commercialisation activities. It mandated basic GMO researchers to be accountable and transparent to the public about their scientific research aims and method (Jasanoff, 2005: 104). GMO industry and pro-GMO scientists vigorously worked for the abolition of public hearing provisions. Thus, when Germany revised its gene law in 1994, the provisions for public hearing were abolished (Meyer, 1994). However, new and further provisions for public information, consultation, and participation were made when Germany implemented EU Directive 90/220 and its subsequent revisions, and when it ratified and implemented the 1998 Aarhus Convention and its subsequent amendment.

NORWAY: In 1993, the Norwegian government enacted the gene technology act that equally invoked the sustainable development, precautionary and public participation principles as critical tools for regulating GMOs in Norway (Myhr & Traavik, 2002). The 1993 Norwegian Gene Technology Act explicitly provided for ensuring that GMO

releases in Norway were to take place if they represent a –benefit to the community" and –sustainable development." Thus, the Norwegian 1993 gene act no. 38 provided for citizens' right to information and consultation, and in 2003, act no. 31 –relating to environmental information and public participation in decision-making processes relating to the environment and participation in the Norwegian GMO decision-making process" was enacted. However, new and further provisions for public information, consultation, and participation were made when Norway ratified and implemented the 1998 Aarhus Convention and its subsequent amendment or took cues from EU Directive 90/220 and its subsequent revisions.

UK: In the UK, section 124 of the Environmental Protection Act 1990 (the EPA) did not provides for public participation. However, in 1985, the government published the Royal Society report, –The Public Understanding of Science," which stressed the need for greater scientific education about GMOs. In 1997, the UK Minister for Science recommended the need to hold public consultation exercises, and the 2000 House of Lords Science and Technology Committee report stressed that –direct dialogue with the public should move from being an optional add-on to science-based policy-making and to the activities of research organisations and learned institutions, and should become a normal and integral part of the process." Furthermore, in 2000, the UK government enacted its Freedom of Information Act. Besides, new and legally binding provisions for public information, consultation, and participation were made when UK implemented EU Directive 90/220 and its subsequent revisions, and when it ratified and implemented the 1998 Aarhus Convention and its subsequent amendment.

FRANCE: In France, in 1995, the government set up a National Commission of Public Debate that, by act of parliament, was to oversee and organize public debates on scientific, technological, or industrial equipment that posed potential dangers to the environment. However, new and legally binding provisions for public information, consultation, and participation were made when France implemented EU Directive 90/220 and its subsequent revisions, and when it ratified and implemented the 1998 Aarhus Convention and its subsequent amendment.

EU: The Danish GMO law triggered EU debates that led to Directive 90/220, which was revised in 2001. EU as a whole is a signatory to the 1998 Aarhus Convention, which it approved in 2005[4]. While EU Regulation (EC) No 1049/2001 of the European Parliament and of the Council provides for public access to European Parliament, Council and Commission documents [5], EU Directive 2003/4/EC provides for public access to environmental information[6]. As well, Directive 2001/42/EC on the assessment of certain plans and programs on the environment and Directive 2000/60/EC (that establish a framework for Community action in the field of water policy) provides for public participation in environmental decision-making[7]. In 2003, the European Union enacted Directive 2003/35/EC on the deliberate release into the environment of genetically

[4] http://europa.eu/legislation_summaries/environment/general_provisions/l28056_en.htm
[5] http://www.europarl.europa.eu/RegData/PDF/r1049_en.pdf
[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:041:0026:0032:EN:PDF
[7] http://ec.europa.eu/environment/aarhus/

modified organisms and Regulations (EC) No 1829/2003 on genetically modified food and feed, and both provides for public participation. Directives 2003/4 and 2003/35 provide for access to justice[8]. In February 2006, EU enacted Regulation (EC) No 1367/2006 of the European Parliament and of the Council on the application of the provisions of the Aarhus Convention[9]. All these legislations align EU GMO policies with the Aarhus Convention, Principle 10 of the Rio Declaration, and Article 23 of the Cartagena Protocol. Because all EU member states have an obligation to enforce EU-level stipulations, governments across Europe embarked on implementing the above EU provisions (Einsiedel & Kamara, 2006; EC, 2005).

Structural responses and infrastructure

The implementation of legally binding statements or policies cannot occur in a vacuum, however. Therefore, as forerunners in adopting public participation in GMO and Biosafety policies, leading European countries set up advisory bodies or committees for implementing public participation policies.

DENMARK: In Denmark, by acts of parliament, the government established statutory bodies, the Danish Board of Technology (DBT), which was appointed in 1986 to undertake technology assessment and initiate public information, consultation, and participation activities. Equally, in 1987, the Danish Council of Ethics (DCE) was established and mandated by act of law to look into the ethical dimensions of modern biotechnology—including its impact on Danish society—and, more importantly, to initiate, oversee, and promote public debates and information campaigns. To ensure the accountability to public values, expert committees‘ memberships were broadened to include lay representatives, as exemplified by public membership on such bodies as the Danish Council of Ethics (DCE). In 1997, a government body, BIOSAM, was formed with the responsibility of assuring openness and informing the public about developments in biotechnology research and applications. In 2001, nine Danish ministries formed an interdepartmental task-group, BioTIK-Task Force, which had the responsibilities of initiating public debates and conducting information activities. In the same way, when Denmark adopted EU Directives 90/220 and 2001/18, the competent authority for GMO release, the Danish Forest and Nature Agency, under the Minister of Environment, was mandated the responsibility of informing, consulting, and engaging the public in decision-making about GMO field releases.

GERMANY: In Germany, the Robert Koch Institute and Central Commission for Biological Safety were mandated with the responsibility of undertaking public information, consultation, and participation.

NORWAY: In Norway, in 1991, the Norwegian government set up the Norwegian Biotechnology Advisory Board (NBAB), an independent body that, among other things, stimulates public debates in Norway. Additionally, the Norwegian NBAB was tasked with the responsibility of examining community benefits and sustainability interests or concerns in terms of the practical applications of the Norwegian gene technology act.

[8] http://ec.europa.eu/environment/aarhus/
[9] http://ec.europa.eu/environment/aarhus/

FRANCE: In France, a national Commission of Public Debate was established in 1995 by the parliamentary Office for Scientific and Technology Choices to encourage and initiate public information and participation activities. In 1998, a steering committee was appointed to oversee and organize the first French consensus conference. When France adopted EU Directives 90/220 and 2001/18, the Ministry of Agriculture and Fisheries became the competent authority. It consults with other relevant ministries and obtains advice from the Commission of Biomolecular Engineering—which has representatives from farmer, consumer, and environmental association—and another person with legal expertise (SBC, 2002: 19-20).

UK: The UK has seen a number of committees constituted, from the establishment of the Genetic Manipulation Advisory Group in 1976 to the establishment of the 2000 Agriculture and Environment Biotechnology Commission (AEBC) that included lay and NGO representatives. AEBC was tasked with the responsibility of looking at the ethical and social consequences of GMOs, providing strategic advice to the government, overseeing UK GMO farm trials, and engaging the lay public, farming groups, and NGOs about GMOs. When the UK adopted EU Directives 90/220 and 2001/18, the Department for the Environment, Food, and Rural Affairs became the competent authority, which was also tasked with the responsibility of furthering public information, consultation, and participation (SBC, 2002: 34). The Department for Business, Innovation and Skills also promotes public dialogues. So are the Department for Communities and Local Government, the Ministry of Justice, and the Sustainable Development Commission (Einsiedel & Kamara, 2006; Burchell, Franklin & Holden 2009: 11).

Disbursement of funds

Issuing policy pronouncements and setting up advisory bodies without reasonable resource, cannot guarantee successful policy implementation.

DENMARK: In Denmark, public participation was promoted as a part of a larger Biotechnology Development Programme. For example, in the 1987 programme, approximately 400,000 Euros were earmarked for technology assessment and public information. This money was to finance most of the bottom-up public debate and information initiatives, the NGOs, public debates, information and education activities, among other activities. The Danish Board of Technology was granted 2.8 million Euros for technology assessment and information activities in 1986. Today, the Board receives an annual subsidy of 1.8 million Euros.[10] The Danish Council of Ethics (DCE) was granted an annual subsidy of around 560,000 Euro in 1988, an amount that has increased since that time. In 2008, DCE received an annual budget of about 1.1 million Euros. An additional 2.2 million Euros was earmarked by the Danish government for the 2001 4-year BioTIK-Task Force initiative, which was tasked with the responsibility of promoting public debate and information.

[10] http://www.tekno.dk/subpage.php3?page=statisk/uk_about_us.php3&language=uk&toppic=aboutus

GEMANY: In Germany, the Robert Koch Institute and Central Commission for Biological Safety were earmarked generous annual budgets to finance public engagement activities, including oral public hearing or meeting events.

NORWAY: In Norway, the Norwegian Biotechnology Advisory Board was earmarked generous annual financial support that was no less than 750,000 and 852,000 Euros for its 2003[11] and 2007[12] budgets, respectively.

UK: In the UK, the Office of Science and Technology earmarked approximately 6.4 million Euros a year to the public understanding of science programs (e.g., museum exhibitions, national science week, and so on). Early this Century, the UK government earmarked approximately 927,600 Euros for nationwide public consultation events on GM food and crops. In May 2005, a Sciencewise-Expert Resource Centre was set up, and between May 2008 and April May 2009, it had a budget of 2.95 Million Euros. This Centre is funded by the Department of Business, Innovation and Skills. In 2008 the UK Higher Education Councils, Research Councils UK and the Welcome Trust founded the National Coordinating Centre for Public Engagement and six regional university-based Beacons for Public Engagement. It has a budget of 10.25 Million Euros for a period of 4 years. Although these latter activities cover GMOs as well as other scientific issues, it is worth noting here that they were triggered by GMO controversies, among other science and technological controversies in the UK (Burchell, Franklin & Holden 2009: 11).

FRANCE: In France, in 1998, the French government financed the first French consensus conference, and the Ministry of Agriculture and Fisheries was earmarked considerable annual budget to finance public engagement activities (Einsiedel & Kamara, 2006).

Public education, information, and participation mechanisms

The above described legal, structural, and economic resources support and further the actual public participation practices: local or district public debates, museum exhibitions, national science weeks, public meetings, hearings, information campaigns, focus group interviews or surveys, barometers, educational courses, school programs, websites and databases, books or videos, as well as the more pronounced methods of public engagement like citizen juries, dialogue meetings, referenda, ~~"p~~eople's panels," or consensus conferences.

DENMARK: Denmark has held more than 22 consensus conferences (some of which involved medical biotechnology, mobile phones, and nanotechnologies), a method that came to be adopted more than 76 times across the globe.[13] Also, the various advisory councils or groups have made public information websites, brochures, fliers, books, videos, TV and radio programs, and school educational programs. As well, they have initiated or provoked media debates, and so on.

[11] Norwegian Biotechnology Advisory Board, 2003:2
[12] http://www.bion.no/uttalelser/aarsrapport_2007.pdf
[13] http://www.loka.org/TrackingConsensus.html

GERMANY: Germany‘s competent authorities have held many oral public hearings or meetings, and people have a right to make written comments. According to the law, scientists have an obligation to inform the public about the goals and aims of their research (Jasanoff, 2005: 104).

UK: In the UK, DEFRA has made public information websites, brochures, and fliers. Also, it provoked media debates, sponsored museum exhibitions, national science weeks, etc. Early this century, the UK government financed over 600 regional, county, and local meetings that were organized across the country. These events, known as *UK GM Nation?*, took place in the summer of 2003 (Einsiedel & Kamara, 2006). In 2005, a Sciencewise public resource centre was established by the Department of Business, Innovation and Skills. In 2008 the UK Higher Education Councils, Research Councils UK and the Welcome Trust founded the National Coordinating Centre for Public Engagement, and six regional university-based Beacons for Public Engagement. In July 2009, the Minister of Science committed higher education funding for public engagement and pronounced that scientists have a duty and obligation to engage and inform the public about the goals, aims and social relevance or effects of their research (Burchell, Franklin & Holden 2009: 11).

Part three: The hard dimension—status of Africa's forerunning countries

In Africa, as in Northern countries, there are no clear or obvious lines between formal and informal mechanisms for promoting public participation or engagement. The activities of southern NGOs and civil organizations have played a leading role in promoting and triggering legal and formal steps towards greater public engagement in Africa.

Policy statements - legal developments

Most African governments have endorsed the Rio Declaration and ratified the Cartagena Protocol on Biosafety. At the time of this writing, the Cartagena Protocol has been ratified by no less than 28 African countries. The Rio Declaration and the Cartagena Protocol send a clear message that active public participation is a prerequisite for achieving sustainable development. Principle 10 of the Rio Declaration calls on the participation of all concerned citizens in the handling of environmental issues. Article 23 of the Cartagena Protocol mandates public awareness and participation.

GHANA: The Ghanaian Constitution provides the right of access to information. Article 21(1) (f) of the 1992 constitution explicitly recognises that all persons shall have the right to information. However, the guarantees to a right to information can be provided only by a legally binding law. Since 2005, attempts have been under way to pass the Right to Information Bill, which is still under negotiation, at the time of this writing.[14,15,16]

However, Ghana ratified the Convention on Biological Diversity in August 1994 and the Cartagena Protocol on Biosafety in May 2003. In July 2005, Ghana launched a National Biosafety Framework under the Ministry of Environment and Science to consider Ghanaian adoption and implementation of the Cartagena Protocol on Biosafety. As a party to the Cartagena Protocol, public participation is part of the negotiation of the Ghanaian Biosafety framework that has been under negotiation since July 2005. Article 42 of the Draft Ghanaian Biosafety Bill explicitly provides for public awareness and participation. These provisions are developed and elaborated further in the Bill's accompanying guideline for public participation, information sharing, and access to justice with respect to genetically modified organisms.[17] However, because the bill has not been passed into law, at the time of this writing, current draft bill provisions and guidelines provide a non-legally binding and voluntary framework that emphasizes good practices.[18] Accordingly, there are no legally binding provisions for public participation in Biosafety and regulation policies in Ghana.

---

[14] http://www.unep.org/Biosafety/files/GHNBFrep.pdf, p. 30.
[15] http://www.ghana.gov.gh/right_to_information_bill_a_bill_entitled_right_to_information_act_2005
[16] http://idealsandrights.wordpress.com/2008/06/24/ghanian-right-to-information-bill/
[17] http://www.unep.org/Biosafety/files/GHNBFrep.pdf, p. 9.
[18] http://www.unep.org/Biosafety/files/GHNBFrep.pdf, p. 31.

UGANDA: In Uganda, while Article 41 of Uganda's 1995 Constitution gives its citizens the right of access to information, Article 42 gives the citizens of Uganda the constitutional right to just and fair treatment in administrative decisions.[19] In April 2006, the government of Uganda enforced the Access to Information Act. The Act led to the adoption of Article 41 of the Constitution. The provisions of the Act apply to all information, including records of government ministries, local governments, statutory corporations and bodies, constitutional commissions, and other government agencies (unless specifically exempted).[20]

Uganda ratified the Convention on Biological Diversity in 1993 and the Cartagena Protocol in 2001.[21] Uganda's Biosafety draft regulation bill provides for the competent authority to disseminate information and consult the public about GMO applications (both contained and field releases) and for taking into account public views and concerns in the decision-making process. Although in April 2008 Uganda approved its first National Biotechnology and Biosafety Policy (Wamboga-Mugirya, 2008), at the time of this writing, it has not passed a Biosafety law.

SOUTH AFRICA: In South Africa, a number of laws explicitly provide South Africans access to information. These include Section 32 of the South African Constitution, the South African Act for the Promotion of Access to Information (No. 2 of 2000), the South African Act for the Promotion of Access to Administrative Justice (No. 3 of 2000), and the Act for Protected Disclosures (No. 26 of 2000).[22] In fact, the Act for the Promotion of Access to Information provides for public right to information and applies to information from private and public bodies, including corporations, partnerships, trusts, and so on.

South Africa ratified the Convention on Biological Diversity in 1995 and the Cartagena Protocol in 2003. Although the South African 1997 Gene Act (amended in 2007) does not provides for public consultation and participation, the government of South Africa pronounce that it recognizes the need for meaningful and effective public participation in matters of environmental governance, including Biosafety governance.[23]

TANZANIA: The Tanzanian Constitution explicitly provides the people of Tanzania the right and freedom of access to information. Articles 18 and 27 are the most relevant constitutional provisions that, together, provide a clear right to obtain and share information on sustainable environment and natural resource management.

Tanzania ratified the Convention on Biological Diversity in 1996 and the Cartagena Protocol in 2003. In addition, the Tanzanian National Environmental Policy (NEP) of 1997 provides for public participation and access to environmental information.

---

[19] http://www.trybunal.gov.pl/constit/constitu/constit/uganda/uganda-e.htm

[20] http://www.humanrightsinitiative.org/programs/ai/rti/international/laws_papers/uganda/its_ur_rt_to_get_info_vincent_babalanda.pdf

[21] http://www.ias.unu.edu/resource_centre/Internationally%20Funded%20Training%20in%20Biotechnology%20and%20Biosafety_Is%20it%20Bridging%20the%20Biotech%20Divide.pdf, p. 186.

[22] http://www.humanrightsinitiative.org/publications/chogm/chogm_2003/country%20chart.pdf

[23] http://soer.deat.gov.za/themes.aspx?m=129

In November 2004, the government of Tanzania enacted its Environmental Management Act (EMA). It provides for broad public information, consultation, and participation for contained and open GMO releases. Article (3) of EMA invokes "(a) the precautionary principle; (b) the polluter pays principle; (c) the principle of eco-system integrity; (d) the principle of public participation in the development policies, plans and processes for the management of the environment; (e) the principle of access to justice; (f) the principle of inter-generational equity and intra-generational equity; (g) . . . and (h) the principle of common but differentiated responsibilities" (GoT, 2004; Jaffe, 2006).

KENYA: The Kenyan constitution does not provide the right of access to information. However, section 79 of the constitution makes provision for the freedom of expression. There is a draft constitution under negotiation, however. Article 51 of the draft constitution explicitly provides Kenyans the right of access to information and stipulates that an act of parliament to enforce this provision be put in place within six months of the enforcement of the new constitution. In 2007, a draft Freedom of Information (FOI) Bill was presented to the parliament. This FOI bill has been in negotiation since and has not been endorsed and passed into law at the time of this writing (Nyokabi, 2007).

Kenya ratified the Convention on Biological Diversity in 1994. In 1999, Kenya passed the Environmental Management and Coordination Act (EMCA). In 2002, the Kenyan government issued the Environmental Impact Assessment and Auditing Regulation (EIAAR). EMCA, EIAAR, and other laws are part of the mandatory Kenyan framework for Strategic Environment Assessment, which was legislated in 2001. Public participation and Access to environmental information and justice are some of the key pillars of the Kenyan SEA framework. GMOs and modern biotechnology in agriculture fall under this framework. Although the Kenyan Environmental Management and Coordination Act of 1999 does not define *public participation* or *the public*, the act explicitly provides for public participation in environmental justice and management. Section 1(5) (a) states that the High Court shall be guided by the principle of public participation when arbitrating environmental justice matters (Onyango & Schmidt, 2007).

According to observers, "though NEMA must consider public views, it is not obligated to take into account the public views in its decision-making" process or in the implementation phase of the policy-making process (Onyango & Schmidt 2007: 319). In the same way, though EMCA offers citizens a right to information and access to documents submitted to NEMA for environmental impact or strategic environmental impact assessments, critics argue that "the clause stating that the information shall be provided "subject to prescriptions of NEMA" (reg29) may be applied to curtail the very aim of that entitlement. Also, the Official Secrets Act which can be used by the government to restrict information is itself a contradiction to the principle of public access to information . . . [and] it is not clear what rights a person has over crucial environment information held by others other than NEMA" (Onyango & Schmidt 2007: 321).

Kenya ratified the Cartagena Protocol in 2002. In 2006, the Kenyan government passed its National Biotechnology Development Policy. The Kenyan scientific experts and

policy-makers argued that there was widespread public engagement in the drafting and negotiation of the Kenyan Biosafety policy. However, observers quoted civic society, saying that the Kenyan "Biosafety process has been very secretive. They think it is the domain of scientists and a few in government" (Harsh, 2005:671).

On 9 December 2008, the Kenyan Parliament approved its Biosafety Act, which was enforced in February 2009. Article 54 (1) provides provisions for the National Biosafety Authority to further public awareness and education of the public on Biosafety matters. Also, article 54 (4) provides the public with the right to submit written comments on a proposed decision on GMOs (within thirty days of gazette). However, the Act does not explicitly provide for taking into account knowledge, views, and concerns elicited from the public in the decision-making process. Also, Article 25 provides broad and generous confidentiality provisions. As much, it gives the Competent Authority broad and open powers of discretion, when considering applicant's confidentiality claims.

The Act has been welcomed by the GMO industry, AfricaBio and powerful donor organizations. However, civic societies express that ~~t~~he provisions dealing with public participation and access to information do not give the Kenyan public the right to participation, but merely an opportunity to make input with regard to GM applications concerning field trials and commercial releases. The notification procedures to inform the public of such applications appear to be inadequate and may have little impact. Too much discretion is given to both the applicant and Authority to decide on the question of confidentiality regarding the information that is available to the public. This can easily lead to the abuse of power and defeating the public's rights to meaningfully engage with the process and making representations" (Mayet, 2009: 4).

ZAMBIA: In Zambia, Article 1 (2) of the Zambian constitution stipulates that every person has the right of access to all information held by the State or any of its organs at any level of government. Although this right has not been implemented by an act of law, in 2002 a Freedom of Information Bill (FOI) was presented by the then Minister of Information and Broadcasting. This FOI bill has been in negotiation since and has not been endorsed and passed into law at the time of this writing.

Zambia ratified the Convention on Biological Diversity in 1993, and ratified the Cartagena Protocol on Biosafety in 2004. In April, 2007, the Zambian parliament enacted its Biosafety Act. Among other things, the act provides for establishing a National Biosafety Authority (NBA). By the act of law, members of the competent authority would include consumer groups, religious groups, farmer groups, and traditional authorities. The Authority will, according to Article 5 (1) *(c)*and *(d)* promote public awareness and education concerning the activities regulated under this Act, through the publication of guidance and other materials that explain and elaborate on the risk assessment, risk management, and authorization processes. Article 12 (b) provides for prohibition of the release of GMOs that are not in line with the public interest, morality, cultural or ethical values of the people of Zambia. Public information, consultation, and participation are explicitly provided by Article 14, and stipulate explicitly that public opinion must be taken into account in the final decision-making process. However,

Article 15 provides the Minister considerable discretionary power over the information to be provided to the public, including how and how long public consultations and participation procedures are undertaken, including discretions over all application decisions. Equally, Article 34 provides broad and generous confidentiality provisions. As much, it gives the Competent Authority broad and open powers of discretion in considering applicant's (information) confidentiality claims. Also, article 35 provides for intellectual property rights (GoZ, 2007).

CAMEROON: The Cameroonian constitution does not provide the right of access to information, and there is no right to information Act. However, Article 7(2) of the 1996 Law on Environmental Management does provide for public participation. Cameroon ratified the Convention on Biological Diversity in 1994 and the Cartagena Protocol in 2003. In the same year, Cameroon Biosafety Law No 2003/006 was enacted. Section 35 and 42 (1) provides for public sensitisation, education and participation. Section 42 (2) states that "the competent national administration shall issue an environmental safety attestation after having taken account of comments made at the public consultation". This is an obscure provision that is open to interpretation because of the ambiguous and open way in which it provides for taking into account comments or concerns elicited from the public. Thus, this section and the law does not, explicitly, provide for taking into account knowledge, views and concerns elicited from the public in the final decision-making process. Indeed, sections 35 and 42 provide the competent national administration with considerable powers of discretion on these matters.

NAMIBIA: The Namibian constitution does not provide the right of access to information. This right of access to information is distinct from the right to freedom of speech and expression[24], which is provided by article 21 of the Namibian Constitution.

However, Namibia ratified the Convention on Biological Diversity in 1997 and the Cartagena Protocol on Biosafety in 2005. In 2006, Namibia passed and adopted its Biosafety Act. Article 24 of the Namibian Biosafety Act explicitly provides for public information, hearing and consultation. Yet, the Act does not explicitly provide for taking into account knowledge, views, and concerns elicited from the public in the final decision-making process. Also, article 24 (1) stipulate that the Biosafety "Council *may* take any action it considers appropriate" (my italics), which include public information, hearing or consultation among other activities. Equally, article 22 (4) stipulates that "*If* advertisement of the application is required the applicant must advertise the application once a week for two consecutive weeks in at least two newspapers circulated widely in Namibia, and by any other means as may be prescribed" (my italics) (GoN 2006). Accordingly, the act provides the Biosafety Council with open obligation and powers of discretion on public information, consultation and participation matters. Additionally, while Article 43 provides broad provisions for the applicant's right to claim certain information as confidential, Article 45 provide the Biosafety Council with open powers of discretion, when considering applicant's confidentiality claims.

[24] http://www.lac.org.na/laws/pdf/namcon.pdf; or http://www.namibian.com.na/index.php?id=28&tx_ttnews[tt_news]=35624&no_cache=1

In 2007, Namibia passed and adopted the Namibian Environmental Management Act. Article 36 of the Environmental Act explicitly provides for public information, hearing and consultation. However, the Act does not explicitly provide for taking into account knowledge, views, and concerns elicited from the public in the decision-making process. Also, article 36 (1) stipulate that the Environmental Commissioner Biosafety –Council *may* take any action the Environmental Commissioner considers appropriate" (my italics), which include public information, hearing or consultation among other activities (GoN 2007). Accordingly, article 36 (1) provide the Environmental Commissioner with open obligations and powers of discretion on these matters.

MALI: In Mali, the 1992 constitution does not provide the right of access to information. However, it provides for the freedom of expression.

Mali ratified the Convention on Biological Diversity in 1995 and the Cartagena Protocol on Biosafety in 2002. In 2008, Mali passed and adopted its Biosafety Act. Articles 12 to 16 of the Malian Biosafety Act explicitly provides for public information, consultation, opinion, and concerns. Also, articles 15 and 16 of the Act explicitly provides for taking into account public views, concerns and the results of public hearing and consultations in the decision-making process. Indeed, articles 12 and 15 stipulate explicitly that the Competent Authority *must* inform and consult the public, and *must* consider public opinion and concerns in its decisions (my italics). Also, the Malian Environment and Sanitation Management Law of 2001, and its 2003 decree (03-594/P-RM) relating to the impact study on the environment explicitly provides for public information, hearing and consultation.

Structural response

Although the implementation of legally binding statements and policies cannot occur in a vacuum, at the time of this writing, very few structural agencies have been set up in Africa to administer and implement policy provisions for public participation in practice. However, there are windows of opportunities.

KENYA: In Kenya, under the EMCA law, the National Environmental Management Authority (NEMA) is the authority responsible for promoting public awareness, consultation, and participation in environmental governance, as well as in GMO and Biosafety issues. Article 5 of the Biosafety Act 2009 makes provisions for the establishment of a National Biosafety Authority. Among other things, public information, consultation, and participation will be the responsibility of the National Biosafety Authority. However, this Authority has not been established at the time of this writing. Still, public participation in matters environmental is managed by an SEA Lead expert who is either an individual or firm licensed by the National Environmental Management Authority (NEMA).

SOUTH AFRICA: The South African Agency for Science and Technology Advancement (SAASTA), which is part of the National Research Foundation (NRF), was

appointed in a non-legally binding way, as the agency responsible for furthering public information, consultation and participation in South Africa, and for implementing the Public Understanding of Biotechnology (PUB) program. The program is implemented by SAASTA (South African Agency for Science and Technology Advancement)" [25]. SAASTA is a business unit of the National Research Foundation (NRF).

GHANA: In Ghana, the National Biosafety Commission is charged with a non-legally binding responsibility for promoting public awareness and information.

UGANDA: In Uganda, the National Council for Science and Technology is charged with the responsibility of promoting and furthering public information, consultation, and participation.

TANZANIA: In Tanzania, the National Environmental Management Act of 1983 established the National Environmental Management Council (NEMC), which states explicitly that one of the NEMC responsibilities is to promote and further public and private participation in sustainable natural resource management and environmental management programs. NEMC is also delegated the responsibility of promoting general environmental education programs. As well, in accordance with the Tanzanian Environmental Management Act (EMA) of 2004, the National Biosafety Committee was charged with the responsibility of furthering public information, consultation, and participation.

ZAMBIA: Articles 4 and 5 of the Zambian Biosafety Act (2007) makes provisions for the establishment of a National Biosafety Authority. Among other things, public information, consultation, and participation will be the responsibility of the National Biosafety Authority. However, to our knowledge, this Authority has not been established at the time of this writing.

CAMEROON: The Ministry of Environment and Nature Protection is the National Competent Authority. The National Biosafety Committee (NABIC) is responsible for promoting public awareness, information, consultation, and participation.

NAMIBIA: In Namibian, before the enactment of the Namibian Biosafety Act (in 2006) and the Environmental Management Act (in 2007), the Namibia Biotechnology Alliance (NABA), a working group established by the Ministry of Science and Technology and the Ministry of Education were charged with non-legally binding responsibilities for furthering public information and consultation. After the enactment of the above Acts, the Biosafety Council and Environmental Commissioner assumed the responsibility of promoting public information, consultation, and participation.

[25] e-mail correspondence with Manjusha Joseph, the coordinator of the public understanding of biotechnology project—on 10-17-2008.

MALI: According to article 5, the Ministry of Environment is the National Competent Authority charged with the responsibility of furthering public information, consultation and participation. However, the National Biosafety and Biotechnology Committee is the National Agency under which, among others, there is a Public Participation Commission that will be responsible for the actual public information, consultation and participation work.

Disbursement of funds

As indicated earlier, legal provisions and agencies that have not been allocated reasonable resources for implementing public participation in practice are more often than not a sign of a lack of government's commitment to a stipulated or pronounced policy. As it will be evident in the following pages, most of the existing public information, consultation, and participation activities have been financed by donor or industrial driven Biosafety programs (Johnston, 2008).

UNEP-GEF: Besides national government earmarks (if any), UNEP-GEF programmes have supported stakeholders' sensitisation and education activities. Each country was to use 20% of the allocated UNEP-GEF projects' money for this purpose (UNEP-GEF, 2006; Johnston, 2008).

SOUTH AFRICA: In Africa, South Africa is perhaps the leading country in earmarking funds for promoting public information, consultation, and participation in Biosafety policies and regulation. The Department of Science and Technology (DST) has, since early 2003, funded the three-year PUB initiative. In the financial year 2008, the PUB program received 4 million rand, which is 365, 663.98 Euros[26]. Additional funding for stakeholders' engagement activities were provided by UNEP-GEF projects, as described above.

ZAMBIA: In 2002, the government of Zambia financed its two-month stakeholders' consultation activities. The precise budgetary allocations for these activities were not available, publicly, at the time of this writing. Additional funding for public engagement activities were provided by UNEP-GEF projects, as described above.

KENYA, TANZANIA and UGANDA: In Kenya, Tanzania, and Uganda, stakeholders' information, consultation, and participation activities were organized by the respective national Biosafety Authorities. The precise budgetary allocations for these activities were not available, publicly, at the time of this writing. However, it is probable that most of the funds for these activities were provided by development agencies, through programmes such as BIO-EARN initiatives, the Rockefeller-funded projects such as the ~~"~~Global Dialogues for Biotechnology," ISAAA African Biotech Stakeholders program, AfricaBio, and other USAID funded projects or programs such as Program for Biosafety Systems (Johnston, 2008: 97, 108-149). Additional funding for stakeholders' engagement activities were provided by UNEP-GEF projects, as described above.

[26] Manjusha Joseph, e-mail correspondence, dated 10-17-2008

CAMEROON: Stakeholders' information, consultation, and participation activities were organized by the Competent Authorities. The precise budgetary allocations were not available, publicly, at the time of this writing. Additional funding for stakeholders' engagement activities were provided by UNEP-GEF projects, as described above.

GHANA: Stakeholders' information, consultation, and participation activities were organized by the Competent Authorities. The precise budgetary allocations were not available, publicly, at the time of this writing. Additional funding for stakeholders' engagement activities were provided by UNEP-GEF projects, as described above.

NAMIBIA: Stakeholders' information, consultation, and participation activities were organized by the Competent Authorities. The precise budgetary allocations were not available, publicly, at the time of writing. Additional funding for stakeholders' engagement activities were provided by UNEP-GEF projects, as described above.

MALI: Stakeholders' information, consultation, and participation activities were organized by the Competent Authorities. The precise budgetary allocations were not available, publicly, at the time of writing. Additional funding for stakeholders' engagement activities were provided by UNEP-GEF projects, as described above.

Public information, consultation, and participation

Legal, structural, and economic resources serve as the backdrop and backbone for putting public participation and empowerment into actual practice.

ZAMBIA: One of the best-known public consultation efforts in Africa is the Zambian public consultation events, which enjoyed widespread regional and international media attention. This was in 2002, when the Zambian government organized a two-month nation-wide consultation on whether Zambia should accept GMO food aid. The events involved nation-wide meetings that included citizens, religious leaders, state bureaucrats, politicians, academics, local and international NGOs, and others. At about the same time, the government of Zambia informed and consulted with the public through interactive radio, television programs and newspaper articles. As well, interested or politically active citizens expressed their views through opinion letters or articles in the media. The Zambian government indicated that these activities were examples of how it was willing to engage the public. Unfortunately, this otherwise laudable public consultation undertaking was a one-off undertaking. Also, commentators noted that these events were not broad based and inclusive—in that the government marginalised resource-poor Zambians in the rural areas. Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme (described below).

GHANA: In Ghana, since 2007, several stakeholders (non-public) workshops, financed by donor organizations, have taken place. Ghanaian Biosafety policymakers presented these efforts as an example of increased public engagement. However, observers have

interpreted these activities as the ―international community...bid to educate and persuade them to accept genetically modified foods."[27] Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme (described below).

UGANDA: The government of Uganda has carried out city and regional stakeholders Biosafety workshops, including stakeholders' awareness surveys at various districts. In fact, the government of Uganda has organised public information activities through radio and television channels and disseminated awareness materials to stakeholders and the general public. Some of these materials have been translated into four languages. In addition, the government of Uganda has negotiated with educational authorities regarding the introduction of GMO and Biosafety education in secondary and tertiary level curricula. Additionally, it has developed a Biosafety website that provides the public with Biosafety information and developments (Johnston et al., 2008: 190). Although developments in Uganda are, relatively speaking, impressive in comparison with developments elsewhere in Africa, observers note that ―while there has been public awareness building and involvement of stakeholders, it was felt that this has often arisen as part of an on-going course of action down a particular path, rather than involvement in decisions about which path to follow" (Johnston et al., 2008: 201). Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme (described below).

CAMEROON: In Cameroon, in 2003-2004, the government held a number of sensitisation workshops. These workshops were attended by members of the civil society (e.g., women, farmer, and consumer groups). Additionally, the Cameroonian government supported televised roundtable debates on GMOs and a number of radio and television interviews. It also printed the Cameroonian Biosafety Law and GMO brochures and disseminated them to the public (Johnston et al., 2008: 176). However, the 2005 National Report of Cameroon on the implementation of the Cartagena Protocol acknowledged that there was limited public effort to promote public awareness and participation and that there has been no real public involvement in GMO and Biosafety decision-making.[28] Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme (described below).

SOUTH AFRICA: In South Africa, as already indicated, the government has supported a number of public perception surveys and launched the Public Understanding of Biotechnology (PUB) program under SAASTA. On the one hand, the PUB website stipulate that ―The overall aim of the PUB programme is *to promote a clear understanding of the potential of biotechnology* and to ensure broad public awareness, dialogue and debate on its current and potential future applications, including Genetic

[27] http://www.thestatesmanonline.com/pages/news_detail.php?newsid=3382&section=2
[28] http://www.cbd.int/Biosafety/parties/list.shtml; http://www.cbd.int/doc/world/cm/cm-nr-cpbi-en.pdf

Modification (GM)."[29] On the other hand, the PUB website stipulates that "An emphasis will be placed on *engaging the public in debate rather than prescribing specific views* and will focus on new, innovative approaches to reach and involve diverse audiences."[30] Both italics are mine.

However, the South African civic groups expressed concern that South African PUB activities were sponsored by the GMO lobby and were specifically meant to engineer GMO acceptance (Biowatch, 2005, 2006a, 2006b). Further, observers indicated that critics considered the South African GMO Act as "passed hastily and without adequate public participation in order to address a situation in which GMOs were already being used in agriculture without any effective controls or regulatory oversight" (Pamela, 2006: 1365). A similar view is held of the amended GMO Act. Studies cite critics expressing that "in the same way that the GMO Act was drafted without public participation, there was equally no public involvement in the drafting of the amendments. Civil societies have termed the amendments as 'an insult to years of civil society engagement with the government.' The civil society has rejected the amendments as inadequate and is calling for a complete redraft of the Act after proper public consultation" (Pamela, 2006: 1366). Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme, described below.

TANZANIA: Western industries or donor-funded programs such as the African Biotech Stakeholders group (ABSF), International Service for the Acquisition of Agri-biotech Applications (ISAAA) AfriCentre, African Harvest Biotechnology Foundation International (AHFBI), East Africa Regional Network on Biotechnology, Biosafety and Biotechnology Policy (BIO-EARN), USAID-funded programme for Biosafety Systems (PBS), Bio-Safe Train programs, among others, report that they have engaged the Tanzanian public (Swanby, 2009: 9-11). Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme, described below.

KENYA: In Kenya, Western industries and donor-funded programs such as the African Biotech Stakeholders group (ABSF), African Biotechnology Trust, International Service for the Acquisition of Agri-biotech Applications (ISAAA) AfriCentre, African Harvest Biotechnology Foundation International (AHFBI), East Africa Regional Network on Biotechnology, Biosafety and Biotechnology Policy (BIO-EARN) program, Rockefeller programs such as the "Global Dialogues for Biotechnology," ISAAA African Biotech Stakeholders program, or the USAID funded projects or programs such as Program for Biosafety Systems (PBS), among others, reported that they have been informing, consulting with, and involving the public about GMOs and Biosafety policy issues, through Biosafety meetings or workshops. (Johnston, 2008: 97, 108-149). Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme, described below.

[29] http://www.pub.ac.za/about/overview.php
[30] http://www.pub.ac.za/about/overview.php

However, studies observed that "a core group of the civil society groups representing small scale farmers and environmental advocacy have not been present at workshops or represented in the NBC [National Biosafety Committee] or the Biosafety process in general . . . . That none of the groups have ever been invited to any of the stakeholders meetings or to NBC meetings" (Harsh, 2005: 672). Also, the civil society indicate that the Kenyan government has allowed GMO field releases since 2003 and imported GMO maize and soybeans since 2001 without informing, consulting or involving the public (Mayet, 2009: 3). For example, the consumer organizations "Says the risks of the GMO foods are aggravated by the fact that Kenyan citizens were never sufficiently educated on the matter." (Thatiah, 2009: an on-line article). Further, observers noted that "Food is not just about science and agriculture. It is also about culture and religion" (Thatiah, 2009: an on-line article). Noting that Muslims, Hindus, vegetarians, or the general public do not know whether they are eating maize or soy with pig, cow, or other unacceptable genes, observers noted that "Citizens do not know; . . . while the above can be mitigated by proper dissemination of information and intensive education, this has not been done" (Thatiah, 2009: an on-line article). Equally, in response to a recent scandal about GMO maize importation, observers expressed that "Food is a universal product and Kenyans have the right to know exactly where they are being taken by GMO proponents. Indeed, they were supposed to be asked if they wanted GMO technology in the first place. This did not happen. They were not even told what the whole technology was all about. As a result, there are many sections of society in Kenya who are at risk of GMOs" (Wakio, 2009: on-line article). Additionally, the civil society indicated that events leading to the enactment of the Biosafety Act did not involve women or small-scale resource-poor farmers who are the most immediately affected by GMOs foods and crops: "A year earlier, the NGO 'Africa Nature Stream' approached the Kenyan courts to intervene and stop the promulgation of a previous version of the Bill (Biosafety Bill 2007). . . . However, this legal intervention proved to be futile as did other forms of resistance on the part of Kenyan activists. Indeed, no amount of opposition by activists in Kenya could have changed the course of history because the US government had the entire regulatory process all wrapped up. The United States Agency for International Development (USAID)'s Program for Biosafety Systems (PBS) has played a pivotal role in the development of the Kenyan Biosafety law and ensuring its safe passage into the Kenyan statute books" (Mayet, 2009b: 3).

NAMIBIA: According to Mnyulwa and Oneughu (2009), "extensive consultation of all stakeholder groups in Namibia together with technical inputs from various national, regional and international experts were consolidated to form a draft policy entitled "enabling the safe use of biotechnology" (p. 19). It was this work that spearheaded a second phase study that considered the Namibian adoption and implementation of the Cartagena Protocol on Biosafety. Again, according to Mnyulwa and Oneughu (2009) "Two training workshops [were] held on Biosafety issues for farmers and consumer groups' representatives…Public awareness material [were] prepared and disseminated, this includes brochures. Brochures were also translated in different local languages for public awareness and these material disseminated" (P.20). Other public information,

consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme, described below.

MALI: Mali undertook the best known dialogic public engagement activity in Africa, namely, the 2006 farmers' jury event that took place on 25th to 29th January 2006. This event, *Espace Citoyen d'Interpellation Démocratique*—l'ECID (Citizen's Space for Democratic Deliberation) was organised in the Sikasso region. This was by the Regional Assembly of Sikasso, in collaboration with the UK International Institute for Environment and Development (IIED) and the Swiss *Réseau Interdisciplinaire Biosécurité* (RIBios) of the *Institut Universitaire d'Etudes du Développement*. It was funded by Swiss and Dutch governments, and organized in line with the methodology of Citizens' Jury model of public engagement that is well adopted and developed in Northern Europe or America. 45 Malian farmers participated in this event that enjoyed widespread media attention, as "Seven local radio stations broadcast the deliberations live every day. Three national newspapers covered the event as did the national TV channel. Many interviewees commented on the role of the media in allowing the debate to be extended from the l'ECID venue to the homes of thousands of Malians." (Bryant 2008: 22) According to observers, this event "Represented an attempt to amplify alternative viewpoints, the voices of those rarely asked for opinions, and the perspectives of the people most profoundly affected by agricultural biotechnology…[It] present[ed] an opportunity to examine the production of scientific knowledge in Mali. It clearly opened up the debate to a wider audience….This broadening of the debate has allowed alternative perspectives to be developed and articulated" (Bryant 2008: 23).

Also, according to observers, people "Talked very convincingly of how l'ECID very clearly demonstrated the ability of citizens to contribute to policymaking processes" (Bryant 2008: 24). Others pointed at how "The success of the exercise proves that decentralized communities and producers are capable of contributing to public policy decision" (Bryant 2008: 24). Although the background material that was disseminated to the farmers were reviewed by pro-GMO and anti-GMO experts, GMO proponents "Complained about the lack 'of scientific basis' and attempted to rubbish the methodology" (Bryant 2008: 22). Also, although analysts question the extent to which farmers' jury's final recommendations influenced the Malian Biosafety policy, they agree that it delayed the Malian Biosafety legislations. All in all, analysts consider this event as the best known example in Africa where, relatively speaking, a dialogic model of public engagement was adopted. Unfortunately, this otherwise laudable initiative was a one-off event, but there is a need for more such events in Mali and across Africa. Other public information, consultation and participation activities have been undertaken or are in the process of being undertaken, under the auspices of the UN-GEF programme, described below.

UNEP-GEF: Besides the specific government-initiated activities across Africa, parallel GMO and Biosafety stakeholders' information and education activities are reported by UNEP-GEF's Projects[31]. According to the authors of these national reports, UNEP-GEF projects implemented Article 23 of the Cartagena Protocol by engaging their respective

[31] http://www.unep.org/biosafety/Projects.aspx

publics in the development and negotiation of National Biosafety Frameworks (NBF), participation or representation in UNEP-GEF's National Coordinating Committee (NCC). However, the list of participants in UNEP-GEF's national[32] (capacity building projects') reports of their workshops and committees list government, civic and environmental NGOs, consumer associations, farmer associations, women's organizations, private sector, commercial associations, private firms, public-sector scientists, public research institutes, and media representations (UNEP-GEF, 2006). Accordingly, and in the main, the UNEP-GEF initiatives involved stakeholders' engagement, but not lay citizens, small-scale farmers, the resource poor in urban and rural areas, or resource poor women, the constituents most immediately affected by GMO.

However, the most recent UNEP-GEF's national reports outline their *future* plans for promoting public education and awareness through TV, radio programs, and by working with national education authorities. Indeed, they report that: "Training workshops (two-days) will be organised for trainers, i.e. provincial officers in charge of public awareness, training, education in [] provincial capitals...The training will be held quarterly and will instruct on how to address target groups and create awareness on the safe use of modern biotechnology products"[33]. Also, they report that: "TV and radio educational programmes in collaboration with the Education and Higher Education authorities on Biosafety will be developed" [34]. Additionally, they articulate that "Biosafety awareness materials. -including posters, flyers and leaflets, and a manual for the public on Biosafety processes and procedures will be prepared, printed, translated in some indigenous languages and disseminated. Best practices and lessons learnt will be disseminated for replication in other countries of the region" [35]. In a similar vein, reports indicate that national Competent Authorities will engage the civil society: "Panel discussions/roundtables will be held for 15 government officials and NGOs representatives as consultees. The discussions will aim at developing awareness strategies and information training programmes at grass root level on Biosafety related issues. In this respect, project agreements with at least five NGOs will be set up."[36]

However, studies have questioned the extent to which UNEP-GEF stakeholders' workshops provided truly consultative events or can provide authentic and robust lay public participation. Indeed, these studies note that "questions were raised about the level of influence the private sector . . . which holds the many key patents and spends [more] on R&D in this area than the public sector" has on the process, and how much it is influencing UNEP-GEF projects (Johnston et al., 2008: 98). Further, studies noted that NGOs and farmer organizations indicated that "their views were not adequately considered in product outputs and activities" (Johnston et al. 2008: 96). Besides, the civil society has questioned the influence of powerful donor states in the infrastructural development and management of UNEP-GEF's public information, consultation and

[32] http://www.unep.org/biosafety/Default.aspx
[33] Cf. Cameroonian MSF project brief, page 18 (http://bch.cbd.int/database/record.shtml?documentid=220)
[34] Cf. Cameroonian MSF project brief, page 18 (http://bch.cbd.int/database/record.shtml?documentid=220)
[35] Cf. Cameroonian MSF project brief, page 18 (http://bch.cbd.int/database/record.shtml?documentid=220)
[36] Cf. Cameroonian MSF project brief, page 18 (http://bch.cbd.int/database/record.shtml?documentid=220)

participation activities. Indeed, the civil society noted that ―the roles of real influence in policy development hav[e] been largely confined to a core group of experts and government policy-makers" (Johnston et al. 2008: 181). Further, observers noted that, in countries where governments are willing to provide opportunities for public participation, governments ―lack the capacity to do so effectively or to stand by the concerns of their publics in the face of opposition from powerful foreign countries" (Johnston et al., 2008: 97).

Part four: The soft dimension of public participation: Insights from forerunning Northern and African Countries

Policy statements, structural responses, financial resources, and actual public participation activities are hard instruments for implementing the principle of public participation. However, government's real commitment to the principle of public participation is evidenced by its commitment to real, active, meaningful and consequential public engagement:

- broad-based inclusion;
- provision of balanced, broad-based, unbiased, non-partisan information;
- provision of time and space for individual and collective symbolic coping with the new and unfamiliar knowledge or information;
- elicitation of diverse social assumptions, hopes, interests, and concerns of diverse national constituents;
- taking into account and incorporating elicited public needs, hopes, interests, and concerns in the actual decision-making process;
- eliciting, taking into account, and incorporating the best available scientific knowledge from diverse and multiple sub-disciplines (democratisation of scientific expertise), and so on;
- furthering a more public engaged science and a more scientifically engaged public;

This authentic, robust and meaningful public participation in the decision-making process provides an environment for bringing to light different normative values and interests that shape media, scientific, political, industrial, or social representations of GMOs and knowledge claims: the soft, albeit powerful, dimension of public participation.

There is a general consensus within the science-and-technology-policy community that, in most science and technology policies (including Biosafety policies), this dimension of public participation is constituted by institutionalised practices; or articulated in governments', agencies' or corporations' declarations, action plans, white papers or reports. Over the last decades, this dimension has evolved from a deficit approach to a dialogic approach: 1) the scientific knowledge deficit model (that further a one way top-down approach); 2) the attitude deficit model (that further a one way, indeed, a social engineering approach); or 3) the trust and dialogue deficit model (that further a two way albeit unscrupulous approach). These models have been criticised and, in their place, a fourth model, the authentic and robust dialogic model (that further a two way virtuous approach), is suggested. The following discussion will consider the first three models, their assumptions and limitations. On the basis of this review and the existing literature on the fourth model, the paper will draw a conclusion and, finally, present this fourth model in the form of a recommendation. That is, it will recommend this fourth model of public engagement for African Biosafety regulations and policies.

Scientific knowledge deficit model of public engagement

The scientific knowledge deficit model of public engagement assumes that science is *the* one and *the* only way of knowing or seeing the world, the arbiter of truth and, therefore, *the* tool for informing science and technology policies, including GMOs. Also, it assumes that the public or lay people are ignorant of science, including GMO science and innovations; that is, they lack knowledge and the capacity to understand this science. Thus, policy-makers, scientists, scientific experts or Biosafety experts informed of or proposing this model assume that public's lack of familiarity, information, knowledge, and understanding of GMO science and innovations cause fear and ambivalence towards GMOs. Consequently, proponents of this model recommend increased or intensive public education, information or basic training about basic scientific facts, theories or methods. If the public continues to express unease or resistance to GMOs, proponents of this model of public engagement see this as a result of a public misunderstanding of facts or as lacking the capacity to understand and discuss complex scientific and technological issues (Wynne, 2006). However, and in passing, it should be noted that it is now accepted that, although biologists are well versed in their areas of enquiry, which in science involves a very small and limited part of the bigger and whole picture, biologists, including leading biologists, do not truly understand complex living organisms (cf. *Nature* editorial, 2006; ENCODE, 2007; Pearson, 2006; Dyer, 2009). Also, scientists readily agree that because they "focus on the details, the bigger picture or the landscape can be obscured or 'forgotten'" by scientists (Burchell, Franklin and Holden 2009: 46). Thus, observers agree that "scientific perspectives on their own are valuable, but are insufficient in and of themselves to the task of enabling science to respond to the real lives" or the "real world" (Burchell, Franklin and Holden 2009: 47). So, and on the basis of their real life experiences, the public bring into the decision-making processes their knowledge of the bigger picture or landscape. This is a valuable form of knowledge that is distinct and complementary to the focused knowledge, generated through science. In this view, "science is one-but not the only—way of knowing or seeing and thus must be complemented by other ways of knowing" (Burchell, Franklin and Holden 2009: 46).

Indeed, empirical studies have shown that citizens, in both northern and southern countries, rework information and knowledge provided by expertise through their own contextual and experiential knowledge, needs, values, and interests (cf. Scott et al., 2005; Wagner et al., 2002; Kronberger et al., 2001; Burchell, Franklin and Holden 2009: 47). Further, studies have indicated that citizens question the integrity of the scientific experts, depending on their past experiences with scientific and policy institutions. For example, in Europe, New Zealand and Mali, observers note that the more the public was educated and informed about GMOs, the more the public became negative and concerned about GMO use. This change, observers noted, showed that the citizens are not ignorant, irrational or unable to "understand and convey complex ideas about genetics" or most science (Burchell, Franklin and Holden 2009: 27). In fact, observers noted that the public is all too aware of and accept the limits of science, scientific uncertainty, and ignorance of risks that may accompany GMO innovations, as well as scientists' inability to tame complex living systems. Also, observers indicated that public concerns are not "primarily

on probabilistic risk of harm, as scientists assumed, but their unavoidable dependency on institutions they could hardly trust" their claims of having knowledge, understanding, and capacity to manage GMO risks (Felt et al., 2007: 56-7). Accordingly, studies have concluded that policy-makers' continuing to argue that public ambivalence to GMOs is caused by ignorance or lack of understanding of science can only reflect how policy-makers and scientific experts sweep under the carpet public views, concerns, interests, and experiential knowledge, when they are different from expert ones (Kamara, 1999; Levidow, Carr, & Wield, 2005; Levidow & Carr, 2005; Levidow, 2005; Levidow, Sogaard, & Carr, 2002). In the EU, when the government and policy-makers failed to reflect on their own denial, it led to a policy impasse and deepened public controversies about GMOs. Consequently, the usefulness and validity of the scientific knowledge deficit model has been questioned.

Examples of public engagement activities informed by the scientific knowledge deficit model of public engagement include the 1980s science communication programs or 1990s public understanding of science or Biotechnology programs across the EU; the current South African public understanding of biotechnology programs; past and current public engagement activities undertaken by UNEP-GEF, AfricaBio, African Biotech Stakeholders group (ABSF), African Biotechnology Trust, International Service for the Acquisition of Agri-biotech Applications' (ISAAA) AfriCentre, African Harvest Biotechnology Foundation International (AHFBI), the East Africa Regional Network on Biotechnology, Biosafety and Biotechnology Policy (BIO-EARN) program, the Rockefeller programs such as the "Global Dialogues for Biotechnology;" the ISAAA African Biotech Stakeholders program, or the USAID-funded projects or programs such as Program for Biosafety Systems (PBS), among many other industrial or donor-supported activities in Africa.

The attitude deficit model of public engagement

In the EU, when public controversies heightened and blocked GMO deployment, a second model that assumed that the public was anti-GMO, anti-science, anti-progress or did not appreciate the benefits of science and technological innovation, commonly known as the attitude deficit model of public engagement, was proposed and adopted. In the main, this model assesses and assumes public resistance to GMOs is caused by a perception or an attitude problem. That is, it assumes that the public lack a positive or the right attitude to GMOs, which should be engineered. Accordingly, policy-makers, scientists, scientific experts or Biosafety experts informed or adopting this model seek to frame GMO in usefulness, social relevance, sustainable development, or utilitarian ethics terms, in particular, in terms of poverty alleviation and food security in third world countries. However, research examining the attitude deficit model has observed that the underlying assumptions informing the attitude model are more or less the same as the assumptions underlying the scientific knowledge deficit model. The difference between the two models is a rhetorical one. Observers interpreted scientific experts', policy-makers', or science communication experts' talk of public perception or attitude as a euphemism for public illiteracy, lack of knowledge or ignorance. Therefore, they

observed that the attitude model continues to educate and provide information to the public. In fact, observers noted that public engagement activities informed by the attitude deficit model seek and continue to inculcate the view that GMOs are safe, useful and beneficial for the society and should be accepted, without taking into account lay knowledge, concerns, needs, interests or knowledge. Observers pointed out how proponents of the attitude model were informed by a particular molecular genetics theory and did not take into account or incorporate other available counter-theories in molecular genetics or theories in other relevant and diverse sub-disciplines in biology (Wynne, 2006; Felt et al., 2007; Boeschen, 2006).

However, scholarly work examining the attitude deficit model observed that practices informed by this model simply treat the symptoms instead of the causes of the perceived problem. In fact, observers note that the public is enthusiastic about certain science and technological innovations, such as cars, mobile phones, chemotherapy, iphones, skype, internet or air travel. Also, like earlier studies examining controversies accompanying nuclear power plant policies, studies examining the European public's ambivalence towards GMOs showed that lay public does not distrust science or GMOs primarily because of ignorance, lack of knowledge, misunderstanding of GMOs and their benefits or because of holding wrong attitudes. Rather, studies indicated that the public distrust governing institutions' ability to handle potential risks, based on their knowledge and historical experiences with institutions of environmental or technological governance (Irwin & Wynne, 1996, Wilsdon, 2005). Observers noted, as indicated earlier, that the public is far more concerned about the way governing institutions ignore experiential and broader public knowledge, values, interests, concerns; or deliberation of non-GMO alternatives. In the EU, policy and expert institutions continued to ignore the public, and the public continued to mistrust these institutions of governance. This mistrust deepened controversies that led to the EU GMO-policy deadlock. Consequently, the usefulness and validity of the attitude deficit model has been questioned.

Good examples of public engagement activities informed by the attitude deficit model of public engagement includes: EU Eurobarometer surveys; the 1990s science communication programs or public understanding of science or Biotechnology programmes across the EU; the current South African public understanding of biotechnology programs; past and current public engagement activities undertaken by UNEP-GEF, AfricaBio, African Biotech Stakeholders group (ABSF), African Biotechnology Trust, International Service for the Acquisition of Agri-biotech Applications' (ISAAA) AfriCentre, African Harvest Biotechnology Foundation International (AHFBI), the East Africa Regional Network on Biotechnology, Biosafety and Biotechnology Policy (BIO-EARN) program, the Rockefeller programs such as the "Global Dialogues for Biotechnology;" the ISAAA African Biotech Stakeholders program, or the USAID-funded projects or programs such as Program for Biosafety Systems (PBS), among many other industrial or donor-supported activities in Africa.

Trust-and-dialogue model of public engagement

In recent years, a way out of the GMO-policy deadlock has been sought through a new model, commonly known as the dialogue deficit model of public engagement. This model shares major assumptions with the first two models. The only difference is that the first two models focus their lenses on the public as the problem while the third focuses its lenses on expert actors and scientific and regulatory institutions as the problem, in particular, as failing to engage with the public. Thus, as a "crisis of public confidence" in expertise and regulatory institutions was appreciated as the major problem, a new solution, building trust and dialogue was proposed (Bauer et al., 2007).

In the early 21st Century, dialogue initiatives have been proposed as tools for rebuilding public trust. Perhaps the best-known examples are reports issued by the UK government and the EU Commission. In the UK, for example, the 2000 House of Lords Report proposed a number of mechanisms for rebuilding public trust. These included citizen juries, deliberative opinion polling, hearings, national debates, meeting of minds, science-wise programs, beacons for public engagement, and so on. In addition, the powerful (UK) Royal Society proposed dialogue engagement as early as possible in the future science-and-technological-development pipeline, the so-called upstream public engagement (Wilsdon et al., 2005). Both the UK government and the Royal Society argued that such up-stream engagement would enable front-end input instead of post-hoc reactions to already established facts. So, UK has been a forerunner for dialogic public engagement innovations that pronounce to be distinct from the scientific knowledge deficit or attitude deficit model of public engagement.

The UK innovations paralleled similar EU appraisals. Since 2000, European institutions and member-state governments have emphasised the need for new modes of science and governance (Bauer et al., 2007; Felt et al., 2007). Declarations concerning new partnerships between science and society have been pronounced everywhere, denouncing the one-way education and information model—the scientific knowledge deficit model or the attitude deficit model. One of European Union's dialogue initiatives for improving stronger relations between science and society is, following the Lisbon Declaration, the EC *Science and Society Action Plan* of 2001-2006. The Action Plan called for an intensive exchange of information and best practices between member-states and the regions on the use of participatory procedures for national and regional policies. A second and parallel dialogue initiative is the 2001 *White Paper on European Governance*. A white paper that extensively considers the relationship between science and citizens recommends extended openness, participation, accountability, effectiveness, and coherence as important principles of governance (Bauer et al., 2007; Felt et al., 2007). A third initiative is the EU *Science in Society* initiative, under the EU seventh framework programme[37].

[37] http://cordis.europa.eu/fp7/sis/about-sis_en.html

Table 8: Dimensions of Public Participation

The hard dimension:

- Policy statements or legal directives
- Structure response
- Disbursement of funds
- Public education and information activities. It is extremely important here that expertise and sponsors of these education and information activities are democratised. Knowledge and information from diverse biological fields, disciplines, and subdisciplines must be included. Equally, knowledge and information from diverse relevant natural and social science disciplines and sub-disciplines must be included.
- Public engagement (communication, consultation, and participation)

The soft dimension:

1. Scientific knowledge deficit: Literacy measures, education
2. Right attitude deficit: Literacy measures, education, spin
3. Trust and dialogue deficit : Spin, consultations, cognitive polyphasia
4. Authentic and robust dialogic model of public engagement: i) Consideration and incorporation of insight from diverse biological fields, disciplines, and sub-disciplines—including their diverse social commitments and values; cognitive and methodological commitments would expose and allow for the questioning of dominant scientific and non-scientific assumptions and justifications—that are not always transparent and explicit. (ii) Consideration and incorporation of insight from other relevant natural and social science disciplines and sub-disciplines—including their diverse social commitments and values. Cognitive and methodological commitments would expose and allow for the questioning of dominant scientific and non-scientific assumptions and justifications—that are not always transparent and explicit. (iii) Consideration and incorporation of diverse forms of experiential and contextual knowledge and social representations, with their accompanying diverse and alternative norms, beliefs, visions, and values of development. (iv) Consideration of diverse political, social, economic, cultural, industrial, ecological, environmental, and geographical contexts.

The third instrument for enacting the soft dimension of public participation is an on-going experiment. However, this model has been characterised as a "Continual reinvention of new deficit models of the public and its reactions to institutional behaviours, performed in the name of science" (Wynne 2006: 2). Critics point that, although policy makers pronounce their move from the now discredited (scientific knowledge or attitude deficit) models of public engagement to a dialogic model, they are "hitting the notes, but missing the music" (Wynne, 2006: 1). Indeed, critics observe that, although policy-makers, scientists and Biosafety experts talk of "dialogue", "two-way

communication", ~~t~~two-way system of exchange and reciprocity", ~~p~~public empowerment", ~~m~~eeting of minds", ~~t~~wo-way process, exchange or interaction", ~~c~~onversations" or any other such positive terms, what these terms mean is vague, ambiguous and vacuous. In fact, commentators observe that dialogue events and venues are more often than not used as instruments for making the public see GMOs (or any other contested scientific innovation) as key to national economic growth, competitiveness, and security. That is, dialogue events or activities are used to convince the public to cave in to dominant coalitions' position. Also, commentators note that these events are used as venues for garnering and winning public support for GMO research funding and other contested science or technological policies. Thus, despite their seemingly positive outlook, in practice, dialogue or conversation pronunciations have not managed to solve EU GMO policy deadlock. The only way out of this deadlock, commentators offer, is an authentic and robust dialogic model of public participation. This authentic and robust dialogic model of public engagement is presented in the recommendation section, as a possible way forward.

Section five: Conclusions

The adoption of public participation in African Biosafety policies has made welcome strides and provisions. The process has been slow and marked with controversies. However, seven African governments have put in place legally binding provisions for the right to public information, consultation, and engagement and for establishing bodies or committees that would translate policy provisions into practice. Others are slowly and surely working to enforce provisions that further public participation.

However, and on one hand, the civic society consider current legal provisions as giving limited power to the public, small-scale farmers, and resource poor. On the other hand, they consider these provisions as providing a great deal of power to the government, GMO companies, and powerful pro-GMO scientists through broad and open discretionary powers, indeed, through generous confidentiality provisions. Additionally, the civil society indicates that National Biosafety Committees' compositions are not inclusive and broad-based, and membership appointments are accompanied by secrecy, networks of connections or patronage.

All the funding for Biosafety public information, consultation, and participation has been provided by donor agencies and multinational corporations. This situation could indicate that African governments do not have the money for supporting public participation in Biosafety policies or that they do not consider this as a priority policy area.

Although forerunning countries' governments have sought to inform the public about Biosafety issues, this information has been biased and unbalanced. This bias could be because governments do not have the scientific and technical capacity to understand the GMO science and innovations. It could also be because Biosafety scientific experts and local and international consultants are not objective and disinterested or are not commissioned and appointed in an inclusive, broad-based, transparent, and democratic manner.

Some stakeholders—such as consumer organizations, large-scale farmers‘ organizations, environmental organizations, and media groups—have been consulted by the government, convenors of UNEP-GEF‘s national Biosafety projects or Biosafety policy-makers. However, these groups indicate that their input did not influence and shape Biosafety decisions; indeed, they have noted that their consultations were used to legitimize decisions that had already been made. Furthermore, key small-scale farmers, resource-poor people in rural and urban areas, a group that largely comprises women, were not consulted or represented in the Biosafety policy process, even though these constituents are the alleged beneficiaries of GMO food and crops.

Since 2001, in countries such as Kenya and South Africa, the public has been exposed to and has possibly been eating and growing GMO maize or soy without being informed or consulted. However, people consider food as more than science and technology. It is about culture, identity, tradition, religion, sustenance, and health and people would like to know and have the right to decide what they grow or eat.

Thus far, public information and consultation in African Biosafety policy and GMO regulations have been characterised by practices that seek to enforce decisions that have already been made through the scientific knowledge deficit or attitude deficit models of public engagement. The scientific knowledge deficit model assumes that the more the public know and understand about GMOs, the more they will accept them. The attitude deficit model assumes that the public have a wrong attitude towards GMOs, and if experts can engineer a positive attitude, the public will accept GMOs. So far, there have been no real attempts to consider and incorporate civil society and lay public concerns, interests, and needs through an authentic and robust dialogic model of public participation.

In conclusion, although leading governments have made legal provisions for public information, consultation, and participation, these policies have not been translated into or reflected in actual practices. Thus, so far, there is no authentic, robust, and meaningful public information, consultation, and participation.

This state is unfortunate. There are compelling—sustainable-development, late lessons from early warnings (that acknowledges scientific ignorance and uncertainty), substantive, normative, instrumental, and rhetorical—perspectives that, when considered together, show beyond any reasonable doubt that an authentic and robust dialogic model of public participation in Biosafety policies and regulations in Africa, as elsewhere, is a necessity and not a choice.

Section six: Recommendations and opportunities

Africa needs to further an authentic and robust dialogic model of public participation in African Biosafety policy, and other science and technology policies. Thus, although some observers see real existing challenges and have genuine concerns that public participation may be even more challenging in Africa, African Biosafety policy makers should see

challenges as setbacks to be overcome. Challenges signal we should work harder. Challenges are opportunities for aiming for greater heights and peak performance. If confronted and well handled, the above described challenges may offer opportunities and open-up possibilities that we can only begin to imagine. Indeed, lay African public's knowledge and free imaginations can lead to inspiring and innovative ideas that can generate novel African innovations. Such novel and emergent African innovations can further African growth and developments, and further responsible and sustainable science and technologies in ways we can only start to imagine.

There are various opportunities for strengthening public participation and for developing authentic and robust dialogic model of public participation in African Biosafety policy. These opportunities include opening up, expanding, and deliberating on scientific expertise; opening-up and deliberating the notions of progress and development; bringing into the open how diverse needs and interests influence and shape knowledge claims; and explicitly defining public engagements, public communication, consultation, and participation in legal stipulations.

Open up, expand, and deliberate on scientific expertise

GMOs are a product of science and technology, and science will continue to be of critical importance in any robust and meaningful endeavour. GMOs released into the environment involve interaction with complex living organisms and ecosystems. Accordingly, different insights from different scientific disciplines and theories play a critical role in achieving a holistic understanding of GMOs, and how they may affect human and animal health, environment, eco-systems, and social and economic systems. All will be important for providing balanced information. Thus, the first dimension of a robust and meaningful dialogic model of public participation should involve democratization of Biosafety scientific expertise (Blok, 2007). In all public information, communication and participation activities, the best available scientific evidence from different and broad scientific disciplines and sub-disciplines must be presented and debated publicly, openly, and transparently.

It is now accepted that science is uncertain and that scientific theories are never absolute; they are always under contestation. That is the nature of science. Thus, in authentic and robust public information, consultation, and participation, all available counter-expertise and knowledge must be provided to the public and openly deliberated by scientists in the media and in public participation events or forums. As Danish consensus conferences have demonstrated, when experts discuss openly, scientific (expert) disagreements are rendered open and transparent, and the public receive balanced scientific evidence. This open and transparent way of communicating science enables citizens to exercise reasoned arguments and judgments concerning claims of validity. It is not uncommon for scientists to express that science is objective and free from non-scientific values or interests. However, it is now accepted that private interests, virtues, and values, as well as national, institutional and cultural socialization, habituation, and affiliation all influence science and scientists (Shapin, 2008: 132; Kamara 2009a). All these influences may potentially affect the scientific questions natural or social scientists pose, the methods they choose, what they see in their research and experiments, the data they collect, the theories they choose to interpret and

analyze the data with, and the conclusions they draw (Wynne, 1992). The same is true for industry and NGOs, including the natural and social scientists they consult or employ. The same is true for the media and their science journalists. The same is true for the different ministries in the government, such as agriculture, health, environment, and science and technology ministries. Thus, interests, values, and norms influence scientific expertise or science communication in significant ways. However, this fact should be made open and transparent to the lay public as a way of demystifying science and expertise—as the "scientific black box is opened in front of the public, with ~~–s~~cientific citizens" having the last word regarding its applicability to issues of common [needs and] concern[s]" (Blok 2007: 168). Indeed, as a means of promoting responsible science and expert culture (Blok, 2007; Wynne, 1992, 2006), and scientifically engaged citizenship.

Open up and deliberate the notions of progress and development

In addition to the deliberation of science and scientific expertise, the second dimension of an authentic and robust dialogic model of public engagement would involve democratisation of the different ways of seeing and understanding notions of progress and development. It involves the need to consider and incorporate diverse social representations of progress and development and the major and unspoken underlying beliefs, values, assumptions, and visions of development and progress. Questions should address what developments should be, and who defines what is development and progress, under whose beliefs, knowledge, and assumptions. Who wins and who loses in the name of development and progress? Who, in reality, benefits? What are the costs and risks, and who, in reality, pays for the costs and risks? Development under what and whose terms and conditions, among many others, should all be communicated and deliberated openly and transparently.

Bring into the open how diverse needs and interests influence and shape knowledge claims

Furthermore, and a dimension that is intertwined with the one above, an authentic and robust dialogic public engagement should involve the democratisation of the public space and the actual decision-making process. This dimension involves taking into account and considering all lay publics' interests, in addition to taking into account and discussing openly and transparently the interests of all diverse farmers, consumer groups, civic organizations, agro-business groups, scientists, policy-makers, Western foundations or trust groups, donors, and Western intermediary institutions (such as the World Bank, IMF, WFP, FAC).

Thus, this dimension involves allowing all the participants to develop their own assessments and develop their own knowledge networks, social representations, or African-based innovation systems in terms that do not robotically correspond with those of powerful donors, policy makers, scientific experts, NGOs, or scientific institutions of

governance, unless these actors genuinely try very hard to transform their own behaviours, assumptions and practices and seek to meet lay African citizens' needs, concerns, and interests on a middle ground (Felt et al., 2007: 59). Such a democratic encounter would allow lay public and other stakeholders to mingle Western scientific knowledge with their own experiential knowledge or systems of symbolic coping and to respond to, represent, translate, transform, or converge with Western scientific notions of knowledge.

Explicitly define public engagement

So far, what has been reported as public information, consultation, and participation in African Biosafety policy process is akin to the "pure asymmetrical model" of corporate public relations (Grunig 2001: 26), which is meant to manipulate or persuade Africans to accept powerful GMO corporations' and powerful donor states' position.

According to democratic theories, public participation in the decision-making process can be defined as the citizens' right and power to 1) demand and be provided with balanced information or knowledge, 2) express their opinion, concerns or interests, 3) be involved and empowered in a) the agenda-setting phase of a decision, b) the identification of an issue area in which it is proposed to make a decision, and c) the decision-making phase, in which alternatives are identified and comparative assessment and the weighing of the pro and cons of the various available options are undertaken according to the needs, interests, and context of the case at hand. It also includes the right and power to be involved at 4) the moment of making the choice between the various options when the actual decision is made. Finally, it involves the right and power to be involved in 5) translating into action and practice the choice arrived at (Hyland, 1995; Ham & Hill, 1993). This power and right is enacted in three ways: through broad-based public communication, consultation, and participation.

Substitute public information with "broad-based public communication" and explicitly define the term

Broad-based public communication involves providing broad knowledge and information to citizens. If the knowledge and information is unfamiliar, complex or technical, as in the case of GMOs, it can and should be easily conveyed through locally known, intelligible, or familiar symbols, metaphors, myths, idioms, euphuisms, signs, drawings, or images of a given community. The media for providing this information depend on the context and accessibility. The public could have access to official files and documents. The information could be provided via an on-line database. It could be disseminated through text messaging, a television channel, the national radio, targeted community radio, letters, a national newspaper, targeted community newspapers, opinion-forming local objective interlocutors who translate or interpret mass-media messages for the benefit of the subordinate community members, schools, churches, temples, mosques, gazettes or announcements, micromedia—such as zines, digital color imaging, mobile walk-in films—mobile talks or presentations, cartoon books or magazines, and so on. The

information should present the issue at hand from diverse disciplinary, sub-disciplinary, and theoretical perspectives in order to provide as balanced and broad-based knowledge and information as possible (Rowe & Frewer, 2005; Wagner et al., 2000, 1998).

Once the information from myriad angles, disciplines, sub-disciplines, opposing theories and perspectives has been provided, the public is given enough time and space for dialogue—at home, in the classroom, school halls, interactive vernacular and national radio discussion programs, minibus, bars, train-compartments, work spaces, women's hair salons, shebeens, village baraza, or meeting points—to digest, respond, and reflect on the information provided. By giving people enough time and appropriate space for dialogue, the unfamiliar knowledge and information will be decoded, translated, interpreted, incorporated or transformed into the shared and symbolic meaning systems of the community. Through this meaning-making system, the new and unfamiliar knowledge is mixed and minced with local experiential and contextual knowledge, assumptions, values, needs, interests, images, social stigma, beliefs, myths, or prejudices—that are all central and important to practical identity, community, memory, institutionalisation, survival, and self-sustenance of a people as a community. It will be translated into another language that is understandable to this community. Once the new information or knowledge has been digested and sieved through within safe, intimate, and sovereign spaces for dialogue—that is, uninterfered with and unfacilitated meaning-making spaces and resources—, the community will reproduce the content of the unfamiliar (Wagner, 1998, 2000). It is at this level that the public is well informed, and ready to convey their opinion to policy makers.

Explicitly define public consultation

So, once this content has been translated, transformed, reflected upon, and responded to, the public opinion or concerns can be sought or the public can convey their concerns, opinion or representation of GMOs to policy-makers, the scientific experts, or government agencies. The media for conveying citizens' representations should be any or a combination of well tested methods, most notably: national barometers or surveys; in-depth qualitative interviews; national referendum; focus-group discussions; regional, community or national consensus conferences; local, regional or national citizen juries; local, regional or national workshops, and so on. The mechanisms and facilitating procedures for eliciting these citizen representations must be transparent, mixed, and matched in order to avoid bias, misinterpretation, misrepresentation, or worse—the manufacturing or doctoring of public opinion or position (cf. Moore, 2008). Whether the public representation or position is in agreement or disagreement with that of the policy-makers, scientific experts, powerful donors or corporations—the information and social representations elicited from the public should be treated with respect, be considered as sound, functional, and valid in their own right (Rowe & Frewer, 2005).

Explicitly define public participation

Public participation involves the actual encounter of diverse forms of knowledge, social representations, visions, hopes, assumptions, and commitments that are exchanged,

reflected upon, and transformed in public spaces or forums where all participants and all ideas, views or opinions are treated and respected equally. Here, all the different ways of knowing are allowed, respected, and taken into account. In case of the Biosafety decision-making process, it would involve taking into account the views of the government, politicians, policy-makers, scientific experts, diverse community groups of scientists both as citizens and as scientists, industrial groups, ordinary or lay individuals, myriad NGOs, big-scale farmer groups, women, women's groups, consumer organizations, individual large-scale farmers, individual small-scale farmers, small-scale farmer groups, organizations or union, and so forth. It involves encountering "the Other" and the Other's world views. It does not involve judging others. It involves listening to and respecting the Other. It involves understanding that the Other's views are as valid as one's own. The spaces for such an encounter could be a local, regional or national consensus conference or citizen juries arrangements. The encounter may be through interactive radio programs, a television debate, or parliamentary debate. Such an encounter may be in the form of organised local, regional, or national meetings or workshops that comprise representatives of all involved parties in different proportions (depending on the mechanism concerned) (Rower & Frewer, 2005). The important point is that critical reflections, questioning, responses, and negotiation serve to transform attitude, views, opinions, and choices and move the participants into agreement, disagreements, decisions, and actions. Disagreements will be as good a result as an agreement (Scott et al., 2005). Public participation should be a collective learning process and a collective responsibility, and lay public input is as valid as that of scientific experts, donors, and government. Public input must be taken into account and must shape the final policy decisions and policy implementation in practice. The government should inform the people which input has been incorporated and how it was incorporated, as well as which input was not incorporated and why, and provide opportunities for further negotiations.

References

Internet

Associated Press (March 6, 2007). Proposed U.S.-Brazil ethanol alliance threatens Amazon rainforest . http://news.mongabay.com/2007/0306-ap.html

Butler, R. A (January 25, 2007). Biofuels could damage environment, stymie development, says report Rhett A. Butler. http://news.mongabay.com/2007/0125-biofuel.html

Clark, N et al (200?) Governing Agricultural Biotechnology in Africa. Building Public Confidence and Capacity for Policy-Making. http://www.acts.or.ke/pubs/books/index.html

CropBiotech (2006). Kenya – Biotechnology Policy in Place: http://www.afaa.com.au/news/n_news-1874.asp

Jordan, B (2008). GM SETBACK FOR MAIZE EXPORTERS. Business Times, South Africa. 28.09.2008. http://www.thetimes.co.za/Business/BusinessTimes/Article1.aspx?id=851643,

Kameri-Mbote, P (2007). Will Kenya's Biosafety Bill of 2005 ever become law? SciDev. 12 June 2007. http://scidev.net/en/agriculture-and-environment/agri-biotech/opinions/will-kenyas-Biosafety-bill-of-2005-ever-become-la.html

Kumekucha, blog (Thursday, January 11, 2007). The Kalonzo Musyoka You Don't Know Part IV: Witchcraft And Dark Forces. http://kumekucha.blogspot.com/2007/01/kalonzo-musyoka-you-dont-know-part-iv.html

Malakata, M (2007). Zambia takes steps towards Biosafety law. SciDev. 12 April 2007. http://www.scidev.net/en/news/zambia-takes-steps-towards-Biosafety-law.html

Maletsky, C (2007). New study examines the right to know. The Namibian. http://www.namibian.com.na/index.php?id=28&tx_ttnews[tt_news]=35624&no_cache=1

Nyokabi, P (2007). Freedom of Information in Kenya. P*riscilla Nyokabi. Pambazuka News 18 May 2007* http://www.humanrightsinitiative.org/programs/ai/rti/international/laws_papers/kenya/foi_in_kenya.pdf

Ringia, Deogratias William and Porter, Stephen J. (1999). Access to Environmental Information in Tanzania. Lawyers' Environmental Action Team. http://www.leat.or.tz/publications/access.to.information/access.to.information.pdf

Peter Thatiah, P (2009). Alarm raised as GMO foods hit market. The Standard Newspaper. Published online 14/05/2009. **http://www.eastandard.net/InsidePage.php?id=1144014150&cid=4&ttl=Alarm%20raised%20as%20GMO%20foods%20hit%20market**

Wakhungu, J (2004). Public participation in science and technology policy-making: experiences from Africa . Presentation at the Public Good or Private Gain, a conference on reclaiming science for sustainable development, Regent's College, London, 11 November.

Wakio, R (2009). Genetically modified food imports an abomination. Opinion article. The Daily Nation. Posted Wednesday, May 13 2009. http://www.nation.co.ke/oped/Opinion/-/440808/597870/-/478b7x/-/

Policy Reports, Statements, Briefings, Laws, Directives, etc.

ACODE: (2008). Uganda and the Biotechnology Revolution: Update and Emerging Issues. Infosheet 5, 2008. **http://www.acode-u.org/documents/Infosheet%20No%5B1%5D.5%20ACODE.pdf**.

ACB (2007). Comments on the Republic of Kenya's Biosafety Bill, Dated –Nairobi, 22nd June 2007". Afrucan Centre for Biosafety.

AfricaBio (2001). Africabio Submission on the OAU Model Law on Biosafety. **http://www.africabio.com/policies/Submission%20OAU%20Model%20Law%20on%20Biosafety%20by%20AfricaBio.htm**

AU (2008). Draft Revised African Model Law on Safety in Biotechnology. January 2008

AU (2007). African Ministerial Conference on Science and Technology (AMCOST III) Steering Committee Meeting. Third Ordinary Session, 6-7 June 2007. Pretoria South Africa. Context for Revising the AU Model Law on Safety on Biotechnology. AU/EXP/STEERING/ST/6(III).

Biowatch (2005). Submission on Genetically Modified Organisms Amendment Bill. Thursday, 17 November 2005. http://www.pmg.org.za/docs/2006/060117biowatch.pdf.

Biowatch (2006a). Press Release. Put all New Applications for Genetically Modified Organisms on Hold until GMO Amendment Bill is Substantially revised. 16 January 2006. http://www.biowatch.org.za/main.asp?show=27

Biowatch (2006b). Press Release. Parliamentary Committee passes Genetically Modified Organisms Amendment Bill despite misgivings. 08 August 2006. http://www.biowatch.org.za/main.asp?show=39.

Bamako Declaration (2007). Declaration of the Farmer Exchange on the Privatisation of Seeds, organized by the CNOP, BEDE and IIED. Preparatory process for the International Forum on Food Sovereignty of Nyeléni, Mali, Bamako, 21st February 2007.

Cameroonian MSP project Brief. http://bch.cbd.int/database/record.shtml?documentid=220

CBD. Cameroon Report on its Implementation of CBD (Sept. 5 2005). http://www.cbd.int/doc/world/cm/cm-nr-cpbi-en.pdf;

CBD. List of Parties to the Cartagena Protocol. http://www.cbd.int/Biosafety/parties/list.shtml

EC (2005). Access to information, public participation and access to justice in environmental matters. http://europa.eu/legislation_summaries/environment/general_provisions/l28056_en.htm

EC (2003). Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC.

EU EcoForum (2005). Right to participate on GMO decisions granted for the Pan-European. Ecoforum, European Environmental Bureau, Friends of the Earth International, all Belgium. 27 May 2005.

EU EcoForum (2006). Amendment to the Aarhus Convention (Almaty, 2005) as an international mechanisms for public access to Decision-making in the field of biosafety. Eco-Tiras, Chisinau, 2006.

GEF Council (2005). Final Draft of the Evaluation on GEF+s Support to the Cartagena Protocol on Biosafety. GEF/ME/C.27/Inf.1/Rev.1. Prepared by the GEF Office of Monitoring and Evaluation.

GoK (2008). Government of Kenya. The Biosafety Act, 2008

Government of Mali (Assemble Nationale. Republic du Mali). 2008. Relative a la Securite en Biotechnologie en Republic du Mali.

Government of Namibia (1998). Namibian Constitution. http://www.lac.org.na/laws/pdf/namcon.pdf

Government of Namibia (2006). Biosafety Act, 2006 (Act No. 7 of 2006).

Government of Namibia (2007). Environmental Management Act, 2007 (Act No. 7 of 2007).

GoT (2004). _Tanzania - Environmental Management Act, 2004', 3/3 Law, Environment and Development Journal (2007), p. 290, available at http://www.lead-journal.org/content/07290.pdf

GoZ (August 2003). National Biotechnology and Biosafety Policy. Ministry of Science, technology, and Vocation Training.

GoZ (2007). The Biosafety Act, 2007. 156 No. 10 of 2007.
http://faolex.fao.org/docs/pdf/zam78318.pdf

GoZ (2007). The Plant Breeders Act, 2007. 239, no. 18 0f 2007.
http://www.farmersrights.org/pdf/Africa/Zambia/Zambia-pvp07.pdf

GoK (2009). The Biosafety Act. Act no. 2 of 2009.
http://www.kenyalaw.org/kenyalaw/klr_app/frames.php

GRAIN (2004). *Food Situation in Sudan and Angola: Call for WFP to Respect Restrictions on GM Food Aid and Provide Real Alternatives.* African Centre for Biosafety, South Africa, Environmental Rights Action, Friends of the Earth, Nigeria, Consumers International, Office for Africa (CI-ROAF), GRAIN, Francophone Africa, Institute for Sustainable Development, Ethiopia. SAFeAge, (South African Freeze Alliance on Genetic Engineering) a network. comprising of over 130 organisations and 250 000 consumers.

Jaffe, G (2006). Comparative Analysis of the National Biosafety Regulatory Systems in East Africa. EPT Discussion paper 146. IFPRI.

Johnston, S. et el. (2008). Internationally Funded Training in Biotechnology and Biosafety. Is It Bridging the Biotech Divide? United Nations University. UNU-IAS. http://www.ias.unu.edu/resource_centre/Internationally%20Funded%20Training%20in%20Biotechnology%20and%20Biosafety_Is%20it%20Bridging%20the%20Biotech%20Divide.pdf

IUCN, UNEP and WWF (1980): World Conservation Strategy: Living Resource Conservation for Sustainable Development. International Union for Conservation of Nature and Natural Resources, Gland.

Mafa, A (editor) and Oneugbu, I.L Geingos (2006). Proceedings of A SADC Regional Workshop on Public Awareness and Participation in Biosafety and the Environment for Civil and Media Organizations, 21-26 May, Creta Hotel, Gabarone, Botswana.

Mayet, M (2009a). Comments on the National Biotechnology Safety Bill of Uganda. African Centre for Biosafety. ACB Briefing Paper No. 8, 2009.

Mayet, M (2009b). Comments on the Biosafety Bill, 2008, of Kenya. African Centre for Biosafety. April 2009.

Meyer, H (1994). Experiences with Public Information and Participation in Germany, pp, 33-42. In Public Information and Participation in the context of European Directives 90/219/EEC and 90/220/EEC. Report of a Seminar held on July 6, 1994, Heemskerk, the Netherlands.

Ministry of Environment and Sanitation. Republic of Mali (2005). National Biosafety Framework Project (GFL-2328-2716-4524). UNEP-GEF Project (GF/2716-01-4319).

Moola, S and Munnik, V (2007). GMOs in Africa: Food and Agriculture, Status Report. African Centre for Biosafety.

National Biosafety Framework for Ghana /[editors Owusu-Biney, *et al.]*. - *Geneva : United* Nations Environment Program, Global Environment Facility ; Accra : Ministry of Environment and Science: Biotechnology & Nuclear Agriculture, Research Institute, 2004

Norwegian biotechnoly advisory board (2003). Sustainability, benefit to the community and ethics.

Norwegian Biotechnology Advisory Board (2004). Co-existence, Apr.

Onyango, V and Schmidt, M (2007). Towards a strategic environment assessment framework in Kenya: Highlighting areas for further scrutiny. Management of Environmental Quality: An International Journal. Volume 18 Issue 3

Owusu-Biney, A (2005). National Biosafety Framework For Ghana - Administrative Guidelines. The Ministry for Environment & Science, Ghana

Panos Report (2005). The GM Debate—Who Decides? An Analysis of Decision-making about Genetically Modified Crops in Developing Countries. The Panos Institute

Queye, E. C et al (2005). Guidelines On Public Participation, Information Sharing And Access To Justice With Respect To Genetically Modified Organisms (by Eric C. Quaye, George Y. P. Klu, Josephine Nketsia-Tabiri, Musheibu Mohammed-Alfa, E. K. Jack-Vesper Suglo, Alex Owusu-Biney). The Ministry for Environment & Science, Ghana

SBC (Schenkelaars Biotechnology Consultancy) 2002. Report of a European Workshop. Public Information and Public Participation in the Context of EU Directives 90/220 and 2001/18.

Schwarte, C (2008). Public Participation and Oil Exploration in Uganda. IIED Gatekepers 138: December 2008.

Schubert, G (1994). The Situation in the Federal Republic of Germany. Pp. 25-32. In Public Information and Participation in the context of European Directives 90/219/EEC and 90/220/EEC. Report of a Seminar held on July 6, 1994, Heemskerk, the Netherlands.

Shumba-Mnyulwa, D and Oneugbu, I. L. Geingos (2009). Biosafety/Biotechnology Capacity Needs Assessment in Namibia. A Country Study for the Namibian Biotechnology Alliance (NABA).

Swanby, H (2009). The Revised African Model Law on Biosafety and the African Biosafety Strategy. African Centre for Biosafety. ACB Briefing Paper No. 9. June 2009

Smith, L (2004). Agriculture in Kenya: What Shapes the Policy Environment? DFiD Report. AG 0150.

Landman, T & Dellapiane, S (2008). Democracy and Development. Issue paper prepared for the Ministry of Foreign Affairs of Denmark.

UNECE (1998). Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention).

UNECE (2005). United Nations Economic Commission for Europe, Report of the Second Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters held in Almaty, Kazakhstan, 25-27 May 2005, Decision II/4 entitled *Promoting the Application of the Principles of the Aarhus Convention in International Forums,* ECE/MP.PP/2005/2/Add.5, 20 June 2005.

UNEP-GEF (2004). Draft National Biosafety Framework for the Republic of Tanzania. UNEP-GEF Report. http://www.unep.org/Biosafety/files/TZNBFrep.pdf

UNEP-GEF (2006). A Comparative Analysis of Experiences and Lessons From the UNEP-GEF Biosafety Projects. Prepared by the UNEP-GEF Biosafety Unit December 2006

UNEP-GEF (2004). Draft National Biosafety Framework for the Republic of Tanzania. UNEP-GEF Report. http://www.unep.org/Biosafety/files/TZNBFrep.pdf

UNEP-GEF (2002). Report of the Sub-Regional Workshops for Anglophone Africa on: Risk assessment and Management and Public Awareness and Participation. November 12-15, 2002, Windhoek, Namibia.

UNEP_GEF (2003). Report of the Subregional Workshop for Francophone Africa on: Risk assessment and Management and Public Awareness and Participation. UNEP-GEF Project on Development of National Biosafety Frameworks. April 22-25, 2003, Dakar, Senegal.

World Commission on Environment and Development *(*WCED*). 1987. "*Our Common Future: A Global Agenda for Change*".* Oxford University Press

WFP (2004). Operational Guidelines on the Donation of Foods Derived from Modern Biotechnology. Executive Board. First Regular Session. Rome, 23–27 February 2004. E. WFP/EB.1/2004/10-C. 11 February 2004.

Scientific References

Bauer, M; Allum, N and Miller, S (2007). What can we learn from 25 years of PUS survey research? Liberating and expanding the agenda. *Public Understanding of Science*; 16; 79-95.

Bauer, M and Gaskell, G, eds., (2002). *Biotechnology. The Making of a Global Controversy*. Cambridge University Press.

Blok, A (2007). Experts on the public trial: on democratizing expertise through a Danish consensus conference. Public Understanding of Science, 16:163-182.

Baylis, J. and Smith, S. (2005). The Globalization of World Politics (3rd ed). Oxford. Oxford University Press. P.454-455.

Beck, U. (1992) *Risk Society: Towards a New Modernity*. London: Sage.

Boeschen, S. (2006). Scientific Cultures of Non-Knowledge in the Controversy over Genetically Modified Organisms (GMO). The Cases of Molecular Biology and Ecology. GAIA 15 (4): 294-301.

Bryant, P. (2008). Mali's Farmers' Jury: An Attempt to Democratise Policy-making on Biotechnology. Participatory Learning and Action. Vol. 58, June 2008. http://www.iied.org/pubs/pdfs/G02530.pdf.

Brown, P. and Mikkelsen, E.J. (1990). No Safe Place: Toxic Waste, Leukemia and Community Action, Berkeley, CA: University of California Press.

Bruno, I. (2009). The 'indefinite discipline' of competitiveness benchmarking as a neoliberal technology of government. Minerva 47:261-280

Burchell, K, Franklin, S and Holden, K (2009). Public Culture as Professional Science. Final Report of the ScoPE Project (Scientists on Public Engagement: From Communication to Deliberation?). London School of Economics and Political Science, and Welcome Trust.

Clapp, J. (2005). The political Economy of Food Aid in an Era of Agricultural Biotechnology. Global Governance 11:467-485.

Clark, N et al (200?) Governing Agricultural Biotechnology in Africa. Building Public Confidence and Capacity for Policy-Making.
http://www.acts.or.ke/pubs/books/index.html

Dahl, R. (1971). Polyarchy: participation and opposition, New haven, CT: Yale University Press

Dyer, G. A et al (2009). Dispersal of Transgenes Through Maize Seed System in Mexico. PLoS one. Volume 4:Issue 5 .e5734, pp. 1-9

Einsiedel, E. and Kamara, M (2006). The Coming of Age of Public Participation. In Gaskell et al (2006). Genomics and Society: Legal, Ethical and Social Dimensions, Earthscan.

ENCODE (2007). ENCODE Research Consortium Press Release: New findings challenge established views about human genome. EMBL-EBI

Felt, U, et al (2007). Science and Governance. Taking European Knowledge Society Seriously. EU Commission Report

Fjaelsted et al, 1998. Sweden. In Durant et el. (1998). Biotechnology in the Public Sphere. Source Book. Science Museum, London.

Fiorino, D (1990). Citizen Participation and Environmental Risk: A Survey of Institutional Mechanisms. Science, Technology, & Human Values, 15 (2):226-243.

Gruning, J, E. (2001). Two-way Symmetrical Public Relations. Past, Present, and Future. In Heath, R. L. (eds). Handbook of Public Relations. SAGE Publications.

Hailu, G. (2000). Environmental Law Ethiopia. International Encyclopedia of Laws. Kulwer Law International. Leuven, Belgium
(http://www.dundee.ac.uk/cepmlp/journal/html/vol9/article9-12.pdf)

Hampel et al (1998). Germany. In Durant et el. (1998). Biotechnology in the Public Sphere. Source Book. Science Museum, London.

Harsh, M. (2005). Formal and Informal Governance of Agricultural Biotechnology in Kenya: Participation and Accountability in Controversy Surrounding the Draft Biosafety Bill. Journal of International Development. 17: 661-677.

Hyland, J. L (1995). Democratic Theory. The Philosophical Foundations. Manchester University Press.

Jaffe, G (2006). Comparative Analysis of the National Biosafety Regulatory Systems in East Africa. EPT Discussion Paper 146. IFPRI. January 2006.

Jelsoe et al. (1998). Denmark. In Durant et el. (1998). Biotechnology in the Public Sphere. Source Book. Science Museum, London.

Kamara, M. W (2009a). The Typology of the Game that American, British, and Danish Crop-and-Plant Scientists Play. *Minerva*, Vol. 47, No 4.

Kamara, M. W, (2009b). 'Nanotechnology and Global Sustainability: The Case of Water Management'. In Wickson et al, (2009). "Nano meets Macro: Social and Ethical Perspectives on Nano Sciences and Technologies". Pan Stanford Publishing.

Kamara, M. W. (2004). The Golden Age of Genetic Engineering: A Challenge to Science. PhD Thesis. TeKsam, RUC, Denmark.

Kamara, M, Coff, C and Wynne, B (2006). GMO and Sustainability: Contested Visions, Routes and Drivers. Report Prepared for the Danish Council of Ethics.

Kamara, M.W.(1999). Making Biotechnology Happen: Danish Agricultural Biotechnology Policy. TEKSAM/RUC publishing.

Kravchenko, S (2007). The Aarhus Convention and Innovations in Compliance with Multilateral Environmental Agreements. Colo. J. Int'l Envitl. L. & Policy. Vol. 18 (1): 1-49.

Kronberger, N (2001). The train departed without us. Public perceptions of biotechnology in ten European countries. Notizie di Politeia, XVII, 63: 26-36.

Kleinman, D. E and Kinchy, A. L (2006). Against the Neoliberal Streamroller? The Biosafety Protocol and the Social Regulation of Agricultural Biotechnologies. Agriculture and Human Values, 24: 195-206.

Korsgaard, Christine M. 1996. The Sources of Normativity. New York: Cambridge University Press.

Leach, M Scoones, I and Wynne, B, eds. (2005). Science and Citizens. Globalization & the Challenge of Engagement. Zed Books.

Levidow, L., Carr, S., Wield, D. (2005) _EU Regulation of Agri-biotechnology: Precautionary Links between Science, Expertise and Policy, Science & Public Policy 32(4): 261-76.

Levidow, L. and Carr, S., eds (2005). _Precautionary Expertise for EU Agbiotech Regulation', special issue, Science & Public Policy 32(4): 257-332.

Levidow, L. (2005) _Governing conflicts over sustainability: agricultural biotechnology in Europe‘, in V. Higgins and G. Lawrence, eds, *Agricultural Governance: Globalization and the New Politics of Regulation*, pp.98-117. London: Routledge.

Levidow, L. and Murphy, J. (2004). _Reframing regulatory science: trans-Atlantic conflicts over GM crops‘, Cahiers d'économie et sociologie rurales 68/69: 47-74.

Levidow, L. (2003). 'Precautionary risk assessment of Bt maize: what uncertainties?', Journal of Insect Pathology 83 (2): 113-17.

Lezaun, J. And Soneryd, L. (2007). Consulting Citizens: Technologies of Elicitation and the Mobility of Publics. Public Understanding of Science 16: 279-297.

Levidow, L., Sogaard, V. and Carr, S. (2002a). 'Agricultural PSREs in Western Europe: Research Priorities in Conflict', Science and Public Policy 29 (4): 287-95.

Moore, D. (2008). The Opinion Makers: An Insider Exposes the Truth Behind the Polls. Beacon.

Myhr, A. I. and Traavik, T. (2002). Sustainable development and Norwegian genetic engineering regulations: Applications, impacts and challenges, Journal of agricultural and environmental ethics, (16) 317-335.

Nature Editorial (2006). Coping with Complexity. Nature.Vol 441.25 May 2006

Onyango V and Schmidt M 2007). Towards a Strategic Environment Assessment Framework in Kenya. Highlighting Areas for Further Scrutiny. Management of Environmental Quality: An International Journal. Vol. 18 No. 3, pp. 309-328.

Pellizzoni, L. (2001). The Myth of the Best Argument: Power, Deliberation and Reason. British Journal of Sociology Vol. 52 Issue No. 1: 59-86.

Pamela, A. A (2006). Developing legal regulatory frameworks for modern biotechnology: The possibilities and limits in the case of GMOs. African Journal of Biotechnology Vol. 5 (15), pp. 1360-1369.

Pearson, H (2006). What is a Gene? NATURE. Vol: 441. 5 May. Pp. 339-441

Rogers-Hayden, T and Pidgeon, N (2007). Moving Engagement “Upstream”? Nanotechnologies and the Royal Academy of Engineering´s Inquiry. *Public Understanding of Science.* 16: 345-364

Rowe, G and Frewer, L. J (2005). A Typology of Public Engagement Mechanisms. Science, Technology Human Values, 30:251-290

Shapin, S (2008). The Scientific Life. A Moral History of a Late Modern Vocation. The University of Chicago Press.

Sturgis, P and Allum, Nick (2004). Science in Society: Re-Evaluating the Deficit Model of Public Attitudes. *Public Understanding of Science*, 13:55-74

Scott, A, et al (2005). Ethics in practice: conversations about biobanks. Critical Public Health 15(4): 359-368.

Storey, A. (2000). The World Bank, neo-liberalism, and power: discourse analysis and implications for campaigners. *Development in Practice, Volume 10, Numbers 3 & 4: 361-370*

Wagner et al (2002). Collective symbolic coping with new technology: knowledge, images and public discourse. British Journal of Social Psychology, 41: 323-343.

Wagner, Wolfgang, Gerard Duveen, Jyoti Verma, and Matthias Themel. (2000). ‗I have some faith and at the same time I don't believe' - cognitive polyphasia and cultural change in India. Journal of Community and Applied Social Psychology 10: 301–314.

Wagner, W (1998). Social Representations and beyond: Brute facts, symbolic coping and domesticated world. Culture psychology 4(3):297-328

Wagner, Wolfgang (2007). Vernacular science knowledge: its role in everyday life communication. Public Understanding of Science 16: 7–22.

Wamboga-Mugirya, P (2008). Uganda gives go-ahead to biotechnology policy. SciDev 11 April 2008. http://scidev.net/en/agriculture-and-environment/agri-biotech/news/uganda-gives-go-ahead-to-biotechnology-policy.html

Wilsdon, J and Willis, R (2004). See-through Science. Why public engagement needs to move upstream. Demos.

Wilsdon, J. et al (2005). The Public value of Science, or How to Ensure that Science Really Matters. Demos.

Wynne, B. (1992a). Uncertainty and Environmental Learning. Reconceiving Science and Policy in the Preventive Paradigm. Global Environmental Change. June, pp. 111-127.

Wynne, B. (1992b). Misunderstood misunderstandings: social identities and public uptake of science. Public Understanding of Science 1: 281-304.

Wynne, B (2001). ―Creating Public Alienation: Expert Cultures of Risk and Ethics of GMOs," *Science as Culture* 10, 445–481.

Wynne, B (2006a). GMO Risk Assessment Under Conditions of Biological (and Social) Complexity. Presentation at the "The Role of Precaution in GMO Policy Austrian Government, EU Presidency Conference, Hofburg, Wien, April 18-19th, 2006".

Wynne, B (2006b). Public Engagement as a Means of Restoring Public Trust in Science. Hitting the Notes but Missing the Music. Community Genetics. 327-T2, pp. 1-10.

Appendix 1: Public Participation Provided by National Biosafety Framework

Source: http://www.unep.org/biosafety/

Algeria	The NBF provides an assessment of the situation on pp 33-36 but does not specify concrete measures: Public participation mechanisms Legal measures and mechanisms must be set up to facilitate and encourage the participation of the public through access to information on LMOs and access to the Biosafety Clearing House and its consideration during the decision-making process (article 23). These measures can translate into modalities of management, publication and dissemination among the public of information related to LMOs, the conditions to be taking into account, opinions and comments in the decision-making and the investigation organization terms and public consultation.
Benin	The NBF provides an extensive public participation strategy on pp 30-41: V - PUBLIC PARTICIPATION, AWARENESS AND EDUCATION IN THE DECISION The populations in fact have the right to know what they get engaged in by consumption and the State the duty to know and inform on what it can engage them in. Better, they have the obligation to effective representation at the negociation table and in the decision process. So as to ensure a full effective public participation four main pillars are necessary: the mechanisms of participation to the transparency and the process responsibility passing through the capacity building to make sure that the participants are well informed and have access to information.
Botswana	2.2 Objectives In order to achieve the goal of the Policy, the objectives are: d) To ensure public participation and access to information; 65. Public Awareness and Participation The Authority shall promote public awareness, participation and education concerning Biosafety matters through the implementation of the National Biosafety Strategy for Public Participation.
Burkina Faso	The NBF provides guidance on pp 29/30: Le mécanisme d'information, de sensibilisation et de participation du public vise à permettre à ce public de prendre en considération les questions liées à la biosécurité dans les actions entreprises pour la

	protection de l'environnement productif, l'augmentation des rendements agricoles, l'autosuffisance en aliments de qualité, et la protection de la santé publique. Cette approche à la population d'acquérir les compétences en matière de biosécurité pour une prise de décision de façon responsable.
Burundi	The NBF provides guidance on PP on pp 54/55: VI.2.2. Public participation The promotion of all stakeholders‘ participation in the biotechnological risk prevention and management is the primary objective in the Biosafety policy. Burundi must use of the formula of partnership with all the people using of biotechnologies. It must be based on the institutions coordinating biotechnological initiatives, local and international NGO, religious congregations, as well as organisational structures of the local communities. [...]This public participation must be based on a regulation which reminds its the mandatory character. Indeed, the public participation constitutes an obligation of the Parties as the Cartagena Protocol stipulates it; moreover, in conformity with its global objective which is "the promotion of modern biotechnology around a participative Biosafety system", Burundi registered "the public involvement in the prevention and the biotechnological risk management in its guidelines" (2nd guideline of 3rd objective.) It would also be necessary to develop a mechanism of evaluating the taking into account of the public opinions in the final decision.
Cape Verdes	E. Consciencialização e participação pública Os processos da tomada de decisão serão transparentes e participativos onde todos os intervenientes relevantes terão acesso à informação adequada e oportunidade de participação. a) Mecanismos para promoção e facilitação da participação, consciencialização e educação pública. Actualmente, não existe um sistema integrado e coordenado para promoção e facilitação da consciencialização pública, nem educação sobre Bio-segurança em Cabo Verde. Contudo, o QNB prevê um procedimento mínimo para a participação pública, onde as agências e instituições relacionadas com a biosegurança deverão consciencializar e educar o público, promovendo uma participação significativa. A participação pública aplicar-se-á a todos as etapas do processo de tomada de decisões sobre a Bio-segurança, desde o momento de recepção da aplicação.
Central African Republic	The NBF provides a strategy on PP on pp 63-67: Participation au processus de décision Cette participation consiste à : - garantir la participation du public à travers une réglementation qui en rappelle le caractère obligatoire, dans le contexte de la gestion de l‘environnement, ainsi que les responsabilités institutionnelles et les modalités de consultation effective des populations ;

	- développer un mécanisme facilitant la prise en compte des résultats des consultations du public dans la décision finale et les modalités d'évaluation de son fonctionnement.
Chad	The NBF provides a strategy on PP on pp 52/53: VIII. INFORMATION, SENSIBILISATION ET PARTICIPATION DU PUBLIC La participation du public est un des principaux principes de droit international en émergence notamment en droit international de l'environnement. Ce principe suppose que les populations soient parties prenantes à l'élaboration des normes. Toutefois avant de participer à l'édification de la norme ou à la loi en droit interne, les populations doivent être sensibilisées sur la base d'informations fiables, claires et précises sur les enjeux de l'heure. En effet, toute participation effective des populations tchadiennes à la mise en oeuvre du programme national de biosécurité que sous-tendent le présent Cadre national de biosécurité et l'imminente Loi nationale sur la biosécurité, nécessite au préalable une appropriation des idées, des concepts relatifs à la biotechnologie et à la biosécurité. Pour atteindre le but espéré, le contenu des idées et concepts doit être traduit dans un langage accessible au public.
Comoros	A) Public Participation The participative approach complies with the country national policy in the framework of the poverty reduction strategy which is a reference paper for any activity or any programme conducted on the territory. The strategy encourages the consultation, debates and discussions at all levels, so as to allow the public to contribute on issues related to the development, especially when they risk having some impacts (positive or negative) on the population. The public participation should allow: - Making biotechnology more accessible to the public which is at times sceptical even suspicious. - The expression of various points of view and debates on biosafety by shedding lights on the main concerns of the different groups concerned whichever way you look at it on biosafety, and take a fully informed position.
Congo, Democratic Republic of	The NBF provides a strategy on PP on pp 96-99: VI.3.3. Public participation The public participation in the decision process relating to the management of GMOs/LMOs assumes its effective involvement in the decision mechanisms defined by this national biosafety Framework and in the decision-making procedures. Besides the participation of the latter in the National Biosafety Committee, the public participation involves, for the CNA, the requirement to inform the population on all the data that will be communicated to it in the framework of the notification. the process of participation provides for the requirement communicating to

	the population all the information and that, in the reasonable time periods and at various phases of the process. It is also about giving the possibility to the public to submit in writing or during a public hearing or a survey, any observation, information, analysis or option that it judges relevant regarding the planned activities putting at stake GMOs/LMOs.
Congo, Republic of	The NBF refers to PP at several occasions: Droit à l'information et la participation du public au processus décisionnel En matière d'élaboration des textes, la procédure administrative adoptée au Congo fait de temps en temps intervenir le public à travers certaines corporations, associations, ONG et la société savante lors des consultations, séminaires et autres forums organisés. Tant que cette participation n'est pas systématisée, la procédure d'élaboration demeure inefficace. Or, les critères de transparence, d'encadrement du public et de gestion participative évoqués plus haut s'imposent comme des éléments incontournables de la veille juridiquerelative à l'information et la participation du public au processus d'élaboration des textes en matière d'utilisation de la biotechnologie moderne au Congo.
Côte d'Ivoire	'The NBF provides an assessment and a strategy on pp 38-42: Participation to the Decision Process This participation consists of: - the public participation through a regulation reminding us of its mandatory character, in the context of the management of the environment, as well as institutional responsibilities and modalities of public effective consultation; - developing a mechanism facilitating the taking into account of results of consultations of the public in the final decision and modalities of assessing its running. Information Mechanism and Public Participation in the Decision Process In the absence of such a mechanism of public participation to decision process proper to biosafety, it is planned to rely on the elements of impact studies of development projects, especially the decree N 96 – 894 of 08 November 1996 determining the applicable rules and procedures relating to the environmental impact of development project which provides in its article 16 a public survey before decision making. The public will be informed of the existence of the Environment Impact Assessment Bureau which will play the role of information bureau on the GMOs with technical support of the experts.
Djibouti	4.2. Public participation to decision-making So that it can take part in an effective way, the public will have to be well informed on the issues of modern biotechnology and biosafety. This can be done by employing the spreading and information methods above-mentioned. The public participation should thus start with the collecting of information at the public the level (Feedback). The creation of a body

	specifically in charge of information, spreading and collecting information which would also represent the public in the decision-making system is thus essential. For that, a public participation group will be created within the National Biosafety Consultative Committee.
Eritrea	The NBF gives guidance on PP on pp 30-34: Many of the national legislations on environmental matters, that have been developed and those that need to be developed in the future, like the Biosafety Policy, should provide mechanisms of public involvement in the process of decision making, as it is an integral component of society democratization and an inevitable right of citizens to have access to information. Many of the national legislations pertinent to environment have not been gazetted and the public knows very little about them. Hence, designing mechanisms of information dissemination and public participation in decision-making and consultations is required and their actual fulfillment and support must be a major component of any environmental plan of action. Mechanisms for participation: The mechanisms for participation in Eritrea should include appropriately established administrative structures (NFP/NCA, SCAs, ministries/institutions, etc.) in terms of assigning responsibilities in implementing the NBF and also in dealing with the overall biosafety issues. All stakeholders need to have access to mechanisms within the government‘s decision-making processes and structures that will allow them to make a contribution.
Ethiopia	24. Public Participation 1. The Authority shall, upon receipt of an application for any transaction of genetically modified organisms or products thereof, make it accessible to the public and relevant government agencies and solicit comments on it. 2. The public may submit the Authority its comments within the period specified under Article 15 of this Proclamation in such a manner as determined by the Authority. 3. The Authority shall ensure that the comments made by the public, and in particular by the communities likely to be affected by the transaction, are incorporated in taking or reviewing its decision. 4. The Authority shall make available to the public information on any transaction, which has been granted or denied authorization.
Gabon	5.2 - Critères de participation des populations Les critères de participation des populations traduisent l‘implication des populations dans l‘appréhension des activités concernées par la biosécurité et au processus de prise de la décision gouvernementale qui leur sera applicable. Les critères d‘une telle participation sont les suivants: - Expression des besoins en matière de biotechnologie moderne. Elle a trait d‘une part aux besoins ressentis par les populations et d‘autre part aux besoins ressentis par le commanditaire (les animateurs du volet

	participation) du projet; - Création des groupes d'intérêt pour s'assurer de la volonté de la population, établir une relation de partenariat et marquer le degré d'engagement. Cette approche par organisation des populations vise la conscientisation, la mobilisation et l'organisation des groupes locaux autour d'un besoin commun ressenti pour résoudre un problème ou satisfaire le ou les besoins exprimés; - Identification et définition des rôles des acteurs impliqués dans le processus de prise de décision pour la mise en place des moyens et ressources nécessaires qui permettront de soutenir financièrement et matériellement les actions relatives à la participation des populations; - Implication des élus locaux à l'élaboration, au suivi de publication des décrets d'application et à la sensibilisation des populations à la législation et aux demandes d'autorisations; - Mise en place par l'ANB des mécanismes de collecte des avis des populations; - Prise en compte des propositions issues des conclusions des préoccupations des populations dans la prise de décision.
Gambia	The NBF provides an extensive PP strategy on pp 65-72: 6.2 Proposed Mechanisms for Public Participation With the establishment of a National Biosafety Authority, the authority can ensure the active participation of all the stakeholders in the implementation or working stage of Biosafety Authority, particularly in ensuring public participation, conducting awareness raising workshops for farmers and the general public. Such an authority will be expected to undertake the production of documentaries on farm-level activities, radio programs, news letters, posters etc. For the smooth implementation of participatory and awareness creation programs, it is proposed that GNBA should establish an IEC component which will coordinate activities with other collaborating institutions on behalf of the Authority.
Ghana	The important role of the public in the deployment of LMOs is spelt out in Article 23 of the Cartagena Protocol. Article 23 (2) requires that the public is consulted in the decisionmaking process regarding LMOs and the results of the decision are also made public while respecting confidential information. In the light of this, there is urgent need for innovative and practical methods for making information accessible to the public. Public education on genetic technologies and LMOs must also be intensified. The processes of educating the people must provide opportunities for the public to freely exchange information thus promoting active participation in decision-making. It is against this backdrop that the ~~–G~~uidelines on Public Participation, Information Sharing and Access to Justice with Respect to Genetically Modified Organisms" have been developed. The guidelines provide a non-legally binding and voluntary framework that emphasizes good practices involving the uses of and specific activities with GMOs.

Guinea	The NBF has a PP strategy on pp 45-48: 4.7 - Consultation L'Autorité Nationale Compétente et le Comité National de Biosécurité organisent des séances de consultation qui offrent la possibilité aux représentants de toutes les parties concernées, y compris le public d'échanger des informations sur le sujet. 4.8 - Participation Le Comité National de Biosécurité en collaboration avec l'Autorité Nationale Compétente assiste les parties prenantes à organiser des séances de travail afin de mettre à contribution les citoyens guinéens dans le processus de prise de décision. Le but visé par ces séances de travail est de permettre aux parties prenantes d'harmoniser leurs positions si nécessaire ou de signifier leur désaccord sur le sujet.
Guinea-Bissau	8.3.2. Public information, awareness and participation: Public awareness, education/training and participation are the three main domains of public information in accordance with the Articles 9 and 10 of the new legislative regime and these rights are granted under the framework of the National Environmental Management Plan and general obligations contained in the legislation on environmental impact assessment and audit within the country. Article 9 Public awareness and participation 1. The Ministry responsible for the Environment, in collaboration with the National Biotechnology and Biosafety Commission, shall establish efficient mechanisms for public awareness and participation and it shall: a) Facilitate public access to the accurate information including the information on application process and the decisions taken, without prejudice to the confidentiality of information granted under the law. b) Disseminate the available data on the matter. c) Enforce compliance to the obligations for information required from the users and all entities that perform activities involving GMO either *in natura*, processed or derivatives. d) Promote public participation in decision making process and take into account their inputs in decision making relating to the application for activities with Genetically Modified Organisms.
Lesotho	The NBF elaborates on PP on pages 29-32: The National Biosafety Policy of Lesotho would ensure the creation of public awareness and understanding of biotechnology and biosafety is such that public opinion is incorporated at all levels of decision making regarding the use and application of biotechnology. It would be required by law that the National Biosafety Council (NBC), should take public opinion into consideration in decision making. No decision would be considered legitimate if public opinion was never considered. (Please

	refer to the Policy and the Bill for details).
Liberia	No specific provision
Libya	Important ways for public participation are: A – Collection of public views and proposals using the following mechanism: • Obtain the views of the public through various information collection models such as direct, paper or electronic data collection including possibly interviews (Internet questionnaires). • Access to important data and details of the proposals, analysis and development and risk management plans for the application relevant to the public. B - Public participation in decision-making and development and solutions in the following ways: • Direct communication with the public through workshops, seminars, forums, lectures, meetings and media awareness days, which highlights the importance of safe application of biotechnology and how to reduce the risks on the environment and biodiversity. • Participation of the officials and decision-makers and the expression of their views and suggestions on the safe applications of Biotechnology and the discussion with the experts across various media. • Establishment of constructive views agreed unanimously that may contribute to the introduction of safe Biotechnologies particularly genetically modified crops and microorganisms for economic development and food security, taking into account the safety precautions approved by the Cartagena Protocol.
Madagascar	The NBF provides a PP strategy on pp 17-19: The Biosecurity National Policy thus aims at the following objectives: to address the issue of GMO in a rational, objective and secure way on the basis of well controlled information , a restricting legal tool, appropriate technical and scientific capacities and according to a process of decision-making implying the public participation. Public Participation - *Specific objective* The objective is to make the country able to address the GMO issues in a rational, objective and secure way, on the basis of well controlled information and participation of an educated public aware of the matter The public participation has five main objectives: - the ministries and the decision makers are informed and their awareness is raised on the GMO stakes ; - a mechanism of information circulation is operational with an active contribution of all the structures at all the levels; - the GMO issues are integrated in the education system (formal and nonformal systems); - the decisions taken relating to the GMO correctly reflect the results of the public participation and specific capacity building is carried out as

	regards GMO
Mali	CHAPTER VI: PUBLIC PARTICIPATION Article 13: The National Competent Authority must, when receiving the notification mentioned at the article 11 and at article 12, make public the pertinent information and inform the concerned ministries. Article 14: The public can give its written opinion within the time limit that will be specified by the National Competent Authority. Any person that challenges the National Competent Authority can seek a counter expertise while bearing the costs pertaining to that. Article 15: The National Competent Authority can decide to organise a public consultation concerning a project of import, contained use, release or placing on the market of a genetically modified organism or the derived product of a genetically modified organism. The consultation can then be announced in the national media and take place at least 15 days before the decision is taken. The public consultation, according to the national law and regulation will respect the confidential nature of information Article 16: The National Competent Authority must, during the review of its decision, take into accounts opinions and concerns of the public, expressed according to the articles 13 and 14 of this law. Article 17: The National Competent Authority makes public the following information: − those relating to genetically modified organism or the derived product of a genetically modified organism for which the import, the contained use, the release or the placing on the market is authorised or denied; and − in particular, any risk assessment report about the genetically modified organism or the derived product of the genetically modified organism
Morocco	The NBF elaborates on PP on pages 80-85: No specific provisions
Mozambique	The NBF provides an extemsive PP strategy on PP 87-90 + Annexes on PP and information sharing: Article 19 Public awareness, education and participation The MINAG shall coordinate, in collaboration with the NBC, the activities on public awareness, education and participation in decision-making process on GMOs and their products and it shall ensure the access of public to information on decisions concerning GMOs without prejudice to the confidentiality granted under the applicable legislation.
Niger	The NBF provides an extensive strategy on PP on pp 43-61: Le cadre proposé place la participation du public au coeur du processus. En effet, la participation du public aux prises de décision apparaît essentielle au devenir de plusieurs dossiers liés à la gestion de risques biotechnologiques. En revanche, elle n'a pas vocation à remplacer les responsabilités de l‘autorité publique, mais bien plutôt à d‘appuyer cette

	dernière. De telles décisions exigent des repères scientifiques, certes, mais également une large participation du public. La participation du public largement exposée dans ce document, doit être sérieusement prise en compte. Les mécanismes et les différents outils décrits dans les systèmes d'information et de participation du public permettront d'atteindre cet objectif.
Nigeria	The NBF provides an extensive strategy on PP on pp 109-116: Goals and objectives of Public Participation and Awareness in Biosafety Framework The goals and objectives of the public participation and awareness component of the Biosafety framework shall include the following: (i) Recognition of the public as a lawful collaborator (ii) Provision of timely, accurate and consistent information on the principles and advances in Biosafety through credible sources (iii) Raising awareness amongst the various stakeholders on issues relating to Biosafety. (iv) Documentation and dissemination of relevant information to as wide an audience as possible (v) Encouragement of public presentations and open debate (vi) Acknowledge that the issues are multi-disciplinary, not limited to science only.
Rwanda	6.2 Public Participation in the Decision Making Processes The Registrar shall arrange for public consultation, through public hearings, written submissions, consultative meetings with various groups, etc., with regard to any import, transit, contained use or placing on market any GMO, and necessary steps shall be made to ensure that media with national coverage shall be used. Although the NCA shall have discretion on the final decisions, these must as much as possible reflect the expressions and concerns of the public *(article 26, para iii and iv of the National Biosafety Bill).*
Sao Tome & Principe	The NBF is essentially the same as of Mozambique: Article 21 Public awareness, education and participation The MARDP shall coordinate the activities on public awareness, education and participation in decision-making process on GMOs and their products and it shall ensure public access to information on decisions concerning GMOs without prejudice to the confidentiality granted under the applicable legislation.
Senegal	3.8 – Participation du public L'établissement et le maintien d'un mécanisme efficace de biosécurité nécessitent une procédure transparente et fiable impliquant l'information et la participation du public dans le processus de prise de décision. Cela

	nécessite aussi une sensibilisation et une coordination dans les actions des divers ministères du gouvernement, des universités et instituts de recherche, du secteur privé et du public en général. L'approche adoptée pour informer, sensibiliser, éduquer le public sur les questions de biotechnologies et de biosécurité, en vue de sa participation dans le processus décisionnel diffèrent en fonction du contexte socio-culturel.
Seychelles	The NBF contains a descriptive annex on PP on pp 56-58 1.5 Public Awareness and Public Participation Committee (PAPPC) PAPPC consists of three members from the National Coordinating Committee and a journalist. The main roles of the PAPPC were to facilitate the dissemination of information and to ensure public awareness and participation for the duration of the project. As Seychelles is more likely to be impacted from Modern Biotechnology through commodity import, a committee was set up under the chairmanship of National Consumer Forum (NATCOF) to design ways to communicate Biosafety issues, techniques, practices and the application of modern biotechnology to the public.
Sierra Leone	The NBF contains a strategy on PP on pages 40/41: 30 Notwithstanding any enactment and without prejudice to any provision in this Regulation, and in order to foster good practices for public participation and in pursuance of an open, transparent, efficient and accountable decisionmaking process on activities with GMOs, the Competent National Authority should: *i.* Encourage potential notifier or applicant to identify the public concerned, to enter into discussions and to provide information as set out in Fifth Schedule regarding the objectives of their application before notifying or applying for a consent or permit for all activities with GMOs, *ii.* Allow the public to submit, in writing or, as appropriate, at a public hearing or inquiry (with the notifier or applicant), any comments, information, analyses or opinions in relation to the proposed activity with GMOs, *iii.* Provide opportunities for members of the public concerned to seek and obtain information relevant to the decision making procedure, *iv.* Ensure prompt information of the public through the necessary channels – *Gazette*, website, newsletter, radio, television, bill *Public Participation in the Decision Making Process* boards and flyers – on decisions taken, *v.* Provide for response of the public to such decisions within fourteen days of the last publication in the *Gazette* or media or after the public hearing or inquiry, *vi.* Make accessible the text of the decision and the reasons and considerations on which the decisions were based and indicating how due account has been taken of the contributions of the public, *vii.* Consider the participation of the public on renewal of consent or permit and on updates of the operating conditions for a specific activity

	with GMO, *viii.* Encourage to explore mechanisms for consensus conferences, round table discussions, stakeholders dialogues and citizens‘ juries on issues relating to risk assessment and management of GMOs. *ix. Promote and facilitate public awareness, education and participation concerning the safe transfer, handling and use of GMOs in relation to the conservation and sustainable use of biological diversity, taking into account risks to human health. In doing so, the National Focal Point should cooperate, as appropriate, with other states and international bodies.*
Sudan	The NBF provides an extensive strategy on PP on pp 15-22: 5.6.2 Mechanisms for participation in decision making Generally, the following mechanisms are used to ensure public participation in the decision making process: • Legal frameworks that provide for the rights of the public to have access to information and to be consulted and involved when making decisions that affect their lives. • Publishing applications for approval of GMOs in an official register as a routine work, giving the public the chance to comment within a specific period of time. This could be taken further by organizing meetings for consultation on the public comments before taking the final decision . • Consultation could be carried out at different levels in the country including the local, state, regional and national levels. • On-going reviewing of biosafety procedures by bodies formulated from the stakeholders. • Formation of advisory committees those are independent from the government and industry with broad representation of the stakeholders. • Convening workshops and seminars targeted to specific groups such as farmers, journalists, local council, residents, consumers, industry representatives. • Bottom-up participatory processes that are facilitated by credible and experienced NGOs, which can help to include stakeholders who risk being left-out of government led consultation processes.
Swaziland	The NBF elaborates on PP on pp 56/57: A process of public notification that has been used successful by the Swaziland and Environment Authority when seeking for public comment in environmental impact assessment report is using the national libraries and newspapers. This arrangement is will be followed for public participation in handling of modern biotechnology request. In this case, the public will be given 60 days to respond to application and after a decision has been reached, those who had queries will be informed of the decision through the same avenues.
Tanzania	The NBF provides an extensive PP strategy on pp 31-35:

	Public awareness and participation shall apply to all stages of the biosafety decision-making process from the time the application is received. In conducting these processes, the following minimum requirements should be followed: a) Notice to all concerned stakeholders, in a language understood by them and through media to which they have access. Such notice must be adequate, timely, and effective. b) Adequate and reasonable time frames for public participation procedures. c) Public consultations, as a way to secure wide input into the decisions that are to be made. These could include public hearings in certain cases, particularly where there is public concern about the proposed measures. These consultations should encourage exchanges of information between applicants and the public before the application is acted upon. Dialogue and consensus building among all stakeholders should be encouraged. d) Procedures for public participation should include mechanisms that allow public participation in writing or through public hearings, and which allow the submission of any comments, information, analyses or opinions. Public opinion as gauged through the procedures for public participation must be taken into account in the decision. The public must be informed of the final decision promptly, have access to the decision, and must be provided with the reasons and considerations resulting in the decision.
Togo	The NBF provides a PP strategy on pp 63-66: 9.6 Public participation mechanism stages The participation of the public shall comply with EIE regulations in Togo. The said participation forms part of the biosafety-related decision-making process. Its specificity is based on the phases of that mechanism. In order to ensure an effective participation, the CNA shall jointly organise all activities of Public Committee bureaux. Mechanism agreed upon in Togo takes into account public participation, public awareness and public education on biosafety issues.