STAKEHOLDER INVOLVEMENT IN THE DEVELOPMENT OF GENETICALLY MODIFIED (GM) FOOD LABELLING POLICY IN SOUTH AFRICA

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ABSTRACT

Like many other countries worldwide, South Africa has come under public pressure to introduce mandatory GM labelling. Although there is an increased understanding about the social and political implications of GM labelling in developed countries, there is still a research gap with regard to implications for developing countries. South Africa, as a country that consumes, produces and trades GM food, represents a fitting case study to investigate these dimensions in the context of a developing economy. There has been very little understanding about how the mandatory labelling law for GM food developed in South Africa. This study, thus, aims to analyse how this policy developed and has been implemented in South Africa, in order to draw wider conclusions about GM food labelling in developing countries. This has been achieved through review of the relevant literature, in-depth interviews with 27 stakeholders from industry, government, NGOs and the academic and scientific community, and document analysis. A stakeholder analysis approach was used for framing and informing the research findings of this study. This framework provided a stakeholder perspective through which to examine the policy development process of mandatory GM labelling.

Findings from this research project reveal that the policy governing the mandatory labelling of GM foods in South Africa was developed and shaped by many significant events and decisions. However, the law evolved within a context of conflict from a diversity of stakeholders. Stakeholders, who participated in and contributed towards the process, had their own degree of “interest and power”, which influenced and impacted on the GM labelling policy-making and the implementation processes. Research revealed that there were important issues that emerged during the policy development and implementation phases. These included: the effectiveness of stakeholder participation; the use of a “may contain” label; the percentage of the threshold level; and labelling costs. The stakeholders’ viewpoints on each of these issues differed among different groups.

Results also revealed that the implementation of mandatory GM labelling encountered several problems – namely, interpretation issues or challenges; the lack of communication by the National Consumer Commission (NCC) with other stakeholders in clarifying and rectifying ambiguities; the lack of recourse for non-compliance; an inefficient Commission; and an absence of a government-enforcement agency. Implementation continues to remain a challenge, and its effectiveness relies on food companies' own understandings of the regulations, with or without ambiguities in the law.

Findings affirm the need for best-practice participation to develop GMO labelling policies in other developing countries by offering "deliberative spaces" for meaningful stakeholder debate, and increasing the representativeness of stakeholders in policy development processes. Government departments need to improve their relationships and increase the allocation of financial and human resources. Civil society can positively contribute to public awareness by monitoring compliance and establishing consumer protection groups. The agri-food industry needs to recognise consumer rights and be more accountable and transparent. Thus, government needs to create and show a public participation process, that is believable by all role-players, and resolve larger policy questions regarding the adoption or rejection of GMOs, before the start of the participatory process.

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LIST OF ACRONYMS

ACB	African Centre for Biosafety (On the 7th of April 2015 the African Centre for Biosafety officially changed its name to the African Centre for Biodiversity)
Agbiz	Agricultural Business Chamber
ARC	Agricultural Research Committee
BDAASA	Biodynamic Agricultural Association of Southern Africa
BIOWATCH	Biowatch South Africa
BUSA	Business Unity South Africa
Bt	*Bacillus thuringiensis*
CCFL	Codex Committee on Food Labelling
CCRD	Consumer & Corporate Regulation Division
CGCSA	Consumer Goods Council of South Africa
COSATU	Congress of South African Trade Unions
CPA	Consumer Protection Act 68 of 2008
CPB	Consumer Protection Bill
CPBioS	Crop and Plant Biotechnology Services
CPG	Consumer Protection Group
DAFF	Department of Agriculture, Forestry and Fisheries
DST	Department of Science and Technology
DOH	Department of Health
DTI	Department of Trade and Industry
EC	Executive Council
EJNF	Environmental Justice Networking Forum
ELA	Earthlife Africa
ESSET	Ecumenical Service for socio-economic transformation
EU	European Union
FAO	Food and Agriculture Organisation
FAWU	Food and Allied Workers Union
FCDA	Foodstuffs, Cosmetics and Disinfectants Act 54 of 1972
FDA	Food and Drug Administration

GE	Genetically Engineered
GEOs	Genetically Engineered Organisms
GM	Genetically Modified
GMO/s	Genetically Modified Organism/s
GSI	Grain Silo Industry
HSRC	Human Sciences Research Council
HT	Herbicide Tolerance
IP	Identity Preservation
IR	Insect resistance
ISAAA	International Service for the Acquisition of Agri-biotech Applications
NCC	National Consumer Commission
NCF	National Consumer Forum
NCM	National Chamber of Milling
NGO	Non-governmental organisation
PACSA	Pietermaritzburg Agency for Christian Awareness
PUB	Public Understanding of Biotechnology
rBST	Recombinant Bovine Growth Hormone
SAAFoST	South African Association for Food Science and Technology
SACC	South African Council of Churches
SAFCEI	Southern African Faith Communities' Environment Institute
SAFeAGE	South African Freeze Alliance on Genetic Engineering
SAGENE	South African Committee on Genetic Experimentation
SANCU	South African National Consumers' Union
SANSAS	South African National Accrediting Services
SANSOR	South African National Seed Organisation
SE	Substantial Equivalence
UFS	University of the Free State
UK	United Kingdom
US	United States
VR	Virus Resistance
WESSA	Wildlife and Environment Society of South Africa
WFP	World Food Programme

WHO World Health Organisation

WTO World Trade Organisation

CHAPTER ONE – INTRODUCTION

1.1 Introduction

Worldwide, there is ongoing controversy over genetic modification (Gaskell, 2004). This debate has increased consumer concerns over the safety and risks associated with genetically modified (GM) food (Phillips and McNeill, 2002); and many countries, including South Africa, have come under public pressure to introduce and implement labelling regulations. The labelling of GM food is one of the most highly disputed food issues of the 21st century (Klintman, 2002; Bansal and Ramaswami, 2010). Since the introduction of the first labelling policies for GM food in 1997 by the European Union (EU), the growth in legislation, policies, regulations and requirements governing the labelling of GM foods has been significant across the globe (Phillips and McNeill, 2002). Subsequently, many developed countries have adopted some form of labelling policy for GM food (Guère and Rao, 2007).

These include the United States (US), the European Union (EU), Canada, Australia, New Zealand, Japan, Hong Kong and outside the EU, both Norway and Switzerland (Guère and Rao, 2007; Gruère et al., 2009). Several developing countries have also adopted laws, policies or regulations that require the labelling of GM food, namely: China, Brazil, South Africa, Russia, Indonesia, India, Kenya and Thailand. However, the majority have yet to fully implement or enforce these laws (Gruère and Rao, 2007; Bansal and Ramaswami, 2010).

Those countries with regulations and/or policies governing the labelling of GM food differ greatly in terms of the characteristics of these approaches and the degree to which they are implemented (Guère and Rao, 2007; Bansal and Ramaswami, 2010). Some countries have opted for a voluntary labelling approach – with guidelines; while others have approved mandatory labelling requirements for GM food (Guère and Rao, 2007; Zainol et al., 2013). Severe scrutiny of these new regulations or systems has also grown (Einsiedel, 2000) and the labelling policies for GM food have become extremely controversial; as the different views on the labelling requirements vary greatly (Caswell, 1998; Hu et al., 2005; Bansal and Ramaswami, 2010; Zainol et al., 2013).

One of the many questions shaping debates on present- day biotechnology is whether the labelling of GM foods should be mandatory or voluntary (Zainol et al., 2013). Although many proponents describe the benefits of GM foods, and modern biotechnology, there is, nevertheless, substantial evidence of the risks that these foods present to human and animal health, and to the environment (Zainol et al., 2013). This debate over the safety of GM foods is also reflected in the labelling of these foods (Zainol et al., 2013).

Almost 40 countries, including South Africa, have introduced mandatory GM labelling (Gruère et al., 2009; Viljoen and Marx, 2013). The EU countries hold the most stringent mandatory labelling regulations – with Japan and Australia having less stringent (intermediate level) mandatory labelling requirements (Gruère and Rao, 2007; Gruère et al., 2009). The primary purpose of mandatory GM labelling is to ensure consumer information and choice (Gruère and Rao, 2007). It has, however, been argued that mandatory labelling of GM food in developed countries does not provide consumer information and consumer autonomy. This is because GMO products have been driven out of many developed countries' markets; producers, consequently, only offer non-GM foods and so, the mandatory labelling system does not then fulfil its intent (Carter and Gruère, 2003a; Gruère and Rao, 2007).

As Table 1.1 illustrates, few developing countries have approved, introduced and implemented mandatory labelling for GM foods (Gruère and Rao, 2007; Gruère et al., 2009; Viljoen and Marx, 2013). China, Brazil, India, South Africa, and recently Kenya, are among the few developing countries that have done so (Gruère and Rao, 2007; Viljoen and Marx, 2013; Oh and Ezezika, 2014). However, many of these countries have not yet fully implemented or enforced these laws – resulting in an absence of studies showing the effects of mandatory labelling on "consumer choice, consumer information, food marketing, and international trade" in developing countries (Gruère and Rao, 2007:56).

Table 1.1: Countries that have adopted mandatory GM labelling (Source: adapted from Gruère and Rao, 2007)

Mandatory Labelling	
Developed countries	**Developing countries**
EU countries: include Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. Australia, Japan, New Zealand, Norway, Saudi Arabia, South Korea, Switzerland and Taiwan	China, Brazil, Russia, India, Kenya and *South Africa*

Since mandatory labelling in developing countries has been to a large extent unimplemented, or only partially implemented and enforced, and thus ineffectual, studies specifically looking at the effects of mandatory labelling on consumer information and choice have been limited (Bansal and Gruère, 2012). This study aims to help fill this research void.

1.2 Rationale for the study

Although there is increased understanding of the social and political implications and/or complexities of GM labelling in developed countries, there is a research gap with regard to the implications for developing countries. South Africa, as a country that both consumes and produces GM food, represents an ideal case study to explore these dimensions in the context of a developing economy. The South African Consumer Protection Act 68 of 2008 (SACPA) includes a provision for mandatory labelling of GM goods or ingredients or components in food (Viljoen and Marx, 2013).

Although the CPA was passed into law in 2009, it only came into effect in April 2011; while its regulations, making provision for GM food labelling, came into force in October, later that same year (Consumer Protection Act, No. 68 of 2008. Regulation 293, 2011). There has been little understanding of how the mandatory labelling law for GM food developed in South Africa. Key areas requiring investigation include the central influences on its

development; the specific stakeholder roles that were played in the evolution of the policy; the incorporation of stakeholders' perspectives, interests and needs in the policy; the contentious issues that arose, and how these were resolved; and lastly, the stakeholders' influences on the development, decision-making and implementation processes of the policy. In addition, little research has been done on the effects that the policy has had on consumer choice, consumer information, food marketing and international trade. This highlights South Africa as an ideal case study for other developing countries which have adopted mandatory labelling regulations; for those that they have found their policies to be ineffectual; or for those developing countries which have not yet adopted a mandatory labelling approach.

This research provides an opportunity to analyse how policy governing the labelling of GM foods has developed in South Africa, how this has been implemented, and what such enforcement means in a developing country. The intention is to examine and assess the problems and opportunities that arise from the legislation, thereby helping to inform other developing countries that are considering mandatory labelling for GM foods. The analysis also intends to suggest various possible improvements to South Africa's own legislation.

1.3 Research aim and objectives

The overall aim of this research is to analyse the development and implementation of mandatory GM food labelling policy in South Africa, in order to draw wider conclusions about GM food in developing countries. The four research objectives that underpin this aim are:

1.3.1 Objectives

1. To describe the development of GM food labelling policy and law in South Africa.

2. To elucidate the roles that those involved in the food production chain, and other stakeholders, have played in the evolution of the policy and its implementation.

3. To analyse the extent to which stakeholder perspectives, interests and needs were addressed in the policy development process.

4. To identify the blockages and/or opportunities that would impede or facilitate the implementation of the GM food labelling policy and law in South Africa.

Table 1.2 addresses the objectives, the relevant chapters, and the methods used to achieve the objectives.

Table 1.2: Linking methods to research objectives and chapters

RESEARCH OBJECTIVES ⇨	METHODS OF DATA COLLECTION ⇨	CHAPTER
1. To describe the development of GM food labelling policy and law in South Africa.	• Document Analysis: Collect, review, interrogate and analyse relevant documents (see table in Appendix B) • Semi-structured Interviews with the food industry, NGOs, government and, academic and scientific community	**5. Policy development**
2. To elucidate the roles that those involved in the food production chain and other stakeholders have played in the evolution of the policy and its implementation.	• Document analysis • Semi-structured Interviews with relevant stakeholders	**4. Key stakeholders** **5. Policy development**
3. To analyse the extent to which stakeholder perspectives, interests and needs have been addressed in the policy development process.	• Document analysis • Semi-structured Interviews with relevant stakeholders	**6. Stakeholder perceptions**
4. To identify the blockages and/or opportunities that would impede or facilitate the implementation of the GM food labelling policy and law in South Africa.	• Semi-structured Interviews with the relevant stakeholders	**5. Policy development** **6. Stakeholder perceptions**

1.4. Thesis structure

This thesis has eight chapters, which are set out as follows:

Chapter One has provided an introduction to the study, a rationale for the research, as well as introduced the overall research aim and objectives of the study.

Chapter Two presents and reviews the literature relevant to GMOs, the global GMO debate, the international and local contexts of GM labelling, as well as the context of the GMO debate in South Africa. This chapter provides the theoretical GM labelling arguments that inform this study.

Chapter Three describes the research approach and methods used to collect and analyse both the quantitative and the qualitative data. The chapter further explains the stakeholder-analysis approach used as the theoretical framework, which informed this research.

Chapter Four provides the background context of the stakeholders involved in the GMO debate in South Africa. It also identifies and explains the roles that the key stakeholders have played in participating in the policy development process for mandatory GM labelling in the country.

Chapter Five describes in detail, the development of the GM food labelling policy and law in South Africa, and elucidates the roles that those involved in the food-production chain and other stakeholders have played in the evolution of the policy and its implementation.

Chapter Six identifies and describes the stakeholder issues that arose after analysing all the stakeholder perspectives, interests and needs that transpired during the policy process.

Chapter Seven brings all the findings together and discusses them in relation to the GM labelling debate literature reviewed in Chapter Two and the overall aim and objectives.

Chapter Eight presents the conclusions of this study, and provides recommendations for best-practice stakeholder participation, policy-making and implementation.

CHAPTER TWO – LITERATURE REVIEW

2.1 Biotechnology, genetic modification and genetically modified organisms

Biotechnology is not a new development: It dates back many millennia to the development of bread, beer (brewing), wine (fermentation), cheese-making – and later on to industrial chemicals and antibiotics (Pretty, 2001; Chassy, 2007). Modern biotechnology, however, is very different. One of the key mechanisms of biotechnology is genetic engineering (GE) (Ahmad et al., 2012). It involves the transfer of DNA, whereby specific genes from the chromosome of one organism are transferred and inserted into the chromosomes of another organism (Pretty, 2001; Ahmad et al., 2012). These organisms, whose genomes have been transformed by the insertion of a foreign gene or genes from another species or unrelated organism, become known as transgenics or genetically engineered organisms (GEOs) (Mehrotra and Goyal, 2013). Thus, the recipient organism expresses traits normally associated with the donor, such as pest resistance or herbicide tolerance (Pretty, 2001; Mehrotra and Goyal, 2013).

Conventional plant and animal breeding has been used by agriculturalists to select desirable traits for some 10 thousand years (Chassy, 2007; Bruce, 2012). This was done, for example, by selecting and growing fatter-grained seeds, selecting seeds from plants which had the best qualities, selecting heavier animals and those hardy to changing environments, and by using cross-fertilization for different species of plants (Uzogara, 2000; Bruce, 2012). Although the traits selected through genetic modification are not entirely different from those sought by conventional plant-breeding methods, genetic modification enables genes to be transferred across species' boundaries, thereby allowing for the development of specific traits, which previously had been difficult to produce (Qaim, 2009; Ahmad et al., 2012). According to Viljoen et al. (2006:73): "GE has the potential to produce improved varieties in terms of quality and yield traits, [and to do so] more quickly than traditional breeding." Plant scientists (biotechnologists), by using GM techniques to modify crops for enhanced resistance to a host of stresses, such as herbicides, insecticides, viruses, as well as both abiotic and biotic stresses, are trying to increase crop production by generating crops

with increased yield and nutritional quality, and improved production of vaccines, antibodies and biofuels (Ahmad et al., 2012; Mehrotra and Goyal, 2013).

2.2 The evolution of transgenic crops

In 1983, a method for creating transgenic plants was discovered, whereby scientists succeeded in using the *Agrobacterium tumefaciens* (bacteria) to insert a foreign gene for antibiotic resistance to kanamycin into tobacco plants (Nottingham, 2003; Matthews, 2010). During the next five years tobacco, along with other transgenic plants, were experimentally released into the environment (Nottingham, 2003). Following their introduction, genetically modified (GM) plants of "about 100 plant species" have been created, which exhibit increased resistance to insects, pests, diseases and abiotic stresses (Ahmad et al., 2012:526). Since 1996, a number of countries have adopted GM crop production (Brookes and Barfoot, 2014). By 2014, 28 countries, of which 20 were developing and eight were industrial countries, including South Africa, had become biotech countries (James, 2014).

There has been a dramatic increase in the cultivation of GM crops over the past 18 years, with the global planted area in 2014 reaching over 181 million hectares. Nineteen of the countries accounting for production have been classified as biotech mega countries, growing 50 thousand hectares or more of GM crops (James, 2014). Today, the world's leading producers of GM crops are the US, Brazil, Argentina, India, Canada, China, Paraguay, Pakistan, South Africa, and Uruguay (Mehrotra and Goyal, 2013; James, 2014). More than ten GM crops are approved for commercial planting, which include main commodities such as maize, soybean, cotton and canola, and fruits and vegetables such as papaya, eggplant and squash (James, 2014). Recently, there has been a selection of newly-approved GM crops which are planned for commercialisation in 2015, as well as the future. These include the Innate™ potato in the US, *Bt* brinjal/eggplant in Bangladesh and sugarcane in Indonesia (James, 2014). Four major GM traits exist or are being deployed in commercial GM crops, which include herbicide tolerance (HT), insect resistance (Bt or IR), virus resistance (VR), and stacked traits[1] (James, 2013).

[1] Transgenic crops containing more than one trait, for example, insect resistant and herbicide tolerant maize.

2.3 What sparked the controversy?

The 1990s saw the launch of the first biotech food becoming available to the public. The first approvals were for Pfizer Corporation's GE rennet used in the cheese-making process, and for the meat and milk of cows treated with the recombinant bovine growth hormone (rBST) (a synthetic growth hormone for cows) (Uzogara, 2000). Following this, in 1994, the first commercial GM crops were planted (tomatoes), and approved for sale by the US Food and Drug Administration (FDA) (Uzogara, 2000; Brookes and Barfoot, 2014). However, this first GM whole food of Calgene Corporation's "longer-lasting" Flavr Savr tomato, modified to delay rotting, was later removed as the high costs discouraged consumers (Matthews, 2010; Stone, 2010).

In 1996, the first GM foods sold in the United Kingdom (UK) were tomato purée and vegetarian cheese (Nottingham, 2003). Both supermarket chains (Sainsbury's and Safeway) that introduced the purée into the UK market decided to label the product voluntarily (Nottingham, 2003; Scholderer, 2005). Similarly, the Co-op supermarket chain selling the vegetarian cheese chose to label the GM product voluntarily (Nottingham, 2003). While the public's reaction to the labelled GM food product was calm, "experiences were rather mixed" as "market shares rose quickly, but declined rapidly – after the promotional activities had ceased" (Scholderer, 2005:266).

In 1996, the US shipped unlabelled GM soybeans, developed by Monsanto, the US-based multinational agricultural biotechnology company, into Europe (Gaskell, 2004; Scholderer, 2005). This incident was exposed publicly, which led to strong criticism from environmental and consumer groups due to safety concerns about GM food entering the food chain (Carter and Gruère, 2003a; Scholderer, 2005). Until then, the public debate had been relatively subdued, however, this trigger event – coupled with previous food scares involving bovine spongiform encephalopathy (BSE– mad cow disease) in the UK, dioxin-contaminated foods from Belgium, and the cloning of Dolly the Sheep in 1997, further decreased public confidence in governments and the European food-supply chain, and created public distrust in GM food (Whitman, 2000; Gaskell, 2004; Scholderer, 2005). In addition, public trust in scientific authority and in the competency of the overall regulatory process was also

affected (Gaskell, 2004). Thus the situation became more volatile in Western Europe, and GM crops and foods also faced increasing opposition in various parts of the globe (Stone, 2010). In response, the EU implemented the first mandatory labelling regulations for GM food (Scholderer, 2005).

2.4 The debate about genetic engineering in agriculture and food production

The release of GMOs into the environment, and the marketing of GM foods sparked a scientific and public controversy with a strong polarisation in views between two distinct groups: GMO opponents or critics, who were genuinely concerned about the environmental and health consequences of GM crops – and those GMO proponents or supporters, who believed in their environmental and health benefits (Buiatti et al., 2013; Hartman, 2014). The debate is still ongoing and prevalent, and it does not only concern or include GM crops and foods but, according to Scoones (2008:315) is "about the future of agriculture and small-scale farmers, about corporate control and property rights and about the rules of global trade. In sum, a debate not just about the pros and cons of a particular set of technologies, but about politics and values and the future of agrarian society".

2.4.1 Environmental risks and benefits

2.4.1.1 Genetically modified crops

2.4.1.1.1 Cheap, successful and environmentally safe

GMO proponents support the production of GM crops, stating that transgenic crops with agronomic traits have greater advantages than those of wild species, with only some constraints (Ahmad et al., 2012). Advocates of GMOs further point to evidence that first-generation GM crops involving "improvements in agronomic traits", by expressing the enhanced resistance to environmental stresses, such as herbicides, pests and diseases, are able to increase crop productivity (Qaim, 2009:666; Ahmad et al., 2012; Buiatti et al., 2013). Thus, it is argued that GM crops are paramount in meeting the ever-increasing global populations' food demand (Ahamd et al., 2012; Mehrotra and Goyal, 2013). GM crops and foods are also claimed to improve both the nutritional quality and the shelf-life of foods,

and enhance biofuel, vaccine and antibody production (Uzogara, 2000; Mehrotra and Goyal, 2013). In addition, first-generation GM crops are believed to directly benefit farmers and the natural environment; and supporters argue that although many consumers see no direct benefits from consuming first-generation crops, the next generation of GM crops may provide health benefits aimed at consumers (Buiatti et al., 2013; Chen and Lin, 2013).

Herbicide-tolerant crops, such as glyphosate-tolerant soybeans, are produced by using an agrobacterium gene tolerant to glyphosate (a systemic herbicide) and inserting it into soybeans, thereby producing crops primarily tolerant to certain broad-spectrum herbicides, such as glyphosate and glufosinate (Round-up) (Pretty, 2001; Ahmad et al., 2012). The major crops engineered with herbicide tolerance include soybeans, maize, canola, cotton, sugarbeet and alfalfa (James, 2013; Goldstein, 2014). The herbicide is applied to herbicide-tolerant crops during their growing season, in order to manage weed population more effectively (Ahmad et al., 2012; Goldstein, 2014).

Proponents assert that glyphosate and glufosinate herbicides are more environmentally-friendly, and are generally cheaper than selective herbicides (Qaim, 2009; Ahmad et al., 2012). However, Buiatti et al. (2013:256) argued that "as the herbicide can in this case be utilized all along the cycle, many more treatments can be carried out and it is widely known that glyphosate exerts detrimental effects on the soil ecosystem, and may be polluting ground water". Furthermore, scientists that recently met at the International Agency for Research on Cancer (IARC), a branch of the World Health Organisation (WHO), to assess the carcinogenicity of the organophosphate pesticides tetrachlorvinphos, parathion, malathion, diazinon, and glylphosate, stated in their assessment of the five pesticides, that glyposate has been classified as "probably carcinogenic to humans" (Fritschi et al., 2015).

Chassy (2007) and Bruce (2012), argue that GM approaches remove crop reliance on large inputs of fertilisers and pesticides, and, in fact, produce crops that are inexpensive, labour and energy efficient, and more environmentally-sound, asserting that GM crops expressing glyphosate tolerance have, in fact, assisted in weed control.

2.4.1.1.2 Increased weediness

GMO opponents, on the other hand, have expressed considerable environmental concerns over the cultivation of GM crops. Critics are concerned that large-scale releases of herbicide-tolerant GM crops may promote unintentional gene transfer or transgene flow from GM crops to other plants, which could then have the potential to become weeds (Altieri, 2005; Buiatti et al., 2013; Mehrotra and Goyal, 2013).

According to Mehrotra and Goyal (2013), there have already been reports of weeds expressing glyphosate resistance in some countries. Chen and Lin (2013) point out that in the US, the extensive use of herbicide-tolerant crops has shown an increase in the development of weeds, which are resistant to glyphosate as opposed to areas without GM crop cultivation. GM crops exhibiting transgenes that express "significant biological advantage" could change wild or weedy plants into novel or more invasive weeds, or so-called "super-weeds" (Altieri, 2005). In the view of Altieri (2005:365), the movement of transgenes to related weed species or members of the same species "is worrisome – given that a number of crops are grown in close proximity to sexually compatible wild relatives".

Moreover, there have been concerns that GM crops have the potential to become weeds themselves, and to invade agricultural or natural environments (Mehrotra and Goyal, 2013), thus needing costly chemical management systems that could be hazardous to these environments (Uzogara, 2000).

2.4.1.1.3 Decreased biodiversity

Concern has also been raised that the extensive cultivation of GM crops might threaten biological diversity and genetic variability by replacement of locally adapted varieties and traditional varieties (land races) with "hybridizations between GM crops and land races, or wild relatives and interactions with non-target organisms" (Dale, 1999; Mehrotra and Goyal, 2013:244). Critics are also concerned about GM crops threatening crop-genetic diversity (Uzogara, 2000; Altieri, 2005), which is already under threat from existing agricultural practices that support the global production of a low diversity of monoculture crops (Uzogara, 2000). The cultivation of GM crops could further increase agricultural

intensification, and, in turn, significantly reduce the world's already diminishing biodiversity (Altieri, 2005; Buiatti et al., 2013).

2.4.1.1.4 Reduction in agricultural chemicals

Another major trait that dominates GM crop cultivation is that of insect or pest resistance (Bt or IR) (James, 2013). Insect- or pest-resistant GM crops contain important pesticide genes, like those for insecticidal *Bacillus thuringiensis* (Bt) toxins, making them resistant to a variety of different pests, such as insects, fungi, and bacteria (Barton and Dracup, 2000, Ahmad et al., 2012). Bt is a "potent insecticide" consisting of a crystalline protein endotoxin, which is created by some strains of soil bacterium, *B. thuringiensis* (Ahmad et al., 2012:526). GM crops expressing the Bt insecticidal protein genes are toxic to lepidopteran, dipteran and coleopteran pests (Qaim, 2009; Ahmad et al., 2012).

This trait is available in maize, cotton, soybean and brinjal crops and the Bt toxin is expressed by all cells of the plant, which then kills off any plant-eating insect pests (Pretty, 2001; Goldstein, 2014). Advocates assert that the production of GM crops has reduced the use of conventional pesticides, which in turn, has "decreased the environmental impact associated with herbicide and insecticide use on these crops" (Brookes and Barfoot, 2013:76; Goldstein, 2014). It is also believed that the use of GMOs may be able to lower agriculture's environmental footprint by preserving fossil fuels, reducing carbon dioxide emissions, and ensuring soil and moisture conservation (Buiatti et al., 2013; Brookes and Barfoot, 2013). Further major benefits of IR GM crops include enhanced crop harvest, decreased use of chemicals, conservation or development of useful insect populations, and decreased amounts of fungal toxins (Engel et al., 2002; Qaim, 2009; Bruce, 2012).

2.4.1.1.5 Increased pest resistance

In counterargument, critics have raised concern over the extensive cultivation of pest-resistant GM crops –thereby possibly leading to the development of pesticide resistance. For example, organisms such as Lepidoptera (butterflies) adopt rapid resistance to *Bacillus thuringiensis* (Bt) (Altieri, 2005; Mehrotra and Goyal, 2013). Long-term planting of HT and IR GM crops could quicken the progression of resistant pests and weeds (Chen and Lin, 2013).

This is evident in Gujarat India, where accounts of unsuccessful wide-scale management of *Bt* cotton in relation to pink bollworm resistance to Cry1Ac have occurred (Chen and Lin, 2013). Similarly, other cases of insect resistance to *Bt* crops have been reported: *Helicoverpa zea* (corn earworm) to *Bt* cotton expressing Cry1Ac in south-eastern United States, *Spodoptera frugiperda* (fall armyworm) to Bt corn expressing Cry1F in Puerto Rico, and *Busseola Fusca* (African stem borer) to *Bt* maize expressing Cry1Ab in South Africa (Van Rensburg, 2007; Bravo et al., 2011; Dhurua and Gujar, 2011).

2.4.1.1.6 Unintentional effects on non-target organisms

There is also concern that GM crops developed to reduce the need for pesticides or herbicides could have unintentional deleterious effects on non-target species, as well as biological control agents (Buiatti et al., 2013; Mehrotra and Goyal, 2013). Transgenic pollen, through pollen dispersal, for example, could be deposited onto surrounding wild species – thereby having unexpected effects on non-target organisms, such as plant-eating insects like the Monarch butterfly (Altieri, 2005; Mehrotra and Goyal, 2013). Bt toxin could also induce "intertrophic level effects on natural enemies" by disturbing the natural control of insect pests or biological control agents (Altieri, 2005:364). Moreover, the overall health and condition of non-targeted species, particularly weeds or local varieties, is decreased when they acquire transgenic traits by means of hybridization (Altieri, 2005).

2.4.1.1.7 Virus-resistance

Virus-resistant GM crops are believed by some to be vital for improved crop protection in agriculture (Prins, 2003; Bruce, 2012). Only a few commercialised GM crops are resistant to diseases, for instance, virus-resistant papaya, squash, plum and bean plants, as well as rice plants resistant to bacterial infections (Buiatti et al., 2013). According to Buiatti et al. (2013), several other GM crops that express resistance to a range of viral, bacterial and fungal diseases are under way. Yet, critics fear that the use of virus-resistant GM crops, may lead to the development of new viruses (with a wider host range) being released into the environment (Barton and Dracup, 2000; Mehrotra and Goyal, 2013). This can occur by "vector-mediated horizontal gene transfer and genetic recombination", which would then produce new pathogenic bacteria and viruses (Altieri, 2005:364).

2.4.1.1.8 Climate-resilient crops

New developments in climate-resilient GM crops tolerant to harsh environmental or abiotic stresses, which include droughts, high salinity levels, flooding, lowered soil quality, exposure to extreme temperatures and oxidative stresses are also underway, although they have been slow to be commercialised (Ahmad et al., 2012; Buiatti et al., 2013). In the view of Ahmad et al. (2012), there would be a significant increase in agricultural productivity if crops were modified to improve their survival of harsh environments. In addition, plants genetically engineered to be drought- and salt-tolerant could be used to cost-effectively utilise harsh environments that are impacted by extreme levels of salt and low levels of water (Ahmad et al., 2012).

2.4.2 Health risks and benefits

Opponents have also expressed their concerns over the use of GM technology to produce human food, as this could result in a number of potentially adverse effects on human and animal health, and the environment (Qaim, 2010; Buiatti et al., 2013). The possible health risks of GM crops and foods to both human and animal health may be linked with nutritional value, intolerance, antibiotic resistance, allergenicity, instability of the inserted gene, and 'microbiological safety' of the food, as well as potential unwanted secondary effects as a result of the interference of the metabolic pathways (Magaña-Gómez and Calderón de la Barca, 2009; Mehrotra and Goyal, 2013:243). Many people remain firm in their view that GM foods can be harmful to human and animal health as there is a lack of appropriate testing (Ahmad et al., 2012). In addition, there are apprehensions over the uncertainty of what kinds of long-term effects GM foods could produce (Mehrotra and Goyal, 2013).

In opposition, promoters of GM foods have claimed that there are no risks to human health (Chassy, 2010; Ahmad et al., 2012). Claims made by opponents of GMOs that there are known adverse health effects are not believed to be validated, as the health risks of GM foods are not "universally accepted" (Bansal and Ramaswami, 2010:170). Christou interviewed in Buiatti et al. (2013) argues that since the first plantings of GM crops in 1996 up until 2010, there has not been a single report of a hazardous incident, as a result of consuming GM food. Bruce (2012) asserts that the presumed environmental and health

disasters have not taken place in those countries that have cultivated and consumed GM crops for a number of years to date.

2.4.2.1 Nutritional quality

Critics have been particularly concerned about the negative effects of GM crops on nutrition (Magaña-Gómez and Calderón de la Barca, 2009), in particular the nutritional quality or value of foods (chemical composition) being altered by the insertion of foreign genes into GM food. This could cause the human body to react adversely to that food, thus producing allergies or causing long-term toxicity (Uzogara, 2000; Ahmad et al., 2012). Critics fear that the nutrient levels may behave erratically– and either increase or decrease within GM crops (Uzogara, 2000). For example, a study carried out by Lappe and Bailey (1998) demonstrated that certain GM foods contained lower levels of vital nutrients, in particular phytoestrogen compounds, which are considered to have a protective action against cardiovascular disease and cancer. In Dona and Arvanitoyannis' view (2009:165), potential risks for animals and people subjected to a diet containing GM food products include "effects on animal and human health resulting from the increase of anti-nutrients".

On the other hand, GMO advocates argue that second-generation crops could include improved quality traits, such as enhanced nutritional quality of food products (Qaim, 2009; Ahmad et al., 2012). Furthermore, proponents believe that these nutritionally enhanced transgenic crops would benefit consumers by providing health benefits – such as reduced levels of allergens; and enhanced levels of proteins; carbohydrates; vitamins and micro-nutrients, such as vitamin A, iron, folate, and ascorbate; antioxidants; fatty acids (lipids), such as oleic acid, omega-3 fatty acid; resistant starch and phytochemicals (Ahmad et al., 2012; Chen and Lin, 2013). One such example is vitamin A enriched Golden Rice, which is expected to combat malnutrition and vitamin A deficiency in many developing countries, where the staple food eaten is rice (Chassy, 2010; Ahmad et al., 2012).

2.4.2.2 Antibiotic resistance

Another concern raised is that the use of DNA that codes for antibiotic resistance in commercial GM crops could have unforeseen effects on the environment, as well as on human and animal health (Carman, 2004; Ahmad et al., 2012; Buiatti et al., 2013). A number of GM crops carry antibiotic-resistance genes, which could be incorporated into human cells or bacteria present in the gastro-intestinal tract, resulting in increased bacterial resistance to antibiotics (Ahmad et al., 2012; Buiatti et al., 2013). Chassy (2010) and Christou (in Buiatti et al., 2013) dispute this view, arguing that there is no research to suggest that antibiotic-resistance genes have been transferred horizontally from plants to bacteria that are human pathogens. According to Chassy (2010:541), research has also shown that GM DNA is not more or less probable to be transferred than other DNA sequences, and assert that it is important to be cognisant of the fact that "humans consume >100 mg DNA per day which is digested and metabolised without ill effect". The authors further claim that vigilant research has revealed that antibiotic-resistant genes are extensive throughout the environment and GM crops have not expanded antibiotic resistance. Instead, its expansion is most probably due to the inadequate management and supervision of antibiotic use by humans.

2.4.2.3 Increased toxicity and allergenicity

Critics also believe that GM crops may be associated with, or could contain, unforeseen toxins, and that more sound research is needed to prove that GM foods are safe for human consumption (Buiatti et al., 2013; Mehrotra and Goyal, 2013). During gene transfer, GE could turn on specific existing genes that were not previously being expressed, which could have the potential to increase the plant's natural toxins or even produce new toxins (Uzogara, 2000; Dona and Arvanitoyannis, 2009). Non-target organisms could experience toxicity through the ingestion of a toxin produced by the GM crop (Mehrotra and Goyal, 2013). According to Dona and Arvanitoyannis (2009), an increase of already existing toxic compounds in two GM foods, tryptphan and g-linolenic acid has already been reported.

Concern has also been expressed that GM crops have the potential to produce allergenic foods (Ahmad et al., 2012; Mehrotra and Goyal, 2013). The first factor of concern is the possibility of genes from known allergens or allergenic compounds being transferred into crops not normally associated with allergenicity (Key et al., 2008; Buiatti et al., 2013), and the second is that GM food crops have the potential to produce new allergens – by either incorporating new genes into the recipient crops, or by "changing the expression of endogenous proteins" (Key et al., 2008:293). The donor organisms could also contain unknown allergens. However, Christou interviewed in Buiatti et al. (2013) contests this view, arguing that there are no reports documenting toxicity or allergenicity after consuming GM food. Likewise, Goldstein (2014) asserts that there has been no reported incident of allergy to an introduced GM protein. Similarly, Chassy (2010:541) asserts that GM protein is not more prone to be an allergen or toxin than that of any other proteins, and possibly least expected as vigilant pre-market evaluation is mandated for GM crops but not for crops developed by other "less precise and more genome disruptive breeding technologies".

Proponents believe that GM has been able to enhance the protein quality of both food and animal feed, and according to supporters, there should be less of a risk of allergies from eating GM food than non-GM food; as they believe that those plants developed by traditional breeding techniques could possibly bring new allergens into the food product (Uzogara, 2000). Proponents view second-generation GM crops as having direct benefits on health, such as crops with reduced levels of allergens. GM crops or foods with reduced levels of allergens are produced by "reducing expression levels of the relevant genes" (Key et al., 2008:293). For instance, studies were conducted to locate an allergen in soybean crops and discard the compound using GM technological techniques (Key et al., 2008).

2.5 Labelling

2.5.1 Product labelling

Product labelling supplies information to consumers and it appears as a mechanism for communication of information – to enable consumers to make an informed choice – or to exercise their freedom of choice in their decision-making processes (Costa-Font et al., 2008; Premanandh, 2011; Huffman and McCluskey, 2014). The intention of labelling is to aid consumers in identifying products that "best match their preferences" (Premanandh, 2011:38). Food product labels can be used as a powerful medium to convey important information, and they are the main method of exchanging information between producers and consumers (Roe and Teisl, 2007; Premanamdh, 2011). According to *Codex Alimentarius*, the terms "label" and "labelling", found under the general standard for the labelling of pre-packaged foods, are defined as follows:

- **"Label: [This]** means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food".

- **"Labelling: [This]** includes any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale or disposal" (Codex, 1985, rev. 1991).

Labels can either comprise a simple symbol or a list of complex ingredients, together with the basic nutritional information. In addition, labels can state whether a product has health benefits (positive labelling) or health warnings (negative labelling) (Einsiedel, 2000; Viljoen et al., 2006).

2.5.2 GM food labels

Labelling is frequently used as a mechanism to provide consumers with information on the attributes of goods that cannot be determined by the consumer (Caswell, 2000). These attributes, according to certain economists, are classified as credence attributes and thus, a product resulting from GM is impossible for a consumer to infer (Caswell, 2000; Premanandh, 2011). Labelling can be used to convert the credence attributes into "search attributes", where consumers are then able to understand what GM is – by examining the packaging of the product, and as a result labelling improves information to consumers (Caswell, 2000; Premanandh, 2011). Over the years, contemporary international and national laws have moulded environmental product labels, which form part of a much bigger unit of instruments that are concerned with providing information (Sand, 2006). Countries that have adopted a labelling system for GM food all use predetermined thresholds, as none can guarantee zero GM content in the final food product, once GMOs have been used in the production process (Viljoen et al., 2006).

The use of positive labels like "GM" or "Containing GMOs" shows that the GM food product contains GM content that is above a set threshold; whereas negative labels "non-GM" or "Does not contain GMOs" are used when there is no detectable GM content, or where these are below a set threshold (Viljoen et al., 2006). However, using threshold labelling poses a problem, as different countries have their own set specific tolerance levels, and also apply their terminology differently (Viljoen et al., 2006).

2.6 Emergence of GM food labelling

The EU introduced the first mandatory labelling regulations for GM food in 1997, as a result of intense pressure from environmental non-governmental organisations (NGOs), the public, and extensive negative media coverage on GM food, because of previous food scares, and the introduction of unlabelled GM soybean from the US (Carter and Gruère, 2003a; Scholderer, 2005). Members of the public considered GM foods to be unsafe and were struggling to accept the new "Frankenfood" (Uzogara, 2000) and the need for it (Miles et al., 2005). This was accompanied by a series of events, in particular a controversial study undertaken by Arpad Pusztai, a scientist then working at the Rowett Research Institute in

Aberdeen, Scotland, who claimed that GM potatoes had increased toxicity in laboratory-fed rats (Scholderer, 2005), and a paper in *Nature* stating that pollen from GM crops containing the Bt toxin could kill larvae of the Monarch butterfly (Uzogara, 2000). The EU government was lobbied to take immediate action, leading to a *de facto* moratorium on the approval of new GM crops and foods (Lieberman and Gray, 2006).

2.6.1 The EU Moratorium

The moratorium announced by five EU member states (Denmark, France, Greece, Italy and Luxembourg) lasted from 1998 to 2004 (Scholderer, 2005). During this period, the European Commission, together with various stakeholders, developed legal mechanisms to ensure that a consistent and comprehensive biotechnology strategy would be put in place (Scholderer, 2005). The moratorium was lifted on 19 May 2004, when the European Commission approved the sale of GM food products (Scholderer, 2005). However, the rate of approval of GM food products, and of the derived ingredients for import, had significantly slowed down (Lieberman and Gray, 2006). According to Carter and Gruère (2003a), locating food products labelled as GM in stores proved to be difficult.

Meanwhile, GM food has been at the centre of a "transatlantic legal controversy" that has now been ongoing for more than ten years (Sand, 2006:185). This trade dispute had arisen between the EU, which insists on the mandatory labelling of GM food, to ensure consumers are provided with the relevant information, and the US which opposes mandatory labelling (Sand, 2006). The conflict has also led to confusion amongst other countries on which labelling regulations or approaches to adopt (Carter and Gruère, 2003a). As consumers worldwide have become increasingly concerned with the safety and risks associated with GM food, many countries, including South Africa, have come under public pressure to introduce and implement labelling regulations (Phillips and McNeill, 2002; Viljoen et al., 2006).

2.7 The GM food labelling debate

The labelling of GM food is a contentious issue, and it remains one of the most highly disputed food issues of the 21st century (Klintman, 2002; Bansal and Ramaswami, 2010). Internationally, there is a distinct divide on whether such labels should be mandatory (Bansal and Ramaswami, 2010). Klintman (2002) identifies arguments in favour of and against labelling, which, together with other supporting evidence, are presented and discussed below. The labelling debate in the US is used at the forefront of Klintman's study. This is based on the distinct difference of opinion between US consumers and government policy on labelling, which is unlike that of EU consumers and government regulations (Klintman, 2002).

2.7.1 Arguments for GM food labelling

2.7.1.1 Consumers' right to know and autonomy

The first argument is grounded on "democratic rationality", which centres on the importance of transparency and the right to information (Klintman, 2002). Many actors supporting GM labelling have argued that consumers have a right to know what is in their food, and what they are eating, regardless of whether they support or oppose GM technology or GM food (Carter and Gruère, 2003a; Huffman and McCluskey, 2014). Thus, consumers are insisting on labelling as this would give them the opportunity to make their own choices about GM foods (Phillips and McNeill, 2002).

Consumers' insistence on their right to know whether the food product contains ingredients derived from GM appears to emerge from their apprehension and concern regarding the unintended environmental and health risks of GM food (Oh and Ezezika, 2014). Oh and Ezezika (2014) argue that the concept of consumer autonomy is also entrenched in the right to know argument, as GM labels enable consumers to make an informed choice – to select and reject certain foods, whether GM, organic, or conventional. According to Miles et al. (2005), the labelling of GM food has also been identified as an effective approach to better inform consumers about the food they eat. In addition, GM labels have the "potential to

contribute positively to consumer education and awareness" similar to that found on nutritional labels (Oh and Ezezkia, 2014:3).

Mandatory GM labelling, in particular, is called for by more circumspect governments, civil society organisations, and other global advocates as it offers consumers the right to know. It should also generate greater consumer choices in light of the present uncertainties over the health implications of some GM food (Bansal and Ramaswami, 2010; Zainol et al., 2013). Public opinion surveys have indicated that many consumers are in agreement on the need for mandatory GM food labelling, regardless of the country (Einsiedel, 2000; Klintman, 2002; Phillips and McNeill, 2002; Li et al., 2002; Miles et al., 2005; Vermeulen et al., 2005; Scholderer, 2005). Many of these consumers are demanding that mandatory labelling systems be introduced into their countries – due to the delay in communicating the risks associated with GM food and the lack of transparency about what is in food (Phillips and McNeill, 2002). According to Costa-Font et al. (2008), studies that have analysed consumer labelling preferences, such as those of Harrison and McLennon (2003), Chern et al. (2002), and Veeman et al. (2005), have deduced that consumers residing in countries, such as the US, Japan, Norway, Taiwan and Canada all support the mandatory labelling of GM food. For example, in the US, the strongest argument in support of Proposition 37, a California ballot measure calling for the mandatory labelling of GM foods, was the right to know argument used by voters (Huffman and McCluskey, 2014).

2.7.1.2 Ethics and religion

The second argument for GM labelling is based on the "diversification of consumer rationalities: and on their ethical or religious concerns" (Klintman, 2002:76). In the past, people were able to see or ask whether the food commodity they were purchasing contained ingredients or went through a production process that would either agree or disagree with their ethical or religious beliefs (Klintman, 2002). However, GM food-production processes make this difficult to ascertain. The assumption is that without labelling, consumers would be unable to determine the attributes of the food product – either through a visual check, or even after consumption, and so, labelling is required to address this issue (Klintman, 2002; Bansal and Ramaswami, 2010). Hartman (2014:50)

asserts that there is an inability for consumers to choose foods in accordance with their preferences, as GM foods differ genetically from their conventional counterparts and this, therefore, reduces consumers' welfare. GM foods have been dubbed "credence goods", as they are difficult to assess – even after using and consuming them (Klintman, 2002; Hartman, 2014). A hypothetical example would be vegetarians eating tomatoes that contain fish genes. These people would be unaware of the animal DNA – unless there were mandatory labels in place (Klintman, 2002).

Supporters argue that GM labels would give those consumers who prefer to purchase GM food – or to avoid them for health, ethical, environmental or religious reasons – the opportunity to do so (Bansal and Ramaswami, 2010; Zainol et al., 2013). For example, the Muslim religion forbids the use of pork in their diets; while the Hindu population largely reject all animal and fish goods, based on their belief system (Premanandh, 2011; Zainol et al., 2013). Thus, with GM labels, consumers are given the opportunity to make informed choices and to proceed, in accordance with their own beliefs and needs, thereby improving consumer sovereignty (Premanandh, 2011). In addition, labelling serves as a clear opportunity for welfare improvements for those consumers apprehensive about the presence of GMOs in food (Hartman, 2014).

Overall, there seems to be "universal agreement that consumer choice needs to be enhanced through effective labelling, to allow consumers to choose between GM and GM-free food products" (Phillips and McNeill, 2002:223). According to Hunt and Frewer (2001, as cited in Miles et al., 2005), there is evidence that shows that people are more prepared to accept GM food if the products are always labelled and provide unambiguous and clear information. Although labelling cannot entirely address the concerns of consumers over GM food, such as safety, environmental and ethical concerns, it does help consumers to feel that they have some form of control over their exposure to GM food; and labelling allows them to make their own decisions about whether or not to buy GM food (Miles et al., 2005).

2.7.2 Arguments against GM food labelling

2.7.2.1 Confuse and mislead consumers

The irrelevance argument, which states that **"**food labelling would be confusing, misleading and irrelevant for consumers", is concerned with turning the issue of free choice around (Klintman, 2002:74). Opponents of mandatory labelling feel that if GM food products are labelled, this would imply that there are potential health risks associated with the product, and that the food is less safe than conventional counterparts, and that this would only mislead and confuse consumers (Carter and Gruère, 2003a; Oh and Ezezika, 2014). What's more, Baker and Burnham (2001) point out that mandatory GM labelling could raise consumers fears regarding GM foods, and "unfairly" stigmatise these products, thereby increasing the biotech food industry's apprehensions over consumer rejection (Huffman and McCluskey, 2014:158). According to Huffman and McCluskey (2014), the biotech industry is concerned that mandatory labelling could give an "impression and even act as a warning signal" that GM foods deviate from, or are more hazardous to, human health than their conventional non-GM counterparts (Carter and Gruère, 2003a; Premanandh, 2011:39; Huffman and McCluskey, 2014). This, it is held, would then discredit or stigmatise the product, "unduly" reduce demand and affect retailers, or inflate demand for their conventional or organic equivalents (Oh and Ezezika, 2014; Huffman and McCluskey, 2014:158). On the other hand, a GMO-free label could insinuate that the food is safer or healthier than foods consisting of GMOs, again misleading consumers (Oh and Ezezika, 2014).

GM labels, it is further argued, also provide consumers with redundant information that might increase food costs, and give a negative public perception of GM technology (Marx, 2010). This is reiterated by Carter and Gruère (2003b), who claim that even with the use of mandatory labelling, standards vary across nations and consumers are given even less of a choice between GM and non-GM foods. This is the case in the EU, Japan and elsewhere, where it is extremely difficult to locate GM foods on supermarket shelves (Carter and Gruère, 2003b; Hartman, 2014). Studies done on consumer attitudes towards GM food labelling in the US and Germany, however, have shown relatively high percentages of consumers who would be less likely to buy products that are labelled as GM, hence, many

producers have been reluctant to label foods as GM, since they are concerned that consumers would not buy these products (Einsiedel, 2000). However, actors involved in the food-production chain are aware of their responsibility to formulate efficient regulations or policies that address any concerns that consumers might have over GM food (Phillips and McNeill, 2002).

2.7.2.2 Costs

Another argument against GM food labelling, the economic irrationality of consumers, argues that the requirement for labelling would greatly increase costs, and that this expense would fall both on producers and consumers (Klintman, 2002; Roe and Teisl, 2007; Oh and Ezezika, 2014). Others, however, are of the opinion that the increased food prices would only be borne by the consumer (Jaeger, 2002; de Leon et al., 2004; Marx, 2010; Gruère and Rao, 2007; Hartman, 2014). Critics of mandatory GM labelling argue that labelling would inflict additional costs on all consumers, in spite of their belief that only a few consumers might, in fact, be opposed to the consumption of GM foods (Zainol et al., 2013). In addition, it is argued that mandatory GM labelling would raise production costs, resulting in higher consumer food prices, and lower profits (Hu et al., 2005; Gruère and Rao, 2007; Zainol et al., 2013). In Hartman's view (2014:51), compliance costs passed onto consumers would reduce their "welfare gains".

Studies previously conducted on the costs of labelling in developed countries with industrialised food sectors indicated considerable costs (Gruère and Rao, 2007). According to Gruère and Rao (2007), three factors induce the cost of implementation. These factors are: firstly, the tolerance level used (a lower threshold level increases costs); secondly, the degree of enforcement because of the requirements for testing laboratories, skilled workforce, and, where the regulation is applicable to highly processed food products, the need for an effective traceability system; and finally, the number of different GM food varieties that are cultivated locally.

It is argued that mandatory GM labelling necessitates a thorough and reliable system of traceability, and the preservation of identity of GM ingredients, food and feed, or of non-GM counterparts throughout the food-production process (tracked from the farm, throughout the food chain, to its packaging) (Miles et al., 2005; Gruère and Rao, 2007; Zainol et al., 2013). This process-based system can be extremely costly and difficult to implement on the ground (Carter and Gruère, 2003a; Miraglia et al., 2004; Zainol et al., 2013). Countries that have already developed stringent labelling regulations, such as the EU and Japan, need efficient traceability systems that are expensive and difficult to implement (Miraglia et al., 2004).

One of the most convincing arguments in opposition to mandatory GM labelling is the considerable costs involved, from systems of segregation and identity preservation, to restrict any "mixing within the non-GMO supply chain", and to "preserve the identity" of all food that could potentially be GM throughout the supply chain (Carter et al., 2012:4; Huffman and McCluskey, 2014; Oh and Ezeika, 2014). Bansal and Ramaswami (2010) confirm that the significant costs of GM labelling are derived from identity preservation and segregation programmes. Opponents of mandatory GM labelling contend that segregating GM foods from their non-GM counterparts would be difficult and costly because of the different "storage, processing, and transportation facilities required" (Zainol et al., 2013:4). According to Carter et al. (2012) and Vigani and Olper (2013), the cost of any identity preservation system relies crucially on the threshold level stated in the labelling law.

2.8 International GM food labelling policy and practice

2.8.1 International standards

International institutions involved in the labelling of GM food are the Committee on Food Labelling of the Food and Agriculture Organization (FAO), the World Health Organization's (WHO) *Codex Alimentarius*, the Biosafety Protocol of the Convention on Biological Diversity (CBD), and the World Trade Organization (WTO) (Kalaitzandonakes and Phillips, 2000). Although the Codex Committee on Food Labelling (CCFL), under the *Codex Alimentarius* Commission, has attempted to carry out the task of formulating labelling standards for GM food (Kalaitzandonakes and Phillips, 2000), this process has been challenging, as views over "mandatory versus voluntary, and process-based versus product-based labelling of GM foods" still differ (Sand, 2006). According to Sand (2006) and others, Codex is easily influenced by powerful governments and industries, which interfere with labelling standards to suit their own vested interests. Although the Commission attempted to formulate guidelines governing the labelling of biotech products in 2007, discordance amongst the stakeholders from various countries on reaching a consensus stalemated the guidelines to be produced by the Commission (Premanandh, 2011). As of yet, there has been no formal agreement on an international standard for the labelling of GM food products (Vigani and Olper, 2013).

2.8.2 The international status quo

The approaches adopted by various countries towards the labelling of GM food differ significantly (Carter and Gruère, 2003a; Gruère and Sengupta, 2010). These labelling regulations or policies differ greatly in terms of their "nature, scope, coverage, exceptions, and their degree of enforcement" among various countries (Gruère and Rao, 2007:51; Bansal and Ramaswami, 2010). Globally, countries have either adopted a voluntary or mandatory type of labelling system; or they have opted for a mixed mandatory/voluntary labelling system, whereby there is mandatory labelling of GM food but there are also voluntary labelling guidelines for non-GM food; or alternatively, they have placed a ban on labelling altogether (Gruère and Rao, 2007; Huffman and McCluskey, 2014). Table 2.1 lists those countries that have adopted a labelling system for GM foods.

Table 2.1: Divide in labelling approaches across various countries (Source: adapted from Gruère and Rao, 2007; Oh and Ezezika, 2014; Randhawa et al., 2014)

Country	Target- product/process	Threshold Level for Unintended GMOs	Degree of Enforcement
Mandatory Labelling			
EU	Process	0.9 %	Enforced
Brazil	Process	1 %	Partial Enforcement
China	Process	None (0 %)	Enforced
Australia	Product	1 %	Enforced
New Zealand	Product	1 %	Enforced
Japan	Product	5 %	Enforced
South Africa	Product	5 %	Does not require enforcement– industry is self-regulating. There is no enforcement agency.
India	Process	No labelling threshold has been implemented in India	Enforced from 2013
Kenya	Unknown	1%	Unknown
Russia	Product	0.9 %	Enforced
Saudi Arabia	Product	1 %	Enforced
South Korea	Product	3 %	Enforced
Taiwan	Product	5 %	Enforced
Thailand	Product	5 %	Partial Enforcement
Voluntary Labelling			
US	Product	N/A	Unenforced
Canada	Product	5 %	Unenforced
Philippines	Product	5%	Plans to introduce labelling
Argentina	Product	Not specified	No specific law

The voluntary labelling system provides guidelines on what foods should be labelled GM or non-GM, and it is left to the discretion of the food companies or producers to choose whether they would use this information on their products (Gruère and Rao, 2007). Countries that have adopted a voluntary labelling approach have no GM labelling threshold, and they do not regulate whether or not GM food labelling is being applied to food products containing GM content (Viljoen et al., 2006; Marx, 2010). In contrast, the mandatory labelling system obligates the food industry, such as food companies, to label the food product or ingredient as GM (Gruère and Rao, 2007). Countries with mandatory labelling differ with regard to coverage, product versus process labelling, and the threshold level (Gruère and Rao, 2007).

First, the regulations can differ in terms of coverage, whereby certain countries may call for labelling of certain food ingredients or of all the ingredients in the packaged food product that contains GM content; or for the labelling of products that have been processed and originate from GM ingredients; or they may require labelling for feed, additives and flavourings, products fed with GM feed, caterer and restaurant food, and even bulk food. Second, the scope of labelling denotes the verification systems that need to occur with labelling (Gruère and Rao, 2007; Bansal and Ramaswami, 2010). If labelling is mandatory only for foods with detectable traces of GM ingredients, then certification of non-GM status could be dependent on testing for the presence of GM protein or DNA in the final product (Gruère and Rao, 2007; Bansal and Ramaswami, 2010). Conversely, Bansal and Ramaswami (2010:168) argue that if labelling is expanded to include processed food products, where present testing systems cannot detect the presence of GM DNA accurately or at an affordable cost, then compliance for these products "would require evidence of identity preservation". According to Bansal and Ramaswami (2010:168), an identity preservation system "requires production, processing and distribution systems, where the identity of the food or trait is preserved". And this could produce dual and separate systems of "production, processing and marketing". This is done by introducing traceability systems that are able to trace GM ingredients, food and feed through the entire food-production chain (ACB, 2012a). Lastly, countries' mandatory regulations differ in the threshold level they set for the labelling of GM ingredients. This ranges from 0.9% to 5% (Gruère and Rao, 2007; Bansal and Ramaswami, 2010).

2.8.3 Developed countries' approaches: the United States versus the European Union

Globally, there has been a significant development in the number of countries adopting labelling policies for GM food (Gruère et al., 2009; Hartman, 2014). The majority of developed countries have adopted some form of labelling policy for GM food (Einsiedel, 2000; Gruère, 2005; Gruère and Rao, 2007). According to Gruère et al. (2009), developed countries have adopted their particular labelling approaches on the basis of countries' national interests. However, severe scrutiny of these new regulations or systems has also grown (Einsiedel, 2000), and the labelling policies for GM food have become extremely controversial (Caswell, 1998), since views on the labelling requirements for GM food vary considerably (Hu et al., 2005).

A perfect example is illustrated between the US and the EU. In the US, the Food and Drug Administration (FDA) is in charge of regulating GM crops by using the substantial equivalence principle (Herrick, 2005; Buiatti et al., 2013; Zainol et al., 2013). The substantial equivalence concept supports the idea that if a GM food product is the same as its conventional counterpart in terms of composition, nutrition and safety, then the GM food is termed equivalent, and no GM label is required (Herrick, 2005). Thus, the voluntary GM labelling guidelines of the FDA do not require labelling of GM foods as such – only if the GM food is found to be significantly different from its non-GM counterpart (Buiatti et al., 2013; Zainol et al., 2013).

In contrast, the EU requires the compulsory labelling of all foods, feed, additives and flavours that contain 0.9% or more of GM content (Buiatti et al., 2013; Zainol et al., 2013). However, the EU excludes products obtained from animals, such as eggs, meat and milk, that were fed GM feed or GM enzymes, which are "used in a process where they do not form part of the final product" (Viljoen and Marx, 2013:390; Zainol et al., 2013). GM labelling is regulated by the Food and Feed Regulation (EC) 1829/2003, which came into force in 2004 (Herrick, 2005; Zainol et al., 2013). Novel foods would only be approved in the EU, if the food is not dangerous and would not mislead the consumer; and if it does not differ in its nutritional composition from its conventional counterpart (Herrick, 2005). The

EU policy is informed or underpinned by the precautionary principle, whereby any food is deemed unsafe, unless this is proved otherwise (Zainol et al., 2013; Huffman and McCluskey, 2014).

The regulatory agencies in the US, such as the FDA and the US Department of Agriculture (USDA), strongly oppose the mandatory labelling of GM food (Uzogara, 2000). Yet the general public are in support of mandatory labelling laws and regulations (Klintman, 2002; Carter and Gruère, 2003a; Goldstein, 2014). This is different from that of the EU, where consumers agree with the mandatory labelling laws that the government has implemented (Klintman, 2002). A GM labelling debate, however, exists in the US (Carter and Gruère, 2003a) and in 2012, Californians voted on Proposition 37, requiring GM foods to be labelled (Carter et al., 2012; Hartman, 2014). However, the Proposition was voted against with 58% opposition – when consumers were notified that mandatory GM labelling would impose costs on the consumers, the opposition to this approach increased[2] (Hartman, 2014; Huffman and McCluskey, 2014).

2.8.4 Developing countries approaches: China, Brazil, South Africa, India and Kenya

Several developing countries have accepted laws, policies or regulations that necessitate the labelling of GM food. However, the majority have not put these into practice, or they have only enforced these laws to some degree (Gruère and Rao, 2007; Bansal and Ramaswami, 2010). In those developing countries, where the enforcement of GM labelling regulations is a problem, regulations may not be stringently enforced (Bansal and Ramaswami, 2010). This is apparent in Brazil, where labelling laws were established in 2003, but have not yet been implemented (Gruère and Rao, 2007; Bansal and Ramaswami, 2010). In Indonesia, which has only partially implemented labelling regulations and requires that trade importers label their products as GM, there are no GM labels found on consumer food products in the country (Gruère and Rao, 2007).

[2] Appendix A details the labelling debate in the US

China adopted its GM food labelling laws in 2004 and, according to Gruère and Rao (2007), is the only developing country that has been able to put an effective labelling policy in place. However, the law has only been implemented to some degree (Bansal and Ramaswami, 2007; Bansal and Ramaswami, 2010). Kenya introduced mandatory GM labelling regulations in 2012, since GM crops will soon be approved for commercialisation (Oh and Ezeika, 2014). India proposed one of the most stringent policies for requiring the mandatory labelling of food commodities in 2006, which was enforced from January 2013 (Bansal and Gruère, 2012; Randhawa et al., 2014). South Africa has adopted a mandatory GM labelling law since 2009, but the proposed draft amendments to the GM labelling regulations have yet to be finalised, thereby delaying its implementation.

Many developing countries are in the process of considering or developing GM labelling policy. Gruère et al. (2009:405) argue that developing countries have adopted their labelling policies based on "regional influences and trade relationships" and that these factors significantly influence and help to determine the labelling policies for GM food in these countries. The authors further argue that "trade factors" might also have a stronger role in influencing the development of labelling policy than the influence from consumer opposition to GM food or anti-GM campaigns (Gruère et al., 2009). However, there is no evidence to suggest that any of these countries have in fact used these considerations put forward by Gruère et al. (2009).

Developing countries' choices for labelling policies and their traceability thresholds are also influenced by the regulatory systems for traceability and labelling, where most do not have the necessary infrastructure to meet the stringent mandatory labelling requirements of the EU (Richey, 2003). Many developing countries also have regulations that are unclear in their coverage of products to be labelled (Richey, 2003). A lack of necessary infrastructure (regulatory systems) and unclear coverage of products could be a result of labelling policies formulated by stakeholders that are "generally misinformed, or have a lack of knowledge around biotechnology and GM crops; [and, consequently, they] do not take ownership of the technology; [they frequently] lack [the necessary] risk-assessment capacity, and have external pressures weighing on them" (Richey, 2003).

2.9 GMOs in South Africa

South Africa is a producer, consumer and trader of GM products (Gruère and Sengupta, 2010); and it is one of the leading biotech developing countries, having many biotech research programmes already established (Kirsten and Gouse, 2003). In 1992, the country introduced the first field trials for Bt cotton, and started growing commercial GM cotton and maize crops in 1997 (Scoones, 2008). Eight years later, Bt white maize used for human consumption was commercialised. South Africa was the only country on the African continent, up until 2007, to commercialise GM crops (Aerni, 2005; James, 2010). Other African countries that have commercialised GM crops since then include Burkina Faso, Egypt and Sudan (Morris and Thomson, 2014). Uganda and Nigeria have GM crops in enclosed fields under trial and both Kenya and Ghana have now passed laws allowing the commercial production of GM crops (Morris and Thomson, 2014; Oh and Ezezika, 2014).

In 2014, GM crops in South Africa accounted for 2.7 million hectares (Viljoen and Marx, 2013; James, 2014). Current GM crops that have South African government approval for importation and exportation, commercial crop planting and food and feed include: insect-resistant and herbicide-tolerant maize, insect-resistant and herbicide-tolerant cotton and herbicide-tolerant soybean (Morris and Thomson, 2014). Three GM crop types have been commercialised in the country, which include maize, soybean and cotton. GM canola may be imported as a commodity under a permit but may not be produced in the country (Viljoen and Marx, 2013).

In the view of Gruère and Sengupta (2010), South Africa is “unique” in that it has allowed for the commercial production of GM crops and has a practical biosafety strategy, even though it is surrounded by countries that have banned GM products from being used. Yet, many South African consumers are unaware of or undecided on the extent of GM crop production in the country and their exposure to GM foods, especially to white GM maize: the staple food eaten by most South Africans (Vermeulen et al., 2005; Botha and Viljoen, 2009; Viljoen and Marx, 2013).

There are many stakeholders that currently, and in the past, have played prominent roles in the South African GMO debate, including certain government agencies and departments, NGOs, government and public research institutions, the academic and scientific community, industry organisations, local and multinational seed companies, food processors and manufacturers, food retailers, local farmers, consumer groups, trade unions, and church faith groups (Aerni, 2005; Wolson, 2007). Although consumer groups have played a role in the GMO debate (Wolson, 2007; Scoones, 2008), this does not suggest that consumers themselves have been effectively represented, since, according to Aerni (2005), Vermeulen et al. (2005) and Botha and Viljoen (2009), consumer awareness of GM technology is still extremely low.

2.10 Conclusion

GMOs, GM labelling and, in particular mandatory GM labelling, remains a highly contested issue internationally. This chapter has reviewed literature and discussed the universal and local arguments in support of and opposed to GMOs, and the labelling of GM foods. The literature review has also looked at how the GM labelling debate emerged internationally and how it differs in different parts of the globe. Although there are studies documenting the GMO debate in South Africa, there is, however, very little research on the GM labelling debate in the country.

CHAPTER THREE – METHODOLOGY

3.1 Introduction

This chapter describes the research approach and the methodologies adopted for this study. Both quantitative and qualitative research methods were used for the data acquisition and analysis. This research study is centred on understanding policy development and implementation, and the stakeholders involved in these processes. Thus, it draws heavily on understanding humans' behaviour, their values, viewpoints, emotions and relationships, which can often differ amongst the various stakeholders (Mack et al., 2005).

Qualitative research can generate data that are both "culturally specific and contextually rich", which is its greatest input as a method of social research (Mack et al., 2005:vi). Quantitative research approaches seek to validate or prove hypotheses about certain occurrences in nature, and its tools use a more structured method of eliciting and sorting the response data from the interviews (Mack et al., 2005). One of the major differences between quantitative and qualitative methods is the degree of flexibility. The qualitative method used for this study was more flexible than the quantitative method, in that it allowed for "greater spontaneity and adaptation between the researcher and the study participants", and it asked open-ended questions, which allowed for more complex answers from the participants (Mack et al., 2005).

In comparison, the quantitative approach used was more inflexible and asked the stakeholders closed-ended or "fixed" questions, which allowed for "meaningful comparison of responses across [the] participants" (Mack et al., 2005:3). When qualitative methods are used, in conjunction with quantitative methods, they can aid in interpretation and an improved understanding of the "complex reality of a given situation and the implications of quantitative data" (Mack et al., 2005:2). Since this research study is focused on accessing stakeholders' personal positions or feelings and their values (Byrne, 2004) associated with policy development, the particular policy issues and implementation, a mixed-methods, research approach was adopted, also using triangulation to verify results (David and Sutton, 2011).

3.2 Theoretical framework: A stakeholder analysis

Stakeholder analysis was used as the theoretical approach for framing and informing the research findings of this study. A stakeholder analytical framework provides a stakeholder perspective through which to examine or analyse the policy development process of mandatory GM labelling in South Africa. In using a stakeholder analytical approach or perspective, new dimensions of the research on policy development were intended to come to light, better informing the research findings.

3.2.1 Stakeholders and analysis

The use of the terms stakeholder and stakeholder analysis has become increasingly popular with a number of different organisations from various disciplines. These terms are currently used by academics, policy-makers, regulators, governmental departments and agencies, NGOs, businesses and the media (Bruga and Varvosovszky, 2000; Friedman and Miles, 2006; Reed et al., 2009). Different fields recognise the "central role of stakeholders (individuals, groups and organisations), who have an interest (stake), and their potential to influence the actions and aims of an organisation, project or policy direction" (Bruga and Varvosovszky, 2000:239).

Reed et al. (2009), in natural resource-management studies, notes the importance of knowing which stakeholders affect or are affected by environmental policy decisions. "Public participation is becoming increasingly embedded in national and international environmental policy, as decision-makers recognise the need to understand who is affected by the decisions and actions they take, and who has the power to influence their outcome" (Reed et al., 2009:1933). In collecting and analysing data on stakeholders, Bruga and Varvosovszky (2000) observe, that a researcher is able to develop an understanding of how stakeholder decisions are made in particular social and institutional contexts, including identifying any potential prospects to influence how these decisions are made.

3.2.2 The stakeholder concept

Owing to its widespread popularity, the stakeholder concept has come to be used in a multitude of contexts, where many differences of opinion exist over the definition of a stakeholder (Friedman and Miles, 2006; Reed et al., 2009). The word "stakeholder" first appeared in 1708 and it was used to describe "a person who holds the stake or stakes in a bet" (Ramirez, 1999:101). System analysts prefer the word "actors", as this denotes the person, who performs one or more of the actions in the system or organisation, whilst sociologists employ the term "social actors", meaning "individuals or social entities", who are educated and proficient – and as a result, can make and defend decisions (Ramirez, 1999:102; Mushove and Vogel, 2005).

However, it was the early work of system theorists that gave rise to the concept of the stakeholder, and it was Freeman (1984), who advanced stakeholder theory to the forefront of the academic research world (Pan, 2005). Several other stakeholder definitions stem from Freeman's (1984) seminal work on "stakeholder theory", which defines stakeholders as "any group or individual who can affect, or is affected by, the achievement of the organisation's objectives" (Friedman and Miles, 2006; Reed et al., 2009). According to Reed et al. (2009:1934), the difference of opinion over stakeholder definitions exists in the literature partly because of attempts to determine what comprises a "legitimate stake".

The stakeholder analysis concept has slowly evolved from various fields (Reed et al., 2009). Initially originating from business-management theory – because of the burgeoning realisation that stakeholders could impact the success of a company, approaches to analyse stakeholders were developed, so as to understand stakeholder behaviour, intentions, inter-relations, interests and influence – and in what way these attributes could encourage or hinder the performance of the company (Bruga and Varvosovszky, 2000; Reed et al., 2009). However, approaches and methods of stakeholder analysis have changed, as tools have been modified gradually from the business management field for use in policy, development and natural resource management (Bruga and Varvosovszky, 2000; Reed et al., 2009:1933).

The development of various methods and approaches has created much confusion over what is intended by stakeholder analysis, particularly with regard to the "concept and practice of stakeholder analysis" (Reed et al., 2009:1933). Stakeholder analysis has been criticised by Weyer (1996) as being a "slippery creature" in that it is "used by different people to mean widely different things, which happen to suit their arguments" (Weyer, 1996:35 cited in Friedman and Miles, 2006). However, Reed et al. (2009) sought to make sense of this confusion by defining stakeholders and stakeholder analysis, as well as demonstrating how these concepts have evolved in different disciplines.

3.2.3 Application

Stakeholder analysis refers to "a range of tools or an approach for understanding a system by identifying the key actors or stakeholders, on the basis of their attributes, inter-relationships and assessing their respective interests related to the system, issue or resource" (Mushove and Vogel, 2005:185; Ramirez, 1999). According to other authors cited by Ramirez (1999), stakeholder attributes and the criteria chosen by the researcher that best suit the context of a particular study would include the following:

- "The relative power and interest of each stakeholder (Freeman, 1984);
- The importance and influence they have (Grimble and Wellard, 1996);
- The multiple 'hats' they wear; and
- The networks and coalitions to which they belong (Freeman and Gilbert, 1987)."

The research presented in this thesis was conducted within a policy context, to analyse the policy development process of mandatory GM labelling. In political and policy sciences, policy analysts have continued to be conscious of the importance of interest groups in the policy process, and the necessity to identify, categorise and investigate the varying degrees of interest and power, which influence, and therefore impact on, particular policies (Bruga and Varvosovszky, 2000; Reed et al., 2009). Thus, this study has used a stakeholder analytical approach "to generate knowledge about the relevant actors (individuals, groups and organisations), so at to understand their behaviour, intentions, inter-relations, agendas, interests and the influence or resources they have brought or could bring to bear on

decision-making or implementation processes" (Brugha and Varvasovszky, 2000:239; Reed et al., 2009). Specifically, a descriptive-stakeholder analytical approach was applied to this study, where the relationship between the policy development process for mandatory GM labelling and its stakeholders was described, by means of specific methods that identified the relevant stakeholders, differentiated between and categorised these stakeholders, and lastly investigated the relationships between them (Reed et al., 2009).

3.3 The mixed- methods approach

The combination of qualitative and quantitative methods allowed for a mixed-methods research approach. The oldest and most common mixed-methods rationale is triangulation, based on the idea that when methods are combined or mixed, this would result in an improved understanding of the research questions and objectives, rather than the use of each approach on its own (Clark et al., 2008). In triangulating the quantitative and qualitative methods for this research study, the different but complementary data sets collected were compared – in order to confirm or verify the results, and to determine any inconsistencies between the different forms of data, or to use the one data type to improve confidence in the results of the other (Spicer, 2004; Clark et al., 2008; David and Sutton, 2011).

Clark et al. (2008) illustrate the triangulation of data forms to aid the researcher in the interpretation of the results (Figure 3.1). The combined-methods research approach used for this study allowed for more information to be gathered from the research data than would have been the case with the use of only one type of research method (David and Sutton, 2011). More importantly, each method has its own strengths and weaknesses, and when combined, can address different types of research questions, which make up different parts of the general research issue. This then allows for the weaknesses of each method used, to be counteracted by the strengths of the others (Jick, 1979; Spicer, 2004).

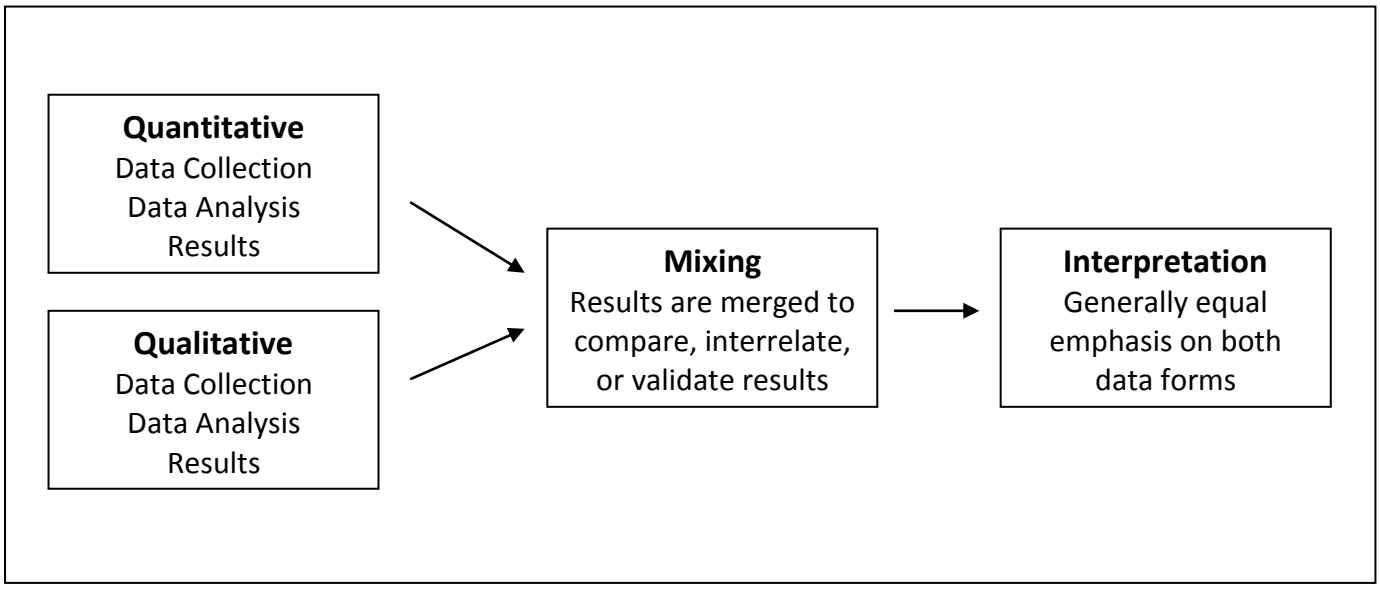

Figure 3.1: Triangulation–mixed methods design (source: Clark et al., 2008:1551)

3.4 The interpretivist framework

The justification for the choice of the interpretivist framework for this research approach is that the focus of this research is on experience and interpretation. The researcher interpreted interviews with various stakeholders, in order to understand how policies and laws for GM food labelling in South Africa were developed and implemented. The interpretivist framework "aims at capturing the lives of participants, in order to understand and interpret meaning"; and the interpretivist researcher comes to understand that using observation in research renders the researcher liable to make mistakes and produce errors; and that any theory can be altered and revised (Henning et al., 2004:19).

In addition, an interpretive researcher should endorse numerous arrays of data and different sources, as well as methods of analysis – in an attempt to achieve credibility in the research. According to Henning et al. (2004:20), "different viewpoints construct the world through different processes of observation", thus, no single scientist can see and capture the world objectively. Interpretivist researchers are also sensitive to the role of context, in this case the South African context and those stakeholders found within that context. The

interpretivist methodology includes unstructured observation, open interviewing, idiographic descriptions and qualitative data analysis (Henning et al., 2004:20).

3.5 The data collection

3.5.1 Document analysis

Document analysis in social research refers both to data collection and analysis (O'Leary, 2005). In this study, document data or different types of text were collected, reviewed, interrogated, and then analysed. These forms of text ranged from archival and historical documents, personal communication, such as emails, policy and legal documents, official government records, activist organisation publications and newspaper articles. The relevant documents collected, reviewed and interrogated for this particular research project are listed in Appendix B.

3.5.1.1 Retrieval and selection process

The majority of the documents collected were obtained from the Department of Trade and Industry (DTI) by requesting access to the records of public bodies. The Promotion of Access to Information Act (PAIA) Form A was completed, and sent to the Records Manager at the Office of the Chief Information Officer at the DTI, and a total of 429 documents on DVD were received via the post. These documents were then sorted and placed into separate folders, and all the irrelevant material was removed. Each document was sorted, according to the stakeholder comments (emails); draft versions of the Act, regulations and exemptions; DTI workshops and presentations on the Act, regulations and enforcement; and other documents containing reports and papers. Other documents, which included emails, reports, unpublished and published papers, were either received by email, or directly at the interviews. In addition, further documents such as news articles, reports, press releases, newsletters, website materials and documents etc. were collected online by the researcher. All the relevant documents were then coded and various themes were extracted for analysis.

3.5.2 Semi-structured interviews

Qualitative interviews can access participants' personal positions or feelings and their perspectives on certain issues (Byrne, 2004). It is particularly important when attempting to understand the development and implementation processes of policy to gain access to the "views, interpretations of events, understandings, experiences and opinions" of all those involved (Byrne 2004:182). Although qualitative interviews cannot provide the direct thoughts of a participant, as a key research method or tool, they can provide "a particular representation or account of an individual's views and opinions" (Byrne, 2004:82). The greatest advantage in using qualitative interviews is the rich, revealing, in-depth and complex data that they elicit (Robson, 1993; Byrne, 2004). However, data that are collected through interviews may be subjective, as this information comes from the stakeholders' personal knowledge and interests (Schmeer, 1999). In this case, the researcher took careful note of the stakeholders' personal feelings and agendas towards other stakeholders or the policy under study. In addition, an attempt was made to maintain as neutral and objective a stance as possible, and to remove any personal bias when interviewing each of the participants, in order to try and gain a holistic impression of how the policy developed, and how it has been implemented.

Interviews of both a quantitative and qualitative nature can be used to find out a great deal more about a particular research subject under study – as opposed to the use of only qualitative interviews or just standardised questionnaires (David and Sutton, 2011). Thus, semi-structured stakeholder interviews were utilised as the main method to collect and analyse the quantitative and the qualitative data. A portion of the face-to-face interviews included standardised, structured questions, whereby the same questions were asked in exactly the same sequence to elicit specific information from each individual stakeholder. The other part of each interview had more flexible, open-ended questions. These were specifically tailored for each different stakeholder group, in order to draw out more considered, in-depth and complex responses.

These methods, including a documentary analysis (data collection and analysis), were used to achieve the four main research objectives, and to inform and meet the overall aim of the study.

3.5.2.1 Sampling and technique

Key stakeholder groups involved in the food-production chain and in the development and implementation of the mandatory GM food labelling regulations were identified from the literature, from the available relevant documents, and from an internet or web-based search. These are illustrated in Figure 3.2. The nine different stakeholder groups that were initially identified for this particular study are listed in Table 3.2. These included those involved in the different sectors of the food-production chain, namely: multinational and local seed companies; farmers; food producers; distributors, traders, wholesalers and retailers; industry-affiliated associations; and lastly, consumers.

Other stakeholders outside this chain included: government agencies and departments; government-research institutions; NGOs, including environmental, churches and religious communities; the academic and scientific community; and lastly, the trade unions.

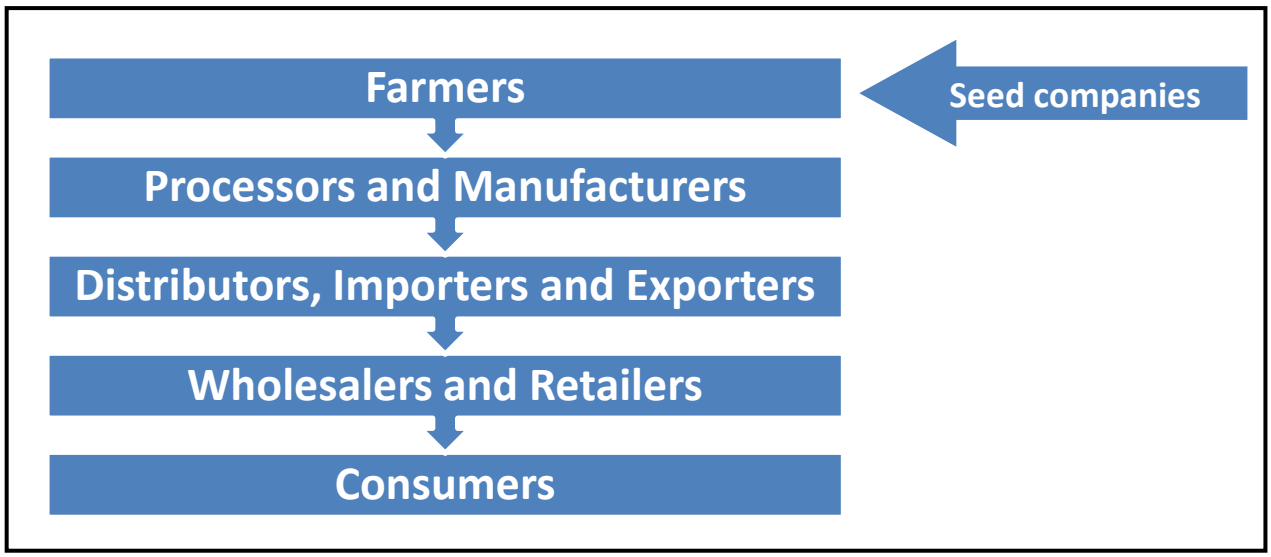

Figure 3.2: Food-production chain/ food-value chain

Table 3.2: Stakeholder groups involved in the food-production chain and in the development and implementation of mandatory GM labelling in South Africa

Stakeholder Group Number	Stakeholder Groups
Stakeholder Group 1	Seed companies
Stakeholder Group 2	Farmer organisations
Stakeholder Group 3	Food producers (processors and manufacturers)
Stakeholder Group 4	Distributors, traders, wholesalers and retailers
Stakeholder Group 5	Consumer groups
Stakeholder Group 6	Government agencies and departments
Stakeholder Group 7	NGOs: environmental, church and religious communities and others
Stakeholder Group 8	Academic and scientific community (universities) Government research institutions
Stakeholder Group 9	Trade unions

Once stakeholder contact details were collected and recorded, the stakeholders were then contacted via email, and in some instances by phone. Selected stakeholders then either accepted or refused to participate in the study, or they gave a referral of a replacement within their organisation, who was more *au fait* with the topic. There was great difficulty in getting stakeholders to agree to participate in this research. This was a result of the huge contention around GMOs, and their political and sensitive nature, as well as the controversy about the labelling of GM food in South Africa. Through the initial set of interviews, additional key stakeholders involved in the food production chain and GM labelling policy process were identified and contacted through local key informants or referrals. This was the main method used to identify all the individuals to be interviewed in this study.

3.5.2.1.1 Snowball sampling

The approach that is termed network or snowball sampling was used, as there was no list of the study population available, despite requests to government – making it difficult to directly identify key stakeholders from all the stakeholder groups (Bloch, 2004; David and Sutton, 2011). This technique works by means of referrals amongst those individuals who have the same or similar characteristics (Bloch, 2004). In principle, the "researcher identifies

one or more individuals from the population of interest and after they have been interviewed, they are used as informants to identify other members of the population" (Robson, 1993:142). Thus, this research project obtained further contacts with key people involved in both the food-production chain and the development and implementation of mandatory GM labelling in South Africa. This was accomplished by referrals from others, who were either directly or indirectly involved. Because this sampling technique could bias the sample or survey results if the researcher interviewed only people from one particular network, many different starting points for snowballing were used, to ensure that access to more than one network was achieved (Bloch, 2004). While each stakeholder interviewed was asked for referrals, the contentious nature of the issue meant that many of the respondents were reluctant to share information, such as organisations' documents or contact details.

3.5.2.2 Scheduled interviews

One-on-one semi-structured interviews took place from November 2012 to May 2013. The interviews were conducted with stakeholders from seed companies; farmer organisations; food producers; distributors, traders, wholesalers and retailers (stakeholder groups 1-4); government agencies and departments; non-governmental organisations, and the academic and scientific community (stakeholder groups 6-8)[3]. No interviews were conducted with stakeholders from the consumer groups and trade unions (stakeholder groups 5 and 9), as representatives from these two groups were unavailable and unattainable during the data collection period.

In total, 27 in-depth interviews were conducted with key stakeholders involved in both the food-production chain and the development and implementation of the mandatory labelling law for GM food. These included: the food industry, NGOs, government departments, and the academic and scientific community. These stakeholders, including their corresponding stakeholder groups and organisations' names with interview dates (schedules) are listed in a table in Appendix C.

[3] See table in Appendix C for stakeholder group numbers and corresponding names

3.5.2.3 Interview location and design

Interviews conducted in person included seven in Cape Town, six in the Johannesburg vicinity, four in Pretoria, and one in Krugersdorp. The remaining nine interviews were conducted over the phone. Scheduling interviews with such a diverse group of stakeholders proved difficult as one had to try and co-ordinate each of their own time schedules, and thus, the interview process expanded over a period of months. The interviews ranged from 30 minutes to two and a half hours in length, with most averaging around one and a half hours.

The questions and/or themes were prepared beforehand, reviewed several times, and once finalised, were piloted prior to the interviews. Appendix D includes a copy of the questionnaire. The standardised, structured, closed-ended questions (part A of the questionnaire) consisted of general questions, asking each interviewee background information. The question categories or options consisted primarily of Yes/No questions, choosing from a list, and ranking and rating responses to questions (David and Sutton, 2011). These questions ranged from having an understanding or knowledge of GMOs in agriculture and GM food labelling, positions on GMOs in agriculture, and any GM labelling systems supported. The more flexible, longer and open-ended questions (part B of the questionnaire) were tailored for each different stakeholder group. These were arranged into three different sections or themes: the overall policy development; the implementation process and the "perceived" enforcement of the regulations that came into effect in October 2011; as well as the possible future implementation and enforcement of the draft amendments to the regulations[4].

[4]Final amended GM labelling regulations had not yet been published as of April 2015.

3.5.2.4 Interview protocol/etiquette

Most of the interviews were coded or labelled to indicate certain organisations (Appendix C). However, in cases requiring complete anonymity, the interviews were coded to indicate the stakeholder group. The responses from each interview were recorded by means of note-taking and audio-recording. Formalities were addressed prior to each interview, which included: scheduling appointments, arriving on time, setting up and checking recording equipment, establishing rapport, introducing the study to the interviewee (informing respondents about the purpose of the study, the research intentions, and objectives, the role of the researcher, and the intended duration of the interview), as well as explaining the ethical issues.

The interviewees were told that participation and the answering of questions was voluntary; and they were also informed about their rights to decline participation, or to withdraw consent from answering questions at any time during the interviews. The respondents were further assured that their participation in the research was confidential and anonymous, and that the information gathered during the study would also remain confidential during the project – unless consent was requested and obtained. Thereafter, the prepared questions for each interview were asked and any clarifications that needed to be made around certain questions were addressed appropriately during the interviews, as well as further explorations or expansions on certain ideas. Where the respondent's answers were indistinct or ambiguous, further clarification was sought. Once all the interviews had been conducted, each audio-recording was transcribed and any additional notes taken were incorporated. The data obtained from the interview questions were analysed to discover the underlying themes (O'Leary, 2005).

3.6 Data Analysis

3.6.1 Analysis of the quantitative data

The quantitative textual data gathered from the interviews were analysed with the use of Microsoft Excel. The responses were coded numerically, and captured and stored in tabular format. Once all the data had been recorded, pie charts and tables were created, using basic statistical methods and techniques. The tables and graphs represented percentages of stakeholders' perceptions on their knowledge of GM food labelling, the labelling system supported, the knowledge of GM, food-price effects, and the effectiveness of policy implementation, and thus showed any recurrences and trends in the dataset. The quantitative results were helpful in that they supported and confirmed some of the qualitative findings, while triangulating the different datasets.

3.6.2 Analysis of the qualitative data

Information acquired through the stakeholder interviews was organised and coded into themes or categories, in order to determine the key patterns, which allowed for further expansion and interpretation (O'Leary, 2005; Seale, 2004). Comprehensive notes were transcribed for each interview – using both the recording and the written notes generated at the time of the interviews. The notes from the interviews were then grouped, according to the various stakeholder groups that participated in the study.

Codes were assigned to the participants' responses after the textual information was recorded (Seale, 2012). The use of open-ended questions and a post-coding scheme meant that the respondents were less restricted by the wording of the questions to answer to the researcher's fixed project objectives (Seale, 2012). Hence, the researcher would have a greater variety in stakeholder answers, and a better understanding of the complex meaning that contributed to a response and to the formation of coding categories (Seale, 2012). This helped the researcher to obtain a diversity of perceived stakeholder issues, and thus to hone in on the most common and significant of these issues.

The responses showing similar phenomena, experiences or trends were extracted and grouped together to form analytical categories or themes (Rivas, 2012). Developing categories made it more likely to identify the "unusual and the unexpected" and thus, "develop richer interpretations of the data" (Rivas, 2012:375). Rivas (2012) explains that the purpose of category development is to "systematically group multiple fragments of unconnected literal codes into something meaningful and more analytical and digestible" (Rivas, 2012:376). At this stage of the thematic analysis, some interpretation occurred, however, most of the interpretive effort was kept for theme and analysis formation. The procedure of carrying out category formation necessitates the "constant comparison" of all parts of the data within, and across the developed categories (Rivas, 2012:375). In this study, for example, when stakeholders were asked to comment on the threshold used to trigger mandatory GM labelling, one response stated that "...*the threshold was too high*", while another claimed that "*another contentious issue was the threshold that should be used*". These comments were post-coded as "*threshold level*".

In another instance, when the stakeholders were asked about their involvement in the mandatory GM labelling policy development process, a response such as "*input and analyses were not considered at all*", and another response, "*listened to us*", were then both post-coded as "*stakeholder participation*".

After all the relevant responses were post-coded, the data were further examined, analysed, compared, categorised, and triangulated with the other datasets, in order to identify any additional patterns in the participants' answers. Important themes relating to the issues of policy development and the implementation of mandatory GM labelling emerged from the interviews. Many of these themes or issues reflected the GM labelling arguments, as discussed in the literature review, as well as the significant issue of stakeholder participation in the development of the mandatory GM food labelling policy of South Africa.

3.6.3 Document analysis

The qualitative textual data from the DTI documents and the other relevant documents were analysed using the same method or approach used to analyse the qualitative textual data from the interviews. Excerpts from the document data were triangulated with the interview responses and those showing similarities to the coded interview data were organised and post-coded into the same corresponding themes or categories. However, excerpts showing differences to the interview data were post-coded into new separate themes. The similarities and differences identified within the document data were also post-coded and categorised.

3.7 Ethical considerations

This research dealt largely with people by making use of human subjects as sources of data. Thus, ethical clearance through the Faculty of Science Research Ethics Committee at the University of Cape Town was obtained[5]. As the main method framed for data retrieval was through interviews with key stakeholders from various different sectors of society, it was of the utmost importance to take cognisance of the ethical responsibilities required of the researcher when in the field. Major ethical responsibilities considered when conducting the interviews were to gain written and oral informed consent, and to protect the privacy and confidentiality of each research subject, so that the potential participants would be respected and their interests protected.

The research background, as well as the intentions and purpose of the study were explained to each of the participants. It was also important to clarify beforehand that the researcher was conducting an academic, objective and independent study, and that the researcher's position was neutral. This clarification was essential as many different stakeholders from the food industry, government, NGOs, etc., associated this particular study of looking at the labelling of GM food products as being biased. Thus, it was pertinent to ensure that the stakeholders were made aware of this neutrality, in order to achieve the most truthful, open and in-depth responses. GMOs are already a very contentious issue, and the labelling of

[5] Ethical clearance form located in Appendix E.

GMOs even more so. Thus, it was vital to consider the different group dynamics and the various opinions of the stakeholders, and not to permit these differences to influence the results of the study.

3.8 Research constraints or limitations

3.8.1 Sample and time constraints

One of the major limitations identified for this study was the difficulty in securing the agreement of the stakeholders to participate in this research. Over 100 stakeholders were contacted, yet only 27 interviews were conducted across the various stakeholder groups. This limitation was a result of the sensitive nature of GM food labelling in South Africa. Certain stakeholders also had prominent positions, and therefore, had pressured work schedules. This resulted in a limited sample of the overall population. Although a limited sample size was obtained, the data that were obtained from the interviews came from the most relevant and prominent stakeholders involved in the policy development and implementation processes.

3.8.2 Document sensitivity

A further limitation identified for this study was that of the sensitive nature of the documents. Data collection, in terms of accessing information, such as publications, reports, minutes and records from certain stakeholders, proved challenging. Although certain stakeholder emails were provided by the government, other sensitive – but not confidential information – had to be accessed through the use of PAIA, whereby a request for public records was submitted. A total of 429 documents were received, reviewed, sorted and analysed; and these provided a substantial amount of data to better inform the study. Other documents pertaining to the development of the policy for labelling GM food were requested from all the stakeholder participants. However, certain stakeholders were unwilling to allow access to these personal and confidential documents containing stakeholder comments.

3.9 Conclusion

The aim of this research was to analyse the development and implementation of mandatory GM food labelling in South Africa. Policy development and implementation processes are complex and multi-faceted and involve the participation of an array of stakeholders. This study used stakeholder perceptions to observe and analyse the policy development and implementation processes for mandatory GM labelling. Thus, both qualitative and quantitative data-acquisition research methods were used, in order to capture an in-depth and holistic understanding of how mandatory GM labelling evolved in South Africa.

Twenty-seven face-to-face, semi-structured interviews were conducted with a variety of key stakeholders from different sectors of society (industry, government, NGOs, and the academic and scientific community), as well as a documentary analysis of all the relevant documents was conducted. Both the interview responses and the document excerpts were analysed – using coding and thematic analysis methods to determine those themes, which facilitated analysis and helped determine connections between the data. The quantitative and qualitative data were triangulated during the analysis, so as to provide a comprehensive narrative of the stakeholder participation in the policy-making and implementation processes of mandatory GM food labelling.

CHAPTER FOUR – KEY STAKEHOLDERS AND THEIR NETWORKS IN THE POLICY DEVELOPMENT PROCESS

4.1 Introduction

This chapter describes the relevant stakeholders, and how they came to be involved in contributing towards the mandatory GM labelling policy-making process and its implementation. Each stakeholder played some part in varying degrees, in agro-food politics and policy-making, each forming part of a network or alliance of stakeholders, in which there is some mutual understanding of the interests and values within their own networks or alliances. In this particular case, they mostly comprised either the pro-GMO lobbyists or the anti-GMO network (Freidberg and Horowitz, 2004). While those involved in the debate about whether or not GM crops should be commercially grown in South Africa were similar to those involved in the GM food labelling debate, the stakeholders also shifted their identities and alliances over time and place and they may not have been intrinsically involved in the GMO labelling debate.

Table 4.1 illustrates the food industry, government, the NGO community, academia, trade unions and consumer-organisation stakeholders in the GM labelling debate. This chapter explores the positions taken historically by each stakeholder in the GM food labelling debate, their involvement or contribution, if any, towards the mandatory GM labelling policy-making process, and their ties and affiliations with other relevant stakeholders in the debate.

Table 4.1: Various actors who have either played a significant part, or no part at all, in the policy development process of mandatory GM labelling in South Africa

Actors	Role played in the GM labelling policy-making process in South Africa
Food Industry	
Farmer organisations	Insignificant
Biotechnology (seed) companies Food producers, distributors, traders, wholesalers, retailers Industry-affiliated organisations (AfricaBio)	Industry collectively formed an industry-working group and played a significant role
Government	
Department of Trade and Industry (DTI): Competition and Consumer Law and Policy	Played a significant role in formulating policy
Department of Health (DOH): Food Control Unit	Participated in and made submissions during process
Department of Science and Technology (DST): Bio-economy Strategy	Participated in and made submissions during process
Department of Agriculture, Forestry and Fisheries (DAFF): GMO Registrar	Participated in and made submissions during process
NGO Community	
Environmental: South African Freeze Alliance on Genetic Engineering (SAFeAGE), African Centre for Biosafety (ACB)	Played a significant role, particularly during drafting and implementing the regulations
Biowatch SA, Wildlife and Environment Society of South Africa (WESSA), Earthlife Africa (ELA)	Played a supporting role to SAFeAGE and ACB
Churches and religious communities: Southern African Faith Communities' Environment Institute (SAFCEI)	Played a supporting role to SAFeAGE and ACB
Academic and Scientific Community	
Universities (University of the Free State – UFS)	Prominent academic in the microbiology field, contributed significantly in formulating the GM labelling policy, in particular the "may contain" clause
Trade Unions	
Part of ANC tripartite coalition: The Congress of South African Trade Unions (COSATU)	Initially, significantly involved in policy process, but during drafting of the regulations played no role
Consumer Organisations	
South African National Consumer Union (SANCU), Consumer Fair (National Consumer Forum)	Insignificant

4.2 Government

The main government institutions involved in developing and implementing GMO policy in South Africa, particularly the labelling policy for GM foods, included the Department of Agriculture Forestry and Fisheries (DAFF), the Department of Science and Technology (DST), the Department of Health (DOH), and the Department of Trade and Industry (DTI).

Historically, the South African government's position on GMOs has been portrayed as cautiously optimistic. In other words, they are positive about the use of GMOs and biotechnology in South Africa, but at the same time, they acknowledge the associated risks that arise (Wolson, 2007). According to the Academy of Science of South Africa (2010:70), South Africa, among several other African countries, has "put in place policies and regulatory frameworks to support the responsible and safe use of biotechnology, assuring public confidence, encouraging local biotechnology innovation based on local priority needs, and helping mitigate against any possible adverse effects on human health and the environment".

However, positions on the use of GMOs in agriculture between certain government departments have been relatively polarised, and these differences in views have created difficulties in reaching a consensus on the development of GM crops (Morris and Thomson, 2014). While DAFF and DOH strongly support GMOs in agriculture, DST prefers to withhold its position on the use of the technology (DOH1; DST1). But all three departments do have a pro-biotechnology stance, and they are more commonly considered as GMO proponents, unlike the DTI and DEA, who are known to have a more sceptical view (DOH1; Wolson, 2007).

4.2.1 Department of Agriculture, Forestry and Fisheries (DAFF)

4.2.1.1 GMO regulation

The Department of Agriculture, Forestry and Fisheries, as a regulatory agency for "food and agricultural biotechnology" is possibly the single most significant department in terms of GMO regulation[6], as it is the deciding body that either accepts or rejects GMO applications (Freidberg and Horowitz, 2004:10). The Genetically Modified Organisms Act, 15 of 1997 is administered by DAFF whose mandate is to regulate the "trade, production and R&D of GMOs" in South Africa (Aerni, 2005:467).

4.2.1.2 GM-labelling standpoint

It is well known that DAFF, together with the DOH and DST, support the voluntary labelling of GM foods, on the basis of the Substantial Equivalence principle that GM foods are equivalent to their conventional non-GM counterparts (ACB, 2012a; DOH1; FoodNCropBio1; ACB1). According to these departments, GM food products approved for commercial consumption in South Africa are considered safe without any associated health risks (DOH1; DST1).

The DAFF openly objected to the adoption of the mandatory labelling of GM foods and cautioned against its inclusion under the Consumer Protection Act (CPA), as they felt it would send out conflicting messages about GMOs contained in the Consumer Protection Bill (CPB) and the GMO Act (SAFeAGE, 2008a). DAFF also felt that labelling for GMOs was already adequately provided for under the FCDA, Regulation 25, and that a stricter labelling regime would undermine the processes and programmes that both they and the DST had in place to develop GMOs (H&H1; DST1). Essentially, the department has been very much in favour of addressing labelling under its own legislative mandate (SAFeAGE, 2008a).

[6] A detailed explanation on the GMO regulation process in South Africa can be found in Appendix F.1.

4.2.2 National Department of Health (DOH)

4.2.2.1 Voluntary labelling – their mandate

The national DOH published South Africa's first labelling regulations for GM food in January 2004 (Freidberg and Horowitz, 2004). The regulations were developed by the DOH's Food Control Section, which is responsible for food safety, and for safeguarding the health of the South African public. One of the main functions of the unit is to administer food legislation, which includes "developing and publishing regulations for food safety, food labelling and related matters, as well as developing technical guidelines where necessary" (Aerni, 2005; DOH, n.d.). Additional roles include: notifying and educating industry, consumers, mass media, other government departments and stakeholders about food safety issues, as well as examining the risk and safety assessments associated with agricultural chemicals and food developed through the use of biotechnology procedures, specifically for the DAFF (DOH, n.d.).

Two policy-makers from the food-control section that were involved in helping develop a voluntary labelling policy for GM foods, believed at that time that few South Africans were aware of biotechnology or GM foods, never mind cared about them, in spite of the growing media interest around the GMO debate (Freidberg and Horowitz, 2004; Rule and Langa, 2005). Thus, without much pressure to include the "unaware" public in drafting the policy, these policy-makers were guided by advice from various local and international sources, who had scientific and policy backgrounds.

4.2.2.2 GM labelling position

The DOH has also been greatly opposed to the mandatory labelling of GM food, believing this approach to be extremely costly, very difficult to implement through informal markets, and to be of no value to the illiterate populace of South Africa. The DOH has thus favoured the voluntary labelling approach (Freidberg and Horowitz, 2004; DOH1). At the same time, the DOH believes that the voluntary labelling regulations under the FCDA are appropriate– until such time that the international Codex Committee on Food Labelling (CCFL) has come to an agreement on an international guideline for the labelling of GM food products (Department of Health, 2008).

In fact, one of the policy-makers from the DOH's Food Control Division, who interestingly has direct ties to the GM food industry, as she is married to an industry representative, has argued that "our population, our consumers, should really trust government on this. We won't let them have something that isn't safe. Never. We are very, very responsible" (interview cited in Freidberg and Horowitz, 2004:16). Civil society groups representing the public, such as SAFeAGE, have found it difficult to trust government's decisions in the policy-making process, when government has had such close and strong affiliations with industry, and have blamed government for "suiting industry and not the consumer" (Kahn, 2004 cited in Freidberg and Horowitz, 2004:16). Further criticisms by public interest NGOs are that the voluntary labelling standards have been a "strongly expert-ruled policy", which disregards social-science research to examine any possible socio-economic impacts that may arise, and that these groups representing the public interest have been excluded from the policy-making decisions (Freidberg and Horowitz, 2004; Aerni, 2005:467).

4.2.3 Department of Science and Technology (DST)

4.2.3.1 Biotechnology advancements, but with caution

The Department of Science and Technology (DST) produced a national Biotechnology Strategy for South Africa in 2001, which was subsequently replaced by the Bio-economy Strategy in 2014, as gaps in the Biotech-Strategy framework were identified (Aerni, 2005: Mayet, 2007; DST[7], 2013). The Bioetch strategy was used to attempt to "define the role of biotechnology for economic development in South Africa" (Aerni, 2005:467); and a National Biotechnology Advisory Committee (NBAC) was established under this strategy (Mayet, 2007). The NBAC was responsible for advising the Minister of DST on biotechnology-related issues. Interestingly, at the time when the committee was formed, an academic, well known for her strongly promotional views of GMOs, Professor Jennifer Thompson, of the University of Cape Town, sat as the Chair of the NBAC; and the previous Executive Director of the industry-funded organisation AfricaBio, was also a member of the same committee. This highlights the intertwined relationships and networks that have existed between government, academia and industry, which are known for the most part to be supportive of

[7] Appendix F.2 contains a short description of this new Strategy

the proliferation of GMOs in agriculture in South Africa (Freidberg and Horowitz, 2004; Aerni, 2005; Wolson, 2007).

4.2.3.2 Educating the public on biotechnology

In 2003, the Department launched the Public Understanding of Biotechnology Programme (PUB), to educate and raise awareness about biotechnology among the broad public, including all facets of society, namely: consumers, educators and learners, and promoting the understanding of the potential of biotechnology (SAASTA, n.d.). According to an extensive survey conducted in 2004 by the programme on South African public perceptions of biotechnology in collaboration with the Human Sciences Research Council (HSRC), eight out of ten South Africans were unfamiliar with the term "biotechnology", and more than half had never heard of the word before (Rule and Langa, 2005).

4.2.3.3 Less-stringent GM labelling

The DST is in favour of GM labelling, but supportive of a less-stringent labelling regime, such as a mixed mandatory or voluntary labelling approach (DST1). They are also of the opinion that a stricter regulatory approach, such as mandatory labelling, would hinder biotechnology development in South Africa, and in turn counter the biotechnology programmes at the DST: "*I think it flows from the national Biotech-Strategy; if we are trying to develop biotechnology for South Africa, we need to have pragmatic ways that are appropriate to our theme, so a strictly enforced regulatory environment, an onerous one, is not conducive to development in biotech*" (DST1).

4.2.4 Department of Trade and Industry (DTI)

4.2.4.1 The consumer must know

The Department of Trade and Industry (DTI) has only recently become involved in the GMO labelling debate in South Africa. While they have been known to carry a more sceptical and cautious view on the use of GMOs in agriculture, they are, in general, supportive of the technology (Wolson, 2007; DTI1). The DTI governs the mandatory labelling of GM foods in South Africa and are concerned with protecting the consumer's right to know (CPA, No. 68 of 2008). The position of the Department is as follows:

"*From where we operate…the law as it stands in section 24(6) requires that consumers* [must] *be aware of what they eat. So, our position is that the DTI...*[which] *is not the same as our sister departments* [who]*...would be informed by the actual scientific thing and so on...the consumer must be aware of, specifically the type, of foods that he/she consumes, so from that premise, we support the labelling of goods*" (DTI1).

Mandatory GM labelling under the CPA is viewed by the DTI solely within the context of ensuring the consumer's right to obtain information needed to make an informed choice about food, and is not about human health, safety or quality issues (DTI1; AfricaBio, 2010). In the Department's view: "*Consumers have to know that when a product is labelled, the label does not carry any safety warning. It's principally for purposes of making the consumer aware, so that the consumer can make that decision*" (DTI1).

4.2.4.2 Drafting the GM labelling law

The Competition and Consumer Law and Policy unit, falling under the Consumer and Corporate Regulation Division (CCRD) of DTI was responsible for the establishment of the mandatory GM labelling law under the CPA. The department also claims that, while they do not have the technical expertise in terms of GM technology, they have drafted the labelling policy to the best of their capabilities, to ensure that consumers' rights to information are addressed appropriately: "*We are not experts on the actual science, but we are aware of the benefits of genetic modification,* [and] *we have also been made aware of what could be the risks associated with that, but we are not experts in that regard. What we are saying is that the consumer must know*" (DTI1).

4.3 Non-governmental organisations

Although the South African government welcomed the introduction of GMOs into the country, their introduction was not as celebrated by the NGOs themselves (Scoones, 2008). The anti-GM coalition in South Africa is made up of predominantly environmental organisations, which act as the "watchdogs over South Africa's rich biological diversity and are advocates for environmental justice" (Aerni, 2005:465). Originally, this more critical movement consisted of a small group of organisations with the most prominent being

Biowatch SA, the South African Freeze Alliance on Genetic Engineering (SAFeAGE), and Earthlife Africa (ELA) (Freidberg and Horowitz, 2004; Scoones, 2008). Thereafter, a much firmer anti-GM coalition developed, by mobilising and pooling the efforts of a wider diversity of organisations. This wider range of groups' mandates was not focused solely on anti-GM activism, but instead took this on as a secondary role, like that of GM labelling (Scoones, 2008). This network of organisations consisted of the trade unions, farmer organisations, consumer groups, rights-based organisations, development and environmental organisations, faith-based groups, conservation groups, and green groups (Scoones, 2008). The GM labelling advocacy network has consisted of a similar range of organisations as the anti-GM coalition. Both networks have included the unions, faith-based groups, and conservation and green groups, but the degree of involvement by these organisations has varied, according to each network (ACB1; SAFeAGE2; SAFCEI1; Biowatch1; WESSA1).

4.3.1 Biowatch

4.3.1.1 The first anti-GM lobbyists

Biowatch South Africa has been a prominent environmental organisation fighting against the proliferation of GMOs in the country. It opposes GMOs on the basis of health, environmental and socio-economic concerns (Wolson, 2007). The NGO serves as an advocacy and research organisation, seeking to disseminate, monitor and research issues around genetic modification, particularly GMOs in agriculture, as well as to encourage and advocate biodiversity conservation (Wynberg and Fig, 2013). The national public interest NGO was formed in 1997, and consisted of only a few volunteers, who had started to conduct research and advocacy work that examined the fairness of the existing legal and permitting frameworks for GMOs and the possible environmental and social effects that could emerge from placing GMOs on the market (Wynberg and Fig, 2013). The group grew disturbed and apprehensive towards the government's easily approving approach for granting permits for field trials of GM crops, and their subsequent commercial release (Wynberg and Fig, 2013).

The small research and advocacy group was initially involved in various workshops, discussions, and also produced papers dealing with labelling and segregation issues (Scoones, 2008). The NGO has also favoured "preventive approaches towards regulating agricultural biotechnology" in South Africa, much like the proposed five-year moratorium on GM crop-field trials and commercial releases called for by the umbrella network, SAFeAGE (Aerni, 2005:466; Wolson, 2007). Although the NGO has been the prominent driving force in the anti-GM coalition, it has taken somewhat of a backseat in the mandatory GM-labelling movement. Instead, it has played a supporting role to those GM-labelling advocacy groups and campaigns, whose primary focus has been lobbying the South African government for the effective labelling of GMOs in South Africa (Biowatch1). A Biowatch representative recalled:

"*You know going back to 2003, 2004, Biowatch has been highlighting issues around GMOs. And so, in some ways our work really has made a difference, but when you look at the last bit, in terms of the regulations around the labelling, we haven't been involved there. We were informed of what was happening, but we didn't participate*. [Instead] *SAFeAGE ran with the labelling issue and Biowatch was part of that network*" (Biowatch1).

4.3.2 South African Freeze Alliance on Genetic Engineering (SAFeAGE)

SAFeAGE, the South African Freeze Alliance on Genetic Engineering, an allied organisation of Biowatch SA and a public interest-networking organisation, was established in 1999 (Scoones, 2008). Similar to its European counterpart the "freeze campaign", the NGO called for a five-year moratorium, essentially a "freeze" on all field trials and the commercial releases of GMOs into the environment, as well as a freeze on the patenting of genetic resources, until the technology was proven safe to use, exhibited no harm to the environment, and regarded the safety and wellbeing of all society, including consumers and farmers (Freidberg and Horowitz, 2004; Viljoen et al., 2006; Wolson, 2007). The campaigns initiated by the organisation were named the GM-Free Food List Campaign and the GM-Free Labelling Campaign, whereby the media were used as the main platform to raise public awareness of the GMO and GM-labelling issues (SAFCEI, 2007; Scoones, 2008).

4.3.2.1 Dissemination of information and raising awareness of GMOs and GM-labelling issues

SAFeAGE was a network organisation sharing information and data with over a hundred other South African advocacy organisations, and more than 60 international groups (Freidberg and Horowitz, 2004). In essence, the organisation pooled together a wide network of concerned individuals and anti-GM and GM-labelling advocacy organisations to support them in both their anti-GM and GM-labelling lobbying campaigns (SAFeAGE2; Biowatch1). The main groups that strongly supported SAFeAGE, particularly in their GM food-labelling campaigns, included the ACB, ELA, Biowatch, SAFCEI and WESSA (ACB1; Biowatch1; SAFCEI1; WESSA1).

The sole purpose of the organisation was to disseminate information, in order to raise awareness of GMOs, the lack of labelling and incorrect labelling; and thus attempt to gain support for their cause, which was to ensure consumers' rights to choose GM-free foods in South Africa – through the establishment of effective GM labelling (Viljoen et al., 2006; ACB1; SAFeAGE, n.d.). For several years, SAFeAGE, together with other pressure groups, fought to have mandatory labelling introduced into South Africa, until they achieved, in 2008, a victory for consumers' rights to know and to choose by civil society groups for mandatory GM labelling (Mayet, 2004; SAFeAGE, 2008b; ACB1; Viljoen and Marx, 2013). Shortly thereafter, once the labelling regulations had been established under the CPA, SAFeAGE had to close its doors – due to funding constraints (SAFeAGE2; ACB1).

4.3.3 Earthlife Africa (ELA)

The NGO and lobbyist group Earthlife Africa (ELA) is a well-known environmental organisation, whose work entails the effective mobilisation of concerned individuals to protest against environmental injustices that may directly or indirectly affect them or their communities (Aerni, 2005). The group was not as active as Biowatch in the initial anti-GMO campaigns in South Africa. However, this changed in 2004, when it became a prominent group mobilising and campaigning against the government's GMO policy (GMO Amendment Act and voluntary labelling), and the World Food Programme (WFP) (Aerni, 2005). It further showed its anti-GMO activism, together with other environmental groups, such as SAFeAGE,

Environmental Justice Networking Forum (EJNF), Earth Woman and the Ekogaia Foundation, when it participated in protests intended to target retailers by stressing the issues of GM labelling, and highlighting voluntary labelling, as well as its inadequacy as an effective labelling option (Scoones, 2008). More importantly, the NGO made numerous submissions to the DTI during the policy-development process for mandatory GM labelling (ELA, 2010a and b; ELA, 2012).

4.3.4 African Centre for Biosafety (ACB)

The African Centre for Biosafety (ACB) is a Johannesburg-based environmental NGO and active lobbyist against GMO use in agriculture in South Africa and elsewhere (Mayet, 2007; ACB1). The organisation was established in 2004, and is centred on actively informing the public about GMO issues, such as the implications of GM food and GM labelling, and also lobbying government to take on a more precautionary approach with regard to GMO applications and field trials (Dugmore, 2013). The NGO seeks to safeguard "Africa's biodiversity, traditional knowledge, food-production systems, culture and diversity, from the threats posed by genetic engineering in food and agriculture" (ACB, n.d.). It purports to give reliable, trustworthy, accurate, pertinent and up-to-date information, research and policy analysis on matters related to "genetic engineering, biosafety and biopiracy in Africa" (Mayet, 2007:4).

4.3.4.1 Campaigners for mandatory GM labelling – a consumer's right to know and choose

ACB has been involved in both the voluntary and mandatory GM-labelling disputes, but it has had greater involvement in the mandatory labelling policy-development process (ACB1). Together with SAFeAGE and other GM labelling advocacy groups, the organisation has also been fighting to get meaningful GM labelling – mandatory labelling – in South Africa (Mayet, 2004; SAFeAGE, 2008b; ACB1). ACB's contribution to the policy-development process included hosting a stakeholder workshop that welcomed all authorities, civil society activists, and food industries to participate and aid in discussion, make them aware of and advising them on the proposed GM-labelling regulations, and to build capacity on pertinent

GM-labelling issues (ACB, 2012a). They also produced a position paper on GM labelling, in conjunction with a fact sheet for South African consumers (ACB, 2012a).

ACB, together with SAFeAGE, also developed a web-based label GM foods campaign (right-to-know initiative) to ensure consumers' right to know, and to choose in terms of GM ingredients or components in foodstuffs under the CPA (Label GM Foods, 2010; ACB, 2012a). The focus of the campaign was to mobilise consumers to sign a petition for meaningful regulations for the labelling of GM foods under the CPA, which they then used to lobby government (Label GM Foods, 2010). Their labelling initiative later joined the social networking site, Facebook, in order to educate and increase public awareness on GM-labelling issues, and to monitor industry (ACB, 2012a).

Both the ACB and SAFeAGE were continually involved throughout the process for drafting the GM-labelling regulations (SAFeAGE1; ACB3). However, after SAFeAGE folded, ACB took on the role as consumer watchdog under their already-established label GM food initiative (ACB1). To date, they are still actively involved in pushing the DTI to release the final amendments to the GM-labelling regulations, which have been with the department since 2012, when the public comment period closed.

4.3.5 Churches and religious communities

Certain religious groups from the churches and religious communities have also joined the anti-GM coalition. These include the South African Council of Churches (SACC), the Pietermaritzburg Agency for Christian Awareness (PACSA), and the Ecumenical Service for Socio-Economic Transformation (ESSET) (Scoones, 2008). In 2005, faith communities wanting to increase their involvement in combating environmental issues, arranged a national multi-faith environment conference, which included Christians, Muslims, traditional African religious groups, Hindus, Buddhists, and Baha'i religions, in order to launch the Southern African Faith Communities' Environment Institute (SAFCEI) (Wolson, 2007; SAFCEI, 2015). The conference addressed and stressed the need for improved "public participation in decision-making on GMOs" (Wolson, 2007:189). According to a SAFCEI member, the organisation functions as an "*environmental NGO among the faith community...it's a multi-*

faith organisation and our work is to get religious organisations to become more involved with environmental responsibility" (SAFCEI1). Since its inauguration, SAFCEI has, through "collaboration, networking, research and action", sought to increase awareness on environmental issues; to increase participation in developing policy and ethical guidelines within faith communities; to guide environmental responsibility and action; to tackle environmental and socio-economic inequities; and to promote and encourage environmental education (SAFCEI, 2015).

4.3.5.1 Support for GM-labelling advocacy work

SAFCEI, in particular, were involved in the initial advocacy work for GM labelling in South Africa. They were heavily involved in SAFeAGE's GM-free food campaign and GM-free labelling campaign and they helped to mobilise other religious groups to support these causes (SAFCEI, 2007). However, their direct involvement has dissipated – owing to other more pressing environmental issues in which they are involved. They have, however, continued to support the GM-labelling advocacy work done by other organisations: "*We try and support organisations, which try and share information...which supports our ethical approaches. A lot of what we've done has been endorsing their recommendations and supporting their ongoing effort to raise awareness around what they're doing, so, in a sense we see ourselves as a communication network for information*" (SAFCEI1).

4.4. Industry

4.4.1 Seed companies

On the other side of the GMO debate are the "most aggressive promoters of GM crops", the multinational seed and chemical companies (Freidberg and Horowitz, 2004:12). Companies like Monsanto, Aventis, Syngenta, and Pioneer Hi-Bred International have infiltrated and dominated the local GM seed market and consider South Africa as the "testing ground" to encourage the proliferation of GMOs in other parts of the continent (Wolson, 2007:187). The biotech production network focuses on the distribution and trade of GMOs (Freidberg and Horowitz, 2004), which 15 years ago was hardly a concern in South Africa, as

government, joined by industry and a small group of scientists "set the terms" (Scoones, 2008:322). However, according to Scoones (2008), this has changed in more recent years.

4.4.2 GM-labelling stance

The pro-GM industry lobbyists support and believe in the benefits of GM crops in agriculture (Monsanto1; CGCSA1; FoodNCropBio1; AfricaBio1; NCM1; GSI1; Aerni, 2005). However, the biotechnology and food industries strongly oppose the idea of GM labelling based on substantial equivalence – that GM foods are equivalent to their conventional counterparts, and thus should not trigger GM labelling (ACB, 2012a; DOH1; FoodNCropBio1; ACB1). Hence, both industries, supported by DAFF and DOH, have lobbied heavily for an unregulated voluntary labelling approach in regard to GM food available on the market (ACB1; Botha and Viljoen, 2009). Most industry players do not support mandatory GM labelling on the basis that it is a costly, complex process, as well as confusing to consumers (Monsanto2; AfricaBio1; Agbiz1; FoodNCropBio1).

4.4.3 Industry-working group

Many industry members contributed towards the mandatory GM-labelling policy development process (Industry-working group, 2011). The various stakeholders in industry, representative of the food-value chain, formed a GM-labelling working group to help co-coordinate their efforts and understand GM labelling under the CPA (Industry-working group, 2011; Agbiz1). A DST official recalled that "*there was an industry group that got together to try and come up with comments on the regulations...I'm not sure if this wasn't a pre-existing alliance, but certainly they came together for this purpose and I was invited to participate in that*" (DST1).

The members of the working group included the Consumer Goods Council of South Africa (CGCSA), the Agricultural Business Chamber (Agbiz), Monsanto, the Grain-Silo Industry (GSI), the South African Association for Food Science and Technology (SAAFoST), Crop and Plant Biotechnology Services (CPBioS), FoodNCropBio, Grain SA, Pioneer Hi-Bred International, the National Chamber of Milling (NCM), Suidwes Landbou, Tiger Brands, the South African National Seeds Organisation (SANSOR), Business Unity South Africa (BUSA), and AfricaBio

(Industry-working group, 2011; Agbiz1; CGCSA1; AfricaBio1). Although AfricaBio considers their association to be an independent NGO, both they and BUSA were also a part of the GM-labelling working group that represented the food industry (Monsanto1; AfricaBio1; CGCSA1).

4.4.4 Industry versus anti-GM organisations

While industry is known for their close affiliations with certain government departments, and with AfricaBio, they are also known for their hostile relationship with the anti-GM NGO community. Therefore, certain NGO groups were excluded from the industry-working group meetings (ACB1; Agbiz1; FoodNCropBio1). An industry representative recalls the relationship as heated: "*...we got all these role-players together and eventually barred the* [one NGO group] *because* [they're] *obviously from the other side and* [we]*...had some fights...various stand-up fights in public*" (Agbiz1).

4.4.5 Independent NGO or industry funded pro-biotech organisation?

4.4.5.1 AfricaBio

AfricaBio is known for its involvement with industry and it is often described as an industry-funded pro-biotech NGO (Aerni, 2005; Wolson, 2007; Scoones, 2008). However, the group portrays itself as an "independent, non-profit, non-political biotechnology stakeholders' association" and claims to be a "civil society organisation" (Freidberg and Horowitz, 2004:19; Wolson, 2007:188; AfricaBio, n.d.(a)). The biotechnology association is involved in all areas of GMO governance in South Africa. This includes research and development, regulating GMO policy, and educating the public (Freidberg and Horowitz, 2004). Its main stated purpose is "to give accurate information and to generate awareness, understanding, as well as knowledge on biotechnology and biosafety, in the country and the rest of Africa" (AfricaBio, n.d.(a)).

Today, the organisation holds an extensive range of representative members, from multinationals such as Monsanto; consumers; industry; farmers and farmer organisations; academia; professionals; scientists; producer groups from the food industry; and state-funded and private research organisations. It provides information to stakeholders, decision-makers, the media, civil society, farmers and international groups, as well as lobbying the key stakeholders (Wolson, 2007; Wynberg and Fig, 2013; AfricaBio, n.d.(b)).

4.4.5.2 Counteracting the anti-GM alliance

AfricaBio was launched in 1999, and it "attempted to occupy the scientific higher ground" using scientific evidence to validate its anti-GM position (Scoones, 2008:321; Wynberg and Fig, 2013). AfricaBio has been involved throughout the GM debate as a solid pro-GM player, and has often been in conflict with organisations expressing concerns about GM, which have nearly always been with the same people in the same arena (Scoones, 2008). AfricaBio's relationship with industry goes beyond mere support. Industry representatives that have previously worked for SANSOR, a GM crop supporter with ties to AfricaBio, and Monsanto, the multinational "gene giant"; have also worked for the stakeholder association. Essentially, AfricaBio and industry are interconnected, and go hand-in-hand (FoodNCropBio1; Monsanto2; Wolson, 2007). Not only does AfricaBio influence industry, but it has also been known to influence consumer organisations, communities and government-research agencies. A SAFeAGE representative stated: "*AfricaBio has very strong connections with these sorts of organisations...it's a very powerful, well-funded organisation. It's a deeply problematic organisation in many respects*" (SAFeAGE2).

4.4.5.3 Replace mandatory GM labelling with existing voluntary GM labelling

Much like industry, AfricaBio opposed mandatory GM labelling, preferring government to replace the policy with the existing voluntary GM-labelling regulations of the FCDA (AfricaBio, 2011). AfricaBio, as part of the GM-labelling working group, contributed to the policy-making process (AfricaBio, 2011), "*As an industry, we gave our inputs; AfricaBio and Agbiz represented the food industry*" (Monsanto1; AfricaBio1; CGCSA1; Monsanto2; AfricaBio, 2011).

4.5 The academic and scientific community

Academics and scientists working in the area of biotechnology are generally supportive of GMOs, and tend to strongly believe in the benefits of GM crops (Freidberg and Horowitz, 2004; Aerni, 2005; Wolson, 2007). They do recognise that there are associated risks with using the technology, but at the same time, they believe that these can be controlled (Wolson, 2007). Critics, on the other hand, are of the opinion that representatives of the academic and scientific community who are experts in the GM field have been "unwilling to give "honest and independent" opinions on the topic – due to the financial support they receive from industry" (Wolson, 2007:188). Yet, Wolson (2007:188) notes that the financial support they do receive is fairly small and most likely does not provide a good enough reason for across-the-board "conflicts of interest".

4.5.1 Academic divide

Industry has strong supporters from the scientific community, in particular from an influential and prominent microbiology professor (Mayet, 2007). This biotechnologist not only has advised government on the GMO Amendment Act on behalf of the scientific community of biotech practitioners, but, together with other associate academics and industry members, sits on the board of the International Service for the Acquisition of Agri-Biotech Applications (ISAAA), and has previously sat on the board of directors as the Vice Chair for AfricaBio (Freidberg and Horowitz, 2004; Mayet, 2007; ISAAA, 2014). Anti-GM groups see this academic as a lobbyist for industry, as comments made on her behalf, representing the biotech scientific community, about the GMO Amendment Bill, were essentially the same as those submitted by SANSOR (Mayet, 2007). These scientists view the mandatory GM labelling regulations under the CPA to be "onerous" and most likely impractical to enforce, needing complex and costly testing to ensure compliance (Morris and Thomson, 2014).

Even with their strong ties to industry, academia are still considered the most vital and trustworthy institution in the public GMO agricultural debate in South Africa (Aerni, 2005; Rule and Langa, 2005). However, there are other prominent biotech scientists who are more neutral, supporting a regulated labelling system, such as mandatory labelling, purely on the

basis of allowing for consumer autonomy. One academic for example, stated: "*It is the only system that actually seems to give consumers the essential choice*" (Academic1; Botha and Viljoen, 2009). The same academic, a professor in the field of microbiology, as well as being a GM-labelling expert, has made a significant contribution to the GM-labelling policy-making process. Although he claims to have not been involved directly in the formulation of the policy, he has most certainly contributed significantly to the process (Academic1).

There seems to be a clear divide among scientists operating in the biotech scientific network– in terms of their positions towards mandatory GM labelling. Interestingly, those in support of a stricter and more regulated GM-labelling approach also have affiliations with industry and government (DTI).

4.6 Trade unions

4.6.1 COSATU

Trade unions, which were central in the fight against the apartheid regime, continue to be highly influential in South Africa, particularly the Congress of South African Trade Unions (COSATU), the main union organisation that forms part of the tripartite coalition that once governed the country (Wolson, 2007; Scoones, 2008). COSATU, together with other trade union groups, have opposed GMOs (Wolson, 2007). The union has had "little impact directly" in the GMO debate, but because the anti-GM network can emphasise the support it receives from the unions, this holds substantially more influence for the anti-GM cause (Scoones, 2008:337).

COSATU openly expressed its opposition to GMO production in South Africa at the COSATU Congress held in 2003, where a call was made to place a moratorium on commercialised GMOs for human consumption. The unions have also conveyed their fears and concerns over cheap GM crops being imported into the country, which would, in turn, affect the price of local products, and result in job losses, as well as GM technology being controlled solely by multinational seed and chemical companies (Wolson, 2007). In the past, the Food and Allied Workers Union (FAWU), a member of COSATU, threatened industrial action if GM

food was not banned within the country, however, these remained as threats only (Wolson, 2007).

4.6.1.1 The relationship – COSATU and SAFeAGE

In addition to openly opposing GMO production, COSATU has also been a key player in the GM-labelling debate in South Africa, and is a firm supporter of mandatory GM labelling (COSATU, 2008; SAFeAGE2; ACB1). They had a long-lasting relationship with SAFeAGE, which COSATU has supported in lobbying government (DTI) to include a mandatory GM-labelling provision under the CPA. A SAFeAGE member recalled: "*We had quite a long relationship with COSATU and the union. We went to the union and said listen, they've moved out now guys, they don't want to listen to us; under the CPA it is very clear that labelling must be present*" (SAFeAGE2; ACB1; ACB3). However, after the CPA came out with the GM-labelling clause, COSATU's presence seemed to fall away. COSATU was linked to SAFeAGE, but when the group folded, COSATU was no longer involved in the cause. According to ACB, their alliance was only valid for a brief period in time: "*I think it was strong, but only for a moment...just that moment … for the CPA, generally speaking, the Churches, the NGOs, the public that* [support] *was always strong and coherent*" (ACB1).

4.7 Consumer organisations and farmers

Although consumer organisations have played a part in the GMO debate in South Africa, their role has been rather weak. Those groups that were originally involved in the anti-GM coalition included the National Consumer Forum (NCF) and the Safe Food Coalition (Wolson, 2007; Scoones, 2008). However, in Aerni's (2005:464) study on stakeholder attitudes towards the risks and benefits of GM crops in South Africa, the findings suggest that consumer organisations "strongly believe in the benefits of GM crops". Scoones (2008:335) in contrast asserts that consumer organisations have been involved in "raising awareness around food-safety issues, mobilising for food labelling, and consumer boycotts to hold supermarkets to account".

For example, the NCF has in the past requested authentic stakeholder engagement in the GMO debate in South Africa, and conveyed concern on a number of GMO-related issues, such as the failure to label GM foods infringing on the consumer's right to know (Wolson and Gouse, 2005). Although consumer groups may have, in the past, lobbied for voluntary GM labelling, evidence from this research study, suggests that the consumer groups played no role in mobilising for mandatory GM labelling in South Africa (SAFeAGE2; retail chain1; SAAFoST1; ACB1; ACB3; H&H1).

4.7.1 No role in protecting civil-society's interests

Consumer organisations may have taken up the fight against GMOs in South Africa but they were not present in the mandatory GM-labelling debate. According to a food industry representative: "*Consumer groups did not feature at all. I don't remember seeing anyone from any consumer group there, but as distinct from a NGO*" (H&H1). Where consumer organisations have failed to represent and protect the public and their interests, civil society organisations have taken on the role to secure consumers' socio-economic rights to have GM foods labelled. An ACB member recalled:

"*The consumer groups and the farmer organisations did not play a role. You can see that's the missing link in the South African social movement...it's an indictment on where we are as a social movement...it is the first time we've seen an alliance or some support by trade unions for farm workers, because they haven't had any support, that's why it's ground-breaking, they've got a lot of support now, they've got NGO support, for the first time, these people have a bit of clout, you see; so it starts to shift things a little bit for them*" (ACB1).

South African consumer organisations may be opposed to mandatory GM labelling on the basis that it might impose unnecessary costs onto the consumer, as well as possibly stigmatising GM foods. Therefore, a reason for the lack of consumer presence during the drafting of the mandatory GM labelling law, may well be that these groups feared expressing their opposition to those consumers, supported by the public interest NGOs, advocating for labelling on the premise that the consumer has the right to know. Consumer

organisations in essence, should allegedly be in support of the interests of the consumer, and their right to choice and information.

An industry representative noted that this was why consumer organisations had been uncertain about implementing GM labelling: "*What happens then, too, in the process is* [that] *food prices just go up because you've got costs and it gets passed on to the consumer. And the Consumers' Unions understand that, that's why they are not pro,* [and are] *overly precarious of* [a] *labelling strategy because it impacts on the consumer in the end*" (Agbiz1).

4.8 Conclusion

Stakeholders involved in the mandatory GM-labelling policy-development process come from all facets of society – each with varying contributions to the policy-making process and its implementation. It is clear that certain stakeholders have their own vested interests in the already established mandatory GM-labelling system in the country, whether it is financial gain, removal of the legislation, or consumer rights. The various stakeholders that participated in the stakeholder-engagement process were divided in their positions on the policy. Divisions existed not only between stakeholder groups, but also among stakeholders in the different groups. Government departments, such as the DAFF, DOH and DST opposed a mandatory GM-labelling system; whereas the DTI supported the policy for protecting consumers' rights. This disharmony in viewpoints created conflict among government departments.

While the majority of industry actors strongly opposed mandatory GM labelling, the findings suggest that the food-industry role-players were noticeably divided in their positions. The public interest NGO community and other supporting GM-labelling advocacy organisations, such as COSATU, as well as consumers, were united in firmly supporting the mandatory labelling of GM foods in South Africa. Unlike the NGO community, a noticeable divide existed within the scientific biotech community with those scientists who believed that the GM labelling regulations were impractical to implement, and with others who were of the opinion that mandatory GM labelling is the only labelling system that would protect consumer autonomy. The consumer organisations and farmer groups' positions remained

uncertain, and a possible explanation for the consumer groups concealing their position may be for strategic reasons.

The next chapter explores the policy development and implementation processes in which these stakeholders have been role-players.

CHAPTER FIVE – POLICY DEVELOPMENT OF GM FOOD LABELLING

5.1 Introduction

This chapter provides an overview of the policy development process for the mandatory labelling of GM foods in South Africa. It reports on the findings from the 27 interviews conducted and the documents collected for this study. The relevant literature, South African labelling legislation and the policy for genetically modified (GM) foods are reviewed. Voluntary labelling under the Foodstuffs, Cosmetics and Disinfectants Act, 54 of 1972 (FCDA) and mandatory labelling under the Consumer Protection Act, 68 of 2008 (CPA) are also reviewed here in detail. More specifically, an in-depth account of the policy conceptualisation for mandatory labelling under the CPA, together with the development process of the GM labelling regulations, is provided. The key stakeholders involved in this process and the degree of their involvement are also analysed. Finally, the period after the regulations were gazetted, is discussed in detail by describing the implementation process. A chronology is provided below, showing the policy development process of GM labelling in South Africa, and highlighting the significant events and decisions.

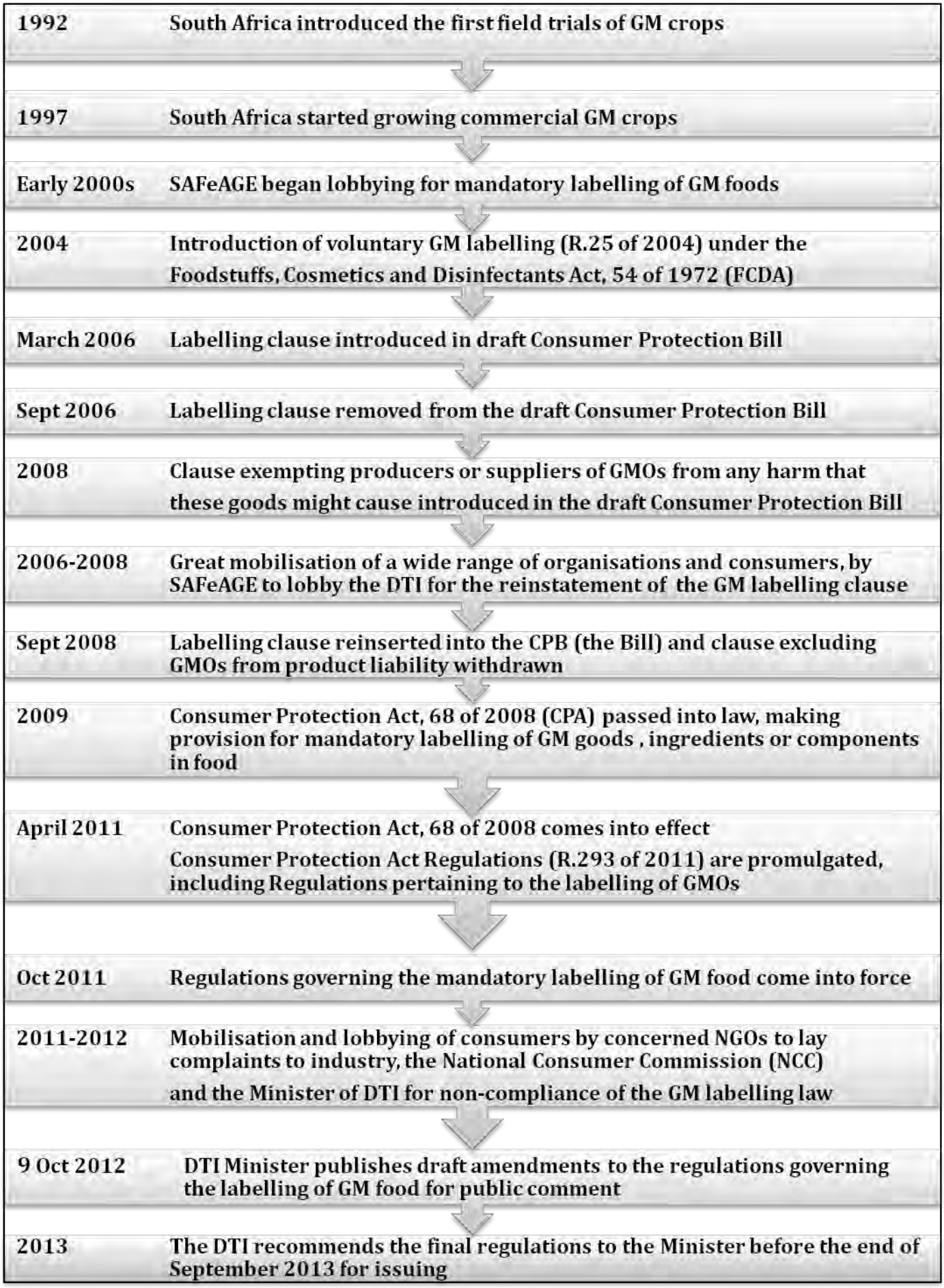

Figure 5.1: Chronology of significant events and decisions during the development process for GM labelling in South Africa

5.2 Review of the relevant legislation and policy

5.2.1 The establishment of voluntary labelling under the Foodstuffs, Cosmetics and Disinfectants Act, No. 54 of 1972

5.2.1.1 Regulation 25 – substantial equivalence

South Africa only began to make provision for GM food labelling six years after the introduction of GM foods to the market (ACB, 2012a). In January 2004, the National Department of Health (DOH) established Regulation 25 under the Foodstuffs, Cosmetics and Disinfectants Act, 54 of 1972 (FCDA) relating to the labelling of foodstuffs obtained through certain techniques of genetic modification. Regulation 25 set the standards for the labelling of GM food products for human consumption in South Africa, based on the US model (ACB, 2012a). While the Regulation includes both voluntary and mandatory labelling provisions, product labelling is not required for GM food products if substantial equivalence with their conventional counterparts can be determined. Thus, for the most part, it is a voluntary measure (Department of Health, 2008). Labelling is, however, required when the food product differs significantly from its conventional (non-GM) counterpart in terms of its nutritional composition, requirements for storage, preparation or cooking, or if it contains an allergen or a human or animal gene (FCDA, No. 54 of 1972, Regulation, 2004:25(2)).

5.2.1.2 Voluntary labelling still applies

Although mandatory GM labelling has since been introduced in the country, sub-regulation 9 of the GM labelling regulations (seen in Appendix G) implies that the GM food labelling regulations of the FCDA remain in place. However, GM labelling under the FCDA do not prescribe labelling for GM foods currently sold on the South African market, as these products are substantially equivalent to their conventional counterparts. However, the GM labelling regulations of the CPA do mandate GM labelling of all goods, which contain at least 5% of GMOs. Only if the GM foodstuff is substantially different would the GM labelling regulations of the FCDA take effect, and subsequently require labelling.

According to the DOH, DAFF and DST, GM foods approved for commercialisation in South Africa have passed strict safety and risk assessments prior to their general release. They are considered safe and unlikely to present any risk to human or animal health (DOH1; DST1; Industry-working group, 2011). Government, therefore, believes that labelling is not there to act as a warning, but rather to provide information, for which there are other means of doing so (Mayet, 2004).

5.2.1.3 Other voluntary claims and labelling exclusions

The GM labelling regulations of the FCDA, specifically regulation 25(3), states that there can be voluntary application of labels claiming that GM foods have value-added traits, such as "improved or enhanced composition, nutritional value, and reduced causation of allergenicity". However, these claims must be verified by a suitable body recognised by the South African National Accrediting Services (SANSAS) (Department of Health, 2008). The regulations are also subject to the new Regulations relating to the labelling and advertising of foodstuffs (R.146 of 2010) of the FCDA, specifically Regulation 14(b), which prohibits negative labels claiming that a foodstuff is free of GM content (Woker, 2009). In other words, one cannot label foodstuffs as GMO-free, non-GM, or organic – if other similar foodstuffs do not contain GM content, or are not derived from GMOs (Woker, 2009). Similarly, mandatory GM labelling does not make provision for these terms, but instead, food producers can either voluntarily label their products as "does not contain GMOs" below a 1% threshold, which is the same threshold level as that set by the DAFF for non-GM status of food exports for South Africa, or they can claim that there is an "absence of GM content below a specific threshold" (Viljoen and Marx, 2013:389). Furthermore, the GM labelling regulations of the FCDA exclude the labelling of GM animal feed, which is usually yellow maize and soy, and foods derived from animals fed on GM feed (Mayet, 2004; Woker, 2009).

5.2.1.4 The impact of voluntary GM labelling

Currently, none of the GM foods commercialised in South Africa fall within the scope of the GM labelling regulations of the FCDA (ACB, 2012a). Before mandatory GM labelling was established in South Africa, only a handful of food companies were voluntarily labelling their products as GMO-free, non-GM or organic (Botha and Viljoen, 2009). However, according to a study conducted by Botha and Viljoen (2009:1061) "voluntary labelling, as applied in South Africa, does not appear to be providing discerning consumers with a choice between GM and non-GM products", as many of the labelled products they tested contained GM. Thus, with a lack of "specific guidance or regulations" for voluntary GM labelling, some companies have been applying their own GM labelling systems, which in turn may have misled consumers (Botha and Viljoen, 2009:1061). Although there are some companies that have chosen to label GM foods voluntarily, consumer preference between GM and non-GM foods has not been provided for by voluntary GM labelling.

5.2.2 The introduction of mandatory GM labelling in South Africa

The inclusion of a provision for mandatory labelling of GM food under the CPA (68 of 2008) marked a great milestone for consumer rights (Viljoen and Marx, 2013). The CPA provides for consumer protection through Regulation 293 (2011), which makes provision for GM food labelling.

5.2.2.1 Consumer protection (fundamental consumer rights)

The purpose of the CPA is to protect South African consumers from unjust trade practices, enhance consumer awareness and information, as well as encouraging consumer confidence, by way of a legal framework that, in addition, presents a system of consumer redress[8] (Viljoen and Marx, 2013). The Act goes on to address various fundamental consumer rights. These include the consumer's right to equality; privacy; choice; the disclosure of information; fair and responsible marketing; fair and honest dealing; fair, just

[8] Section 3(1)

and reasonable terms and conditions; fair value, good quality and safety, as well as the supplier's accountability to its consumers[9].

5.2.2.2 Provision for mandatory GM labelling

The fundamental consumer right to disclosure and information includes a section on product labelling and trade descriptions. Clause 24(6), mandating the labelling of GM products, or ingredients, or components in food, states that "any person who produces, supplies, imports or packages any prescribed goods must display on, or in association with the packaging of those goods, a notice in the prescribed manner and form that discloses the presence of any genetically modified ingredients or components of those goods, in accordance with applicable regulations"[10]. Liability is also addressed, whereby the producer, importer, distributor or retailer of any goods is liable for any harm caused by a defective product, irrespective of any negligence[11]. Retailers and distributors are also protected from liability[12], which, according to Woker (2009), means that "the consumer must find the manufacturer or importer" and "will also have to prove that harm was as a result of consuming GM food".

5.2.2.3 Mandatory GM labelling regulations

A second victory for consumer rights was the promulgation of the CPA GM labelling regulations, providing for the mandatory labelling of GM foods under Regulation 7, which regulates the labelling of imported and locally produced GM food products on the market (Viljoen and Marx, 2013). The CPA defines goods, among others, as "anything marketed for human consumption"[13]. Table 5.1 summarises some of the provisions of Regulation 7[14].

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[9] Chapter 2

[10] Section 24(6)

[11] Section 61(1)

[12] Section 61(4)(c)

[13] Section 1

[14] Appendix G provides a complete list of the requirements governing the mandatory labelling of GM foods

Table 5.1: Regulation 7. Product labelling and trade descriptions: genetically modified organisms

Mandatory Requirements
Mandate the labelling of "any ingredient or component" in any packaged good that "contains at least 5 percent of genetically modified organisms"; the "good, ingredient or component" must be labelled "contains Genetically Modified Organisms".
If an ingredient or component of a food product is "intentionally and directly produced using genetic modification processes", it must be labelled as "Produced using genetic modification". This implies process-based labelling, and in order for a food producer or supplier to label accordingly, a traceability system (e.g. involving a paper trail of documentation), such as that of Identity Preservation (IP) systems, will be required from the farm through to the final packaged product stage. South Africa already has IP systems in place to facilitate the identity preservation of GM and non-GM products.
Voluntary Requirements
Goods, or ingredients or components that "contain less than one percent of genetically modified organisms" may voluntarily be labelled "does not contain genetically modified organisms".
In spite of regulation 7(6), if the genetic modification quantified in the ingredients or components of a particular good is less than 5 percent it may voluntarily "state that the level of genetically modified organisms contained in the good or ingredient or component" "is less than 5 percent".
Goods that cannot be tested for "the presence of genetically modified organisms or ingredients" as it is "scientifically impractical or not feasible", may be labelled as "may contain genetically modified ingredients".

5.2.2.4 Exclusions

The GM labelling regulations by default exclude the labelling of animals that are fed GM feed. This is because the feed is processed to such an extent that there is no detectable GM material found in the animal product (Viljoen and Marx, 2013). Unlike voluntary labelling, animal feed that contains 5% or more of GMOs does require labelling (ACB, 2010; AFMA, 2013).

5.3 Conceptualisation to finalisation: mandatory GM labelling in South Africa

5.3.1 Emergence of GM labelling

Civil society began lobbying for the mandatory labelling of GM foods from the start of the commercial production of GM crops in South Africa (ACB, 2012a; ACB1). However, in the early 2000s, both the biotechnology and food industries, supported by the DOH and the DAFF, lobbied strongly for voluntary labelling in regard to GM food imported, marketed and released at that time (ACB1; Mayet, 2004; DOH1; FoodNCropBio1). In 2004, voluntary labelling was introduced by the DOH (Mayet, 2004). Shortly thereafter, the Draft Green Paper on the Consumer Policy Framework was published for public comment (DTI, 2004). This draft paper proposing the new Consumer Law provided the first glimpse of labelling GMOs in terms of consumer protection, and addressed consumers' needs by requiring a description of the product to "facilitate more accuracy in labelling and ethical standards regarding, for example, the use of genetically modified organisms" (DTI, 2004:s3.4.2).

5.3.2 The Consumer Protection Bill

5.3.2.1 Introduction of the GM labelling clause

The South African Freeze Alliance on Genetic Engineering (SAFeAGE), together with consumers and other GM labelling advocacy groups, had been fighting for mandatory GM labelling for several years and continued to push the government for this (SAFeAGE, 2008a, ACB1). In March 2006, a clause requiring the mandatory labelling of GM food was included in the initial draft of the Consumer Protection Bill (CPB), released for public comment. The labelling clause[15] stipulated the labelling of GM ingredients or components of locally produced or imported packaged goods. The draft Bill also made provision for product liability[16], whereby any producer, distributor or supplier would be strictly liable for any damage caused by their product, including any damage that might arise from consuming GM food.

[15] Section 29(1)(a)

[16] Section 71(1)

5.3.2.2 GM labelling clause thrown out

Various submissions were made on the draft CPB, including opposition from the DAFF, the DST and the DOH on the inclusion of the labelling clause, on the grounds that it would send out a confusing message to consumers (SAFeAGE, 2008b). Furthermore, concerns relating to the cost of labelling, the technical expertise required in regulating safety issues in GMO products, and the cost of labelling on food prices were identified by DAFF and DOH (DTI, 2008a). The DAFF, in particular, had "cautioned against the CPB causing confusion – due to conflicting messages about GMOs contained in the Bill and the GMO Act" (SAFeAGE, 2008a).

As a result, the requirements for GMO labelling were removed from the revised draft, with agreement from the committee that DAFF would address this under the GMO Act (SAFeAGE, 2008a). An NGO representative recalled the sudden turn of events when the GM labelling clause was removed: "*There was a clause in…and then industry went and lobbied the caretaker President Kgalema Motlanthe,* [who] *took it out and so, it went to the National Council of Provinces without the labelling clause in it*" (ACB1).

Another representative from a public interest group recalled the same story: "*What's important is the whole history of the CPA. Initially, the CPA had labelling of GM, it was covered* [in] *the first draft. Then industry lobbied,* [and in] *the second draft, there was no mention* [of it]*, they took it out*" (SAFeAGE2).

However, industry had different perspectives. A representative from an influential association of agribusinesses operating in South Africa, for example, recalled: "*When they were writing the CPA, GM labelling was not actually envisioned in this whole thing, and then it was taken out*" (Agbiz1). Another industry representative remembers the run-up to the Act: *"*[There was] *external consultation with* [the] *biotechnology industry,* [and] *a big meeting and a process* [took place], [where] *DTI saw that it wasn't working and then dropped it…*[the labelling clause]" (Monsanto2).

5.3.2.3 SAFeAGE mobilise

That same year, an internationally respected and independent GMO testing facility at the University of the Free State (UFS) published test results for the GM content of different maize and soy products in South Africa (Viljoen et al., 2006). This was done to determine the uptake of GM in the South African food chain, and to verify the legitimacy of labels claiming that certain local and imported products were void of GM content. The study revealed the extent of GM uptake in the South African food chain, and it affirmed the need for effective regulations, in order to protect consumers' rights against false claims (Viljoen et al., 2006).

For the following two years, SAFeAGE used this study, as well as its own research to aid in their GM labelling campaign by increasing public awareness around GMOs, the lack of labelling and incorrect labelling (ACB1; SAFeAGE, n.d.). The national co-ordinator of SAFeAGE recalled that the "shocking" results enabled the group to raise a great deal of concern and that every week, the issue of GMOs was debated either on radio or in the media (Treherne, 2013). SAFeAGE was then able to mobilise other GM labelling advocacy groups, consumers, and the Congress of South African Trade Unions (COSATU) to lobby the DTI to have the mandatory labelling clause reinstated into the Bill (SAFeAGE, 2008a; ACB1; SAFeAGE2).

5.3.2.4 Product Liability – exclude GMOs

The next version of the draft CPB was not published until April 2008 and it contained a new and curious addition under the "liability for damage caused by goods" section (Consumer Protection Bill, 2008:s61). The section[17] no longer applied to any GMOs regulated in terms of the GMO Act, 15 of 1997. Soon thereafter, in May 2008, the CPB, No. 31027 of 2008 ("the Bill") was introduced into Parliament. The Bill did not make provision for GM labelling and it rendered GMOs exempt from liability for damage caused by them (DTI, 2008b). According to a representative from a pro-biotech NGO: "*There were some consultations with different stakeholders*… [and] *there was a draft that everybody agreed on*…" (AfricaBio1).

[17] Section 61(1)

5.3.2.5 Public hearings and provincial briefings

In June 2008, public hearings and provincial briefings were held on the CPB, lasting over two months (DTI, 2008b). During this period, there was great mobilisation of consumers by SAFeAGE, as a result of their widespread consumer and public-awareness outreach programme. This resulted in a flood of protest letters to the National Council of Provinces (NCOPs) (ACB1; ACB3). At the same time, SAFeAGE also tested several random food products and released the results of unlabelled products, showing relatively high percentages of GM content (SAFeAGE, 2008b). SAFeAGE was supported by a wide range of organisations, such as ACB, ELA, BIOWATCH SA, SAFCEI, WESSA, Ekogaia Foundation, and especially COSATU (SAFeAGE2; SAFeAGE1). With this accumulative body of evidence and support, SAFeAGE was able to strongly lobby certain provinces of the NCOPs, specifically the Western Cape NCOP, for the reinstatement of the GM labelling clause (ACB3; Treherne, 2013).

5.3.2.6 Bill adopted

The Bill was adopted in August 2008 with certain amendments, and later debated in the NCOPs (DTI, 2008b). Shortly thereafter, SAFeAGE submitted their input to the Parliamentary Portfolio Committee on Trade and Industry, calling for the reinstatement of the GMO labelling clause, and the withdrawal of a clause that exempted producers or suppliers of GMOs from any damage that these organisms might cause to the consumer (SAFeAGE, 2008a; Gosling, 2008). Public hearings on the CPB took place again in September and numerous stakeholders made submissions (Donovan, 2008). This gave SAFeAGE the opportunity to present their case (ACB3; Treherne, 2013). COSATU, in support of SAFeAGE, also presented to the Portfolio Committee and submitted comments, supporting the need for GM labelling (COSATU, 2008).

Without the support and influence from COSATU, GM labelling might not have been included in the CPA (ACB1). Numerous other organisations concerned with protecting consumer rights also made submissions. These groups wanted the GM labelling clause reinstated, based on the fundamental principle that a consumer has the right to know and the right to choose (SAFeAGE1; ACB2). The former media and communications officer of

SAFeAGE remarked: "*Everybody has the right to know* [and] *everybody's health is the responsibility of the individual and that individual must be given all the information, in order to make an informed choice*" (SAFeAGE1).

5.3.2.7 Reversal of the decision

GMO labelling was originally covered in the CPB, but, it was removed after concerns were raised by DAFF and DOH (DTI, 2008a; DTI, 2008b). While the DTI had "no problems with the principle of regulating labelling", they had noted that they did not have the "technical capacity to pronounce on the safety or non-safety of GMOs", but could "deal with consumer redress issues" and any "technical aspects on safety [would be] dealt with in the GMO Act" (DTI, 2008a; DTI, 2008b).

Based on stakeholder submissions, the Bill was again amended, requiring the labelling of GMO products (DTI, 2008b; SAFeAGE, 2008b). Following much debate, the parliamentary portfolio committee adopted the clause on 16 September 2008 (Gosling, 2008). In addition, the clause exempting producers or suppliers of GMOs from any damage that these organisms might cause to the consumer was withdrawn from the Bill (Gosling, 2008; Ensor, 2008). One of the main reasons underlying the DTI's decision to reinstate these clauses was that there would be "no substantial cost implications anticipated by introducing GMO labelling, as the Bill [did] not prescribe how labelling should be done" (DTI, 2008b).

5.3.2.8 Victory for consumer rights

This was a great accomplishment for GM labelling advocacy organisations and consumers. One SAFeAGE respondent recalled: "*We were all quite happy when it went back in again*" (SAFeAGE2). However, the new clause, unlike the original, did not require the "presence, nature and extent" of any GM ingredients or components of those goods to be disclosed on the product label; nor for any ingredients or components that had been determined to pose a chemical or biological threat in relation to its concentration in those goods (SAFeAGE, 2008c). "*We didn't get exactly what we wanted; and that's why our influence on decision-making towards the policy was moderate*", noted a SAFeAGE representative (SAFeAGE2). Although there had been much debate around the inclusion of the labelling clause among

different interest groups, its reinstatement was "considered a victory for consumer rights by advocacy groups for GM labelling, in South Africa", particularly in terms of the right to know and the right to choose (Viljoen and Marx, 2013:387).

The Act was believed by those supporting labelling to be contrary to the GMO Act, which, according to SAFeAGE allows: "*Untested, unlabelled and irresponsible genetic modification to run rife in the country*" (SAFeAGE, 2008b). "*Government has embarked upon the first step towards regulating agribusiness involved with GMOs. Not only have consumers been given a choice to reject GM foods, now, GM food can also be tracked from farm to fork – in order to hold Monsanto and others liable when we discover that something has gone wrong*", noted one advocacy group (SAFeAGE, 2008b); while a spokesperson for the Safe Food Coalition remarked: "*the Department of Trade and Industry should be congratulated for this bold move. Current GM labelling laws in South Africa are so flawed that they do not label any of the GM foods currently on the market*" (SAFeAGE, 2008b).

The organisations involved in lobbying to have GM labelling included in the Act were of the opinion that the DTI had a very strong policy for the protection of the rights of consumers and the right to know. According to ACB: "*They were coming from a very strong position and they saw no good reason to not include GM foods*" (ACB1).

5.3.2.9 Opposition still disapproves

However, interest groups, such as the DOH, DAFF, DST and the food industry, which had disputed mandatory labelling, were still concerned, for many of the same reasons. These included the cost of labelling; the technical complexity that GM labelling entails; an increase in the price of food; and that this would send out a confusing signal to consumers (DTI, 2008a; Ensor, 2008; DST1). In a press release issued by the DOH after the clause was reinserted into the Bill, the Department gave their viewpoint as follows:

"*The Department of Health is of the view that in light of capacity constraints and the inevitable impact that mandatory labelling will have on the price of, among others, an important staple food, such as maize, resulting from the implementation of an effective identity preservation system required to ensure the truthful labelling of foodstuffs containing GMOs, and the implications thereof for especially the section of the population already suffering from the consequences of poverty, the current regulations of the Department of Health are considered appropriate, until such time that the Codex Committee of Food Labelling has finalised the matter*" (Department of Health , 2008).

The Department went further to say that "*if the* [GM labelling] *clause is included in the CPB and passed*", they would then have to advise all the stakeholders involved accordingly, "*so that the implementation of the clause does not lead to unintended consequences*" (Department of Health, 2008). According to labelling proponents, this sent shockwaves through industry: "*The clause went in and when the CPA was published, industry had a heart attack, they were shocked to see it in there, they couldn't believe it, because they thought it was out, and they'd done their job*" (ACB1).

The food industry felt duped, both because the clause was reinserted without consultation, and because the NGOs had successfully influenced government (Monsanto2; Agbiz1). This was noted by an industry association representative: "*I believe that the activists were able to go behind those and influence the process...*[and that]*...all of a sudden, a different version came out*" (AfricaBio1).

5.3.3 The result

In September 2008, the National Assembly debated and adopted the Bill, subject to certain amendments (DTI, 2008b). These included the reinsertion of the labelling clause and the removal of the clause rendering GMOs exempt from product liability. The Portfolio Committee on Trade and Industry presented the Bill in Parliament with the proposed amendments, to the Select Committee on Economic and Foreign Affairs for final consideration and agreement (Hill, 2008, DTI, 2008b). Once approved, the Bill was then considered by the NCOPs and the final version was assigned to the Presidency for signature

(Hill, 2008). The Act assented to by the President was passed into law on 29 April 2009 (CPA, No. 68 of 2008).

5.4 Drafting the regulations

5.4.1 Early stages

Drafting of the CPA regulations began relatively soon after the Act was passed. The DTI held a conference in December 2009, inviting all the relevant stakeholders to attend. The conference addressed sections of the CPA that required regulations, which included section 24(6) on product labelling and trade descriptions (DTI, 2009). According to section 24(4), the Minister could prescribe "categories of goods" that are required to be labelled, including "anything marketed for human consumption" (CPA, No. 68 of 2008). In particular, section 24(6) under the Act requires an appropriate description on the packaging, indicating the presence of GM ingredients or components in certain foodstuffs (DTI, 2009). Various stakeholders submitted their comments on a number of the provisions, including those for GM labelling. The Department further hosted a GMO labelling workshop in 2010, inviting targeted stakeholders, which focused solely on section 24 of the Act (SAFeAGE, 2010).

5.4.2 The process

5.4.2.1 Stakeholder contributions

Over the course of 2010 and 2011, the DTI received many submissions from a variety of stakeholders specifically relating to the labelling of GMO products. They also had various meetings with different stakeholders and stakeholder groups[18]. GM labelling advocacy groups, SAFeAGE, ACB and ELA, with strong support from other NGOs, such as Biowatch, SAFCEI, WESSA and the EkoGaia Foundation, were continually involved and contributed throughout the process (ACB, 2012a; SAFeAGE2). Many groups had launched GM labelling campaigns, at different times during the policy development process, in order to increase awareness among consumers. As a result, the Department received many submissions from consumers.

[18]See Appendix I for the list of stakeholder comments submitted to DTI

The GM labelling advocacy groups in South Africa were largely responsible for raising awareness, and for the lobbying of consumers to push government for mandatory GM labelling in the country. An ACB representative noted their contribution to the process: *"… labelling is not our pet issue, but we've made as much of a contribution as we could and gave a lot of guidance, a lot of expert input on the regulations, on the process, we always pitched up for consultations, hosted a labelling workshop in 2008 and we called industry...*[and]*...government to that...trying to raise awareness*" (ACB1).

Similarly, a representative from SAFeAGE recalled their involvement: "*We wrote policies [and] lobbied government. We were involved in stakeholder meetings* [and] *lobbied stakeholders. We lobbied government departments. We wrote policy documents* [and] *made policy suggestions to the government. So, of course, the government drew up the policies* [and] *the regulations and we pamphleteered you know, lobbied the public, the consumers*" (SAFeAGE1).

Industry was also greatly involved in contributing to the drafting of the GM labelling regulations. The Chairman of the task team recalled:

"*We recognised that labelling needs to be done. Then obviously there was a whole process concentrated around the regulations, because it's not the Act that's a problem, it's the regulations.* [So]*…we created a task team, I actually got it together, I was the Chairman and we got all these role players together...the CGCSA were part of this, ourselves, Monsanto, Grain Silo Industry, SAAFoST, Crop and Plant Biotechnology Services, Grain SA represents the producers* [and] *farmers, NCM, Tiger Brands and SANSOR* [etc.]*...and what we did was to put our resources and our thinking caps together to try* [and get a] *unified position from the business sector..."* (Agbiz1).

He continued*: "We made various submissions to the DTI, because they were responsible for this. We consulted with other government departments, specifically the three government departments...DST, DOH and also DAFF, because they are responsible for the GMO Act and there's a registrar and there's a whole process around the Biosafety Protocol, which is the responsibility of DAFF*" (Agbiz1).

5.4.2.2 Draft regulations on GM labelling

Stakeholders were invited to submit comments on the draft set of regulations to the Department by 31 August 2010 (Industry-working group, 2011). During this short commenting period, the DTI received comments from various stakeholder groups, which included industry; NGOs; government departments and consumers (full list of the stakeholders who submitted comments is shown in Appendix I). Later, on 29 November 2010, draft CPA regulations were published for public comment[19] (Draft Consumer Protection Act Regulations, 2010), and further submissions were made by various stakeholders[20]. The Minister of the DTI published the CPA regulations (R.293), which included the GM labelling regulations in terms of section 120(1) of the Act on 1 April 2011.

5.5 Implementing the regulations (October 2011 – present)

5.5.1 Industry lodges complaints

The third GM labelling saga began once the regulations had been promulgated. The industry-working group wasted no time, and in May 2011 requested a meeting with the DTI to assist them in the interpretation of the GM labelling regulations (Industry-working group, 2011; Agbiz1). Industry had concerns about compliance and understanding the regulations (SAFeAGE2; Agbiz1). They were trying to develop compliance measures for the regulation, but were finding it challenging to establish an industry-wide interpretation and to implement it practically (NCM, 2011). Furthermore, many industry representatives were of the opinion that the published regulations had been poorly written, and that the terminology that had been used, was vague and ambiguous (Retail chain1; CGCSA1; Agbiz1; Agri SA, 2011). The issue of quantifying the 5% GM content and trying to clarify and define what was meant in terms of "*contains at least 5% of GMOs*" emerged as a central concern (CGCSA, 2010b; AfricaBio, 2011).

[19]Appendix J.1 contains a Table listing only the draft versions of the regulations with significant changes as a result of stakeholder comments/input in order to produce a final version of the GM labelling regulations.

[20] Full list of stakeholders who submitted comments to the DTI on the draft CPA regulations is shown in Appendix I.

5.5.1.1 Technical understanding?

Some industry stakeholders, as well as the DOH, blamed the DTI's failure in developing practical and clear labelling regulations on the lack of "*technical understanding of how to do the labelling*" (Agbiz1; DOH1). A food producer recalled this particular issue: "*You know, we, as food and technical experts, struggled to actually interpret what the legislation meant. I think there were people that took part in the writing that eventually did not quite understand what they said*" (SASKO1). Another representative from the same food company stated that industry's inputs should have been considered, in order to produce practical regulations: "*The regulation wasn't compiled with the input from the industry;* [so] *it becomes impractical – and that also leads to resistance*" (SASKO1). Thus, industry believed that the regulations should have been drafted by experts or people with the technical expertise, in relevant areas, such as the DAFF and the DOH (CGCSA, 2010a; Agbiz1; FoodNCropBio1; Retail chain1). As a result, industry, with a unified voice, lodged complaints with the National Consumer Commission (NCC) (Agbiz1).

5.5.2 The National Consumer Commission (NCC)

5.5.2.1 Draft guidelines for GMO labelling

The National Consumer Commission was inundated with requests from industry on the GMO labelling requirements, which included being invited to attend various meetings for clarifying the matter. The Commission referred this issue to the Minister of the DTI, requesting the Department's view (Mohlala, letter to Minister, 10 February 2012). Specifically, clarity was sought on the implementation of regulation 7 of the CPA, so as to ensure that their interpretation was correct, specifically their understanding of whether the 5% GM labelling requirement was to apply to all products, including processed products, as well as local and imported products (Mohlala, letter to Minister, 10 February 2012).

Furthermore, they noted that according to section 22(1) of the CPA, a producer of a notice must produce, provide or display that notice in either: (a) the form prescribed in terms of the Act; or (b) in plain and understandable language, if no form has been prescribed for that notice (CPA, No. 68 of 2008). It was proposed that guidelines be developed for methods of assessing whether a notice satisfies the requirements of plain and understandable language.

According to the NCC, the provisions of section 22 seek to "*ensure disclosure of information to consumers, to ensure that they make informed choices in the market place*". However, an initial assessment to ensure industry compliance, showed "*widespread non-compliance, especially regarding maize*" (Mohlala, letter to Minister, 10 February 2012). Therefore, the Commission wanted to intensify its engagements with members of the public for awareness-raising purposes, as well as with suppliers for the enforcement of the provisions (Mohlala, letter to Minister, 10 February 2012). The Minister concurred that the NCC played a crucial role in the implementation of the regulation, and that it was imperative that they publish guidelines (Davies, letter to Commissioner, 27 March 2012).

5.5.2.2 Task team

As a result, the Commission established an interdepartmental government task team to draft the guidelines, consisting of officials from various departments appointed by their Directors-General (DOH1). Representatives were nominated from four different departments – DOH, DAFF, DST and the DTI (DST1; Agbiz1; DOH1). An official nominated from the DST remembered his participation in developing the guidelines, and recalled: "*They sat together with agriculture, health,* [and] *industry*" (DST1). However, an Industry-working group member recalled that industry was never a part of the task team established by the Commission (Agbiz1).

5.5.3 Complaints lodged

In early 2012, ACB became aware that minimal labelling of GM foods was being carried out by industry and they urged consumers to lay complaints with the NCC (Label GM Foods, 2012a; ACB3). After investigating this phenomenon, ACB learnt that two of South Africa's largest retail chains, Pick 'n Pay and Woolworths, among others, were not labelling GM food products – according to one role-player, because "*The Commissioner of the National Consumer Council, Mamodupi Mohlala,* [had] *decided to put the implementation of the regulation pertaining to the labelling of GM foods on hold, until such time as she* [was] *fully cognisant of the issues around GM;* [and] *Pick 'n Pay* [was] *waiting for feedback from the Commissioner*" ("Foot-drag on GM labelling...", 2012).

In response, ACB released a story to the Saturday Star, criticising the Commissioner for delaying implementation. "*Industry has always opposed GM labelling and we have to wonder whether the Commissioner has been lobbied to delay these regulations*". "*This is the first time I have heard that the NCC can override legislation – and suspend legislation. Where would she get such legal authority? This issue has been dealt with ad nauseam with government and we find this to be totally and absolutely unacceptable. When did they advise consumers of this?*" ("Foot-drag on GM labelling...", 2012; Label GM Foods, 2012a).

5.5.4 The Commissioner responds

However, the Commissioner dismissed the allegations and she stated in a subsequent article:

"*Firstly, I have not sent out an official statement with respect to the GMO labelling. Secondly, with respect to the NCC enforcement aspect, we are actually in discussions with the DTI, and have forwarded correspondence to the minister, to ensure our interpretation of* [the] *regulations is correct, specifically whether the GMO 5% labelling requirement is to apply across the board, irrespective of whether those goods are produced or supplied, imported or packaged locally or overseas.*" She further stated: "*Once that clarity has been provided we will proceed to engage with industry and consumers on the matter to raise the required awareness and ensure compliance. Thirdly, the NCC has at no time given any person or entity an exemption from the compliance with the provisions of the GMO regulations. We actually do not have the authority to grant any such exemptions*" ("GMO labelling needs...", 2012).

5.5.5 Industry is labelling products

Although there has been ambiguity in the law, there were a few food producers that had started phasing in GM labelling, according to the new regulations – and how they would understand them, such as Tiger Brands and Premier Foods ("Foot-drag on GM labelling...", 2012; SASKO1; Monsanto1; Agbiz1). The Chairman of the Industry-working group recalled:

"*Generally, I think they are being implemented... because I know that some of the guys have been labelling...But I think what people are also feeling...you know there's implementation and there's implementation, so I think what we're probably also finding is implementation is being done, according to...what they think is right, as they interpret it – and...what their legal opinions are...or according to the legal opinion that they obtained, and what their interpretation is, as to what their responsibilities are...in many cases local...but, it hasn't satisfied the anti-lobby...They are implementing to the best of their knowledge, according to their interpretations..."* (Agbiz1).

5.5.6 Product testing reveals non-compliance

That same year, ACB carried out tests on several food products, and issued a press release stating that many of the products tested positive for GM, and contained high levels of GM content, yet, they were all unlabelled (ACB, 2012b). A representative from an environmental NGO recalled:

"*...I certainly don't think there's been 100% compliance. I think that a lot of manufacturers and suppliers will be trying to find loopholes and claiming they didn't know...and that's consistent with a lot of South African legislation, which says certain things and then there isn't sufficient compliance, or effort, attached to it...South Africa* [has a] *very poor compliance record generally* (WESSA1).

Biowatch South Africa also conducted tests that year, on three brands of maize-meal products, which all tested positive for GM, and contained over 50% of GMOs, however, only one product carried a label in compliance with the CPA (IDEX, 2012; Biowatch1). Subsequently, complaints on the lack of compliance by industry were laid by consumers and ACB to the NCC (ACB1; ACB3; Label GM Foods, 2012a). The four non-compliant companies included Nestlé, Pioneer Foods (Bokomo), Futurelife, and Premier Foods.

5.5.7 Industry's reaction

In response, the Consumer Goods Council of South Africa, on behalf of industry, including the four non-compliant companies, issued a press release stating that the CGCSA sought clarity on GMO labelling, and whether "*the members must label only the four varietals of maize, cotton, soybean and rape seed (canola), according to the provisions, or is it the intention that they label even products of which these varietals are ingredients or components*?". Many of these industry members, as well as the DOH and the DST, were confused about what actually required labelling: the GMO or the ingredients derived from the GMO (AfricaBio1; H&H1; DOH1; DST1). A DST representative noted:

"*The really big issue from the industry perspective was interpretation: What do these regulations actually mean?...There wasn't a problem with actually doing it, you know, this is the law, we've got to comply, but does it mean only the maize kernels and the soybeans? Or, does it mean the flour? Or, does it mean everything, any ingredients, and to what level? Is it 5% or 1%, and what do you label them because there are so many different options to write on the things? So, there was huge confusion as to what government's intentions actually were*" (DST1).

The CGCSA further noted in their press release that they had formally requested clarification on this issue from the NCC, but had yet to receive a formal response (CGCSA, 2012; CGCSA1). But "*the response from the NCC to questions asked at the annual CGCSA conference in 2011, was that the NCC* [would] *not enforce the Act, as clarity* [had] *not been reached and all loopholes* [had] *not been closed*" (CGCSA, 2012). They were further informed of a task team appointed by the Commission to "*clarify all legal uncertainties and*

ambiguities, which may rise to interpretation problems", but had not yet heard whether the process still stood (CGCSA1; CGCSA, 2012). As a result, the CGCSA maintained that they would continue in their efforts to obtain clarity from the NCC, to ensure that consumers be informed (CGCSA, 2012). In the meantime, the CGCSA advised its members not to label until they were given clarity on the regulations (CGCSA1). According to the Head of the Food Safety Initiative, companies had not been implementing "*because of uncertainties* [and] *the financial impact on industry– as they could not afford to spend money on something that is unclear*" (CGCSA1). One such case includes a high-end retail chain, which has been unable to implement the regulations, as the law has been so unclear. The company's food scientist recalled:

"*Well, we can't implement the regulations as it was published, that's why we've continued with our own voluntary system because the mandatory regulations are just not practically implementable. And we actually believe that our voluntary system is more consumer-friendly and delivers the intent better than what the actual regulations deliver, because obviously the CPA is about protecting consumers and giving them information; and we believe we're giving that, even though it's not the letter of the law...we believe that we are providing more than what the law requires...*" (Retail chain1).

Another, much smaller food producer has also struggled to implement the labelling regulations (e'Pap1). Not only has the producer experienced problems with trying to understand how to label his products GM, but he has struggled to gain help in interpretation from the DTI: "...*because with the requirements being unclear, we can't enforce something that's unclear. No one knows how to implement, no one knows how to enforce...we were trying to get some guidance into that and they just wouldn't talk to us and they just said it's another department. So, government doesn't talk to each other*..." (e'Pap1).

5.5.8 Slight ambiguities – industry circumvents the law

Although ACB and other civil society NGOs agreed with industry about the clarification of certain terminology; they strongly disagreed with industry's notion that the regulations were unworkable and could not be implemented in their current format. Instead, the NGOs felt that the intent of the regulations, which was to label, was very clear and that industry was purely biding their time– in the hope that the regulations would eventually fall away (SAFeAGE2; ACB1; ACB3; Biowatch1). This was affirmed by an academic representative:

"*I can actually say that quite simply* [that] *the companies that say that they cannot implement are actually trying to delay implementation, and well simply use delaying tactics...let me say that if some of the biggest food producers in South Africa and Africa can comply without any problems, everybody else's argument will simply become defunct...the regulations are actually quite clear, some individuals would like to suggest that there is duplicity in the regulations, there are not, and they* [are] *actually incredibly simple* [and] *that any delay or any suggestions to this effect is simply delaying tactics.*" (Academic1)

5.5.9 The NCC sought to clarify the issue

Relatively soon after industry's statement, the NCC issued their own press release on GMO labelling. The Commission stated that they were in the process of developing GMO labelling guidelines to help industry with implementation, and had contacted the DTI to get a "*policy perspective on the extent of the GMO requirement*" (NCC, 2012). Furthermore, they planned to resolve the issue of "*whether the labelling of goods approved for commercialisation extends to products, of which these varietals are ingredients, or components thereof*" – by engaging in a meeting with the "*Executive Council for GMOs, and the Bio-safety Division of the DoA, as well as major stakeholders in the industry*" (NCC, 2012).

Consumers and NGOs, however, were not invited to attend the stakeholder meeting (NCC, 2012), which prompted the ACB to write to the Commissioner. The letter made note of the proposed stakeholder consultation with industry, and averred in the "*interest of fairness and equity*" that the Commission should give consumers and public interest groups equal

opportunity to participate and make representations on the guidelines (ACB, letter to Commissioner, 28 March 2012e).

5.5.10 Formal complaint lodged to the NCC regarding non-compliance

At the same time, ACB and the consumers lodged formal complaints[21] with the NCC, after the CGCSA and the four companies it represented had failed to provide them with an undertaking that they would start labelling in the allotted time provided (ACB, 2012c, Label GM Foods, 2012a). According to the ACB, during the weeks that followed, there was "*no public statement from* [the Commissioner] – *either acknowledging consumers and their concerns, or that there* [would] *be a consultation process with* [the] *consumers*" (Label GM Foods, 2012b; ACB3). However, the meeting that was scheduled by the NCC in April on GMO labelling inviting only government and industry stakeholders was later changed to target only the DTI, DOH and DAFF (Label GM Foods, 2012c).

5.5.11 Industry threatens litigation

In the meantime, several big food producers were threatening to take legal action against the ACB, if the public interest NGO continued to make claims that they were flouting the law by not having GM labels (Gosling, 2012). Food companies, such as Nestle and Pioneer Foods both responded to the NGO, stating that each company was "*fully compliant*" with the law, and although it was not their intent to litigate by correspondence, if the group continued to make defamatory allegations of non-compliance, they may then have to take legal action (Gosling, 2012). The two companies further stated that they were "*waiting the outcome of a meeting between the NCC and industry representatives for a ruling on the GM labelling legislation*" (Gosling, 2012). However, Premier Foods notified the NGO that their company would be "*phasing in new packaging for its mealie-meal to include GM labels*" (Gosling, 2012).

[21]A briefing paper on the law, titled: 'GM Labelling in SA: The Law Demystified' was compiled by the ACB to aid consumers in lodging complaints (ACB, 2012(b)).

At the time of their interview, a representative from Pioneer Foods maintained that the company had been labelling their products in compliance with the GM labelling regulations, and that they keep labelling "*very simple*" and as "*clear as possible*" (SASKO1). The representative further explained:

"We *went down to an ingredient base. That, if there is any ingredient within our bread or products that we produce, which is potentially GMO, we mark that as* [produced] *using genetic modification...We believe that even if there's a half percent, or a quarter percent inclusion of say soya meal or maize in specific products, then that specific ingredient needs to be labelled. So, the packaging would contain or the wording would say there is GMO in this product, although it may be far less than the 5%*" (SASKO1).

5.5.12 Commissioner leaves

In May of 2012, the Democratic Alliance (DA) Shadow Deputy Minister, Geordin Hill-Lewis of the DTI, issued a statement proclaiming that the Commissioner, Ms Mamodupi Mohlala, had been fired by the Department, through "*an advertisement in the newspaper*" (Hill-Lewis, 2012). He further alleged: "*The manner in which this has been handled is obviously unacceptable, and likely represents a breach of our labour legislation. It is also indicative of a dysfunctional and hostile relationship between the Commissioner and the Minister of Trade and Industry*" (Hill-Lewis, 2012). However, the DTI responded that the Commissioner's tenure was set to expire in September, and according to the Department, the Minister of the DTI, as part of due process, notified the commissioner that her contract would not be automatically renewed, and "*in line with the CPA, the position of the Commissioner would be advertised, and that she was welcome to apply*" (DTI, 2012a).

5.5.13 Inefficient National Consumer Commission

NGOs and consumers that laid complaints of non-compliance by industry with the Commission came across various obstacles. An ACB representative recalled the difficulties they had experienced with the Commissioner:

"*We had problems with the Consumer Commissioner, we were very upset that she had a side deal with industry and she said you don't have to comply, and this we found in a press release of the CGCSA. We were very unhappy about that – because she's got no right to suspend laws...she had no consultation at all with us. We were very unhappy with her performance and we were very happy that she went. She was bad news* [and] *it was a relief that she left for us...after their meeting, she should have done a communiqué to all stakeholders...Also, we were very unhappy with the position of industry, the lack of good faith that they showed. Why don't you label anyway, why hide behind ambiguity in the law, why not call for clarity and say we're going to label anyway because we deserve our right. Show some good will*" (ACB1).

Industry encountered similar problems with the Commission. A CGCSA representative recalled: "[We] *made many appointments with her but she didn't pitch*...[there was] *no response from the office*, [we] *hand-delivered submissions or queries and kept asking, but nothing happened. The NCC can't enforce the regulations and at the CGCSA there* [was] c*onfusion– too many uncertainties surrounding the regulations. They appointed a working group to clarify the regulations*...[but] *nothing happened* (CGCSA1).

5.5.14 Commission has capacity and capability constraints

Stakeholders have blamed the NCC's failure to function effectively on capacity or administrative personnel constraints, as well as a lack of resources and capability (ACB3; Biowatch1; DOH1; Industry-working group, 2011). A representative of AfricaBio remarked: "*I don't think we even have the capacity...I don't think that they have systems in place, in terms of the personnel to go and monitor and make sure that there's compliance and all of that*..." (AfricaBio1). The industry representative further noted:

"*I think the Commissioner herself last year was complaining that they don't have money* [and] *people around to help them. So, we've seen one department...they* [are] *not even talking to each other, so, the Minister is supposed to really make sure that it's government* [that] *works harmoniously...*" (AfricaBio1).

Similarly, an NGO stakeholder recalled: "I *don't think there are staff available, resources, and structure– I haven't seen this. The NCC doesn't seem to be functioning*..." (ACB3). The Director of the organisation stressed the lack of political will by the Commission*: "I think I would have capacity constraints on the part of the Commissioner. And I think that if you lodge a complaint to them, we're not certain of the outcome of that complaint – where it would go? I don't know whether the Commission has the political will to really fine those that are found not to comply"* (ACB1). An academic stakeholder also noted lack of resources as a serious problem but the stakeholder did, however, have faith that the Commission would function effectively in the future. He remarked:

"*I do think that we would never have in South Africa any recourse into the consumer issue. I think the government was slightly naive when they published the NCC and they didn't give it sufficient resources*...*The reality is...from my understanding*...[the NCC] *has been highly inundated with complaints* [but] *the Director of the NCC most certainly seems to be keen to make the office function properly...and I think that* [the] *office will hopefully also develop and grow; and so we will have; and I am certainly hoping that there will be – a different approach in terms of being able to process things, that it won't just become typically South African, we have an office, but it is actually not functional*" (Academic1).

5.5.15 Draft guidelines to explain GM labelling regulations dropped

The ACB, after exhausting all its options, wrote to the Minister of the DTI requesting urgent intervention to resolve the matter concerning non-compliance by industry, the failure of the NCC to enforce the legislation. This was compounded by media reports stating the Commissioner's contract was coming to an end. This, they noted, was necessary, in order to ensure speedy enforcement of the applicable legislation (ACB1; ACB, letter to Minister, 8 June 2012f). Shortly thereafter, the NGO received a response from the NCC, informing the interest group that the "*Commission planned to take the draft guidelines for the interpretation of the GM labelling regulations, through a consultative process, before the final guidelines could be published. All interest groups would be given an opportunity to make representations on the guidelines*" (Label GM Foods, 2012d).

Meanwhile, an industry stakeholder, Business Unity South Africa (BUSA), had managed to have a meeting with the Commissioner, in which they discussed the "*current challenges pertaining to the regulations, of the Act, including GM labelling*" (Esterhuizen, 2012). The Commissioner acknowledged the interpretation problems with the GM labelling regulations and had been working with a task team to develop guidelines to help with the interpretation, which, according to plan, would be published at the end of July that year (Esterhuizen, 2012).

Interestingly, although the Commission had advised both the NGO and industry stakeholders that proposed guidelines would be published, the Commission had meanwhile written to the Minister requesting "*corrections to be effected on the GM labelling regulations*" (Vananda, submission to Minister, 21 June 2012). The task team had encountered "*some errors*" in the interpretation of regulation 7, and had brought it to the Commission's attention that there was a problem caused by the interpretation of the term "*GMOs*". There was a discrepancy between "*GMOs*" being used in the regulations and "*GM ingredients or components of those goods*" in section 24(6) of the Act (Vananda, submission to Minister, 21 June 2012). The task team advised that "*the referral to GMOs in regulation 7, instead of to GM ingredients or components of those goods, limits the extent of the application of the labelling requirement*". Both the task team and the Commission suggested rectifying the inconsistency by including components and ingredients instead of organisms, and that the Minister should amend the GM labelling regulations, as this would affect enforcement (Vananda, submission to Minister, 21 June 2012). A DOH official recalled:

"*They then formed a working group [and] we were part of that working group...indicating the regulations can't be implemented in their current format: they need to be either removed or changed. Our feeling was that it should be appealed, and the process should start from scratch to develop a regulation, which would take into account the practical implications for industry, but they didn't go that route, they went the route of saying OK, let's make some amendments* [and] *they then published an amendment...*[and] *we only saw it when they published it and our opinion was that it probably* [wasn't] *going to clarify everything then...and that process I am not sure where they are with that? Because I know there were extensive comments on the amendments* (DOH1).

According to a DST official, the guidelines were never published:

"[The DTI] *are at last beginning to understand that what they've got is not workable, and hence, the request to the ministry to change the wording of organisms, that was just one of the failings. And then we just developed guidelines, which were dropped, because they were never formally adopted. We sat together with agriculture, health, industry…I think that's it, to come up with guidelines and I actually drove for the wording,* [which] *is largely my own, and it indicates that the assessment can't work, so the guidelines could never be implemented because* [of] *the contradiction"* (DST1).

Thereafter, the Minister indicated that the GMO regulations were to be amended. Oddly enough, this notification appeared in a written reply in an unrelated article. It had become apparent to the Minister, "*that reference to 'goods, ingredients and components' in the GMO regulations would make enforcement difficult*"; and these "*words* [were] *to be substituted by the word 'organisms'*" (DTI, 2012b). However, the word "*organism*" was instead substituted by the words "*goods, ingredients and components*". On 9 October 2012, the DTI published draft amendments to the regulations governing the labelling of GM food for comment[22] (Consumer Protection Act, No. 68 of 2008. Draft Amendment Regulations, 2012:7).

The draft amendments required that all local and imported food products, including processed products, containing 5% or more GM ingredients or components must be labelled as "*contains genetically modified ingredients or components*" to enable consumers to make informed choices (Oh and Ezezika, 2014). In other words, it is the "*ingredients of products that must be labelled in terms of GM*" and so, an "*ingredient or component that contains 5 percent or more of GM content must be labelled as 'containing GM ingredients'*" (ACB, 2012). According to an ACB press release, the draft amendments suggested that South African consumers had "*won a hard earned victory*" in terms of labelling GM foods and the right to know (ACB, 2012d); and the former media and communications officer of SAFeAGE professed that he was: "*delighted that finally, the best interests of the public have been*

[22]See Appendix K for proposed draft amendments to the regulations

considered..." (ACB, 2012d). ACB stated: "*the proposed amendments convey the clear intention of government that the food industry must now step up to the plate and label their products*" (ACB, 2012d).

5.5.16 Current state of mandatory GM labelling in South Africa

The DTI published the draft amendments to the regulations after receiving advice from both the DAFF and DOH (DTI, 2013). Although the comment period closed on 9 November 2012, the Department received numerous comments "*on what the final regulations should state*" and consolidated and considered such input (DTI, 2013). The DTI recommended the final regulations to the Minister before the end of September 2013 for issuing (DTI, 2013). However, according to a press release issued by the ACB, the final version of the amended regulations had still not been promulgated "*due to a powerful industry lobby that does not want consumers to know about the GM content in their food and* [they] *have lobbied the DTI and Parliament with fallacious arguments that labelling will raise food prices, and cause a 'food scare' that will lead to food insecurity. They insist that it is only the producers of non-GM foods that should be obliged to label their food products, as not containing GM*" (ACB, 2014).

In July 2014, the Department hosted a consultative GMO Labelling Regulations Conference (DTI, 2014). The meeting was convened to discuss the regulations governing the labelling of GMOs in terms of the CPA, as implementation remained a challenge (DTI, 2014). According to ENTECOM, who participated in the meeting, stakeholders were given the opportunity to provide general comments on the draft amendment to the regulations, after the presentation (ENTECOM, 2014). The ACB, which also attended the meeting, noted that the DTI only held the workshop in a "*desperate bid to appease the industry*"; and that the Department especially thanked AfricaBio, "…*who is spearheading the industry lobby*" for "*their assistance and collaboration regarding identifying the stakeholders present*".

However, the public interest group strongly objected to the bias and they highlighted the issue that there was a noticeable absence in stakeholders from "*GMO concern groups*" (ACB, 2014). The DTI responded that they had intended to advertise the conference to the public, but were unsuccessful as a result of "*logistical problems*" (ACB, 2014). The DTI extended the public comment period on amendments to the regulations until 15 August 2014 (ACB, 2014; ENTECOM, 2014). However, to date, the amended GM labelling regulations have yet to be published.

5.5.17 Monitoring

The monitoring of the Act continues to rest largely within the confines of civil society organisations (ACB1; Biowatch1; SAFeAGE2). An ACB member confirmed they are an oversight body and explained:

"*I think we are the only organisation which has been monitoring – in a sense that we test it, that's the best thing to do, to test, to expose, we began to engage with the food producers...and we'll still do more work on it...every year we'll test...monitor, but we won't be able to monitor every day, but we'll do some strategic work...we'll see whose labelling, whose not, we'll have to see how the law looks, then we'll have to see what's the best thing to do...if there are too many "may contains" that will be the thing, we'll interrogate the "may contains" because if it's labelled what can we do? If it's labelled, it's labelled, we're happy it's labelled that's good – but* [this should be] *in terms of enforcement of the law*" (ACB1).

While there is an increase in the number of food companies labelling products as GM, the ACB have identified from tests conducted on various maize-based and soya-based food products, including common maize-meal and bread brands, over the course of 2013-2014, that many of these labelling claims are incorrect, according to the percentage of GM content found within the product, and thus, can mislead consumers (ACB, 2014). However, many of the tested products also remain unlabelled, even some of those with high percentages of GM content (ACB, 2014). An ACB representative noted: "*Yes, there is labelling happening* [and the] *public are aware of labels, but it's not proper labelling being*

done according to the law...Because I think companies are aware that they are obligated to start doing it. *A lot of them are labelling, but using the "may contain" principle on the labels...*" (ACB3).

Similarly, a SAFeAGE representative remarked: "...[with regard to] *the mandatory labelling system, we cannot allow the corporate lobby to monitor themselves...*[and] *to allow them that leeway would open the door to corruption, which was proved on many occasions*" (SAFeAGE1). According to another SAFeAGE member, the organisation could have been a consumer protection group (CPG), had they not stopped functioning. The CPA recognises the role of CPGs, which must function predominantly in order to promote the interests or the protection of consumers (Woker, 2009; CPA, No. 68 of 2008).

Although industry is self-regulating, consumers or consumer groups, however, have recourse against companies for fraudulent labelling, or against those who are in contravention of the CPA, through the NCC, established under the Act (Woker, 2009; Viljoen and Marx, 2013). This was noted by an academic:

"*...however, the NCC enables at least consumers or consumer groups to bring complaints, that then have to be investigated, in a sense that is probably suspicion in terms of policing at this point because the groups that are really interested in this issue will have recourse and I think that is the most important thing, in the past there was no recourse, now, there is recourse*" (Academic1).

5.6 Conclusion

The policy development and implementation of GM labelling in South Africa has been a long and complex process, with many significant events and decisions that have managed to shape the current GM labelling policy. To date, this remains unresolved and highly contested. Mandatory GM labelling has evolved from being included in the Draft Green Paper on the Consumer Policy Framework, the Consumer Protection Bill, and finally as a provision under the Consumer Protection Act. The inclusion of mandatory GM labelling in the CPA was strongly objected to, and lobbied against by industry actors and certain

government departments, which included the DAFF, DOH and DST. However, NGOs representing civil society interests, consumers, and other GM labelling advocacy organisations, such as COSATU, strongly supported and lobbied for GM labelling, as it provides consumers with the right to make informed purchasing decisions in terms of their health and safety.

Many of these interest groups have influenced and contributed towards this process, each with their own degree of “interest and power”. This has influenced and impacted upon the GM labelling policy-making and implementation processes. Interest groups that formed alliances during the development process were able to greatly influence decision-making or implementation processes. At present, the CPA mandates the labelling of all GM foods in South Africa, because the DTI, which is responsible for drafting the labelling legislation, believed that a strong policy for protecting the rights of consumers, such as the right to choice and disclosure of information, was necessary for South African consumers. However, GM labelling continues to be a contentious issue and the future of the mandatory GM labelling legislation in South Africa is still uncertain.

CHAPTER SIX – STAKEHOLDER PERCEPTIONS ON KEY ISSUES

6.1 Introduction

Each stakeholder comes with his or her own perceptions, ideas, interests, and needs when developing and implementing policy. Four key issues, shown in Table 6.1, emerged from the data:

- The degree of stakeholder participation in the policy development process;
- A "may contain" clause being included in the regulations, which is a labelling option that may be used by industry;
- The threshold level, which allows a tolerance for the adventitious presence of approved GMOs;
- Costs, which include the expense of quantitative GM testing, who would and should bear these costs, and whether the implementation of GM food labelling would increase food prices.

These issues, the stakeholder positions, their interests behind these positions, and the outcomes for each issue, are identified and examined in this chapter.

Table 6.1: Stakeholder issues identified from the data

Issue identified		Affected stakeholders with issues
1.	Stakeholder participation	Food Industry and Government
2.	"May contain" clause	NGOs and Industry
3.	Threshold level	NGOs and Industry
4.	Cost	Food Industry and Government

6.2 Stakeholder issues

6.2.1 Effectiveness of the participation process

The first key issue identified was the degree of stakeholder participation in the policy development process, and whether and how submissions were considered by the Department of Trade and Industry (DTI). The DTI was responsible for ensuring that all the relevant actors were given an equal opportunity to participate, and to comment, and to give input during all stages of drafting the policy governing the labelling of GM food (DTI, 2010).

6.2.1.1 Feelings of exclusion: undue process

The food industry and the Departments' of Health (DOH); Agriculture, Forestry and Fisheries (DAFF); and Science and Technology (DST) felt excluded from the participation process, believing that their comments and requests were not taken into consideration (DOH1; DST1; Monsanto2; Agbiz1; AfricaBio, 2008). A spokesperson for industry recalled:

"*The basic position was that the way it was written, and the process that they followed, was unacceptable. They bypassed, in one later step, parliamentary procedures, they took it out, it went through the system, approved by a council, and after that they put it back in. I have the minutes of the portfolio committee that acknowledge that they made a mistake. The process was wrong; the fact that they did not accept any inputs from the food chain was wrong...they kept on taking something out, modifying it, it was so poorly written that it was junk, stand up to that it was unimplementable, unenforceable*" (FoodNCropBio1).

A pro-biotech organisation noted: "*AfricaBio would like to express its grave concern over the process that your Department has followed in the drafting of the Consumer Protection Act*" (AfricaBio, 2010). They further articulated: "*While initially, we were invited to submit comments on the draft Act, last minute additions, such as the above section on the labelling of GMOs, has mitigated against* [a] *consensus agreement, and created a lot of negativity among* [the] *stakeholders*" (AfricaBio, 2010).

According to AfricaBio, neither the food and biotechnology industries, nor the DOH and the DAFF were consulted on the parliamentary procedure to include the GM labelling clause (AfricaBio, 2008). Africabio found it disconcerting that government departments worked in disharmony with one another (AfricaBio, 2008), and expressed concern for the outcome of the proposed amendments to the GM labelling regulations, stating:

"*What I'm concerned* [about] *is that there will be implementation of these labelling regulations without people understanding what it says...government enforcing...these regulations without having involved the stakeholders,* [and] *without having explained even the terminologies that are there...we've seen something that will go out there, without, or maybe with, stakeholders not having been taken through all this...they've* [government] *said that they've engaged us; we've submitted our opinions; but will they actually...factor our opinions and comments, so what we're saying is that...without taking into consideration what we have suggested, or what we have proposed...so* [will this be] *something that* [is] *just forced on us*" (AfricaBio1).

6.2.1.2 Interdepartmental disharmony

There is clear dissonance between the different government departments, making it difficult for certain departments to work co-operatively (DST1; SASKO1). A representative from the DOH recalled how DTI ignored their inputs: "*Let's say on the policy itself, on government, my comments, input and analyses were not considered at all. In other words, the DTI, because of my critical approach, paid no attention to it in terms of the agri-industry and the food industries*" (DOH1). The DOH representative further expressed:

"*Look, they didn't take into account our comments, because we expressed our concern for the practical implications...in other words, we pointed out to them this might require now a dual system for the supply of products, such as maize to the consumer, and secondly, the...implications that it will have on the price of food if they would go through because we pointed out to DTI that we already have regulations that are sufficient to deal with GMO labelling, then we indicated further that we are concerned about the impacts that it might have on a staple such as maize, which can become let's say universally mandatory, in other*

words for all products. [All] *those points were what we wanted them to take into account, they never gave us an opportunity to deliberate on that, or to discuss it with them. We put it in the comments, made a media statement and they just noted it; and so we had no influence on the regulations*" (DOH1).

Similarly, a DST representative felt that their Department's comments were not considered and remembered: "*Collectively, we expressed reservations to DTI that they hadn't thought through the process, and nothing had become of that*" (DST1). As a result, the DST was not happy with either set of regulations, and stated that they were still waiting on the final version (DST1). Both the DOH and the DST believed that the DTI did not consult with either department sufficiently during the participation process, indicating interdepartmental disharmony between the various departments, and their difficulty in working with one another. Industry representatives also found a lack of working cohesion between the different government departments (SASKO1; Agbiz1). An industry member recalled:

"*That's where I think part of the problem* [is]*...because at that stage, they didn't consult sufficiently with the other government departments, and only after they saw this, they knew that there was a problem.* He further remarked*: "DTI were a bit out of their depth with all due respect, instead of consulting and getting experts in within their own government to help them, they didn't do it*." (Agbiz1).

6.2.1.3 Feelings of successful inclusion

While some stakeholders felt "*blatantly*" excluded from the policy-making process, others considered their involvement to be relatively effective and successful. A representative from a civil society group recalled: "*The DTI were very accessible and approachable, and they actually listened*" (SAFeAGE2). A fellow-member of SAFeAGE concurred, noting:

"*Look, I have to be honest that they listened. In saying what I just said I've also got to be fair to the government, that's one thing that came out in the discussions, was that we got the sense that the people were listening. We weren't just ignored or the consumer wasn't...In*

the DTI meetings, we had the impression that...there was good communication" (SAFeAGE1).

Another public interest NGO also fully participated in all of the consultation phases. They were given many opportunities to give input during the process, and made their own work and studies on the issue available to the DTI (ACB, 2012a). Table 6.2 shows that of the eight NGO stakeholders who participated in this study, 75% believed they had either an excellent or good knowledge of GM food labelling, and thus offered valuable input during the drafting of the policy.

Table 6.2: NGO stakeholder groups' knowledge of GM food labelling

NGO representatives	Knowledge of GM food labelling
SAFeAGE1	Excellent
SAFeAGE2	Excellent
ACB1	Excellent
ACB3	Excellent
ACB2	Good
WESSA1	Good
Biowatch1	Average
SAFCEI1	Poor

6.2.1.4 The outcome

The DTI were of the opinion that they continually encouraged stakeholders to provide their input during the policy development process; and that they also tried to balance the interests of all the stakeholders (DTI, 2010; DTI, 2014). A Department representative noted: "*Well, we came up with the policy, consulted stakeholders, until the law was passed.* [The DTI had] *consultations and engaged with all stakeholders, organisations, parliament, and government departments with the drafting of the labelling regulations"* (DTI1).

According to the Department, their role with regard to GM labelling is to protect the rights of consumers in South Africa, which is achieved by working with the other relevant departments responsible for GMO regulation in the country:

"[Once]...*the DST* [has] *defined and trusted GM goods* [and] *the council under the DoA* [has] *approved the commercialisation of certain goods, then our department only comes into play. These are the consumables that a consumer is supposed to know beforehand, whether they have been derived from genetic modification, or not, and that is generally our role..."* (DTI1).

6.2.2 "May contain" clause

A second and more prominent issue that emerged was that of a provision for a "may contain" clause being included in the CPA GM labelling regulations[23], and as a result, possibly being used by food producers to label food products (Viljoen and Marx, 2013; CPA regulations, 2011). The "may contain" option can be utilised when there is an issue of trying to trace the product back to its source and it "*applies to products derived from, but not containing GM material – as a result of processing*" (Viljoen and Marx, 2013:388). There was much contention on its inclusion in the regulations– with a definite divide amongst the stakeholder groups.

6.2.2.1 The Proposed "may contain" provision in Regulation 25 of the FCDA (2004)

Food industry representatives were largely unhappy with the DTI's decision to not go the full "may contain" route, and to include only "may contain" language in the GM labelling regulations of the CPA (Industry-working group, 2011). Industry wanted the DTI to use this wording to ensure the regulations were straightforward and simple to implement. An industry representative recalled: "*I think they tried to compromise...they didn't go the full "may contain" principle...I think that was our biggest disappointment...We said make it dead simple and bring in those "may contain"* [principles]." (Agbiz1). Instead, some industry members found the "may contain" provision in the draft regulations to be confusing, as the terms "*impossible*"[24] and "*not feasible to test*" were ambiguous and "*open to wide interpretation*" (BUSA, 2011; Industry-working group, 2011).

[23] See Appendix G for sub-regulation eight.

[24] "Impossible" was used in the earlier draft versions of the regulations but was later replaced with "scientifically impractical" in the final version.

An industry representative noted: "*Very few things are impossible, at an absolute level, and almost anything can be argued to be 'not* feasible'*, if costs are taken into account*" (Massmart, 2010). Other industry actors were also confused by the vagueness of the terms and they put questions to the DTI: "*Who will be the arbitrator in this regard? And on what grounds? Statutory laboratory capacity and costs will be important, because tests will have to be done right through the value chain. It will also be very time-consuming. Feasible testing can only be done on products containing novel DNA, or the novel protein in the goods. Maize starch and sugars will, for example, fit into the impossible category, as would soya oil*" (Industry-working group, 2011). However, other industry members welcomed the inclusion of the "may contain" clause (FoodNCropBio, 2011a and b). Even certain government departments, such as the DST, favoured a more pragmatic option and stated:

"*...we need to have pragmatic ways that are appropriate to our theme...But, we are also wanting transparency and openness...and the more pragmatic thing is a "may contain" option* [and this] *is possibly a good one...but* [the "may contain" option provided in the regulations [is] *too onerous*" (DST1).

6.2.2.2 Improvements or alternatives?

Some industry members suggested improvements be made to the "may contain" provision to rectify the ambiguities, stating that the wording "*chosen not to*" should be included in the provision, as the terms "*impossible*" and "*not feasible*" were very relative, and a choice should be given whether to test the goods or not, and then apply the "may contain" label (CGCSA, 2010b; Massmart, 2010). However, most other industry stakeholders recommended that the GM labelling regulations of the FCDA should have replaced the entire proposed draft of the mandatory GM labelling regulations under the CPA (Industry-working group, 2011; AfricaBio, 2011).

Figure 6.1 shows that of the 15 industry stakeholders interviewed for this study, 53% supported a voluntary labelling system. Interestingly, this was not a clear majority view, as the other 47% of industry representatives either supported a mandatory GM labelling system or a mixed system. Perhaps these industry stakeholders feared a backlash from their

consumers if they expressed opposition to mandatory GM labelling. Pioneer Foods and Monsanto were very much in favour of meeting the consumers' needs.

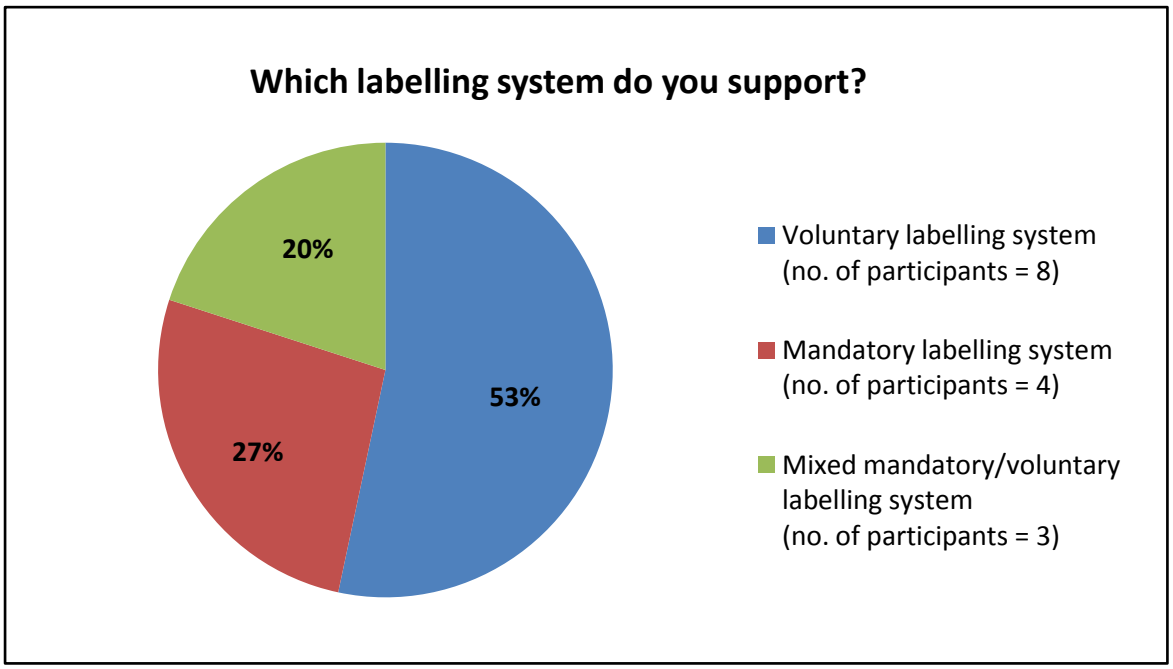

Figure 6.1: Labelling systems supported by industry stakeholders (n=15)

The same industry stakeholders from the industry-working group, also noted that while Regulation 25 might imply that the labelling of GM foodstuffs is not mandatory, this could be improved by making it "*mandatory that any foodstuff product containing, or perhaps containing the novel GM DNA, be labelled as 'may contain GM ingredients'*" (CGCSA, 2010a; Industry-working group, 2011). Industry also commented that labelling would not be necessary in the "*production, storage and processing of the original maize and soya, as the mainstream commercial products are almost exclusively GM in any case*" (Industry-working group, 2011; Agri SA, 2011). Industry made a final suggestion that if government were to agree to these changes, this would ensure "*alignment between government departments, and would indicate compliance and alignment with government's National Biotechnology Strategy*". They suggested that further regulations would be needed for those members of industry wanting to support the non-GM market (Industry-working group, 2011).

6.2.2.3 Is the clause an opt-out for industry?

NGOs were dead set against the use of a "may contain" option, as they felt that such labels would be vague, misleading and unscientific. They had concerns over its misuse by industry (ACB, 2010; ELA, 2012; ACB2). One NGO noted:

"*...Without careful monitoring and enforcement of the law...this clause enables industry to easily avoid providing for accurate and meaningful labelling by claiming that it was impossible or not feasible to test goods, when it is possible to test for GM content and will lead to shelves being swamped with "may contain" labels*" (ACB, 2011; ACB, 2012).

NGOs also disagreed with the way in which the provision was drafted, in particular the terms "*may contain*" and "*not feasible*" (SAFeAGE, 2010b; ACB, 2010; ACB, 2012). They argued that the former term would create uncertainty and they suggested that it be replaced with a less ambiguous term, like "*contains*" (SAFeAGE, 2010b), and that the latter term was open to wide interpretation. They questioned, for example, whether "*not feasible*" would relate to the "*particular or financial constraints of any given producer*" (ACB, 2012). One group noted that the wording "*basically undermines the entire intent of these regulations, and instead institutes a system of voluntary labelling*" (Ekogaia Foundation, 2010). A member of SAFeAGE recalled: "*But the problem is that there is still a loophole. That's one of the major shortcomings of the Act. It says if it isn't practicable to measure or quantify the amount, you can say "may contain" GMO*" (SAFeAGE2).

Although these organisations were not happy with the "may contain" provision, it remained in the final published GM labelling regulations, but the term "*impossible*" was replaced by "*scientifically impractical*".

6.2.3 Threshold level

The third significant issue was that of the threshold level, which allows a tolerance for the adventitious presence of approved GMOs. Essentially, the issue was about what percentage of GM content should be allowed in a product before triggering mandatory GM labelling. The threshold used to trigger mandatory GM labelling in South Africa is set at 5%[25] (CPA Regulations, 2011).

6.2.3.1 Lowest possible threshold

This issue sparked much debate amongst the stakeholders. Since the introduction of a 5% threshold, NGOs have opposed this percentage level, arguing that it was far too high, and in effect, would not protect the consumers' right to know what is in their food (SAFeAGE2; ACB1). An NGO group argued that food products containing less than 5%, but more than 1% GM ingredients or components (GMOs) need not require a positive GM label, thereby misleading consumers into thinking that those products do not contain "measurable" GM ingredients or components, when in fact they do (ACB, 2012). Thus, the 5% threshold does not offer transparency to consumers with regard to GM foods, as it does not honour concerns from health or allergen to moral and religious. For those reasons, the NGO position was that any presence of GMO content, at any level, should trigger labelling, or failing this, should be set at 0.9% (ELA, 2010a; ACB, 2010; SAFeAGE, 2010a).

A member from SAFeAGE recalled: "*We were shooting for 1% because you have to allow for a bit of adventitious presence; and that's acceptable as far as we're concerned*..." (SAFeAGE2). Another environmental NGO, Biowatch, stated that more than 1% would be a compromise: "*I think we might have just said if it's got to be labelled, it's got to be 1% or less. And I'm sure lots of NGOs would be saying 5% would be too high. But, I'm sure industry is also saying it's too low*" (Biowatch1). Almost all NGOs confirmed the controversy surrounding the threshold level, and that the threshold was set too high (SAFeAGE2; Biowatch1; ACB3).

[25] See Appendix G for sub-regulation three.

6.2.3.2 Accommodate trading partners

NGOs also noted that the EU, South Africa's major export partner, had set the threshold for adventitious presence at 0.9% and they suggested that it would be more practical and beneficial to "*set one consistent threshold for domestic and international trade, and to develop a single identity preservation system in the country*" (ELA, 2010a; ACB, 2011). Inconsistencies were noted between the proposed 5% and 0.9% threshold set by the DAFF for non-GM export bulk shipments, recommending alignment with that of the African Model Biosafety Law's threshold of 0.9%, which prescribes guidelines for other African countries on how to develop their own National Biosafety Frameworks (ACB, 2011).

6.2.3.3 Avoid a threshold and GM testing

The food industry's overall standpoint was to avoid the use of a threshold, or failing its removal, to increase it (Industry-working group, 2011; CGCSA, 2010b). One of South Africa's largest high-end retail chains maintained that "*by implementing a 5% regulatory limit for GM, industry* [would] *have to implement comprehensive quantitative GM testing to ensure compliance of* [products]" (Woolworths, 2010b). According to industry, "*GM testing is not reliable*" as "*sampling and testing techniques used are not perfect techniques and these have led to many costly disputes internationally*", especially when testing "*processed ingredients or foods*", where there is "*degradation of the target DNA, or removal during processing*" (Woolworths, 2010b; Industry-working group, 2011).

Critics argued that GM testing could be reliable and that a statement claiming that "*some food products cannot be accurately analysed or labelled, because they do not contain detectable protein*", was "*misleading*"; and although "*it is true that processing destroys protein, making it undetectable*...*the world standard*, [however] *for performing genetic modification analysis on food is not based on detecting protein, but rather on DNA (the molecule responsible for making the protein)*" (Viljoen, 2011). Although there may be complete degradation of the novel DNA and/or its novel protein in extremely processed food products, the ingredients that make up the product can still be tested for GM content (Viljoen, 2011).

6.2.3.4 Where did the 5% come from?

There are certain stakeholders who believed that the 5% threshold was chosen as "*guesswork*", and that it "*had no scientific or reasonable basis, and appeared to be a rather arbitrary figure*" (SAAFoST1; SAFeAGE, 2010c; ACB, 2010). This included the DST, which noted:

"*It's a good fun fact. It doesn't have a scientific validity, it never would. 4.99% is not significantly different from 5.01%, and they looked at thresholds elsewhere in the world and tried to do something similar. But, I don't see that there's a good basis for that figure, and there may not be. Someone just has to thumb-suck and say politically this is the figure. There isn't going to be a scientific validation for that*" (DST1).

The DTI, however, maintained:

"*Well, we did our international comparative research and we considered the unintentional introduction of trade barriers. We had to look at the potential of costs* [in terms of requiring] *the 1%, and the availability of the capacity of recent laboratories...that is, if you have it probably at 5%, you are actually allowing for more adventitious presence. So, the main consideration at that time* [and] *I wouldn't be able to recall all of them now, but based on our research, we then said, and we're not factoring in, really, other countries,* [the main considerations for] *the 5%* [were the] *barriers to trade and the practicalities and so on,* [and so] *the 5% is more practical in our circumstances" (*DTI1).

The 5% threshold remained in the published regulations. The DTI's main consideration of trade barriers correlates with the findings of Gruère et al. (2009) for developing countries' decisions to adopt labelling on the basis of trade factors. Also, South Africa has a rudimentary system for enforcing GM labelling, and thus, has adopted a less stringent mandatory system than the EU.

6.2.4 Costs

6.2.4.1 Does labelling cost?

6.2.4.1.1 The high costs associated with GM labelling

The issue of cost was a significant bone of contention between industry and the NGOs during the policy development process. Stakeholders from industry, the DOH, DAFF and DST all indicated cost concerns over the implementation of a mandatory GM labelling system in South Africa (Agbiz1; DOH1; DST1; DTI, 2008). In their opinion, implementation would carry considerable and "*unnecessary*" costs for business down the value chain, which would inevitably be passed onto the consumer. As a result, this additional cost would increase the prices of food and feed, making staples, such as maize much more expensive, affecting the most vulnerable of consumers and have a negative impact on food security in the country (Grain SA, 2010; Industry-working group, 2011).

As shown in Figure 6.2, of the 15 industry representatives that were interviewed for this study, 14 industry respondents (93%) believed that GM labelling would increase food prices.

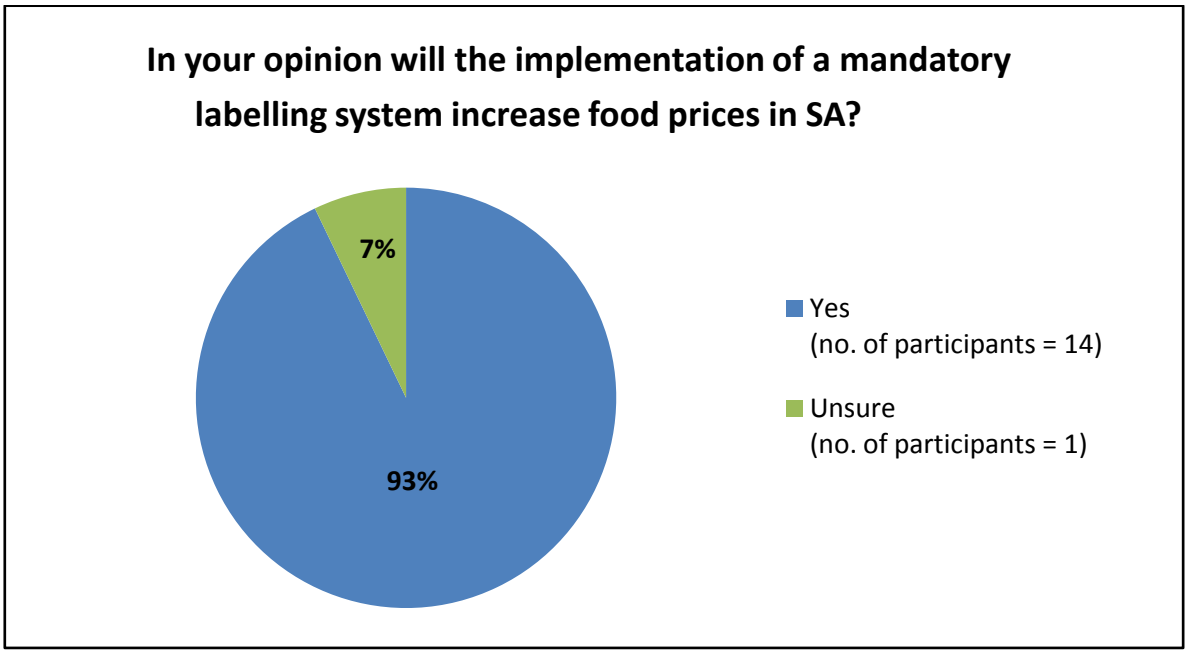

Figure 6.2: Industry perceptions on impact of GM food labelling on food price (n=15)

Industry substantiated their claims by citing studies carried out to determine the possible cost impact of mandatory labelling (Industry-working group, 2011).

6.2.4.1.2 Segregation and testing costs

Industry actors, as well as the DOH and DST associate GM testing with significant costs (Woolworths, 2010b; CGCSA, 2010b; AfricaBio1; DOH1; DST1). According to one industry actor:

"...*The cost analyses have been done*, *if you want honest labelling it will cost, everything will cost, every test for GM presence will cost you...hundreds of thousands, millions of thousands* [rand]. *We don't even have the capacity in South Africa to do that; we will* [have to] *get from international forces and they will make massive amounts of money. The other option is people will stick on labels, but we can't verify them. There will be costs, unless they have a very simplistic way that people can use it - it contains GM, no it does not, and because we can't* [carry out] *a complex processing regime in factories – yes it may contain, the minute that you add a percentage you have to do a PCR test that will cost you over R4000 per one sample- there's no lab that can handle that because I did those* [tests]*. I interacted with the labs*" (FoodNCropBio1).

Another industry representative similarly noted: "*GM testing is an expensive and time-consuming process, it takes from what I understand, a number of days to get a result and it costs several thousand rand to analyse it...It is a long process*" (H&H1).

Furthermore, industry purported that the "*production costs for the food and feed industry would increase significantly if the threshold level was set too low: i.e. as it approached the level of detection"* (Industry-working group, 2011). AfricaBio, as well as other industry stakeholders, confirmed that GM testing would become more costly, as the recognised threshold decreased. In other words, detecting 1% levels of GM DNA/protein would be more expensive than trying to determine 5% levels (AfricaBio, 2010).

Additionally, industry raised concern over smaller companies having to cope with the costs for GM testing. A representative body of the food industry feared: "*To test GM costs money and the question is how would smaller industries survive – i.e. each time the recipe changes,*

reconfirmation of GM levels must be determined – which impacts on product cost and affordability to the consumer – how would the DTI regulate this?" (CGCSA, 2010a).

According to industry, segregation costs are also important. Industry noted that labelling GM products implies setting up a system for segregating GM and non-GM products, identity preservation and traceability throughout the value chain. This "...*creates difficulties with certain products, such as soybean or maize, where it may be costly to segregate GM crops and their by-products. Such segregation could have an impact on economies of scale. The end-result could be higher food prices, for both GM and non-GM food products*" (Industry-working group, 2011). Similarly, a DOH official claimed: "[The implementation of a mandatory GM labelling system is] *very expensive because of keeping the two systems apart, in other words the supply chain will have to be separated. Secondly, there will have to be continuous testing all down the supply chain*" (DOH1).

Furthermore, industry noted that the draft regulations had been influenced by recommendations from a "*well-known anti-GM lobby group*". According to industry, the group's strategy was to "*make the segregation and labelling of GM products so expensive and cost-prohibitive in the whole value chain that this critically important technology [would have] to be ditched or shelved*" (Industry-working group, 2011).

"*So the problem is it works back down the value chain, and that's why we knew it was going to have an impact on our business or my members' business, and also on the farmers etc. because now we must also tell the farmers...if you come and deliver you have to tell me: Is it GM? Or is it non-GM? What is the variety of the seed used, etc., and work back down the value chain, and then we had to put systems in place that can check the value system and that was part of their strategy to make it difficult, because they knew now you're going to have cost implications all down the value chain and then the consumer must pay for it, and then they make it too expensive and they say OK, you can only go non-GM, and that would be defeating the purpose of the whole technology*" (Agbiz 1).

6.2.4.1.3 Cost effective option – use of "may contain"

Industry claimed that costs could be kept to a minimum if they were to use the "may contain" option, a cost-effective option, which an industry representative argued "[would] *add no cost to the manufacturer, retailer or consumer, as opposed to expensive testing to meet 5% thresholds*" (Agbiz1; FoodNCropBio, 2011a and b). But industry would incur costs if GM testing was done right through the value chain (Agbiz1; SAKSO1).

"*It all depends on what the regulations are going to look like and it comes just back to the same argument. It depends on how they word it and what it means...If you go the "may contain" principle, the cost is insignificant, so you can absorb that cost...but if you go into mandatory testing...and labelling...right down the value chain that cost becomes significant* [and] *it will impact on the food prices...* [and] *that cost has to be passed onto the consumer. There is no other way...That is the big argument that just goes to the crux of the whole matter –and that is why it has been such a contentious issue*" (Agbiz1).

Similarly, a DST representative asserted that labelling costs would depend on how GM testing is carried out, and whether they would be carried out down the value chain. According to the DST representative: "*There is a cost associated, but again if you have to test every single food product, or if just one silo is easier to test and that's enough. But, there will be a cost increase, and it will ultimately be transferred to the consumer, who will have to pay for it*" (DST1). However, the DST official did note that using the "may contain" labelling clause would be a more pragmatic option and this would minimise labelling costs, but, this would depend on whether the "may contain" principle was workable or not:

"*It depends on the "may contain". I'm sure it will increase the cost if they don't allow a "may contain"*...[and] it *hinges on whether "may contain" is workable, then, all you're doing is putting a sticker on it, or just add one line to the label, so that will have minimum effect. But if we're going to say this is below* [or] *above 1%, less than* [or] *more than 5, it's going to be an expensive process....*" (DST1).

In addition, some critics have observed and confirmed that the "may contain" clause would provide a cost-effective option for food companies to label food products (Viljoen and Marx, 2013). In principle, the "may contain" clause, if used, relieves food producers of the "financial considerations to verify the GM content of a product" (Viljoen and Marx, 2013:387). Furthermore, an academic stakeholder noted that companies had been developing their own labelling approaches, according to the regulations, where certain companies were looking at whether their products "may contain" GM; and they were labelling these products accordingly, while others were carrying out tests to confirm GM content and were labelling them accordingly (Academic1).

6.2.4.1.4 Negligible costs associated with GM labelling

NGOs and an academic representative firmly believed that implementation, even without the cost-effective labelling option, would involve negligible costs, and would not raise food costs (Academic1; ACB, 2012; ELA, 2012). An academic representative remarked:

"*The reality is that nowhere in the world where mandatory labelling has been implemented has there been any study to show that there is an increase, or a significant increase in costs, no single study, there are studies showing projected value, but the studies that are based on actual evidence show that there is basically, if any, minimal costs*" (Academic1).

This view differed from industry's claim that research showed that additional expenses would result if mandatory GM labelling was implemented. As noted by one academic, claims suggesting that GM labelling would raise food prices 10% to 20% were "*unfounded and based on misinformation*" (Viljoen, 2011). The academic pointed to evidence from a comprehensive study conducted in the EU, where the additional cost to food labelled GM was estimated from 0.01% to 0.17%, and depended on the stringency required. Since the EU GM labelling system is significantly more rigid than that which is applied in South Africa, it could then be deduced that food labelling costs would be a great deal lower than they are in South Africa (Viljoen, 2011).

6.2.4.1.5 Food companies have incurred costs

These views were contested by those food companies who have begun to implement the regulations, who noted costs not only amounting to label changes on packaging, but also to implementation challenges concerning the interpretation of the regulations (SASKO1; Monsanto1; NCM1). "*We've got lawyers* [paid legal fees to interpret the regulations] *and we had seminars; and we had flight costs and had issues and, and, and...*" (SASKO1). Despite this, the company has been in favour of good legislation that benefits the consumer, as well as themselves. They support any new legislation that comes through, as long as they are given ample time to implement this and the costs are limited as far as is possible (SASKO1).

A SAFeAGE representative noted that there would be an initial set-up cost associated with implementing a GM labelling system, which is the case for any new labelling regime, but once in place, costs would then be absorbed (SAFeAGE2). This was the case for a biotechnology company that initially had expenses in implementing labelling but, thereafter, costs were absorbed into the system (Monsanto1).

6.2.4.1.6 Testing is inexpensive

NGOs and a GM testing expert shared the view that GM testing was not "*unreasonably burdensome and costly*", nor was it substantially more onerous financially (Viljoen, 2011; ACB, 2012; ELA, 2012). While industry may be convinced that a lower threshold implies increased production costs, according to the GM expert, testing products for 5% or more GM content is not an expensive process and whether the threshold is 5% or 1% makes no difference to the cost of the laboratory testing (Viljoen, 2011; Viljoen and Marx, 2013; ELA, 2012). In fact, one academic maintained: "...*it makes no difference to costs…a paper on this* [indicates]*…that it makes absolutely no difference to the number of products being labelled*" (Academic1). He further reflected:

"*Many people involved in this process have got absolute knowledge and that, they think is substantial and absolute,* [but] *unfortunately no knowledge is absolute in this regard...simply there was, I think to a large extent, a perception that a 5% threshold would*

be easier to implement than a 1% threshold...and that less products would be impacted [but] *this perception is incorrect*" (Academic1).

In addition, NGOs and one academic asserted that the GM labelling regulations made provision for companies to assume that ingredients derived from soy or maize[26] in South Africa would, therefore, contain a high percentage of GM material (Viljoen, 2011). Therefore, these companies need not do further testing, thus cutting extra costs. In comparison, other companies wanting to label their products as not containing GM content would then need to carry out verification tests at their own expense. This is no different from the current state of practice (ACB, 2012; Viljoen, 2011). One academic noted:

"*In South Africa, the production in terms of soybean and maize is at such a high level that should companies not decide to go for "may contain", but actually label that the product is GM– then they could do this with, or at very little* [additional] *cost, because simply 80% of the maize that we produce is GM...we make a simple assumption that if your product contains maize it also contains GM, some companies may prefer to actually do testing to confirm this and again they wouldn't be doing exhaustive testing, they would probably be doing testing on a sort of 1 to 2 frequency per year and so the cost of that is not going to have a significant contribution in terms of the overall costs of the products and that in fact is going to be negligible...where there is going to be cost, is where there has always been cost, and that is when companies want to provide non-GM for niche markets because there, firstly, they have to implement policies to acquire non-GM products and that has to be verified. So your greatest costs would be to go the non-GM route...in the end it is going to be passed onto the consumer but remember in those cases the consumer is buying a niche product and so you have added value to the product and so the cost recovery is always through the consumer, but again this has been happening in South Africa for some time and I've never heard companies complain onerously about the additional cost they are trying to service a niche market that's costing them, because of the niche market they're also getting added premium[27]*" (Academic1).

[26] A crop for which there is a GM equivalent cultivated in the country

[27] While it is somewhat ironic that even under mandatory GM labelling the consumer pays for non-GM labelling, however, the consumer will pay, because non-GM foods are provided as a niche market in South

Interestingly, some industry members felt that it should be those consumers wanting to know if their food products are derived from GMOs and contain GM material that should bear the additional labelling costs. In other words, GM foods would not require positive GM labelling and GM labelling would be made voluntary for non-GM foods; and consumers then wanting to buy these foods, would have to pay a premium (AfricaBio1; Monsanto2; Industry-working group, 2011).

6.3 Conclusion

The issues that have emerged from the various stakeholders have given insight into the complexities of crafting policy in South Africa. Each issue has presented a myriad of challenges, affecting the policy development process for the mandatory labelling of GM food. However, the following issue outcomes resulted:

- Although industry and certain government departments felt excluded from the participation process in drafting the GM labelling policy, the NGO stakeholders, felt validated by the process, and participated throughout.

- Although NGOs opposed the inclusion of a "may contain" clause, and a high percentage threshold being required to trigger mandatory GM labelling, both the labelling option and a 5% threshold were retained in the final published regulations.

- There was considerable disharmony between the DTI and the other government departments (DAFF, DST and DOH) responsible for regulating GMO policy in South Africa.

Africa. Again, in order for companies to verify that their products are in fact non-GM, tests need to be carried out, which will cost the producer and therefore, be passed onto the consumer. However, this is no different to the current status quo. In comparison, other companies can assume an ingredient contains genetically modified matter if it was derived from a crop for which there is a genetically modified equivalent being produced in South Africa, such as maize or soybean. In such a case, no laboratory testing would be required, with no additional cost to the company.

- Opposing cost views were expressed by the various stakeholders. Although industry, the DOH, DAFF and DST expressed concern for the significant cost impacts of mandatory GM labelling, the mandatory GM labelling policy remained in place.

CHAPTER SEVEN – DISCUSSION

7.1 Introduction

This chapter synthesises conclusions emerging from the research, including arguments advanced for and against GM labelling, and places these in the wider context of how they compare to other studies and what learnings might apply to other developing countries attempting to introduce mandatory GM labelling. The chapter further explains the type of participatory process adopted by the Department of Trade and Industry (DTI) – and whether this mechanism was fair, inclusive and consultative. Finally, the various forms of influence used by the different interest groups to achieve their policy outcomes are presented and discussed.

7.2 Arguments in support of GM food labelling

7.2.1 Democratic rationality

Costa-Font et al. (2008) explain that product labelling supplies information to consumers and presents an instrument for "communication of information to enable consumers to make an informed choice" (p.100), or to exercise their freedom of choice (Premanandh, 2011). The GM labelling literature identifies "democratic rationality" as an argument in favour of GM labelling, which focuses on the importance of transparency, and the right to information (Klintman, 2002:76). Oh and Ezezika (2014) explain that many have outlined the reason for GM labelling– purely "as a right to know issue" (p.3). Similarly, Klintman (2002) asserts that various actors give arguments stressing the right to know, "even without understanding or opposing the technology" (p.76). Therefore, consumers are demanding labelling, as this would give them the opportunity to make appropriate decisions on GM foods (Phillips and McNeill, 2002).

Many supporters of GM labelling have called for mandatory labelling of GM food in particular, as these actors contend that consumers have the right to know what is in their food, and what they are consuming, considering the existing unknown health implications of many GM foods (Hartman, 2014; Huffman and McCluskey, 2014; Zainol et al., 2013).

In addition, proponents assert the right to know as being of critical importance to consumer sovereignty (Huffman and McCluskey, 2014). In essence, it is contended that even if there are health or environmental risks, or benefits associated with GM food, or if there are considerable differences between GM and non-GM conventional foods, consumers have the right to know – in order to make their own decisions (Premanandh, 2011). The findings from this research support this notion, showing that NGO stakeholders, supported by other GM labelling advocacy organisations, such as COSATU, as well as by consumers, have lobbied for GM labelling, on the basis of the fundamental principle that consumers have the right to know, and the right to exercise their freedom of choice, or, in other words, consumer autonomy. The very premise of the Consumer Protection Act (CPA) is about protecting the rights of consumers and ensuring that one of the fundamental and democratic consumers' rights- the right to know is addressed appropriately. Not only has the democratic rationality argument been used by South African civil society groups and consumers to lobby for mandatory GM labelling under the CPA, but it has also been used by other developing countries' consumers, who wish to know which foods contain GM ingredients, such as those in China, Kenya, Colombia and India (Zhong et al., 2002; Curtis et al., 2004; Premanandh, 2011; Oh and Ezezika, 2014).

7.2.2 Diversification of consumer rationalities

The findings are also reinforced by the literature expressing arguments in favour of GM labelling, specifically that dealing with the "diversification of consumer rationalities: ethical or religious concerns" (Klintman, 2002:76), which argue that GM labelling would give consumers the opportunity to make informed choices and to proceed, in accordance with their own beliefs and needs, thereby improving consumer autonomy (Premanandh, 2011; Zainol et al., 2013). Thus, the "may contain" clause, which is believed by pro-labelling groups to be misleading to consumers, as well as unscientific, would not give those consumers who want to purchase GM food or avoid them for genuine reasons, such as health or dietary requirements, or ethical or religious concerns, the choice to do so. In instances, where consumers must avoid certain food products on the basis of their religious beliefs, the label "may contain" would not provide clear information that informs their purchasing decisions (Hunt and Frewer, 2001, cited in Miles et al., 2005). Instead, these consumers would be

confused by the label, and what in fact it alludes to: either the food product "does contain" or it "does not contain", GMOs. For instance, Muslims, do not eat food products that are not "Sharia-compliant" or that are not produced or prepared in a "Shariah-compliant manner" (Zainol et al., 2014:4).

Consumers concerned that the "may contain" label could be misleading, could engage with the supplier/producer/retail distributor of the product in order to obtain the necessary and accurate information needed to meet their desired ethical, religious, health or environmental needs/concerns. The same consumers could also demand that these suppliers/producers/retail distributors provide transparent, honest and informed labelling that either declares that the food product "does contain" or "does not contain", GMOs. If these suppliers/producers/retail distributors are unable to meet the demands of the concerned consumers, then these consumers could resort to boycotting products that display the "may contain" GM label.

A focus group study undertaken by Teisl et al. (2002) assessing consumer reactions to GM food labels identified that consumer participants from the US required labels to clearly indicate whether the food contained GM ingredients. In addition, these consumers indicated the need to know why the food was GM, in order for them to make informed choices, which would reflect their "desire for, or against, a specific modification" (Teisl et al., 2002:8). Similarly, a study carried out in Canada by the National Institute of Nutrition (1998), showed consumers rejecting the use of the statement "may contain", maintaining that the labelling claim portrayed "the image of a producer who did not know enough about the product he was selling, or that there perhaps was some kind of "mix-up" involved" (Caswell, 2000:234). Although there have been a few, similar studies conducted in the developing world indicating that consumers wish to know which foods contain GM ingredients (Curtis et al., 2004), there has been limited research that specifically asks consumers which GM food labels they would prefer to see on food products. For example, in South Africa a survey conducted by the programme on South African public perceptions of biotechnology in collaboration with the Human Sciences Research Council (HSRC) in 2004, asked consumers

about food labels in general, and what they would like to see on these labels, but did not ask specifically about GM food labels and whether consumers would like to see these labels on food products, and which GM labels they would prefer (Rule and Langa, 2005).

In the literature, advocates supporting GM food labelling note that labelling emphasises the importance of transparency – by respecting all the concerns regarding GM foods along a variety of preferences – from health, or allergens, to moral and religious scruples (Oh and Ezezika, 2014; Hartman, 2014). The findings from this research suggest that the 5% threshold level triggering the mandatory labelling of GM food would not allow those consumers wanting to entirely avoid GM food products for ethical, religious, health (allergens) or environmental reasons the choice to do so, thereby infringing on their democratic right to know. The use of a 5% threshold is believed to be misleading to consumers; food products containing less than 5%, but more than 1% of GM ingredients or components do not require a positive GM label, hence misleading consumers into thinking that those products do not contain "measurable" GM ingredients or components, when they actually do. This is an especially pertinent issue in other developing countries where literacy levels and education are low amongst the majority of consumers. This is because such consumers would first, not be able to decipher or understand the threshold level indicating the GM quantity on the food label, never mind the terms GM or biotechnology; and second, would not necessarily understand that just because the food product does not contain a positive or negative GM label, it does not mean the product does not contain "measurable" GM ingredients or components. These consumers with low rates of literacy and education are particularly vulnerable to misleading, deceptive and complex labels, and would not know that their ethical, religious, health or environmental beliefs were being contravened.

7.3 Arguments in opposition to GM labelling

7.3.1 Irrelevance argument

As discussed in Chapter Two, arguments opposing GM food labelling include the "irrelevance argument", which suggests that GM labels would confuse, mislead and provide consumers with redundant and irrelevant information (Klintman, 2002:74; Premanandh, 2011), thereby giving consumers a negative public perception of GM technology (Klintman, 2002; Marx, 2010). The "economic irrationality of consumers" or costs argument argues that GM labelling would significantly increase production costs, raise food prices, and lower profits both for producers and consumers (Klintman, 2002:75; Roe and Teisl, 2007; Zainol et al., 2013).

These notions were similarly played out in the present study, as industry, and DAFF, DOH, and DST opposed mandatory labelling on the premise that it would:

1) Convey a confusing message to consumers and possibly mislead consumers, because many South African consumers are unaware of the definition of biotechnology, and would find GM food labelling irrelevant;

2) Interfere with government departments' own interests; and

3) Spike food prices and create additional costs to be borne by the consumer.

Similarly, in Kenya, millers from the food industry opposed the new mandatory labelling regulation, arguing that they would incur additional costs in order to meet the new requirements, which would be borne by the consumer. Experts and politicians in Kenya also cautioned that such labelling could raise food prices, thus preventing attempts to address food security in the country (Oh and Ezezika, 2014). In many parts of the US, the food industry has been responsible for campaigning against GM labelling arguing that such labelling would only mislead and confuse consumers, as well as raise food prices (Hartman, 2014). The arguments posed by the biotech and agri-food industry to prevent the development and implementation of mandatory GM labelling laws appear to be universal.

However, whether and how these arguments prevent or delay the development and implementation of GM labelling policies is dependent on the context of each country.

An important finding that emerged from this research is that government and industry feared that mandatory GM labelling offering consumer preference in South Africa could create a negative impression of biotechnology, thus hindering biotechnology development and interfering with established GMO processes and programmes. Carter and Gruère (2003a) affirm that mandatory GM labelling requirements could gradually decrease further development of GM technology. For example, in the EU, there were concerns expressed over a reduction in agri-biotech research and the long-term "international competitiveness of EU agriculture" (p.2). However, as Botha and Viljoen (2009:1060) note, this inaccurately implies that "ignorance and acceptance" are one and the same, and suggests that understanding GM would bring about "rejection of GM food by consumers".

The lack of coherence between different government departments in South Africa is of concern. This suggests that different government departments can be lobbied independently and will adjust their stance according to issues to what they narrowly consider their stakeholders. For instance, specific government departments (DOH, DAFF and DST) influenced by industry, claimed to know best for consumers. Instead of consumers being able to make their own rational and informed purchasing decisions on the basis of health; religious; ethical or environmental concerns; government departments, greatly influenced by their stakeholders' interests (for example, to remove mandatory GM labelling), preferred to make these decisions on behalf of the public. This technocratic view held by DAFF, DST and DOH suggests that the South African government has the view that legislation should be governed by technical experts in different areas of governmental decision-making. This approach is of concern as it removed the democratic right to know from the consumer.

7.3.2 Economic irrationality of consumers

The introduction of a mandatory GM labelling law opened up an important discourse on the costs of implementation. As Oh and Ezezika (2014) explain, mandatory labelling of GM food involves a lot more than simply manufacturing a sticker or label that indicates the presence of GM ingredients. Instead, the various processes, such as segregation and identity preservation that must be executed at different stages of the food-supply chain may place costs on a number of stakeholders, such as farmers, traders, food manufacturers and producers, government, and eventually consumers (Carter and Gruère, 2003a; Miraglia et al., 2004; Zainol et al., 2013). This forms the premise for the "economic irrationality of consumers" or costs argument – that the implementation of a labelling system would be costly, and that this expense would fall not only on the producers, but perhaps on the consumers as well (Jaeger, 2002; Klintman, 2002; de Leon et al., 2004; Gruère and Rao, 2007; Roe and Teisl, 2007; Huffman and McCluskey, 2014).

In South Africa, the costs of implementation emerged as a key argument in opposition to GM food labelling by industry, and by government departments. Industry and DOH perceived that labelling GM food products would require a system to be set up for segregating GM and non-GM products, identity preservation, and traceability throughout the value chain, and that these segregation costs would be one of the associated costs of mandatory GM labelling. Elsewhere, literature identifies identity preservation and segregation systems as a substantial adverse claim against mandatory GM labelling (Carter and Gruere, 2003a; Bansal and Ramaswami, 2010; Carter et al., 2012; Huffman and McCluskey, 2014).

It is assumed that mandatory GM labelling necessitates a thorough and reliable system of traceability that tracks GM ingredients, food and feed or non-GM counterparts throughout the food-production process. This process-based system places a large burden on the "production, transportation, marketing, and processing chain for crops" (Miles et al., 2005; Gruère and Rao, 2007; Huffman and McCluskey, 2014:157). Moreover, it can be extremely costly, and difficult to implement on the ground (Miraglia et al., 2004). However, most countries outside the EU which have adopted mandatory GM labelling do not use a

traceability system, as these countries' regulations target the presence of GM material in the final product and not on the production process. According to Gruère and Rao (2007:54) countries that have adopted product labelling "base their regulation on consumer demand for product information". Thus, many of these countries may have opted for a less stringent mandatory GM labelling system than that of the EU, which inherently requires monitoring and product traceability, as labelling costs would be much lower. Many developing countries do not have the sophisticated technology for segregation systems required for mandatory GM labelling. These countries do not have the technological and financial resources to support and manage such a labelling system, and also lack the capacity, basic infrastructure and expertise to implement mandatory GM labelling.

Another disputed issue revolved around industry's perception that lower threshold levels raise costs – although the accuracy of this opinion was disputed. Bullock and Desquilbet (2002), for example, confirm that threshold levels are an important component of costs in non-GMO segregation, and that threshold levels set at zero, may be impracticable to achieve "without major organizational and economic costs" (p.4). Other studies similarly note that cost significantly increases as the threshold level becomes more stringent (lowered) (KPMG, 2002a and b; Jaeger, 2002; de Leon et al., 2004; Carter et al., 2012).

In contrast, Viljoen and Marx (2013) show that the difference in the number of products necessitating GM labelling is negligible when comparing a threshold level of GM material of 1% and 5% (there is no difference in cost). Differing cost results between studies could be linked to a disparity in the countries being investigated (Oh and Ezezika, 2014), but the discrepancy highlights the ambiguity of arguments, which are used variously to support or refute different stakeholder positions. For example, a report conducted by KPMG, indicates that consumer prices in both Australia and New Zealand would increase, as a result of mandatory GM labelling (KPMG International, 2002). However, both these countries continue to provide mandatory labelling of GM foods (Zainol et al., 2013).

Although a number of cost studies have been done to demonstrate that mandatory labelling would produce extra costs that would ultimately be borne by the consumer, these are all *ex ante*, and there have been no reported studies to date, suggesting food price increases as a result of mandatory GM labelling in countries producing GMOs, such as Brazil and China, which apply mandatory GM labelling (Viljoen and Marx, 2013; Oh and Ezezika, 2014). In fact, evidence from a comprehensive study conducted in the EU in 2001, demonstrates negligible additional costs; it was determined that approximately US$0.23 was added to the price of food per person per year due to the mandatory labelling of GM foods, and depended on the stringency required (Viljoen and Marx, 2013; Oh and Ezezika, 2014).

Since the EU GM labelling system is significantly more rigid, with an ingrained requirement for monitoring and traceability than the self-regulating system applied in South Africa, it could be deduced that food labelling costs would be a great deal lower in South Africa (Viljoen, 2011; Viljoen and Marx, 2013). Zainol et al. (2013) assert that those countries that have adopted a mandatory GM labelling system have expressed no criticisms regarding cost increases as a result of the mandatory GM labelling approach. Clearly, "more case-by-case assessments" are required on the financial costs of mandatory GM labelling, in order to prevent unsubstantiated cost claims. The findings of this research support the assertions by Oh and Ezeika (2014:4) that the "cost" argument appears to have been exaggerated by industry – so as to "avoid the real fear of stigmatization".

Interestingly, the DTI indicated that they were unsure whether mandatory GM labelling would be expensive to implement and would only know if costs would be incurred once the amended version of the regulations had been finalised. In this case, the South African government would have "[benefited] from credible assessments that allowed them to determine the economic viability of regulating the mandate" before having introduced mandatory GM labelling into the country, in addition to establishing which stakeholders could indeed be impacted (Oh and Ezezika, 2014:4). As noted by Oh and Ezezika (2014), additional research is clearly needed to assess the possible economic costs of mandatory GM labelling in African countries, as most of the costs analyses relating to mandatory labelling arise from the knowledge of countries that are different from Africa. These countries where costs analyses have been done, also have different economies, cultures,

industries, civil society awareness, standard of living, education, technological infrastructure, expertise, financial resources and consumer education and awareness than those from Africa.

7.4 The Process

7.4.1 Stakeholder participation

A range of divergent views was presented in the GM food labelling policy process. The question remains as to whether the process was inclusive, fair and consultative, or exclusive, unfair and resulted in conflict. The complex, dynamic, uncertain, and multi-scale nature of today's environmental problems, as well as the various stakeholders and organisations it affects, calls for "flexible and transparent decision-making that embraces a diversity of knowledge and values" (Reed, 2008:2417). Consequently, stakeholder participation has gradually become more popular and entrenched in environmental decision-making, across national and international policy (Stringer et al., 2007; Reed, 2008:2417). Participation has been defined by Reed (2008:2418) as a "process where individuals, groups and organisations choose to take an active role in making decisions that affect them". Reed (2008) explains that this definition is centred on stakeholder participation, instead of more general public participation, with the provision that stakeholders are characterised as those stakeholders who affect or are affected by a policy decision.

The involvement of the public in activities and decisions that affect their everyday lives has been recognised as a fundamental democratic right and principle (Reed, 2008; UCT, 2007). This right, or a normative benefit, according to Reed (2008:2418), is "increasingly being used by proliferating environmental interest and pressure groups". Numerous pragmatic benefits are believed to accompany public participation, including the fact that stakeholders involved in the process would probably improve the "quality and durability of policy decisions" (Reed, 2008:2418). In addition, these claimed benefits of stakeholder participation have to a degree "driven its widespread" inclusion in local and international policy contexts (Fischer, 2000; Beierle, 2002; Reed, 2008:2420). However, with benefits come costs, and "disillusionment" over the limitations and failings of public participation has also developed

amongst many stakeholders, practitioners and facilitators, and the public at large, who are disappointed when these claimed benefits of participation are not fulfilled in practice (Reed, 2008). As previous discussions have revealed, this disillusionment was also experienced by certain stakeholders involved in the public participation process in the development of the mandatory GM food labelling policy of South Africa.

Various typologies have been developed to understand the premise for stakeholder participation, including those based on "different degrees of participation on a continuum", whereby there are many phrases indicated for various rungs of the ladder; those founded on the "nature of participation", in accordance with the "direction of communication flows"; others centred on "theoretical basis", in essence recognising between normative and/or pragmatic participation; and lastly, a typology developed on the "basis of the objectives for which participation is used" (Reed, 2008:2419)[28]. Clearly, however, there is no "right desired democratic nature of administrative processes and [the] criteria used to evaluate public participation"; and, as noted by UCT (2007:14) a "one-size-fits all approach" to evaluate participation "does not exist".

In order to evaluate the effectiveness of the public participation process, stakeholders' "expectations" or predictions for specific processes are examined below.

7.4.2 Characteristics

The typology of Rowe and Frewer (2000), which centres on the "nature", instead of the "degree" of stakeholder engagement, categorises the type of participation that took place in the development of GM food labelling policy in South Africa (Reed, 2008). The authors define different forms of public engagement by the way in which "communication migrates" (Reed, 2008:2419). In the perspective of these authors (2000), collecting or soliciting information or public input from participants is deemed "consultation"; and "active participation" is seen as a two-way communication between participants and facilitators,

[28] Describing the typologies that have been developed to understand the differences between interpretations of participation and their associated approaches and methods, and understand the different contexts to which they apply is beyond the scope of this research.

whereby there is an exchanging of information in some kind of dialogue or bargaining (Rowe and Frewer, 2000:6; Reed, 2008:2419). Experiences from the South African policy process reveal the term "consultation" as being used repeatedly by stakeholders. This implies that parts of the stakeholder participation process were consultative– in that there was a gathering of information from stakeholders during the public hearings and comment and review procedures.

Other, more participatory mechanisms were also used, however, including workshops, meetings and conferences, which opened up space for two-way communication and more meaningful interaction amongst the participants. Innes and Booher (2004:426) assert that involving stakeholders to "jointly recommend regulations" is part of a collaborative participation process, or in Rowe and Frewer's (2000) view, is "active participation". This implies a process that is inclusive of stakeholders, and that places dialogue at the centre of the process, rather than receiving already-established proposed regulations, and then providing comments. Thus, it is concluded that both consultation and active participation mechanisms – with open dialogue and two-way information exchange – were used by the government (DTI) during the participation process in developing policy governing the labelling of GM foods.

7.4.2.1 Adequate representation

The use of a stakeholder participation process could benefit "democratic society, citizenship and equity" (Reed, 2008:2420). Stakeholder participation should represent the full range of stakeholders and it should lessen the probability that those participants on the "periphery of the decision-making context or society are marginalised" (Reed, 2008:2420). As a result, more relevant stakeholders could be involved in the decisions that impact on their lives and "active citizenship" could be encouraged, with advantages for the broader community (Martin and Sherington, 2007; Reed, 2008). However, this benefit of stakeholder participation was not realised for the participation process in the development of the GM labelling policy in South Africa. Instead, there was under-representation, or inadequate representation, of the given population or larger community, as farmer organisations and consumer groups played no role in the participation process. This could well have weakened

the process, as noted by Parkins and Mitchell (2005). In addition, representation in the participation process was restricted to a reduced set of interests comprising those stakeholders, who held a stake in and/or had knowledge of GM food labelling, which is a complex issue (Hull et al., 2001; Parkins and Mitchell, 2005). This meant that certain groups, such as industry and particular NGOs, dominated the policy space.

An interesting exception was the mobilisation of public interest NGOs to represent diffuse and under-represented interests (consumers). If these organisations had not taken up the voice of consumers, there may well have been an imbalance of lay versus expert participation, or diffuse versus concentrated interests (Parkins and Mitchell, 2005). Public interest groups, as noted by Aerni (2005:465), are involved in "protest events that attract the attention of the mass media and build up public pressure on politicians to respond to [their] concerns". Clearly, public opinion can have an effect on, and shape politics in developing countries, such as South Africa, although, as Aerni (2005:465) argues, it may well be "the opinion of academic, political, economic and traditional elites, rather than the public at large that matters in such elite democracies".

7.4.2.2 Degree of fairness

It has also been argued that the use of stakeholder participation might enhance the chances that "environmental decisions are perceived to be holistic and fair", fulfilling a range of principles and needs and acknowledging the intricacy of society-environmental relationships (Reed, 2008:2420). Herian et al., (2012) confirm and provide evidence that citizens given information regarding governments' use of public participation procedures do perceive governmental activities to be more fair. Stakeholder participation could boost "public trust in decisions and civil society", if the participatory procedures are believed to be "transparent and consider [all the] conflicting claims and views" (Reed, 2008:2420).

In the case of GM food labelling policies, an interesting schism developed both between NGOs, and industry, and government departments, and, significantly, within government departments. In this case, the DOH and the DST, as well as industry, distrusted the DTI, as they believed that the process was not always transparent, that their views were not always heard, and that their input was not even considered. NGOs, in contrast, perceived the participatory process to be, for the most part, transparent, as they felt that they were "listened" to, and that their views and inputs were considered. This enhanced the NGO's trust in decisions and policy-makers (Reed, 2008). Herian et al. (2012:1) who "tested whether the use of public participation by a local government increases perceptions of procedural fairness among the public and proposed an explanation for why fairness is a strong predictor of satisfaction with governmental decisions" support this notion. This was also evident when industry and certain government departments that were unhappy and dissatisfied with the stakeholder participation process, then perceived the DTI's activities to be unacceptable and unfair. Contrary findings showed that NGO stakeholders, who were largely satisfied with the DTI's participation procedures, perceived the DTI to be accessible and approachable – and saw the process as being reasonably fair and consultative.

Despite the concurrent positions of industry, and the DOH and the DST, on the participation approach adopted by the DTI, the findings suggest that the public participation process selected and used by the Department was indeed fair and consultative, that it created space for open dialogue or communication with a two-way transfer of information, and that it attempted to balance all the stakeholders opposing and diverse viewpoints, interests and needs. This is affirmed by the fact that the NGO stakeholder groups, whose certain interests and needs were not addressed still recognised the process as being fair and transparent. It was noted by a SAFeAGE representative:

We didn't get exactly what we wanted and that's why our influence on decision-making towards the policy was moderate" (SAFeAGE2).

Industry and certain government departments' (DAFF, DOH and DST) interests were not entirely met and these stakeholders remained unsatisfied with the process. Industry in particular, did not achieve what they intended in terms of the CPA and regulations. However, if industry and certain government departments' had achieved their outcome, which was to have the policy either completely rejected, or replaced by the existing voluntary GM labelling regulations of the FCDA, then these stakeholders may well have found the process to be fair.

The disharmonious and weak relationships between industry and the DTI policymakers, as well as between the DTI and other government departments, also indicates why these stakeholders believed that the process from the start would be unfairly conducted, and would be in the NGOs and the public's favour.

7.4.2.3 Social learning

Participation can have an important role to encourage and ensure social learning through information exchange, the growth of new interactions, the strengthening of existing relationships, and changes in conflictual relationships, as the actors learn to trust each other and to value the validity of each other's views (Collins and Ison, 2006; Pahl-Wostl and Hare, 2006; Blackstock et al., 2007; Reed, 2008). The development of new relationships, for example, between NGOs, COSATU, the DTI, and consumers; industry members within the Industry-working group; and the strengthening of existing relationships between industry, AfricaBio, DAFF, DST and DOH; and between NGOs, the wider GM labelling advocacy community, as well as consumers, allowed for, or ensured a space for social learning.

However, the severity in the polarisation of views between the NGOs and industry, not surprisingly, did not allow for the transformation of such adversarial relationships. Social learning was thus limited for stakeholders during the participation process. A major contributing factor for industry's hostility towards NGOs was that industry perceived GM labelling to mask the true intention of NGOs calling for labelling, which was to drive out the technology and commercialisation of GM crops. This view is supported by Carter and Gruère

(2003a), who assert that for some interest groups, such as industry in this case, “GM labelling appears as a first step towards an outright ban of GM products” (p.5).

On the other hand, the NGOs perceived industry’s opposition to GM labelling as indicative of a concern that GMOs would be further stigmatised and rejected. Oh and Ezeika (2014:6) confirm that in Africa, agricultural stakeholders largely understand labelling regulations as a form of tacit resistance by decision-makers to GM food cultivation, which adds to confusion, allegations and “perceived stigmatization”. The findings of this study suggest that government tried to manage the conflict between the opposing interests, such as the threshold level to trigger mandatory GM labelling, and the use of a “may contain” labelling option. Government, thus, performed a “balancing act” by trying to reconcile all the stakeholders’ interests. While many of the contentious issues between these stakeholder groups were seen to be balanced by the DTI, many stakeholders viewed these issues as remaining unresolved.

Research findings also suggest that the conflict may have been aggravated by the perception of industry that they were excluded, that their voices were not heard, and that their technical expertise was not considered. NGOs, in contrast, believed industry’s lack of compliance and ineffectual implementation of the regulations was a ploy to delay the process.

7.4.2.4 Democratic and/or deliberative process?

A possible participatory method that could have transformed the adversarial relationships between stakeholders might have been the use of a deliberative democratic process. Stakeholders may develop what is known as “consultation fatigue” from being increasingly invited to engage in participatory activities that are at times inefficient, or when they perceive that their engagement has achieved them modest rewards or the ability to “influence decisions” that impact them (Reed, 2008:2420). The concern is that participatory methods become “talking shops” that produce uncertainty and hinder definitive activity (Reed, 2008:2420). In the context of this study, industry, the DOH and the DST experienced consultation fatigue during the participation process. These stakeholders were dissatisfied

with how the consultation processes were run, as their views and interests were not taken into account, and they therefore, perceived their inputs to have little influence over policy outcomes. NGOs also suffered consultation fatigue when trying to communicate with the Commission regarding the non-compliance of GM labelling by industry. The Commission was erratic in response and clearly under-resourced. It can thus, be deduced that the consultations produced "talking shops" – instead of authentic participation or discussion, which was prevented, because of the conflict between certain stakeholders. This resulted in ambiguity in the policy outcomes, and delayed decisive-collective action or consensus.

Democratic participation, noted Parkins and Mitchell (2005), is restricted to "voting and where public deliberation is severely limited to issue 'sound bites' and popularity contests" (p.530), which occur, for example, during public hearings. Greater attention, it seems, should have been given to creating "deliberative spaces" and their role in producing concepts and knowledge that could enhance both expertise and understanding, and boost the quality of decisions. As noted by Parkins and Mitchell (2005), deliberative democratic participation offers and solicits debate and deliberation/dialogue that is intended to bring about rational, knowledgeable views, in which the participants are prepared to amend preferences in view of "discussion, new information, and claims made by fellow participants" (p.530). These deliberative spaces, if provided by the DTI, may well have provided an opportunity for meaningful stakeholder debate, personal rumination, and informed stakeholder opinion. For example, the DTI could have improved the participation process by replacing their "tool-kit approach", which stresses picking the applicable tools for the task, with a method that looks at "participation as a process" (Reed, 2008:2421). Reed (2008) asserts that, in order for this process to be "successful", it needs to be supported by a suitable theory, and should take into account how to involve the relevant stakeholders at the most suitable time, and in a way that would allow for the stakeholders to "fairly and effectively shape environmental decisions" (Reed, 2008:2422).

7.4.2.4.1 Best-practice participation

Best-practice participation could ensure that stakeholders would have the power to really influence policy decisions, and ensure that stakeholders would have the technical competence to "engage effectively with the decision" (Chase et al., 2004; Richards et al., 2004; Tippet et al., 2007; Reed, 2008:2422). The DTI should have not only provided stakeholders with an opportunity to participate, but should have ensured that stakeholders were all able to participate (Weber and Christopherson, 2002; Reed, 2008). For instance, when decisions presented themselves as "highly technical", the DTI could have educated stakeholders, and developed their understanding and confidence, which was needed for these stakeholders to purposefully interact in the process (Reed, 2008:2422).

When the DTI implemented the participation process, a possible suggestion to improve its effectiveness could have been to design the process extremely well, and as early on as possible, or from the onset of the process. In Reed's (2008:2422) view, engagement with stakeholders from as early on as possible in decision-making has been repeatedly referenced as crucial, if participatory processes are to bring about "high quality and durable decisions" (Beltson, 1995; Chess and Purcell, 1999; Reed et al., 2006). The inadequate representation of stakeholders, which weakened the participatory process, could have been addressed by means of a stakeholder analysis to methodically identify and represent those actors relevant to the decision-making processes (Reed, 2008; Reed et al., 2009). The level of participation in the stakeholder analysis should extend to active engagement, whereby there is two-way transfer of information between stakeholders and policy-makers (Reed, 2008).

Another key aspect of best-practice participation could have been for the DTI policymakers to clearly express the objectives towards which the stakeholders would have been working, and to ensure agreement among these actors at the start of the process, so as to design a suitable process using appropriate tools (Lynam et al., 2007; Reed, 2008). This, however, would have required negotiation and various stakeholders could have had conflicting goals (Chess and Purcell, 1999; Reed, 2008).

Lastly, for an effective participatory process to occur, a highly skilled facilitator should have been brought in to assist in the process. Facilitation is particularly necessary when dealing with high levels of conflict between industry and NGOs (Bojorquez-Tapia et al., 2004; Reed, 2008). In order for the facilitator to be successful and effective, the co-ordinator that is used should be seen as neutral, and open to various viewpoints, and receptive. In addition, the facilitator should be able to "maintain positive group dynamics", manage powerful or disrespectful individuals, promote stakeholders to query "assumptions" and re-assess fixed standpoints, and draw the most out of reserved actors (Reed, 2008:2425).

7.4.3 Power and influence

Citizens can voice their opinions to decision-makers in policy development and implementation by channelling views through interest groups. According to Dür and De Bièvre (2007:1), "their participation in policy-making may improve decision-making processes by supporting policies that are in line with citizen preferences, and blocking [those] policies that solely reflect the interests of the governing elite". Concurrently, however, strong interest group demands could pose difficulties for policy-makers to ensure that policy decisions do not impose cost burdens on sectors of the public (Dür and De Bièvre, 2007), or do not represent the views of dominant pressure groups with narrow self-interests (Gullberg, 2008).

In the case of GM labelling in South Africa, industry influenced the threshold level, and the "may contain" principle in the GM labelling regulations and was seen as being in favour of their own interests, and not those of the public's right to know. Public interest NGOs, in contrast, represented the interests of the consumers.

Government Departments of Agriculture, Forestry and Fisheries, Science and Technology, and Health were not believed to be neutral, and did not represent the public's interests during the policy development and implementation of mandatory GM labelling. These departments opposed the adoption of mandatory GM labelling under the CPA in South Africa. The DOH, whose position was to support the interests of and safeguard the public's health through, for example, mandatory GM labelling, was instead surprisingly dismissive.

The position of the DAFF towards mandatory GM labelling, however, was more expected, due to its administration of the GMO Act and the promotion of GM crops.

The DOH works closely with, and is influenced greatly in their position towards GM labelling by the DAFF, as they evaluate risk assessments related to agricultural chemicals and food produced through biotechnology for the DAFF. The DAFF was highly influential in contributing towards the voluntary labelling guidelines established by the DOH under the FCDA, which was a strongly "expert-ruled" policy that excluded the public from the decision-making processes. Hence, the DOH's narrow self-interest, which was to remove the mandatory GM labelling regulations, and replace them with the existing GM labelling regulations prescribed by its Department, as none of the current GM foods commercialised in the country apply to the Department's GM labelling guidelines. The DAFF and the DST, which have processes and programmes in place to develop the production or promotion of GM crops and biotechnology in the country, did not want a stricter labelling regime to undermine their mandates. An ultimate objective of the DAFF was to address GM labelling under their own legislative mandate, so as to ensure that GM labelling remained non-applicable to all GM foods in South Africa, and consumers remained ignorant and "accepting" of GMOs.

The amount of power that interest groups possess, and how that power is diffused among the various groups helps determine a normative assessment of the role of interest groups in democracies. An understanding of the role of interest groups in the policy-making process is thus, essential to help elucidate policy outcomes. As noted by Dür and De Bièvre (2007:3), the failure of studies to ascertain the influence of interest groups rests to a large degree on the "notorious difficulty" in defining the concepts of "influence" and "power" and measuring these concepts empirically, either quantitatively or qualitatively. If, as Dür and De Bièvre (2007:3) suggest, we recognise power as "control over outcomes", with the other two likely alternative conceptualisations of power being "control over resources" and "control over actors", and also recognise the term "influence" as "control over political outcomes", then, we can regard stakeholders involved in the policy process for GM labelling "as being powerful", if they are able to influence outcomes in such a way that leads them closer to their "ideal" goals.

7.4.3.1 Variations in influence

7.4.3.1.1 Interest group characteristics

There have been some theories that connect interest group "characteristics" to the influence that these groups hold over policy outcomes (Dür and De Bièvre, 2007). In essence, interest groups with more resources should be more influential than groups with fewer resources. Dahl (1961:226, cited in Dür and De Bièvre, 2007), describes resources as "anything that can be used to sway the specific choices or the strategies of another individual". Such resources can vary from campaign funding, information on different interests, expertise on policy issues, and information on the opinions of other policy-makers (Dür and De Bièvre, 2007). Since decision-makers in government remain reliant on resources either to be re-elected or to achieve policy objectives, interest groups may trade their resources for influence over policy outcomes (Dür and De Bièvre, 2007).

For example, resources were used by both industry and NGOs to influence the GM labelling policy outcomes. In the instance of industry, DOH and DST, resources such as technical and policy expertise and advice were used to influence policy outcomes. However, as the study findings indicated these stakeholders perceived the use of this resource as unable to achieve their desired outcomes, as they believed their informed opinions and input were excluded from the process. Industry used other resources, which included, social ties or existing relationships with other GMO regulatory government departments (DAFF, DOH and DST); financial resources to setup an Industry-working group to exchange expert information and opinion, which reinforced their interest group position; as well as money to easily communicate and meet up with government to discuss pertinent issues that influenced the outcome of the GM labelling stipulations.

Similarly, NGOs used resources, such as policy expertise, GM labelling knowledge and expertise, existing relationships with GM labelling advocacy groups, consumers, as well as newly mobilised relationships with COSATU, other consumers, and the DTI to influence the desired policy results. A limited resource for NGOs was financial support, as many depend upon external sources of funding. If these stakeholders had had greater financial support to

increase campaigning, rallies and their attendance at meetings or workshops with the DTI, this could have increased their impact on certain policy decisions and outcomes.

7.4.3.1.2 Type of actor

Influence may also differ with regard to the type of actor (Dür and De Bièvre, 2007; Mahoney, 2007). Those with concentrated interests, for example, such as industry, should find it easier to get mobilisation than those of diffuse interests. Furthermore, NGOs defending diffuse interests, such as those of consumers, could find themselves "disadvantaged" to the degree to which certain resources, for example, finances and knowledge become important (Dür and De Bièvre, 2007). NGOs are likely to be less endowed with these specific resources than concentrated interests. However, those stakeholder groups protecting diffuse interests may have an advantage when they make use of the public or consumers and the "possession of the 'higher moral ground'" (Dür and De Bièvre, 2007:6).

7.4.3.1.3 Saliency

Another determining factor for interest group influence is the saliency of an issue, as influence may depend on the importance of an issue (Dür and De Bièvre, 2007; Mahoney, 2007). In other words, the more recognition that is given to a specific issue or decision by civil society, the more problematic it becomes for single interest groups to influence policy outcomes. The saliency of GM labelling in South Africa by public interest NGOs, COSATU and consumers made it difficult for industry, and the DAFF, DOH and DST to influence and force mandatory GM labelling out of the policy agenda.

In addition, these concentrated interests were unable to influence the DTI to remove the mandatory GM labelling regulations, and to replace them with the existing GMO labelling regulations under the FCDA. But as Dür and De Bièvre (2007:7) note, the conceptualisation of saliency is evasive or slippery, and it may in fact be internal to the policy process if stakeholders increase the significance of an issue in the public's perception for calculated motives. For example, the NGOs defending public interests in the policy development process for mandatory labelling increased the saliency of the issue in the perceptions of

consumers, the GM labelling advocacy network, and the DTI, as an effective strategy to increase its influence. The NGO stakeholder group also used "voice strategies" to influence and shape public opinion by means of demonstrations, public and organisation meetings, petitions, press releases, campaigning and the testing of food products, which in turn, would influence policy outputs (Dür and De Bièvre, 2007:8).

7.4.3.1.4 Technicality

Another argument for elucidating the variation in influence across issues is the "technicality" of an issue – in as much as it "determines the resource requirements" of policymakers or law-makers (Dür and De Bièvre, 2007; Woll, 2007). Thus, as noted by Dür and De Bièvre (2007:7), "as the level of technicality of an issue increases, decision-makers' need for input from societal actors, such as expert information, should increase as well" (Coen and Grant, 2005). This was true for the policy-makers of the Competition and Consumer Law and Policy unit of the Consumer and Corporate Regulation Division (CCRD) of DTI, which were reliant on expert information and advice from other government departments, as well as other stakeholders, to inform policy decisions.

In fact the DTI claimed to be non-experts on the science of GMOs, and were not proficient with the technicalities. This, may provide reasons for the resultant ambiguities in the regulations with regard to the coverage of products, since the DTI created the GM labelling policy with a lack of knowledge. External pressures from interest groups also weighed down on them to produce the policy – regardless of any flaws.

Those interest groups that are able to provide the essential information to produce effective policy should be able to increase their influence. However, the DTI did not make use of industry and other departments, such as the DOH, DAFF and DST's technical experience and advice, which may have aggravated the participation process for these stakeholders, as they were unable to gain in influence and affect the policy outcomes. This, may have resulted in the unclear GM labelling regulations, which led to proposed draft amendments and a delayed implementation process.

Although industry was perceived to gain no influence, they did, however, achieve a higher threshold level and the inclusion of a cost-effective "may contain" label in the GM labelling regulations. While the NGOs, who also offered expertise to the DTI, may not have influenced the specific policy objectives, they did appear to have had greater influence in the overall decision-making of the policy process. Interestingly, a study on public participation in environmental decision-making in the new South Africa, revealed that case studies that dealt with highly technical issues and required scientific understanding of the issues, led to satisfaction among stakeholders with a "technical background" (p.72), and with those who were largely involved throughout the participation processes (UCT, 2007). This is in contrast to the labelling policy process – where stakeholders with highly technical backgrounds, and who were also extensively engaged in the participation processes were highly dissatisfied with the participation process.

7.5 Conclusion

The results of this research have shown that the GM labelling arguments presented by opposing interest groups in developed countries differ from those in developing countries, and are applicable to the context of the country. In South Africa, during the policy development and implementation of mandatory GM labelling, opponents used the irrelevance and economic irrationality of consumers to lobby against GM labelling. Proponents used the democratic rationality and diversification of consumer rationalities to lobby in favour of the law. Stakeholders have a democratic right to participate in environmental decision-making, such as the policy-making process of mandatory GM labelling in South Africa, as this policy could affect their everyday lives. The findings show that although stakeholders from both industry and government believed themselves to be excluded from the participation process, the NGOs felt included throughout the entire length of the process.

However, the findings reveal that the public participation process in the development of mandatory GM labelling policy in South Africa took place in a very contentious setting. The DTI selected and used a stakeholder participatory process that was fair and consultative, created space for open dialogue or communication with a two-way transfer of information, and attempted to balance all the stakeholders' opposing and diverse viewpoints, interests and needs. Although the DTI tried to manage the conflict between the opposing interests, such as the threshold level – to trigger mandatory GM labelling and the use of a "may contain" labelling option, by performing a "balancing act" of divergent interests, many stakeholders still viewed these issues as unresolved. This, is because the debates around GM food and GM labelling are so contentious, regardless of the technology, and so those stakeholders who participated in the policy development process were coming from hard and different positions on GMOs and GM labelling. In order for the participatory process to have been at all effective, the DTI should have tried to resolve and streamline these contentious issues, as well as disparate and rigid positions before the start of the policy-making process. It could be argued that the failure to have an effective, transparent and inclusive public participation process prior to the introduction of GMOs in South Africa in the 1990s (Wynberg and Fig, 2014) set up the labelling process for failure, even before it had begun.

CHAPTER EIGHT – CONCLUSION AND RECOMMENDATIONS

The overall aim of this research was to analyse the development and implementation of mandatory GM food labelling policy in South Africa, in order to draw wider conclusions about GM food labelling in developing countries. In order to achieve this aim, four research objectives were met. First, an in-depth account of the development of GM food labelling policy and law in South Africa was described. Second, the roles of various relevant stakeholders engaged in the evolution of the policy and its implementation, including the decision-making processes, were elucidated. Third, the extent to which these stakeholders' perspectives, interests and needs were addressed in the policy-making was investigated. Lastly, any blockages and/or opportunities that would impede or facilitate the implementation of the law were identified.

The results from this research project have shown that the policy governing the mandatory labelling of GM foods in South Africa was developed and shaped by many significant events and decisions. The policy evolved under conflict from a diversity of stakeholders. These interest groups participated in and contributed towards the process, each with their own degree of "interest and power", which influenced and impacted on the GM labelling policy-making and the implementation processes. Moreover, the interest groups that formed alliances during the developmental process were able to greatly influence the decision-making and the implementation processes.

The NGO actors, as well as the consumers that they represented, supported and lobbied for mandatory GM labelling, arguing that the consumer has the right to disclosure of information. This resonates with other countries, in particular developed countries, which have adopted GM labelling legislation because of environmental protection and consumer interest groups, as well as consumers calling for labelling.

In developing countries, Gruère et al. (2009) asserted that regional influences and trade relationships are important aspects in the determination of choices for adopting GM labelling, and that trade factors may indeed have a stronger role in influencing the development of the labelling policy than consumer opposition. Trade issues, they assert, may even be more significant than the "presence" of consumer opposition to GM food or anti-GM campaigns from environmental organisations. This, however, was contrary to the findings in South Africa. For instance, the DTI based their decision on adopting GM labelling under the CPA, on the basis of the consumer's right to know and choose. Their decision was heavily influenced by public interest NGOs and the consumers that they represented, as well as other GM labelling advocacy groups, such as COSATU –but not primarily by trade factors.

The majority of industry and a triumvirate of government departments strongly opposed mandatory GM labelling, using costs, food price increases on staples such as maize, and concerns about confusing and misleading the consumer, as the main considerations to try to prevent the policy from becoming law. This was supported by the broader literature that identified costs, and irrelevancy associated with GM labelling, as significant arguments used by the biotech or agri-food industry to oppose mandatory labelling. Although the arguments presented by the biotech and agri-food industry against mandatory GM labelling seem to be universal, whether and how these arguments affect development and implementation of GM labelling policies and laws is unique to each country.

This study also revealed that there were important issues that emerged during the policy development and implementation phases. These included: the effectiveness of stakeholder participation; the use of a "may contain" label; the threshold level; and costs. The stakeholders' viewpoints on each issue differed among the groups. A consultative and active stakeholder participation process was pursued by government, which would suggest that their perspectives, interests and needs were, in fact, addressed by this approach.

The Department of Trade and Industry encouraged all stakeholders to participate and provide their input, while trying to balance opposing interests. However, the extent to which inputs and concerns were addressed varied, according to each stakeholder group. Although industry and government departments' (DOH and DST) interests and inputs were perceived to be excluded and ignored, the policy outcomes for mandatory GM labelling suggest otherwise. For example, the "may contain" label, providing a cost effective-option and addressing cost concerns, and the 5% threshold, were retained in the final GM labelling regulations. In contrast, although NGOs perceived participation to be communicative and their engagement with DTI to be very accessible and approachable, they found their goals to remove the "may contain" label and reduce the threshold level not met. However, the "may contain" label, which provides a cost effective manner in which GM labelling can be applied, could be used by other developing countries with financial constraints, as it would lower costs with regards to GM detection (Marx, 2010; Viljoen and Marx, 2013).

The positions adopted by the stakeholders on mandatory GM labelling, as well as the policy outcome seemed to influence the stakeholders' perceptions on the fairness of the participation process. Those that lobbied for labelling felt the process was fair as the policy outcome was in their favour because the law was passed. Those against labelling perceived the process to be unfair and unacceptable as the outcome was not in their favour, since the mandatory GM labelling policy was not completely rejected or replaced. It is important for other similar developing countries aiming to implement GM labelling to ensure that the public participation process is fair and authentic for all actors involved. However, in the case of mandatory GM labelling in South Africa, the perception of fair and unfair by the relevant stakeholders had a lot to with their perceptions on the outcome of the policy, rather than the policy process itself. Therefore, if schisms, for example, between industry and NGOs are not resolved or addressed for big policy questions or issues of GMOs before the GM labelling policymaking process begins, then these countries participatory measures in developing GM labelling policies are doomed to fail from the start.

The results of this research showed that the implementation of mandatory GM labelling encountered several problems. The process was impeded by interpretation issues or challenges experienced by all the various stakeholders, including government; by the lack of communication by the National Consumer Commission (NCC) with other stakeholders in clarifying and rectifying the ambiguities; the lack of recourse for non-compliance; an inefficient Commission; and an absence of a government-enforcement agency.

The majority of the stakeholders found ambiguities in the GM labelling regulations. They therefore, found the interpretation to be challenging and had concerns about implementation and compliance. NGOs were the exception; although they agreed there were slight ambiguities they disagreed that the regulations were unimplementable. However, the argument made mainly from industry and government (DOH and DST) that the GM labelling regulations were ambiguous was in fact much more about their opposition to implementation, rather than actual ambiguity. Industry was looking for ways to undermine the policy (delay and possibly prevent implementation). Despite the perceived extent of compliance being disparate among stakeholders, the application of mandatory GM labelling has been reasonable and food companies are working towards their implementation.

Communication from the NCC to stakeholders regarding the Commission's plan to rectify and clarify the implementability of the regulations was negligible and the Commission was found to be extremely inefficient. For instance, although the Commission tried to provide support to industry by drafting GM labelling guidelines to assist industry in interpretation and implementation, these guidelines were never published. In addition, numerous complaints made by NGOs and consumers about industry's "widespread non-compliance especially regarding maize" were ignored. The Commission's failure to run efficiently was due to a number of inhibiting factors, which included, a strained and "hostile" relationship with the Minister of the DTI; capacity and capability constraints, such as a lack of resources, both financial and human, and an absence of skills and technical understanding; as well as the lack of political will. Other developing economies planning to adopt mandatory GM labelling may encounter similar problems or constraints, as many are resource-poor developing countries with limited financial and technological resources, and may not have

the capacity, infrastructure and expertise to regulate mandatory GM labelling in their countries.

According to Morris and Thompson (2014), long delays and poor decisions are a result of inefficiencies and lack of expertise in the South African government, a conclusion which resonates with the implementation of mandatory GM labelling in South Africa. The deficiency in expertise or technical ability of the DTI was highlighted by the industry actors and other government departments responsible for GMO policy. The simple lack of understanding on the part of food companies as to what is required by the law, and the lack of resources at the NCC are blockages that could impede effective implementation in the future. Technical understanding and expertise of GMOs by government authorities and decision-makers in policy-making is pertinent for developing countries aiming to adopt mandatory GM labelling within their country. If government authorities in control of decision-making and crafting the policy are unable to understand the technicalities and complexities of implementing mandatory GM labelling, the law will result in ambiguities and become unimplementable.

Opportunities or recommendations to improve the effectiveness of implementation in South Africa for other policies, as well as for those developing countries aiming to implement mandatory GM labelling, are provided below.

A main recommendation for policy-makers that could help improve stakeholder participation processes in the future would be to conduct a collaborative and deliberative democratic participation process. For example, the participation method could provide debate and deliberation (authentic dialogue) on interests or issues that would bring about rational, knowledgeable viewpoints, in which the stakeholders are prepared to amend their preferences (Parkins and Mitchell, 2005). This approach could transform adversarial relationships between the stakeholders, provided that common objectives are identified. However, it is unlikely that this would have been possible in the development on policy governing mandatory GM labelling in South Africa, since the stakeholder positions and interests were on principle and not rationality. If, stakeholders are not willing to negotiate

their positions and interests and identify common objectives, then conflictual stakeholder relationships will not be transformed.

If “deliberative spaces” are offered by government in the future, this could provide an opportunity and platform for meaningful stakeholder debate, personal rumination, and informed stakeholder opinion. Government needs to improve stakeholder engagement by having feedback sessions or discussions to gauge whether actors are satisfied with the participation process, whether they find the process to be fair, and if their inputs were taken into consideration. In engaging with stakeholders after policy development, this would enable future improvements in other policy formulations and decision-making processes.

Government should find more effective ways to foster collaboration between the various stakeholders, and more importantly, to ensure that all the stakeholders from all sectors of society are represented in the participation process, such as those representing consumer organisations and farmer groups, so as not to weaken the process (Parkins and Mitchell, 2005). Instead, there is the perception that the South African government does not value or support NGOs or consumer groups in the country. That is, government already views interventions by these stakeholders as negative, disruptive and interfering and are thus, not interested in including these groups. Nonetheless, government needs to have a more open view which includes the voices of the historically disadvantaged, by providing capacity building to under-represented stakeholders to empower them to be informed about their rights to participate in policy-making and decision-making processes. This would promote fairness and the participation of affected individuals in the decision-making processes.

A further recommendation, specific to South Africa, but which could also be applicable to other countries in the developing world, is for government (DTI) to make sufficient efforts to improve alignment with other government departments. This would improve communication, co-operation and the “working” environment within government. For instance, if the DTI had reinforced its relationships with the other departments in regulating GMO policy, then these departments could have believed that their help or expertise was considered and aided in policy development for GM labelling under the CPA. Government

needs to provide and allocate appropriate resources and funding for the NCC, as the Commission is responsible for the entire CPA, and all consumer complaints. Increased support, in terms of training and manpower, are also requirements needed to improve the Commission's efficiency.

Another recommendation, specific to South Africa, but which could also be extended to other developing countries, is for civil society organisations to promote the establishment of consumer protection groups, which are provided for under the CPA, in order to monitor industry and compliance. In the developed world, there is an aware civil society movement, but this is not necessarily mirrored in countries in the developing world. In addition, the agri-food industry in South Africa, and applicable to the developing country context, should recognise consumer concerns and be more responsible for meeting their consumers' needs such as the rights to know which foods are GM or non-GM, by providing their consumers with authentic GM labelling. Consumers should hold them accountable for this.

The study provided an in-depth account of the policy development and implementation of mandatory GM labelling in South Africa. A variety of actors participated and contributed towards these processes, each with different forms and levels of influence to achieve their desired policy outcomes. Although contentious and significant issues surfaced during decision-making and implementation processes, and were not resolved, *per se*, the DTI was able to balance these conflicting interests and come to some sort of resolution. The implementation of the law remained a challenge, because of a number of contributing factors, and its effectiveness now relies on food companies' understandings of the regulations, with or without ambiguities in the law.

The findings of this dissertation, therefore, affirm the need for best-practice participation to develop GMO labelling policies in other developing countries, by offering "deliberative spaces" for meaningful stakeholder debate, and increasing the representativeness of stakeholders in policy development processes. Government departments need to improve their relationships and increase the allocation of financial and human resources. Civil society can positively contribute to public awareness by monitoring compliance and establishing consumer protection groups. The agri-food industry needs to recognise consumer rights and

be more accountable and transparent. Thus, government needs to create and show a public participation process, that is believable by all role-players, and resolve larger policy questions regarding the adoption or rejection of GMOs, before the start of the participatory process.

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APPENDICES

Appendix A: GM labelling debate occurring in the US

Appendix B: List of relevant documents

Appendix C: Stakeholder interview schedule

Appendix D.1: Interview questions- Part A

Appendix D.2: Interview questions- Part B

Appendix E: Ethical Clearance Form

Appendix F.1: GMO regulation in South Africa

Appendix F.2: Bio-economy Strategy

Appendix G: CPA regulations (R293 of 2011)

Appendix H: Table showing significant changes that occurred during the policy development process of mandatory GM labelling

Appendix I: List of stakeholder comments submitted to the DTI

Appendix J.1: Table showing draft versions of the GM labelling regulations with significant changes

Appendix J.2: Original list of goods

Appendix K: Proposed draft amendments to the mandatory GM labelling regulations

APPENDIX A: GM LABELLING DEBATE OCCURRING IN THE US

More recently, ballot initiatives requiring mandatory GM labelling were rejected in Washington State, Oregon and Colorado (Huffman and McCluskey, 2014). According to Hartman (2014:50), the industry opposed labelling for fear of food price increases and confusing the consumer, and injected millions into the cause in the closing weeks before the vote. Despite opposition in these States, Maine and Connecticut passed legislation requiring GM labelling in 2013; but this will only take effect when specific requirements are achieved. Vermont enacted a GM labelling law in 2014 (Hartman, 2014; Huffman and McCluskey, 2014). GM labelling has been proposed on ballots in Missouri, Pennsylvania, and many other parts of the country. This demonstrates the increasing or expanding nationwide grassroots movement to require labelling of GM products (Hartman, 2014:50). This expanding attitude of the public towards their "right to know" about the ingredients in their food shows that the day may have arrived for the US (Hartman, 2014).

APPENDIX B: LIST OF RELEVANT DOCUMENTS

Relevant documents collected, reviewed and interrogated to contribute to the analysis of policy development and implementation

Document Archive/Collection	
Relevant literature, legislation and policy	➢ Journal articles, books, reports ➢ Consumer Protection Act, 68 of 2008; Foodstuffs Cosmetics and Disinfectants Act, 54 of 1972, Genetically Modified Organisms Act, 15 of 1997; Promotion of Access to Information Act, 2 of 2000; Consumer Protection Act Regulations (No.R.293); proposed draft amendments to regulations (Notice No.824 of 2012); FCDA Regulations (No.R.25 and No.R.146)
Official government records (Department of Trade and Industry)	➢ Policy and legal documents: different drafts of the mandatory GM food labelling regulations, including the final version and the different versions of the proposed draft amendments to the regulations. ➢ Stakeholder comments and submissions on different draft versions of GM labelling policy made to Department of Trade and Industry (DTI) (emails). ➢ Email correspondence between government officials and certain stakeholders ➢ DTI presentation and workshop materials ➢ Letters between Minister and National Consumer Commission (NCC) ➢ Notes ➢ Minutes ➢ Other documents
Various organisations' records	➢ Personal email correspondence ➢ Press releases ➢ Newsletters ➢ Letters to DTI, NCC and other stakeholders ➢ Campaign notices/letters ➢ Website material and documents ➢ Online news articles

	➢ Published and unpublished documents ➢ Social networking site: Facebook page (posts, comments, links, documents) ➢ Reports ➢ Submissions made to DTI on different draft versions of GM labelling policy (Act, Regulations and proposed amendments) ➢ Other documents
Other sources	➢ Policy and legal websites such as polity.org.za: draft and final versions of GM food labelling policy documents under the CPA and CPA Regulations, final legislation, various stakeholder submissions, government presentations such as DTI among others ➢ Online news articles ➢ Hardcopy newspaper articles available online (Cape Times, Saturday Star, Business Report, Mercury) ➢ Specific website documents: Legalbrief Today, Parliamentary diary; Government press releases/media statement releases and Parliament of the Republic of South Africa: NA and NCOPs, Meetings of Committees, etc. (all found online) ➢ Websites ➢ Social networking site: Facebook

APPENDIX C: STAKEHOLDER INTERVIEW SCHEDULE

Stakeholder Group Number	Old Stakeholder Group	Final Stakeholder Group	Interview Date	Interview Number	Organisation	Code/Reference
7	NGOs: environmental, churches and religious communities and others	NGOs	8 Nov 2012	1	South African Freeze Alliance on Genetic Engineering (SAFeAGE) (previous) and African Centre for Biosafety (ACB) (current)	SAFeAGE1
7	NGOs: environmental, churches and religious communities and others	NGOs	8 Nov 2012	2	South African Freeze Alliance on Genetic Engineering (SAFeAGE)	SAFeAGE2
7	NGOs: environmental, churches and religious communities and others	NGOs	28 Nov 2012	3	Wildlife and Environment Society of South Africa (WESSA)	WESSA1
4	Distributors, traders, wholesalers and retailers	Food Industry	5 Dec 2012	4	High end retail chain	Retail chain1
7	NGOs: environmental, churches and religious communities and others	NGOs	11 Dec 2012	5	Biowatch South Africa	Biowatch1
6	Government agencies and departments	Government	13 Dec 2012	6	Department of Trade and Industry (DTI)	DTI1

2	Farmer organisations	Food Industry	21 Dec 2012	7	Biodynamic Agricultural Association of Southern Africa (BDAASA)	BDAASA1
6	Government agencies and departments	Government	21 Jan 2013	8	Department of Health (DOH)	DOH1
8	Academic and scientific community	Food Industry	21 Jan 2013	9	South African Association for Food Science and Technology (SAAFoST)	SAAFoST1
6	Government agencies and departments	Government	23 Jan 2013	10	Department of Science and Technology (DST)	DST1
1	Seed companies	Food Industry	25 Jan 2013	11	Monsanto	Monsanto1
1	Seed companies	Food Industry	25 Jan 2013	12	Monsanto and AfricaBio	Monsanto2
3 & 4	Food producers, distributors, traders, wholesalers and retailers	Food Industry	28 Jan 2013	13	Sunley Consulting	Sunley1
3 & 4	Food Producers, distributors, traders, wholesalers and retailers	Food Industry	30 Jan 2013	14	Consumer Goods Council of South Africa (CGCSA)	CGCSA1
1	Seed companies	Food Industry	31 Jan 2013	15	South African National Seed Organization (SANSOR) (previous) and FoodNCropBio (current)	FoodNCropBio1
7	NGOs: environmental, churches and religious communities and others	NGOs	31 Jan 2013	16	African Centre for Biosafety (ACB)	ACB1

1	Seed companies	Food Industry	1 Feb 2013	17	Agricultural Business Chamber (Agbiz)	Agbiz1
7	NGOs: environmental, churches and religious communities and others	NGOs	1 Feb 2013	18	African Centre for Biosafety (ACB)	ACB2
7	NGOs: environmental, churches and religious communities and others	NGOs	11 Mar 2013	19	Southern African Faith Communities' Environment Institute (SAFCEI)	SAFCEI1
3	Food producers (processors and manufacturers)	Food Industry	14 Mar 2013	20	e'Pap Technology	e'Pap1
1	Seed companies/ NGO	Food Industry	20 Mar 2013	21	AfricaBio	AfricaBio1
7	NGOs: environmental, churches and religious communities and others	NGOs	25 Mar 2013	22	African Centre for Biosafety (ACB) and South African Freeze Alliance on Genetic Engineering (SAFeAGE) (both previous) e-labels (current)	ACB3
1,3 & 4	Seed companies, food producers, distributors, traders, wholesalers and retailers	Food Industry	26 Mar 2013	23	Hahn and Hahn Pty (Ltd)	H&H1
3 & 4	Food producers, distributors, traders, wholesalers and retailers	Food Industry	26 Mar 2013	24	SASKO division Pioneer Foods	SASKO1
8	Academic and scientific community	Academic and	19 Apr 2013	25	University of the Free State	Academic1

		scientific community			(UFS)	
3 & 4	Food producers, distributors, traders, wholesalers and retailers	Food Industry	7 May 2013	26	National Chamber of Milling (NCM)	NCM1
4	Distributors, traders, wholesalers and retailers	Food Industry	9 May 2013	27	Grain Silo Industry (Pty) Ltd (GSI)	GSI1

APPENDIX D.1: INTERVIEW QUESTIONS – PART A

SEMI-STRUCTURED KEY STAKEHOLDER INTERVIEWS

The primary stakeholder groups identified in this study include:

Stakeholder Group No.	Stakeholder Groups
Stakeholder Group 1	Seed companies
Stakeholder Group 2	Farmer organisations
Stakeholder Group 3	Food producers (processors and manufacturers)
Stakeholder Group 4	Distributors, traders, wholesalers and retailers
Stakeholder Group 5	Consumer groups
Stakeholder Group 6	Government agencies and departments
Stakeholder Group 7	NGOs: environmental, churches and religious communities and others
Stakeholder Group 8	Academic and scientific community (Universities) Government research institutions
Stakeholder Group 9	Trade unions

Interview Details:

Interview#				
Date				
Interviewer				
Participant Details	**Name**	**Surname**	**Telephone**	**E-mail**
Context	**Place:**			
	Time of day:			

	Sound conditions (background noise):
	Other people present:

Study Background:

I am conducting a Master's research project at the University of Cape Town (UCT), on the development and implementation of genetically modified food (GM food) labelling in South Africa. The research forms part of a Masters I am doing in Environmental and Geographical Science at the University of Cape Town (UCT) under the supervision of Associate Professor Rachel Wynberg in the Bio-economy Research Chair. The focus of the study is to investigate the development, decision-making and implementation of the GM food-labelling policy of South Africa, in order to improve both our understanding of the social and environmental implications of labelling and its effects. Specific objectives are:

1. To describe the development of GM food labelling policy and law in South Africa.

2. To elucidate the roles that those involved in the food production chain and other stakeholders have played in the evolution of the policy and its implementation.

3. To analyse the extent to which stakeholders, involved in the GM food production chain, and other stakeholders' perspectives, interests and needs have been addressed in the policy development process.

4. To identify the blockages and/or opportunities that will impede or facilitate implementation of GM food labelling policy and law.

Participation in the study will involve an interview that requires completion of a short checklist survey that asks you basic questions about yourself, your organisation, your position on GMOs and their labelling. It should take no longer than one hour. You can choose to remain anonymous if you prefer.

A. General/Common set of closed-ended questions: all stakeholder groups

1 Introductory

1.1 What organisation/institution/association do you represent?

1.2 What is your position or role in the organisation/institution/association?

2 Position on GE and GMOs

2.1 How would you rate your knowledge of Genetic Engineering and GMOs?

Excellent	Good	Average	Poor	Non-Existent

2.2 What is your position on GMOs in agriculture?

Strongly support	Supportive but with reservations	Neutral	Some potential with concerns	Strongly opposed

3 Position on GM food labelling

3.1 Do you think food product labelling is necessary?
Yes/No/Unsure

3.1.a **Yes:** If so why do you think it is necessary?

3.1.b **No:** If not why not?

3.2 Which foods in your opinion should be labelled as GM?

Different Foodstuffs	Yes/No
White maize	
Soybean	
Yellow maize	

Other:	

3.3 Please rank each of the following foodstuffs in order of labelling importance, with #1 being the most important foodstuff to be labelled as GM through #3 being the least important foodstuff to be labelled as GM.

Different Foodstuffs	**Ranking**
White maize	
Soybean	
Yellow maize	
Other:	

3.4 How would you rate your knowledge of GM food labelling?

Excellent	**Good**	**Average**	**Poor**	**Non-Existent**

3.5 Which labelling system do you support?

Voluntary Labelling System	**Mandatory Labelling System**	**Mixed Mandatory/Voluntary Labelling System**	**None**

3.5.1 Why?

3.6 How would you rate your knowledge of the new Consumer Protection Act (CPA) and its mandatory labelling regulations in SA?

Excellent	**Good**	**Average**	**Poor**	**Non-Existent**

3.7 The final mandatory labelling regulations came into force in October 2011. In your opinion how successful has the application of mandatory labelling been thus far?

Extremely	Very	Moderately	Slightly	Not at all

3.8 How would you rate your knowledge of Regulation 25 under the Foodstuffs Cosmetics and Disinfectants Act (FCDA) and its mandate?

Excellent	Good	Average	Poor	Non-Existent

3.9 Before mandatory labelling was adopted did you have the same position on the labelling of GM foods as you do now?

Yes/No

3.9.a **Yes:** Why did your position stay the same?

3.9.b **No:** 1. If not how and why did your position change?

2. What position did you have on labelling?

Strongly Support	Supportive but with reservations	Neutral	Some potential with concerns	Strongly opposed

APPENDIX D.2: INTERVIEW QUESTIONS – PART B

B. Tailored set of open-ended questions: General

2.1 ***Policy Development***

2.1.1 Was your organisation/institution/association involved in the mandatory labelling policy development process to label GM food in terms of the CPA? **Yes/No**

2.1.1.a **Yes:** If so how was your organisation/institution/association involved?

2.1.1.b **No:** If not why not? (how do you think government could have involved your organisation/institution/association in the policy development process?)

2.1.2 What was your organisation/institution/association's position on the labelling of GM food during the policy development process?

2.1.3 To what extent were you involved in the development of this law?

2.1.4 Were the perspectives, interests and needs of your organisation/institution/association addressed in the policy and law development process? **Yes/No/Partially**

2.1.4.a **Yes:** If so to what extent were these addressed and incorporated in the policy?

2.1.4.b **No:** If not why not? (how do you think these could have been addressed by government and later incorporated in the policy?)

2.1.5 Were the perspectives, interests and needs of your organisation/institution/association also addressed in the final outcome of the policy development process? **Yes/No/Partially**

2.1.5.a **Yes:** If so to what extent were these addressed and incorporated in the policy?

2.1.5.b **No:** If not why not? (how do you think these could have been addressed by government and later incorporated in the policy?)

2.1.6 Which of these stakeholders have had the most influence in the development of the current labelling policy? Please rank from #1 being the most influential through to #9 being the least influential.

Stakeholder Groups		Ranking
1	Seed companies	

2	Farmer organisations	
3	Food producers (processors and manufacturers)	
4	Distributors, traders, wholesalers and retailers	
5	Consumer groups	
6	Government agencies and departments	
7	NGOs: environmental, churches and religious communities and others	
8	Academic and scientific community (Universities) Government research institutions	
9	Trade unions	

2.1.7 What were their positions in developing the policy? 1=supportive of labelling; 2=neutral; 3=against labelling.

Stakeholder Groups		**Positions**
1	Seed companies	
2	Farmer organisations	
3	Food producers (processors and manufacturers)	
4	Distributors, traders, wholesalers and retailers	
5	Consumer groups	
6	Government agencies and departments	
7	NGOs: environmental, churches and religious communities and others	
8	Academic and scientific community (Universities) Government research institutions	
9	Trade unions	

2.1.8 Were any stakeholder alliances formed during policy development? **Yes/No**

2.1.8.a **Yes:** 1. Please circle the stakeholders within the same alliance with the same corresponding colour.

Stakeholder Groups	
1	Seed companies
2	Farmer organisations
3	Food producers (processors and manufacturers)
4	Distributors, traders, wholesalers and retailers
5	Consumer groups
6	Government agencies and departments
7	NGOs: environmental, churches and religious communities and others
8	Academic and scientific community (Universities) Government research institutions
9	Trade unions

2. How strong was each alliance and what level of cooperation was there?

Please tick.

Alliance (Colour)	**Strong**	**Moderate**	**Weak**
	Full Cooperation	**Moderate Cooperation**	**Little to None Cooperation**

2.1.9 During the policy development process did any contentious issues between the different stakeholders arise? **Yes/No/Don't Know**

2.1.9.a **Yes:** 1. If so what were they?

2. Were these issues resolved? **Yes/No/Don't Know**

i.) **Yes:** How were these issues resolved, if at all?

3. Which of these issues/ concerns was most contested between the different stakeholders?

2.2. A. Implementation process under the first regulations (October 2011- October 2012)

2.2.1 Has your organisation/institution/association been involved in the implementation of the mandatory GM labelling policy in terms of the CPA? **Yes/No**

2.2.1.a **Yes:** 1. If so how has your organisation/institution/association been involved?

2. Have the perspectives, interests and needs of your organisation/institution/association been addressed in the implementation of policy? **Yes/No/Partially**

i.) **Yes:** If so to what extent were these addressed and incorporated in the implementation?

ii.) **No:** If not how do you think they could have been addressed by government?

3. Has your organisation/institution/association experienced any problems whilst participating in implementation of the policy? **Yes/No/Unsure**

i.) **Yes:** 1. If so what were they?

2. How were these addressed, if at all?

2.2.1.b **No:** If not why not? (how do you think government could have involved your organisation/institution/association in the policy implementation process?)

2.2.2. What influence did your organisation/institution/association have on decision-making and implementation processes of the policy?

Strong	**Moderate**	**Weak**	**None**

2.2.2.1 Explain.

2.2.3 In your opinion are the regulations being implemented? **Yes/No/Don't Know**

2.2.3.a **Yes:** If so how?

2.2.3.b **No:** If not why not?

2.2.4 In your opinion how effective has policy implementation been since the first regulations came into effect?

Extremely	Very	Moderately	Slightly	Not at all

2.2.4.1 Explain.

2.2.5 Have you incurred any costs since implementation of the policy? **Yes/No**

2.2.5.a **Yes:** If so what costs have you incurred since implementation of the policy?

2.2 B. Enforcement

2.2.1 In your opinion are the regulations being enforced by the relevant government authority? **Yes/No/Don't Know**

2.2.1.a **Yes:** If so how is the law being enforced?

2.2.1.b **No:** If not why isn't it being enforced?

2.3 A. Implementation process under the new finalised regulations

2.3.1 How expensive will implementation of a mandatory labelling system be?

Extremely	Very	Moderately	Slightly	Not at all

2.3.1.1 Explain.

2.3.2 Who will bear the additional cost for labelling of GM foods?

Producers	
Consumers	
Other. Please state:	

2.3.3 In your opinion who should bear this additional cost for labelling of GM foods?

Producers	
Consumers	
Government	
Retailers	
Farmers	
Other:	

2.3.4 In your opinion will the implementation of a mandatory labelling system increase food prices in SA? **Yes/No/Unsure**

2.3.4.a **Yes:** If so how?

2.3.5 In your opinion are there any potential blockages that will impede effective implementation of mandatory labelling in the future? **Yes/No/Unsure**

2.3.5.a **Yes:** 1. If so what could these potential blockages be?

2. Which of these blockages will be most significant/ important in impeding effective implementation?

2.3.6 In your opinion are there any potential opportunities that will facilitate effective implementation of mandatory labelling in the future? **Yes/No/Unsure**

2.3.6.a **Yes:** 1. If so what could these potential opportunities be?

2. Which of these opportunities will be most significant/ important in facilitating effective implementation?

2.3.7 In your opinion how effective will policy implementation be once the amended regulations are finalised?

Extremely	**Very**	**Moderately**	**Slightly**	**Not at all**

2.3.7.1 Explain.

2.3 *B. Enforcement*

2.3.1 In your opinion what impedes effective enforcement and compliance?

2.3.2 What concerns do you have with regards to the monitoring and enforcement of the law, and the newly amended regulations?

Additional questions asked for each stakeholder group, in addition to Part B questions:

<u>Stakeholder Groups 1, 3 and 4: Seed Companies, Food Producers (Processors and Manufacturers), Distributors, Traders, Wholesalers and Retailers</u>

4.2.1 Have you incurred any costs since implementation of the policy? **Yes/No**

4.2.1.a **Yes:** If so what costs have you incurred since implementation of the policy?

4.2.2 Are the crops that you receive separated into GM and non-GMOs? **Yes/No**

4.2.2.a **Yes:** If so how?

4.2.2.b **No:** If not how will this be resolved?

4.2.3 Are you currently being regulated to ensure separate labelling for GM and non-GMO products? **Yes/No**

4.2.3.a **Yes:** If so how are you currently being regulated?

4.2.3.b **No:** If not why not?

4.2.4 Are your finished products tested to detect significant and quantifiable traces of GM materials or ingredients? **Yes/No**

4.2.4.a **Yes:** If so how are these products being tested?

4.2.4.b **No:** If not why are these products not being tested?

4.2.5 Do you think that the 5% threshold for GM content is a reasonable measure? **Yes/No**

4.2.5.a **Yes:** If so why?

4.2.5.b **No:** If not what threshold do you think is reasonable?

4.2.6 Are you being regulated to ensure that products containing 5% or more GM content are being correctly labelled GM? **Yes/No**

4.2.6.a **Yes**: If so how are you being regulated?

4.2.6.b **No:** If not why not?

4.2.7 Is testing products for 5% GM content or more an expensive process? **Yes/No**

4.2.7.a **Yes:** 1. If so why?
2. Who incurs this cost?

4.2.8 Is there an enforcement agency in place to monitor and ensure that no mixing between GM and non-GMOs occurs so that the authenticity of the labels is not affected? **Yes/No**

4.2.8.a **Yes:** If so how does the enforcement agency ensure this?

4.2.8.b **No:** If not why is there not an enforcement agency?

4.2.9 Have all your labelled products (this includes GM and non-GMO products) been tested for significant and quantifiable traces of GM materials or ingredients? **Yes/No**

4.2.9.a **Yes:** If so how are these products being tested?

4.2.9.b **No:** If not why are these products not being tested?

4.2.10 Does the enforcement agency ensure authenticity of your food product labels? **Yes/No**

4.2.10.a **Yes:** If so how does the enforcement agency ensure this?

4.2.10.b **No:** If not why not?

4.2.11 Is there consumer demand for segregated products? **Yes/No**

4.2.11.a **Yes:** 1. If so from whom? Which consumers/income bracket in particular?

2. Where is this demand coming from? Is it high-end supermarkets or low-end supermarkets?

4.2.12 Have the first/initial mandatory labelling regulations for GM foods affected the South African local GM seed market? **Yes/No/Unsure**

4.2.12.a **Yes:** If so how has it affected the market?

<u>Stakeholder Groups 6 and 8: Government Departments and Scientific Community</u>

6.2.1 Are GM foods currently being tested to detect significant and quantifiable traces of GM materials or ingredients?
Yes/No

6.2.1.a **Yes:** If so how are they being tested?

6.2.1.b **No:** If not why are they not being tested?

6.2.2 Is there currently an active testing facility in place? **Yes/No**

6.2.2.a **Yes:** 1. If so who facilitates and enforces the testing?

2. Is a testing facility difficult and costly to implement?

6.2.2.b **No:** If not why isn't there a testing facility in place to enforce the law?

8.2.1 Is research for a cost-efficient and accurate testing facility to detect 5% or more GM content being carried out? **Yes/No**

8.2.1.a **Yes:** 1. Is your organisation/institution/association involved in this research? **Yes/No**

i.)**Yes:** Who funds this research?

6.2.3 Why was a product-based labelling system chosen as oppose to a process-based labelling system?

6.2.4 Why was a 5% threshold for GM content set?

6.2.5 Is testing products for 5% GM content or more an expensive process? **Yes/No**

6.2.5.a **Yes:** 1. If so why?

2. Who incurs this cost?

Stakeholder Group 7: NGOs (Environmental, Churches and Religious Communities and Others)

7.1.1 What were the main reasons for developing the GM labelling policy in terms of the CPA?

7.1.1.1 Which of these reasons had the most influence for the development of the current labelling policy?

7.1.2 What consumer issues/concerns was your organisation most concerned with addressing by use of the current labelling policy?

7.1.2.1 Which of these issues/concerns was of highest priority to your organisation?

7.1.3 What were the main consumer issues/concerns that the other stakeholders were most concerned with addressing by use of the current labelling policy?

7.1.3.1 Which of these issues/concerns was of highest priority to the other stakeholders?

7.1.4 What issues/concerns do SA consumers have towards GM foods?

7.1.4.1 Which of these issues/concerns is of highest priority to SA consumers?

7.1.5 In your opinion do the current labelling regulations for GM foods address these consumer concerns? **Yes/No/Partially**

7.1.5.a **Yes:** If so how?

7.1.5.b **No:** If not why not?

7.2.1 Do you think the finalised labelling regulations will give consumers the opportunity to choose between GM and non-GM foods? **Yes/No**

7.2.1.a **Yes:** If so in what way will they allow this?

7.2.1.b **No:** If not why won't they offer this opportunity?

7.2.2 In your opinion do you think the finalised labelling regulations for GM foods will either a. Inform and educate, b. mislead and confuse or c. have no influence on consumers' knowledge of GM food and biotechnology?

a. Inform and educate	b. Mislead and Confuse	c. uninfluenced

7.2.2.1 Explain.

APPENDIX E: ETHICAL CLEARANCE FORM

Department of Environmental and Geographical Science
University of Cape Town
RONDEBOSCH 7701
South Africa

e-mail: Michael.meadows@uct.ac.za
phone : + 27 21 650 2873
fax : +27 21 650 3791

14th September 2012

Ms Taryn de Beer
Department of Environmental & Geographical Science
University of Cape Town
taryn.debeer@gmail.com

Dear Ms de Beer

The Development and Implementation of Genetically Modified Food (GM Food) Labelling in South Africa

I am pleased to inform you that, having scrutinized the details of your above-named applications for research ethics clearance, the Faculty of Science Research Ethics Committee has approved your revised proposal in terms of its attention to ethical principles.

Your approval code for the three projects is: SFREC 37_2012

I wish you success in the work involved.

Yours sincerely

Signed by candidate

Michael E Meadows
Professor and Head of Department
Chair: Science Faculty Ethics in Research Committee

APPENDIX F.1: GMO REGULATION IN SOUTH AFRICA

Initial regulation of GMOs in South Africa commenced in the late 1970s, when the South African Genetic Experimentation Committee (SAGENE), a national scientific advisory body on biotechnology research and development, was established (Aerni, 2005; Wolson, 2007). The committee, consisting of a voluntary group of scientists, was known to be closely connected to industries that encouraged the growth and marketing of GM crops and seeds (Wynberg and Fig, 2013). The scientific advisory committee's main role involved monitoring and providing recommendations on the development of GMOs in South Africa (Wolson, 2007). Guidelines established by SAGENE were used as the basis for approvals of applications for GM crop field trials and commercial releases, and were used to approve the first field trials in South Africa for transgenic cotton in 1992 (Freidberg and Horowitz, 2004; Wolson, 2007; Wynberg and Fig, 2013).

Later, regulation of GMOs by SAGENE was replaced by the Genetically Modified Organisms Act, 15 of 1997, which came into force in December 1999 (Aerni, 2005). Government's role during the time when drafting of the GMO Act took place, was largely passive as more pertinent issues took preference in the policy domain, and instead civil servants and individuals with vested interests were afforded the opportunity "to submit more peripheral laws and policies without following due process", which was the case with the GMO Act (Wynberg and Fig, 2013:20). The GMO Act is administered by the DAFF, whose mandate is to regulate the "trade, production and R&D of GMOs" in South Africa (Aerni, 2005:467). The Registrar of the GMO Act, appointed by the Department, deals with all applications for permits to carry out field trials on GM crop varieties and to commercially release GMO products onto the market (Freidberg and Horowitz, 2004; Aerni, 2005). Once applications are assessed by the GMO Registrar they are passed onto an advisory committee of academics, where "safety reviews and risk assessments" are carried out (Aerni, 2005:467). The advisory council consists of many individuals from the former SAGENE committee, and most members of the advisory council are scientists in the field of GM research, in particular, the development and release of GMOs (ACB, 2011a; Wynberg and Fig, 2013). Recommendations for approvals are then given to the Executive Council (EC), the decision-making body, to consider. The council, established by the GMO Act, consists of no more

than 10 members, each representing a different government department (Aerni 2005; Mayet, 2007; Wolson, 2007; ACB, 2011a). The EC has the authority to approve or refuse applications, or can request additional information regarding an application from various individuals or parties (ACB, 2011a). In the case of the EC being satisfied with the advisory committee's decision, the Registrar, with the EC's approval, may issue a permit for that particular application (Aerni, 2005).

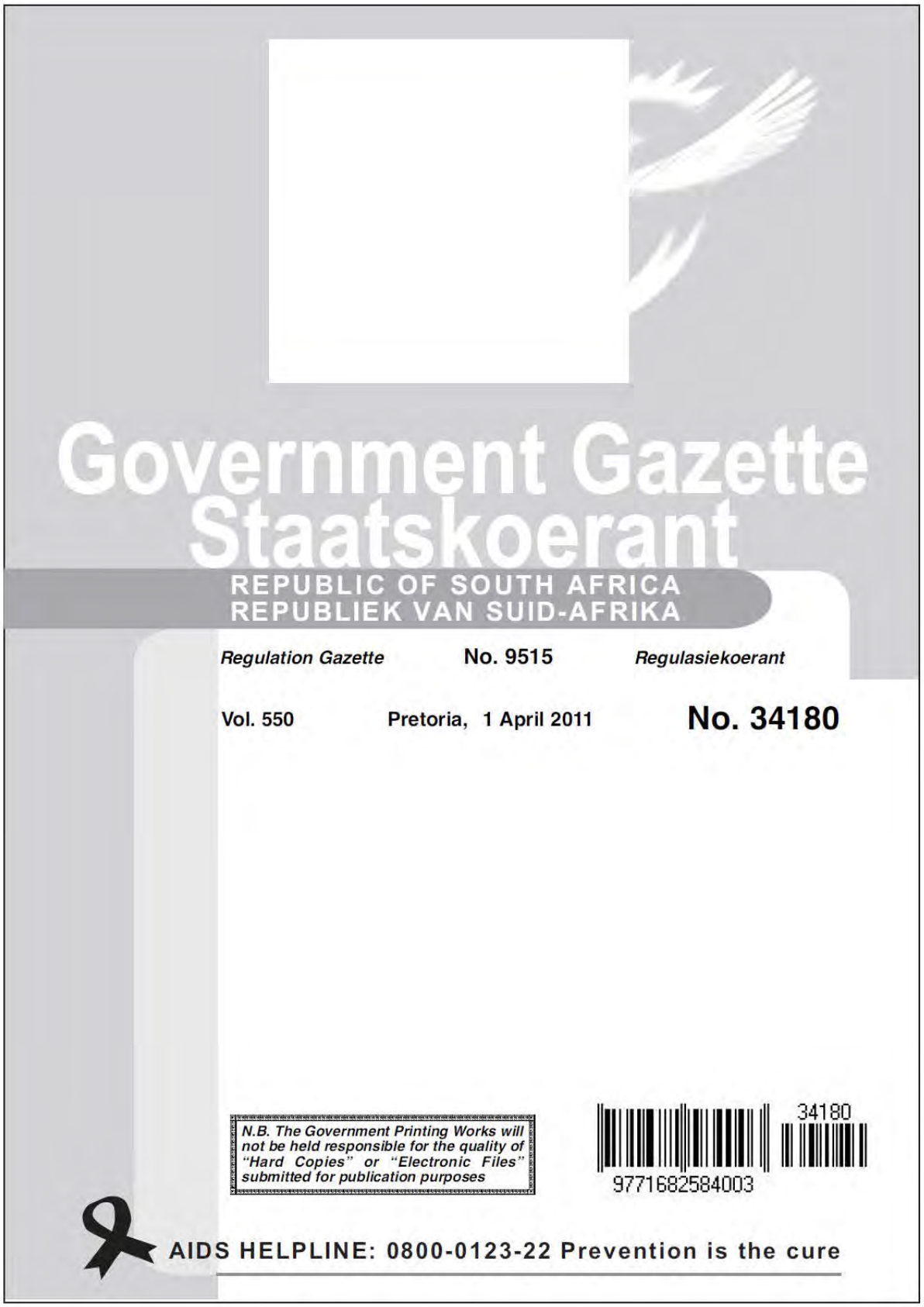
The regulation of GMO applications has not always been thoroughly checked and many applications have passed through the system effortlessly, drawing little attention or input by way of the available public participation mechanisms (Wolson, 2007). Although this has changed in recent years, as opponents of GM technology are playing a more active role by submitting regular requests for information regarding GMO applications, as well as submitting their objections, interested and affected parties (I&APs) are still finding it difficult to engage with the government on the regulation of GMOs, and to participate effectively in GMO-permitting processes in South Africa, due to the lack of transparency in the decision-making process, and in particular the lack of information made available to the public (Wolson, 2007; ACB, 2011a).

Another means of ensuring that GMO applications do not bypass the system was when South Africa ratified the Cartagena Protocol on Biosafety, a global agreement concerned with protecting a country's biodiversity from the environmental effects of GMOs, by regulating their transboundary movement by implementing a precautionary approach (Freidberg and Horowitz, 2004; Mayet, 2007). This agreement requires South Africa to use the precautionary principle, when assessing and reviewing GMO applications, in order to safeguard the country's biodiversity (Freidberg and Horowitz, 2004). The GMO Amendment Act, 23 of 2006 came into effect in early 2010, and is also administered by the DAFF. These amendments, among other things, were intended to give effect to the Biosafety Protocol (ACB, 2011a).

APPENDIX F.2: BIO-ECONOMY STRATEGY

In 2014, the Biotech Strategy was replaced by the Bio-economy Strategy, as gaps in the Biotech-Strategy framework were identified (DST, 2013). According to the DST, the lead agent guiding the Bio-economy Strategy, the concept of "Bio-economy" includes biotechnological activities and processes that transform into economic productivity, especially those with industrial application. In South Africa, these can include, but are not restricted to, the industrial and non-industrial exploitation of natural resources, which ranges from animals, plant biodiversity, micro-organisms to minerals, so as to enhance health, tackle issues of food security, which would, in turn, add to economic growth and improved quality of life (DST, 2013). The idea is for "South Africa's bio-economy to be a significant contributor to the country's economy by 2030, in terms of the gross domestic product (GDP)" (DST, 2013). This is to be accomplished by means of the establishment and expansion of new industries that create and develop "bio-based services, products and innovations" (DST, 2013). Therefore, the Bio-economy Strategy affords South Africa with an "economic engine" for the future economy that would subsequently present a foundation for future growth (DST, 2013).

APPENDIX G: CPA REGULATIONS (R293 OF 2011)



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GOVERNMENT NOTICE

DEPARTMENT OF TRADE AND INDUSTRY

No. R. 293 **1 April 2011**

THE CONSUMER PROTECTION ACT, 2008 (ACT NO. 68 OF 2008) REGULATIONS

I, Dr Rob Davies, Minister of the Department of Trade and Industry, in terms of and under section 120 (1) of the Consumer Protection Act, 2008 (Act 68 of 2008), read together with the respective sections indicated in the regulations below, do hereby make the regulations set out in the schedule hereto and issue the attached notices in terms of the respective sections indicated in such notices.

Signed by candidate

DR ROB DAVIES, MP
MINISTER OF TRADE AND INDUSTRY
DATE:..31../..3..../ 2011

(ii) in the event of a textile manufacturer, importer or seller operating in the Republic using imported greige fabric to produce dyed, printed or finished fabric in the Republic, that such fabric has been dyed, printed or finished in South Africa from imported fabric; and

(iii) that a locally manufactured product using imported material must state "Made in South Africa from imported materials";

(b) such goods conform to the South African national standards for fibre content and care labelling in accordance with the provisions of Government Notice No. 2410 of 2000, published in the Gazette of 30 June 2000;

(c) if after such goods have been reconditioned, adapted, rebuilt or remade, whether in the Republic or elsewhere, a trade description is applied to such goods in a conspicuous and easily legible manner stating clearly that such goods have so been reconditioned, adapted, rebuilt or remade, as the case may be;

(d) if the goods were wholly assembled or made in the Republic, a trade description is applied to such goods in a conspicuous and easily legible manner stating "Made in South Africa."; or

(e) goods are correctly labelled.

(2) This regulation does not apply to -

(a) textiles so small in size that labelling is not reasonably possible;

(b) second-hand clothing imported for charity purposes; or

(c) goods where the number of goods imported by a natural person does not exceed 1000 single items in any one calendar month;

but does apply to goods imported for marketing purposes.

(3) This regulation does not amend or repeal or detract from any other regulation made under or in terms of any legislation.

Product labelling and trade descriptions: genetically modified organisms

7 (1) In this regulation, "genetically modified organism" means a genetically modified organism as defined in section 1 of the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997), and "genetically modified" has a corresponding meaning.

(2) This regulation applies to goods approved for commercialisation by the Executive Council for Genetically Modified Organisms established by section 3 of the Genetically Modified Organisms Act, 1997.

(3) For purposes of section 24(6) of the Act and subject to subregulation (4) and (6), this regulation applies to all goods referred to in subregulation (2) which contain at least 5 percent of genetically modified organisms, irrespective of whether such making or manufacturing occurred in the Republic or elsewhere, and to marketing material in respect of such goods.

(4) Any good or ingredient or component to which subregulation (3) applies may not be produced, supplied, imported, or packaged unless a notice meeting the requirements of section 22 of the Act is applied to such good or marketing material, as the case may be, in a conspicuous and easily legible manner and size stating, without change, that the good or ingredient or component "contains Genetically Modified Organisms".

(5) If goods listed or contemplated in subregulation (2) are intentionally and directly produced using genetic modification processes, the goods or marketing material, as the case may be, must be labelled, meeting the requirements of section 22 of the Act, without change, as "Produced using genetic modification".

(6) A notice meeting the requirements of section 22 of the Act must not state that a good or ingredient or component does not contain genetically modified organisms unless such good or ingredient or component contains less than one percent genetically modified organisms.

(7) Notwithstanding the provisions of regulation 7(6), a notice meeting the requirements of section 22 may state that the level of genetically modified organisms contained in the good or ingredient or component to which subregulation (2) applies is less than 5 percent.

(8) If it is scientifically impractical or not feasible to test goods contemplated in subregulation (2) for the presence of genetically modified organisms or ingredients, a notice meeting the requirements of section 22 of the Act must be applied to such goods or marketing material, as the case may be, in a conspicuous and easily legible manner and size, stating "May contain genetically modified ingredients".

(9) This regulation does not amend or repeal or detract from any other regulation applying to product labelling and trade descriptions of genetically modified organisms made under or in terms of any other legislation, nor do any such regulations detract from or prejudice this regulation.

(10) This regulation will come into effect six months after the commencement of the Act.

APPENDIX H: Table showing significant changes that occurred during the policy development process of mandatory GM labelling

Date	Policy development process	Significant changes	Interest groups that lobbied for change
9 September 2004	Draft Green Paper on the Consumer Policy Framework	First mention of labelling GMOs in terms of consumer protection in South Africa	Civil society, including GM labelling advocacy groups that lobbied for mandatory GM labelling in South Africa -SAFeAGE, ACB, COSATU, and other supporting organisations
15 March 2006	First draft of Consumer Protection Bill (CPB) published for public comment	GM labelling clause introduced Product liability for GMOs introduced	
21 September 2006	Second discussion draft of CPB	GM labelling clause removed	DAFF, DOH and industry lobbied for requirements of GMO labelling to be removed
25 April 2008	Draft CPB published	Clause added - rendering GMOs exempt from product liability for damage caused by them	
After 19 May 2008	CPB introduced into Parliament	The Bill did not make provision for GM labelling and excluded GMO products from product liability	
June- July 2008	Public hearings and provincial briefings held on CPB		SAFeAGE mobilised other GM labelling advocacy groups and consumers to make submissions requiring GM labelling clause be reinstated
August 2008	Select Committee adopts CPB		Same interest groups continued to lobby DTI
	Revised version of the Bill debated in the NCOPs		SAFeAGE submitted input
2-4 September 2008	Public Hearings held on CPB		Numerous stakeholders made oral and written submissions. SAFeAGE made its case, supported by COSATU, and other GM labelling advocacy organisations

16 September 2008	Parliamentary portfolio committee adopted GM labelling clause	GM labelling clause re-introduced and clause rendering GMOs exempt from product liability removed	and consumers.

APPENDIX I: LIST OF STAKEHOLDER COMMENTS SUBMITTED TO THE DTI

Submissions made on behalf of stakeholders on draft regulations governing GM labelling to the DTI in 2010

Date	Stakeholder	Title of document (submission)	Code/Reference
6 December 2009	SAFeAGE	Input from SAFeAGE as stakeholders for Consumer Protection Act: re: regulations for mandatory labelling of Genetically Modified Organisms and covering letter	SAFeAGE, 2009
21 January 2010	AfricaBio	Biotech stakeholders response to the call for inputs into the drafting of the proposed regulations from the Consumer Protection Act and covering letter	AfricaBio, 2010
29 January 2010	Woolworths	Comments on the forthcoming Consumer Protection Regulations	Woolworths, 2010a
15 March 2010	SAFeAGE	Further notes and inputs relating to the labelling regulations, particularly in association to the clauses related to products derived from Genetically Modified Organisms (GMOs, or GM crops or foods), aimed at providing an accurate and transparent labelling regime, as related to The Consumer Protection Act, Act 68 of 2008; and covering letter.	SAFeAGE, 2010a
30 July 2010	CGCSA	RE: Consumer Protection Act – Industry input on the regulations. This submission was prepared and submitted by the Consumer Goods Council of SA (CGCSA) on behalf our industry members; and covering letter.	CGCSA, 2010a
24 August 2010	Woolworths	Woolworths comments to draft regulations relating specifically to paragraph 4, namely, " Product labelling and trade descriptions: genetically modified organisms"	woolworths, 2010b

30 August 2010	Hahn & Hahn on behalf of client Pick n' Pay	Comment on General Regulations under CPA - Reg 9(6)	Pick n' Pay, 2010
30 August 2010	ACB	Comments On The Draft Government Notice On The Consumer Protection General Regulations	ACB, 2010
31 August 2010	Hahn & Hahn on behalf of client Massmart Holdings Limited	Comments and Proposals on Regulations Required in Terms of the Consumer Protection Act	Massmart, 2010
31 August 2010	SAFeAGE	Submission to the Department of Trade and Industry on the Draft Regulations W.R.T. the Consumer Protection Act	SAFeAGE, 2010b
31 August 2010	Ekogaia Foundation	Re; inputs to draft regulations, specifically those relating to GMOs and labelling thereof	Ekogaia Foundation, 2010
31 August 2010	ELA	Comments on the Draft Consumer Protection General Regulations with respect to 'Product labelling and trade descriptions: genetically modified organisms'	ELA, 2010a
7 September 2010	ELA	GMO testing options	ELA, 2010b
8 September 2010	CGCSA	Comments and Proposals on Regulations Required in Terms of the Consumer Protection Act	CGCSA, 2010b
23 September 2010	Tiger Brands	Proposed Consumer Protection Act (CPA) Regulations	Tiger Brands, 2010
27 September 2010	SAFeAGE	Comments in support of the Submission to the Department of Trade and Industry w.r.t. Consumer Protection General Regulations	SAFeAGE, 2010c
12 October 2010	SANSOR	GMO Labelling – SANSOR'S Proposal for South Africa's Consumer Protection Act	SANSOR, 2010
13 October 2010	Industry-working	Industry Submission on Draft Regulations for Consumer Protection Act (Act nr 68 of 2008): GM-	Industry-working group, 2010

	group	Labelling (Clause 24 (6)).	
19 October 2010	Grain SA	Grain SA Comment: CPA Regulations	Grain SA, 2010

Submissions made on behalf of stakeholders on draft regulations governing GM labelling to the DTI in 2011

Date	Stakeholder	Title of document (submission)	Code/Reference
20 January 2011	Industry-working group	Industry Comments on GM-Labelling Clause (Clause 24 (6)), as Included in Proposed Regulations for Consumer Protection Act (Act Nr. 68 of 2008), as Published in Government Gazette, Vol. 545 of 29 November 2010, Nr. 33818.	Industry-working group, 2011
22 January 2011	FoodNCropBio	Submission In Respect of Regulation 9 (Version 30 November 2010) of the Consumer Protection Act 68/2008 Section 24(6) and Relevant Sections 22 and 41	FoodNCropBio, 2011a
28 January 2011	FoodNCropBio	Final Submission to the Department Of Trade and Industry in Respect of Section 24 (6) in the Consumer Protection Act No 68 of 2008 and Regulation 9 in the Draft Regulations	FoodNCropBio, 2011b
26 January 2011	Agri SA	Comments: Consumer Protection Act, 68 of 2008 Regulations	Agri SA, 2011
26 January 2011	Grain SA	Grain Sa Comments on GM Labelling Clause (Clause 24(6)) as Published for Comment on 29 November 2010	Grain SA, 2011
28 January 2011	AfricaBio	Annexure 1: CONSUMER PROTECTION ACT (Act Nr. 68 of 2008) Proposed regulations pertaining to clause 24(6) of the Act. (Government Gazette, Vol. 545 of 29 November 2010, Nr. 33818).	AfricaBio, 2011
31 January 2011	ACB	African Centre for Biosafety (ACB) Comments on: Regulations to the Consumer Protection Act	ACB, 2011

		related to labelling of Genetically Modified Organisms: Regulation 9.1 for the purposes of Section 24(6)	
31 January 2011	Bayer CropScience: BioScience	RE: Bayer inputs to the draft Consumer Protection Act Regulations: Regulation 9 –Product labelling and trade descriptions: genetically modified organisms	Bayer, 2011
31 January 2011	AFMA	Feedback: Consumer Protection Act, Act 68 oF 2008 – Regulations	AFMA, 2011
8 February 2011	DTI (email correspondence with FoodNCropBio)	Re: Submission on Regulation 9	DTI, 2011
10 February 2011	BUSA	Proposed Consumer Protection Regulations 2010 in terms of the Consumer Protection Act, 2009 (68/2008): Submission by Business Unity South Africa	BUSA, 2011
23 August 2011-31 August 2011	NCM (email correspondence with DTI)	CPA regulations- GM labelling	NCM, 2011

Submissions made on behalf of stakeholders on proposed draft amendments to regulations governing GM labelling to the DTI in 2012

Date	Stakeholder	Title of Document (submission)	Reference
1 November 2012	ELA	Submission on Draft Amendment Regulations on Consumer Protection Act Regulations 2011 (Product Labelling and Trade Descriptions: Genetically Modified Organisms)	ELA, 2012
8 November 2012	ACB	Comments on: Draft Amendments to Regulations to the Consumer Protection Act related to labelling	ACB, 2012

		of Genetically Modified Organisms	
9 December 2012	Hahn & Hahn Attorneys	Submission to Department of Trade and Industry: GM Labelling Requirements under Section 24(6) of the Consumer Protection Act 68 of 2008 and Regulation 7 there under	Hahn & Hahn, 2012

Submissions made on behalf of stakeholders on proposed draft amendments to regulations governing GM labelling to the DTI in 2013

Date	Stakeholder	Title of Document (submission)	Reference
22 February 2013	AfricaBio	Comments in Response to the Draft Amendment Regulations of Consumer Protection Act, 2011 (Product Labelling and Trade Descriptions: Genetically Modified Organisms)	AficaBio, 2013

Other documents received by other relevant stakeholders

Date	Stakeholder	Title of Documents	Reference
2006 and 2007	SAFCEI	GM Free Food List Campaign	SAFCEI, 2007
6 September 2008	SAFeAGE	Letter	SAFeAGE, 2008c
22 February 2010	SAFeAGE	Email: GMO Labelling Workshop - 22 February 2010	SAFeAGE, 2010

APPENDIX J.1: TABLE SHOWING DRAFT VERSIONS OF THE GM LABELLING REGULATIONS WITH SIGNIFICANT CHANGES

Date	Draft Name	Description of Significant Changes	Stakeholder Issue Identified in Comments
19 July 2010	First Draft Basic CPA Regulations	❖ Contains Annexure B[29], which lists all goods to which this draft regulation applies	Submission made by an NGO stakeholder, suggested that all products containing GMOs should be labelled.
12 October 2010	Consolidated Regulations Draft 6	❖ **List of goods** under Annexure B **shortened** considerably to include only maize and soya bean	Industry stakeholders suggested for the sake of practicality, reliability and enforceability the list of goods should include exclusions. One such exclusion is that "GM food does not need to be labelled if they have been processed to an extent that GMOs cannot be reliably detected".
29 November 2010		❖ **Removed** sub-regulation 6 from previous version: a statement claiming "does not contain genetically modified ingredients "GMO free", "organic" or any similar statement may not be applied to goods listed or contemplated in Annexure B".	Stakeholders recommended removing this provision as it implied that organic soya beans and maize would not be allowed to be labelled as "organic". This would also clash with the guidelines governing organic food, which must by definition be GM-free. GM-free labelling is also prohibited by the GM labelling regulations (R.25) of the FCDA. Individuals involved in the organic and non-GM value chain have paid premiums to ensure their products are GM-free and should be able to provide this information to the consumer. -An NGO stakeholder requested for GM-canola to be included in the list of goods. The organisation noted that while GM canola is not produced

[29] See Appendix J.2 for original list of goods

		❖ Imported canola oil was **added** to the list of goods under Annexure B but was later **removed** when Annexure B was replaced	in the country, it is imported and widely available on the South African market, and thus should be subjected to the GM labelling requirements -However industry stakeholders recommended removing canola oil from the list of goods as GM canola oil contains no novel DNA and therefore cannot be tested for GM content
10 March 2011	Regulations Post Public Consultation	❖ Sub-regulation 2 **replaced** Annexure B: Now applies to goods approved for commercialisation by the Executive Council for GMOs ❖ **Added** sub-regulation (9): This regulation will come into effect six months after the commencement of the Act	Stakeholder's recommended replacing Appendix B which lists a limited number of GMO ingredients. This list is constantly changing and instead of stipulating exactly what crops are used it would be more practical if the products listed should only apply to "approved GMOs" by the DAFF. Industry stakeholders provided their reasonable implementation date, as food product labels are updated in about 3 year cycles, thus a reasonable period would be 3 years to implement
1 April 2011	The Consumer Protection Act, 2008 (Act No. 68 of 2008) Regulations	❖ Sub-regulation 6 was **amended.** Previously allowed labels to state GM content is below 1%, if less than 1% of the ingredients or components from which it is made consist of a GMO to now allowing labels to state does not contain GMOs if the good or ingredient or component contains less than 1% GMOs.	This last minute change to include a 1% threshold for voluntary non-GM labelling was to accommodate for non-GM certification of food exports, as most of South Africa's trade partners apply mandatory GM labelling using a 0.9% or 1% threshold

		❖ **Added** sub-regulation (7): Makes provision for the "absence of GM below a specific threshold"[30] ❖ Wording in sub-regulation 8 changed from if it is "**impossible**" to if it is "**scientifically impractical**"	This was a last minute addition to the final regulations Many stakeholders commented on the terms "impossible and "not feasible" being ambiguous and providing a very grey area for interpretation.

[30] Viljoen and Marx, 2013

APPENDIX J.2: ORIGINAL LIST OF GOODS

First Draft of Basic CPA Regulations
***Annexure B**- Regulation 9(2)*
1. Maize. 2. Soya bean. 3. Cotton. 4. All animal products produced using genetically modified ingredients. 5. Prepared or cooked food which contains more than 5% genetically modified ingredients which is sold or provided directly to consumers or employees in restaurants, fast food outlets, take-aways, canteens or similar establishments. 6. Any goods which after the commencement of these regulations are approved by an organ of state in terms of legislation applying to genetically modified organisms for cultivation in the Republic. 7. Any goods to which any other international instrument applying to genetically modified organisms binding on the Republic applies. 8. Goods with additives where the additive itself has genetically modified ingredients. 9. Any seed or other means of propagation in respect of goods listed or contemplated in this Annexure. 10. By-products of any goods listed or contemplated in this Annexure.

APPENDIX K: PROPOSED DRAFT AMENDMENTS TO THE MANDATORY GM LABELLING REGULATIONS

CONTENTS • INHOUD

GENERAL NOTICE

NOTICE 824 OF 2012

CONSUMER PROTECTION ACT, 2008

DRAFT AMENDMENT REGULATIONS ON CONSUMER PROTECTION ACT REGULATIONS, 2011 (PRODUCT LABELLING AND TRADE DESCRIPTIONS: GENETICALLY MODIFIED ORGANISMS)

I, Dr Rob Davies, the Minister of Trade and Industry hereby, in terms of section 120(1) of the Consumer Protection Act, 2008 (Act No. 68 of 2008) intend to make amendments to the regulations in the Schedule.

I hereby invite comments from the public on the proposed regulations on or before thirty (30) days from the date of publication of this notice. Please forward comments to Mr. Ntutuzelo Vananda at:

77 Meintjies Street

Block B, 1st Floor

Sunnyside

Pretoria

Contact no: 012 394 1383

Fax No: 012 394 2383

Email: NVananda@thedti.gov.za

Signed by candidate

DR ROB DAVIES (MP)
MINISTER OF TRADE AND INDUSTRY
DATE:

GENERAL EXPLANATORY NOTE:

[ ] Words in bold type in square brackets indicate omissions from existing enactments.

___ Words underlined with a solid line indicate insertions in existing enactments.

SCHEDULE

Definitions

In this schedule any word or expression to which a meaning has been assigned in the Act bears the same meaning so assigned, unless the context indicates otherwise.

Amendment of regulation 7 of Regulations

1. **Regulation 7 of Regulations is hereby amended by-**

(a) the substitution for subregulation (2) of the following subregulation:

"(2) This regulation applies to all goods that contain genetically modified ingredients or components.

(b) the substitution for subregulation (3) of the following subregulation:

"(3) For purposes of section 24(6) of the Act, and subject to subregulation (4) and (6), this regulation applies to all goods that contain genetically modified ingredients or components which contain at least 5 percent of genetically modified **[organisms]** ingredients or components, irrespective of whether such manufacturing occurred in the Republic or elsewhere, and to marketing material in respect of such goods.";

(c) the substitution for subregulation (4) of the following subregulation:

"(4) Any good **[or ingredient or component]** to which subregulation (3) applies may not be produced, supplied, imported, or packaged unless a notice meeting the requirements of section 22 of the Act is **[applied to such good or marketing material, as**

the case may be] displayed on, or in association with the packaging of those goods in a conspicuous and easily legible manner and size stating, without change, that the good **[or ingredient or component]** "contains genetically modified **[organisms]** ingredients or components".;

(d) the substitution for subregulation (6) of the following subregulation:

"(6) A notice meeting the requirements of section 22 of the Act must not state that a good **[or ingredient or component]** does not contain genetically modified **[organisms]** ingredients or components unless such good **[or ingredient or component]** contains less than one percent genetically modified **[organisms]** ingredients or components.";

(e) the substitution for subregulation (7) of the following subregulation:

"(7) Notwithstanding the provisions of subregulation 7(6), a notice meeting the requirements of section 22 may state that the level of genetically modified **[organisms]** ingredients or components contained in the good **[or ingredient or component]** to which sub-regulation (2) applies is less than 5 percent.";

(f) the substitution for subregulation (8) of the following subregulation:

"(8) If it is scientifically impractical or not feasible to test goods contemplated in subregulation (2) for the presence of genetically modified **[organisms or]** ingredients or components, a notice meeting the requirements of section 22 of the Act must be **[applied to such goods or marketing material, as the case may be,]** displayed on, or in association with the packaging of those goods in a conspicuous and easily legible manner and size, stating "May contain genetically modified ingredients or compoonents.";

(g) the substitution for subregulation (9) of the following subregulation:

"(9) This regulation does not amend or repeal or detract from any other regulation applying to product labelling and trade descriptions of goods derived from genetically modified organisms made under or in terms of any other legislation, nor do any such regulations detract from or prejudice this regulation."

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