ABHANDLUNGEN / ARTICLES

A Comparative Analysis of the South African and Burkinabe Experiences with Genetically Modified Crop Regulation

By *Odile Juliette Lim Tung*[*]

Abstract: Over the past two decades, the adoption of genetically modified (GM) crops has been moderate in Africa with mainly four countries, namely South Africa, Burkina Faso, Egypt and Sudan that commercialize such crops. While South Africa is set on the commercial cultivation of GM maize, soya and cotton, Burkina Faso intends to phase out its only approved GM crop (insect-resistant cotton) as from 2016. This paper analyses the genetically modified organism (GMO) regulatory experiences of South Africa and Burkina Faso as the two biggest African GM crop producers and highlights their similarities and differences as well as strengths and weaknesses in the light of their international obligations regarding biosafety. The paper starts with an overview of key international obligations on biosafety followed by a summary of the South African and Burkinabe GMO regulatory frameworks. It then compares main aspects of their GMO decision-making processes (their institutional framework, the scope of GMO-related activities covered, their risk and impact assessment mechanism, public participation in decision-making) and follow-up mechanisms (access to information through labelling of GMOs, post-approval mechanism, and liability regime for GMO-related damage).

***

A. Introduction

Africa is home to over 900 million people where hunger and malnutrition affect at least one in three people and where food production is decreasing.[1] Against this background, modern biotechnology[2] is said to have the potential to solve agricultural constraints but there are

* Post-doctoral fellow, Mandela Institute, School of Law, University of the Witwatersrand, South Africa.

1 See Remi Akanbi, Agricultural Biotechnology: does it work in Africa?, in: Academy of Science of South Africa (ASSAF) (eds.), GMOs for African Agriculture: Challenges and Opportunities, Workshop Proceedings Report, 2010, p.132.

2 "Modern biotechnology" is defined as "any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use"

environmental[3] and safety concerns regarding genetically modified organisms (GMOs).[4] The opportunities and challenges that modern biotechnology offers for Africa's agriculture are highly debated.[5] Towards the end of the 1990's, the African negotiators of the Cartagena Protocol on Transboundary Movements of Living Modified Organisms (LMOs) (hereafter the "CP")[6] to the Convention on Biological Diversity (CBD) intended to develop a

(art 2 Convention on Biological Diversity (CBD), 5 June 1992, UN Doc UNEP/Bio.Div/N7-INC.S/4 reprinted in (1992) 31 ILM 818).

3 Scientists disagree about the risks associated with GMOs (see *James F. Ewing,* Agricultural Biotechnology: Is the International Regulation of Transgenic Agricultural Plants for the Birds (And the Bees)?, Suffolk Transnational Law Review, 25 (2002), pp. 617, 640). The first GM tomato was introduced in the United States (US) in 1996 and GM products have been claimed to be safe by the biotechnological industry over the past two decades. See Academy of Science of South Africa (ASSAF), Regulation of Agricultural GM Technology in Africa, Mobilising Science and Science Academies for Policymaking, South Africa, 2012, p. 9; A voluntary private sector compensation mechanism known as the "Compact" has nonetheless been set up in 2010 by six major plant biotech companies for damage caused to biological diversity by one of their living modified organisms (LMOs). See Croplife International, The Compact, 2017, available at http://www.biodiversitycompact.org/ (last accessed March 2017); See the scientific research outcomes regarding impacts of GM maize MON810 on biological diversity in South Africa from 2008-2010. (Department of Environment Affairs (DEA), Monitoring the Environmental Impacts of GM Maize in South Africa (hereafter the "EBCP study"), 2010).

4 See for concerns regarding the risk of unpredictable toxins *Kurt Buechle*, Great, Global Promise of Genetically Modified Organisms: Overcoming Fear, Misconceptions, and the Cartagena Protocol on Biosafety, Indiana Journal of Global Legal Studies 9 (2001) 1, pp. 283, 292 and for the risk of provoking allergic reactions *Katherine A. Van Tassel,* Genetically Modified Plants Used for Food, Risk Assessment and Uncertainty Principles: Does the Transition from Ignorance to Indeterminacy Trigger the Need for Post-Market Surveillance, Boston University Journal of Science & Technology Law 15 (2009) 2, pp. 220, 222; for studies finding no health hazards regarding the adverse effects of GM food on animal health see *Chelsea Snell et al*, Assessment of the health impact of GM plant diets in long-term and multigenerational animal feeding trials: A literature review, Food and Chemical Toxicology 50 (20129, p. 1134, available at http://www.sciencedirect.com/science/article/pii/S0278691511006399 (last accessed March 2017). Opinions of the panel on GMOs of the European Food Safety Authority (EFSA) are available at http://www.efsa.europa.eu/en/panels/gmo (last accessed March 2017)). Other studies show adverse health impacts on animals, see for instance *Gilles-Eric Séralini et al*, Republished Study: Long term toxicity of a Roundup herbicide and a Round-up tolerant GM maize, Environmental Sciences Europe 26 (2014), 14 available at http://www.enveurope.com/content/26/1/14 (last accessed March 2017); for health concerns regarding the use of chemicals (glyphosate) for herbicide-resistant GM crops see International Agency for Research on Cancer (IARC), Report on Glyphosate, World Health Organisation (WHO), 2015, available at http://www.iarc.fr/en/media-centre/iarcnews/pdf/MonographVolume112.pdf (last accessed March 2017).

5 See Academy of Science of South Africa (ASSAF), GMOs for African Agriculture: Challenges and Opportunities, Workshop Proceedings Report, 2010.

6 Cartagena Protocol on Transboundary Movements of Living Modified Organisms, 29 January 2000, UNTS, 2226, p. 208; Both South Africa and Burkina Faso ratified the CP in 2003. The CP list of States parties is available at https://bch.cbd.int/protocol/parties/ (last accessed March 2017); *Francis Nang'ayo*, The Status of Regulations for Genetically Modified Crops in countries of Sub-Saharan Africa, African Agricultural Technology Foundation, 2006, p. 4.

biosafety model law to guide the development of African domestic biosafety laws.[7] The first version of the Draft Revised African Model Law on Biosafety (DRAMLB) was based on the proposal of the African Group for a biosafety protocol and was submitted to the CBD Secretariat in 1996.[8] South Africa nonetheless approved its first GM crops in 1997 before the coming into force of its legislation regulating GMO-related activities.[9] While the African negotiators of the CP took a strong stand against major genetically modified (GM) crop producers during the negotiations of this protocol, South Africa's position was to ensure that the contents of the CP would facilitate integration with its existing GMO Act.[10] The South African Developing Community (SADC) established an advisory committee in 2003 to set guidelines for GMO policy in the region.[11] The Common Market for East and Southern Africa (COMESA) and the Economic Community for West African States (ECOWAS) are key players in readying their Member States for the commercialization of GM cotton, through harmonized biosafety policies.[12] A regional instrument has been adopted by the Member States of the West African Economic and Monetary Union (WAEMU) including Burkina Faso.[13]

Over the past two decades, the adoption of agricultural biotechnology has been moderate in Africa, with mainly South Africa, Burkina Faso, Egypt and Sudan that commercialize

7 See Judith A. Chambers, Biosafety of GM Crops in Kenya, Uganda and Tanzania: An Evolving landscape of Regulatory Progress and Retreat, Center for Strategic and International Studies, 2013, p. 10; See CBD, note 2.

8 See *Chambers*, id, p. 10; The 2008 DRAMLB is no longer publicly available. A copy is available with the author; See the African Union (AU) list of States parties available at http://www.au.int/en/countryprofiles (last accessed March 2017).

9 The South African GMO Act (hereafter the "SAGMO Act") 15 of 1997 entered into force in 1999; *Marianne Iversen et al*, Detection of Transgenes in Local Maize Varieties of Small-scale Farmers in Eastern Cape, South Africa PLOS ONE 9 (2014), 12, available at http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0116147 (last accessed March 2017).

10 See Land And Environmental Affairs Select Committee, Economic Affairs Select Committee: Joint Sitting, Cartagena Protocol on Biosafety to Convention on Biological Diversity: Briefing, Minutes of Proceedings, South Africa, Meeting 1, March 2002, available at https://pmg.org.za/committee-meeting/1210/ (last accessed March 2017).

11 United Nations Environment Programme (UNEP), Africa Environmental Outlook 2 (2006), p. 316, available at http://new.unep.org/dewa/africa/docs/en/AEO2_Our_Environ_Our_Wealth.pdf (last accessed March 2017).

12 *Haidee Swanby*, Cottoning on to the Lie: The Introduction of Genetically Modified Cotton in Africa will Harm, not Help, Smallholder Farmers, African Centre for Biodiversity (ACB), 2015, p. 4; See ECOWAS http://www.ecowas.int/; International Service for the Acquisition of Agri-biotech Applications (ISAAA), COMESA Regional Biotechnology and Biosafety Policy Implementation Plan Validated, 2017, available at http://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=13270 (last accessed March 2017).

13 See Burkina Faso, Third National Report on the Implementation of the Cartagena Protocol on Biosafety, 2015, (hereafter the "BF Third national report"), available at https://bch.cbd.int/database/record.shtml?documentid=109117 (last accessed March 2017).

biotech crops.[14] South Africa has a solid history of engagement with traditional biotechnology and modern biotechnology.[15] Burkina Faso has also been working towards recognition as Western Africa's leader in biotech acceptance before the country decided to phase out its use of insect-resistant cotton in 2016.[16] Research in agricultural biotechnology is being carried out in other African countries[17] but altogether African countries are concerned about the impacts of GM crops on their exports to the European Union (EU) which has stringent GMO standards.[18] In order to exploit the potential benefits of modern biotechnology while safeguarding against potential risks, most African countries signed and ratified the CBD as well as the CP.[19] South Africa proceeded to align its existing GMO regulatory framework[20] with this protocol while Burkina Faso enacted its first biosafety law in 2006 under the United Nations Environment Programme (UNEP) Global Environment Facility (GEF) national biosafety project.[21] Only eight African countries have ratified the 2010 Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress (hereafter the "NSP")[22] to the CP for damage resulting from the transboundary movement of LMOs. These protocols cover

14 See *Florence M. Wambugu*, The Importance of Political Will in Contributions of Agricultural Biotechnology. Towards Economic Growth, Food and Nutritional Securities in Africa, in: Florence Wambugu and Daniel Kamanga (eds.), Biotechnology in Africa: Emergence, Initiatives and Future, Switzerland, 2014, p. 3.

15 Director-General of Arts, Culture, Science and Technology (DGACST), A National Biotechnology Strategy for South Africa, Executive Summary, 2001, p. i, available at http://www.esastap.org.za/download/sa_biotechstrat_jun2001.pdf (last accessed March 2017).

16 See Burkina Biotech, Burkina Faso's Regulatory Authority to Play Key Role as West Africa Embraces Biotech, 2015, available at http://www.biotechburkina.org/burkina-fasos-regulatory-authority-to-play-key-role-as-west-africa-embraces-biotech/ (last accessed March 2017).

17 See *Swanby*, note 12, pp. 6-8; *Wambugu*, note 14, p. 3.

18 *David Wafula et al*, GMOs and Exports: Demystifying Concerns for Africa, Policy Brief, 2008, available at https://www.isaaa.org/resources/publications/Downloads/Biosafety%20Policy%20Brief%20(June%202008).pdf (last accessed March 2017); The United States (US) with a more permissive approach and the EU with a restrictive or precautionary approach are the two main contenders on norm-setting for GMO trade. See *Robert Falkner and Aarti Gupta*, The Limits of Regulatory Convergence: Globalization and GMO Politics in the South, International Environmental Agreements: Politics, Law and Economics 9 (2009), p. 114.

19 *Nang'ayo*, note 6, p. 4; 39 out of the 54 members of the African group have national biosafety frameworks. See United Nations Environment Programme (UNEP), List of Countries Having National Biosafety Frameworks, available at http://unep.org/biosafety/National%20Biosafety%20frameworks.aspx (last accessed March 2017).

20 *Rodney Nelson Godfrey*, Case Studies of African Agricultural Biotechnology Regulation: Precautionary and Harmonized Policy-Making in the Wake of the Cartagena Protocol and the AU Model law, Loyola of Los Angeles International and Comparative Law Review 35 (2013), pp. 409, 420.

21 See United Nations Environment Programme (UNEP)-Global Environment Facility (GEF), A Comparative Analysis of Experiences and Lessons from the UNEP-GEF Biosafety Projects, UNEP-GEF Biosafety Unit, 2006, p. 11; See the Burkinabe biosafety law (Loi N° 005-2006/AN Journal Officiel N° 18 du 4 mai 2006) (hereafter the "2006 Biosafety Law").

22 See the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety (adopted 15 October 2010, not yet in force) (2010) 50 ILM 105.

only LMOs (which can be considered as a sub-group of GMOs according to the Food and Agriculture Organisation (FAO)) instead of GMOs due to a lack of consensus on the scope of products to be covered by the CP.[23] Both the terms "GMOs" and "LMOs" will be used in this analysis.

This paper focuses on the South African and Burkinabe regulatory experiences as the two biggest African GM crop producers. South Africa is the world's ninth GM crops producer (2.3 million hectares) and Africa's current leader in research involving genetic engineering and GM vaccine trials whereas Burkina Faso ranks 14th in the world and Africa's second GM crop producer (400 000 hectares) in 2015.[24] South Africa is a net food exporter although 2015-2016 has been one of its most severe drought periods.[25] Both countries adopted a GMO regulatory framework as a GM crop producer. However, the 1997 South African GMO Act[26] (hereafter the "SAGMO Act") mainly regulates GMO-related activities while the 2012 Burkinabe biosafety legislation (hereafter the "BFBL")[27] focuses on biosafety. In 2015, South Africa authorized its first drought-tolerant GM maize (MON 87460) with stacked biotech traits as licensed by Monsanto under the Water Efficient Maize for Africa (WEMA) project.[28] This drought-tolerant GM maize also includes the insect-resistant biotech trait that has had adverse environmental impacts identified by South African

23 See FAO Newsroom, Living Modified Organisms: New Guidelines for Risk Assessment, available at http://www.fao.org/newsroom/en/news/2004/43684/index.html; Art 3(1) NSP.

24 See International Service for the Acquisition of Agri-biotech Applications (ISAAA), Pocket K No. 16: Global Status of Commercialized Biotech/GM Crops in 2014, available at http://www.isaaa.org/resources/publications/pocketk/16/ (last accessed March 2017); Burkina Faso is a low-income Sub-Saharan country with a population of 18.11 million in 2015. World Bank, Burkina Faso Country Overview, available at http://www.worldbank.org/en/country/burkinafaso/overview (last accessed March 2017).

25 *Nick Vink*, South Africa's Poor Face Rising Food Prices as Drought intensifies, Times Live, 14 January 2016, available at http://www.timeslive.co.za/local/2016/01/14/South-Africa%E2%80%99s-poor-face-rising-food-prices-as-drought-intensifies (last accessed March 2017).

26 Act 15 of 1997.

27 See the decree promulgating the BFBL (Décret nº 2013- 046/présidentiel promulguant la loi n° 064-2012/AN du 20 décembre 2012 portant régime de sécurité en matière de biotechnologie. Journal Officiel n°25 du 20 juin 2013 p. 5410).

28 See *Rachel Moore*, ARC Approves Drought-Tolerant Maize Trait for South Africa, 24 June 2015, available at http://monsantoblog.eu/arc-approves-drought-tolerant-maize-trait-for-south-africa/#.Vwy0BJx96M9 (last accessed March 2017); See the WEMA initiative (*Shenaz Moola*, Africa's Green Revolution Drought Resistant Maize Scam, African Centre for Biosafety (ACB), Briefing paper 12, 2010, p. 5); "Gene stacking" refers to the combination of two or more genes of interest into a single plant: see International Service for the Acquisition of Agri-biotech Applications (ISAAA), *Pocket K No.42: Stacked Traits in Biotech Crops*, available at http://isaaa.org/resources/publications/pocketk/42/default.asp (last accessed April 2017). The drought-tolerant GM maize approved in South Africa has two biotech traits (the *Bt* insect protection trait and the drought tolerance trait). See *Sylvester Oikeh et al*, The Water Efficient Maize for Africa Project as an Example of a Public-Private Partnership, in: David D. Songstad et al. (eds.), Convergence of Food Security, Energy Security and Sustainable Agriculture, Berlin Heidelberg, 2014, p. 318.

scientific studies yet it has been approved.[29] By contrast, Burkina Faso decided to phase out its GM cotton since 2016 due to the inferior lint quality of GM cultivars.[30] This paper makes a comparative review of the biosafety approaches of the two biggest African GM crop producers and their effects on regulatory decision-making. An examination of the South African and Burkinabe experiences with GM crop regulation arguably provides useful insights regarding the impact of GM crop technology and the adoption of GM crops in Africa.[31] This paper compares the South African and Burkinabe GMO regulatory experiences, highlighting their similarities and differences as well as strengths and weaknesses in the light of their international obligations regarding biosafety.[32] It first presents main international obligations regarding safety in biotechnology and an overview of the South African and Burkinabe GMO regulatory experiences. It then compares and contrasts main aspects of their GMO decision-making processes (their institutional framework, the scope of GMO-related activities covered, their risk and impact assessment mechanism, public participation in decision-making) and follow-up mechanisms (access to information through labelling of GMOs, post-approval mechanism, and liability regime for GMO-related damage).

B. Key international obligations regarding safety of biotechnology

The CBD recognizes the need for appropriate procedures to enhance the safety of biotechnology to reduce potential threats to biological diversity, taking into account risks to human health. However, it merely sets the stage for the development of such procedures.[33] It is the CP (also known as the "biosafety protocol") which provides biosafety procedures to ensure

29 See EBCP study, note 3; See reports of gene flow from *Bt* maize to non-*Bt* maize, impacts on non-target organisms, insect resistance development and irresponsible management in the country. See *J.B.J. Van Rensburg*, First Report of Field Resistance by the Stem Borer, Busseola Fusca (Fuller) to Bt-transgenic Maize, South African Journal of Plant and Soil 24 (2007), pp. 147-151; *Marlene Kruger et al*, Transgenic Bt-Maize. Farmers' Perceptions, Refuge Compliance and Reports of Stem Borer Resistance in South Africa, Journal of Applied Entomology 13 (2012) pp. 38-50; Iversen *et al*, note 9; *Johnie Van den Berg*, Field-resistance of the African Maize Stem Borer to Bt Maize: What Did We Learn? Conference paper (Advancing the Understanding of Biosafety Conference, India, 28-29 September 2012), p. 2, available at http://www.ensser.org/fileadmin/files/3.4-vandenBerg-paper.pdf (last accessed April 2017).

30 See GM Watch, Burkina Faso Abandons GM cotton, 28 January 2016, available at http://www.gmwatch.org/news/latest-news/16677-burkina-faso-abandons-gm-bt-cotton (last accessed March 2017).

31 South Africa is still the biggest African GM crop producer while Burkina Faso was the second biggest African GM crop producer until 2015.

32 To the extent that the CP uses the term "biosafety" and not "biosecurity", "biosafety" will be used in this analysis; Biosafety refers to "the need to protect human health and the environment from the possible adverse effects of the products of modern biotechnology". See Secretariat of the Convention on Biological Diversity, The Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2000, p. 1.

33 Arts 16(1), 18(g) and 19(3) CBD.

an adequate level of protection for the safe transfer, handling and use of any LMO resulting from modern biotechnology that may have adverse effects on biological diversity.[34] Main components of a biosafety framework comprise a precautionary approach for the safe transfer, handling and use of LMOs;[35] an advanced informed agreement[36] (AIA) procedure; a risk assessment and monitoring mechanism;[37] competent national authorities and national focal points;[38] information-sharing and a Biosafety Clearing-House[39] (BCH); public awareness and participation in decision-making;[40] socio-economic considerations[41] and provisions sanctioning illegal transboundary movements.[42] During the negotiations of the CP, the identification and labelling of LMOs was heavily discussed. However, the CP was finalized with compromises on this issue.[43] Liability and redress for LMO-related damage was also addressed during the negotiations of the CP but with no consensus regarding the details of a liability regime.[44] The 2010 NSP provides international rules and procedures in the field of liability and redress relating to LMOs at the discretion of its States parties but it is not yet in force.[45] Unlike South Africa, Burkina Faso is a State party to the NSP and has already implemented it.[46]

At the African level, the DRAMLB is not yet in force but has been recommended by the African Union (AU) Executive Council as a significant regulatory policy to guide national biosafety frameworks in Africa.[47] The precautionary stand of the DRAMLB on GM crops has been criticized as a *de facto* ban on GM crops by proponents of GM technology.[48]

34 Art 1 CP.

35 Ibid.

36 Prior to the first intentional transboundary movement of LMOs for intentional introduction into the environment. Art 7 CP.

37 Arts 15-16 CP and Annex III to the CP.

38 Id art 19.

39 Id art 20.

40 Id art 23.

41 Id art 26.

42 Id art 25.

43 Id art 18; *Odile J. Lim Tung*, Transboundary Movements of Genetically Modified Organisms: Key Issues and Concerns, Potchefstroom Electronic Law Journal 17 (2014), p. 1750; See the sub-section on "access to information through labelling of GMOs".

44 See t (art 27 CP).

45 *Odile J. Lim Tung*, Genetically Modified Organisms and Transboundary Damage: A Two-Pronged Compromise for Redress in the Liability and Redress Protocol to the Cartagena Protocol, South African Yearbook of International Law 38 (2013), p. 69.

46 Burkina Faso acceded to the NSP in 2013. See the list of States parties having ratified the NSP, https://bch.cbd.int/protocol/parties/#tab=1 (last accessed March 2017).

47 *Chambers*, note 7, pp. 10-11.

48 Id, p. 11; See the DRAMLB's stringent standards on some aspects (GM labelling provisions (arts 14-15) and a 0.9 per cent labelling threshold for adventitious presence of GMOs (art 13(2)); finan-

After this overview of main international obligations regarding safety in biotechnology, the following sub-section presents a summary of the South African and Burkinabe GMO regulatory experiences.

C. Overview of the South African and Burkinabe GMO regulatory experiences

Both South Africa and Burkina Faso have had ambitious modern biotechnology endeavours but adopted different approaches to the adoption of GM crops. South Africa proceeded to a rapid adoption of GM crops as from 1997 with insect-resistant and herbicide-resistant cotton, maize and soya.[49] By 2007, GM crops made up 62 per cent of maize, 80 per cent of soybean and 90 per cent of cotton cultivated in the country reaching 2.3 million hectares in 2014.[50] Current research using genetic engineering techniques focuses on drought-tolerant GM maize and pharmaceutical production from GM maize and GM tobacco.[51] The country has not officially started breeding, importing or marketing GM livestock but applications have been made regarding the approval of HIV vaccine, measles and tuberculosis trials involving GMOs.[52] By contrast, in Burkina Faso field trials with GM crops started only in 2003 and it allowed mainly the *bacillus thuringiensis* (*Bt*) or insect-resistant cotton.[53] Its economy is heavily reliant on agricultural production[54] with high climate risk and locust attacks and it is less advanced than South Africa in terms of research using genetic engineering techniques.[55]

Both countries adopted a GMO regulatory framework as a GM crop producer. South Africa was the first African country to enact a GMO legislation[56] in 1997 before the com-

cial guarantee covering liability (art 8(8)); community rights for GM free zones (art 21); public awareness and participation (art 7(2)); Liability and redress provisions (art 19)).

49 *Iversen et al*., note 9.

50 African Centre for Biosafety (ACB), Overview of GMO Regulatory Regime in South Africa, South Africa, 2011, p. 4.

51 *Moola*, note 28, p. 5.

52 See Department of Agriculture, Forestry and Fisheries (DAFF), Genetically Modified Organisms Act 1997 Annual Report 2008/09, Directorate: Biosafety, 2009, p. iii.

53 See *H. Traoré et al*, Bt Cotton in Burkina Faso demonstrates that political will is key for Biotechnology to Benefit Commercial Agriculture in Africa, in: Florence Wambugu and Daniel Kamanga (eds.), Biotechnology in Africa: Emergence, Initiatives and Future, Switzerland, 2014, p. 24.

54 World Bank, note 24.

55 *Regina Birner et al*, Biofortified Foods and Crops in West Africa: Mali and Burkina Faso, AgBioforum 10 (2007) , p. 192.

56 SAGMO Act 15 of 1997; See also GMO-related regulations: such as the Consumer Protection Act Regulations GN R 293 GG 3418 of 1 April 2011 (hereafter the "2011 Consumer Protection Regulations"); Regulation relating to the Labelling of Foodstuffs Obtained through Certain Techniques of Genetic Modification GN R 25 of 16 January 2004 (hereafter the "2004 Labelling Regulations"); GMO Regulation GN R 120 GG32966 of 26 February 2010; Department of Agriculture, Guideline Document for Work with Genetically Modified Organisms. Genetically Modified Organisms Act 1997 (Act 15 of 1997) Guidelines GN 1046 in GG 26422 of 11 June 2004 (hereafter

ing into existence of the CP and improved its biosafety approach under the UNEP-GEF national biosafety project later on.[57] By contrast, Burkina Faso enacted its first biosafety law in 2006 after ratifying this protocol. The BFBL includes the precautionary principle[58] whereas the SAGMO Act does not include this principle although its "Guideline document for work with GMOs" provides for a precautionary approach for risk assessments.[59] South Africa currently has a GMO decision-making process with GMO institutions, basic risk assessment and monitoring requirements for the release of GMOs, a public participation and information mechanism, a labelling regime for GMOs, and basic liability requirements for GMO-related damage.[60]

As for Burkina Faso, the 2004 National Rules for Biosafety enabled the adoption of *Bt* cotton and other GM crops and the setting up of the National Biosecurity Agency (NBA).[61] In 2006, this framework was strengthened with a biosafety law[62] (hereafter the "2006 Biosafety Law") which was in turn, repealed by a comprehensive biosafety legislation in 2012.[63] By contrast, South Africa mainly amended its fragmented GMO framework. Burkina Faso has a GMO decision-making mechanism, GMO institutions, risk assessment and management requirements, a public participation mechanism, and a comprehensive civil liability regime for GMO-related damage but no standard for GM products labelling.[64]

the "Guideline document for work with GMOs"); Department of Agriculture, Guidelines GN 1047 in GG 26422 of 11 June 2004.

57 UNEP-GEF, note 21, p. 12.

58 Arts 2(26) and 23 BFBL.

59 See the Guideline document for work with GMOs, p. 5; Art 1 CP and the Preamble of the DRAMLB.

60 No AIA procedure (art 7(1) CP); Mainly a basic risk assessment undertaken by the GMO permit applicant, discretionary EIA and socio-economic impacts; Not all decisions on GMOs are communicated to the BCH; Inadequate monitoring and lack of enforcement on risk management measures (art 16 CP); Liability and redress rules mainly but no comprehensive regime and no financial guarantee covering liability; See the following sub-sections for more details.

61 *Traoré et al*, note 53, p. 24.

62 See the 2006 Biosafety Law; *Nang'ayo*, note 6, p. 15; UNEP-GEF, note 21, p. 3.

63 See art 114 BFBL.

64 The precautionary principle guides the BFBL (art 23 BFBL); An AIA procedure (arts 11-12 and 32 BFBL; art 7 CP); Independent risk assessment (art 23 BFBL); Communication of all decisions on GMOs to the BCH (art 56 BFBL; arts 6 and 10 CP); Good level of public participation in the GMO permit process and awareness (art 38 BFBL; art 23 CP); Liability and compensation regime (arts 72-92 BFBL; arts 2, 3, 5, 6 NSP); Financial guarantees covering liability (art 93 BFBL; Art 10 NSP); See the following sub-sections for more details.

South African policies which are relevant to GMO-related activities are namely, the 2001 National Biotechnology Strategy[65] and the 2005 Draft Biosafety Policy[66], the 2005 National Biodiversity Strategies and Action Plan (NBSAP).[67] The 2001 National Biotechnology Strategy was finalized after the introduction of GM crops in the country and before South Africa ratified the CP.[68] The Draft Biosafety Policy targeted the promotion of sustainable development, safe use of modern biotechnology and the reduction of its potential risks to human and animal health and the environment.[69] One of the strategic outcomes of the NBSAP targets an effective management and control measures to minimize the potential risks to biodiversity posed by GMOs.[70]

By contrast, Burkina Faso does not have comprehensive policies on biotechnology and its experience with GMOs concerns mainly GM crops for non-food purposes.[71] Burkina Faso approved the commercial cultivation of insect-resistant cotton[72] as from 2007. Research was also undertaken on *Bt* cowpea and hybrid maize.[73] Due to insufficient production quality, local cotton companies planned to reduce the amount of *Bt* cottonseed to 30% in the 2016/17 season and return to non-GM cotton for the 2017/2018 season.[74] These companies are also claiming US$ 280 million from Monsanto in compensation for losses incurred since 2010.[75]

D. Comparison of key aspects of the GMO decision-making processes

This sub-section examines and compares main aspects of the South African and Burkinabe GMO decision-making processes (their institutional framework, the scope of GMO-related

65 Director-General of Arts, Culture, Science and Technology (DGACST), A National Biotechnology Strategy for South Africa, 2001, available at http://www.esastap.org.za/download/sa_biotechstrat_jun2001.pdf (last accessed March 2017).

66 See Department of Agriculture (DA), Draft Biosafety Policy GN 1576 in GG 27913 of 26 August 2005 (hereafter the "Draft Biosafety Policy").

67 Art 6 CBD.

68 DGACST, note 65.

69 See Draft Biosafety Policy, note 73, pp. 7-8.

70 Department of Environmental Affairs and Tourism, South Africa's National Biodiversity Strategy and Action Plan, 2005, p. 30.

71 See the 2001 National Biotechnology Strategy (note 65) and the Draft Biosafety Policy (note 66).

72 See African Biosafety Network of Expertise (ABNE), Burkina Faso Regulatory Status, available at http://nepad-abne.net/contry_report/burkina-faso/ (last accessed march 2017).

73 See Burkina Biotech, note 16.

74 See *Brian Dowd-Uribe and Matthew A. Schnurr*, Briefing: Burkina Faso's Reversal on Genetically Modified Cotton and the Implications for Africa, African Affairs 115 (2016), p. 170, available at http://afraf.oxfordjournals.org/content/early/2016/01/04/afraf.adv 063.extract (last accessed march 2017).

75 See GM Watch, note 30.

activities covered, their risk and impact assessment mechanism, public participation in decision-making) in light of their international biosafety obligations.

I. Institutional framework

Both South Africa and Burkina Faso have competent national authorities in line with the CP[76] and the DRAMLB,[77] comprising specific administrative bodies and consultative bodies as well as a national focal point to liaise with the Secretariat of the CP. In South Africa, the Executive Council of GMOs (EC),[78] the Advisory Committee (AC),[79] the office of the Registrar,[80] a local BCH[81] and inspection officers[82] under the Department of Agriculture, Forestry and Fisheries (DAFF) are responsible for the GMO permit process. Environmental monitoring and the national focal point for the CP are under the aegis of the Department of Environmental Affairs (DEA).[83] The Directorate Biosafety under DAFF implements the SAGMO Act whereas the DEA is empowered with respect to international negotiations and implementation of agreed national programmes on the environmental safety of GMOs.[84] In Burkina Faso, the NBA[85] was strengthened by the 2006 biosafety law[86] and is supported by other consultative bodies, namely the National Observatory for Biosafety (NOB)[87] and the

76 Art 19(1)) CP.

77 Art 4 DRAMLB.

78 It advises the Agriculture Minister, makes decisions regarding GMO permit applications and is responsible for implementing measures regarding the notification of an unintentional transboundary movement to an affected or potentially affected State or the BCH. Ss 3-7 SAGMO Act.

79 A multidisciplinary committee with scientists from different backgrounds which reviews permit applications. Id s 10.

80 It has an administrative role and is competent for the issuance of permits, authorisations or certificates for the import and export of GMOs. It is the CP BCH national focal point under the Genetic Resources-Biosafety (DAFF). Id s 9.

81 See DAFF, Biosafety Clearing House, 2017, available at http://www.daff.gov.za/daffweb3/Branches/Agricultural-Production-Health-Food-Safety/Genetic-Resources/Biosafety/Biosafety-Clearing-House.

82 Responsible for GMO permit compliance under the SAGMO Act. Ss 8-9 and 15 SAGMO Act.

83 See the South African National Biodiversity Institute (SANBI) (s 11(1)(b) of the National Environmental Management: Biodiversity Act (NEMBA) Act 10 of 2004); See the sub-section on post-approval monitoring.

84 See EBCP study, note 3, p. 6; See Convention on Biological Diversity, South Africa-National Focal Points available at https://www.cbd.int/countries/nfp/?country=za (last accessed March 2017).

85 A public legal entity responsible for GMO permit applications, inspections and technical audits regarding GMO-related activities. It is the national focal point for the CP Secretariat and BCH. (Burkina Faso Government, National Framework for the Prevention of Biotechnological Risks in Burkina Faso, National Committee on Biosafety, 2005); See arts 4 and 5 BFBL.

86 *Regina Birner et al*, note 55, p. 194.

87 A multidisciplinary body which implements sensitization programmes on the prevention of biotech risks in collaboration with the NBA and the Open Forum on Agricultural Biotechnology in Africa. BF Third national report, note 13.

National Scientific Committee on Biosafety (NSCB).[88] Certified NBA officers are competent to carry out investigations with powers of entry.[89]

Altogether the South African regulatory institutions have relatively less members than the Burkinabe institutions[90] and no civil society member as required by the DRAMLB.[91] The South African DAFF and DEA, competent for GMO-related activities arguably need adequate coordination to ensure efficient handling of their different tasks regarding such activities.[92] A specific institution with civil society participation (such as the NOB) to implement programmes on the prevention of biotech risks would arguably help the public to understand such risks in South Africa.[93] While the NBA has increased powers in terms of independence and decision-making, the EC is subject to the Agriculture Minister for final decision-making.[94] Unlike Burkina Faso, there is no South African institution responsible to maintain and make publicly available a data base on GMOs.[95] To promote responsible decision-making, the EC could be made fully responsible if a permit is approved in breach of the SAGMO Act resulting in GMO-related damage.[96] Unlike the EC, the NBA's influence has been stretched to the region impacting on Ghana's and Nigeria's biosafety laws.[97] The main strength of the Burkinabe institutional setup lies in its specific institutions (NBA, NOB and NSCB) including civil society participation for a better sensitization and respect of biosafety. While the South African institutional setup involves specific institutions (EC, AC and the Registrar) as noted above, there is room for improvement in terms of independence, civil society participation and coordination of GMO-related activities.

II. Scope of GMO-related activities

Both regulatory frameworks include activities relating to the development, production, release, use, import, export, storage, transit and application of GMOs[98] but exclude the trans-

88 A technical body competent for scientific assessment and biosafety surveillance. Arts 3, 4 and 7 BFBL.

89 Id arts 96-98.

90 Both the EC and the AC have not more than 10 members (ss 3(1) and 10(1) SAGMO Act); By contrast, the NOB has 33 members (Sylvain Da, Les OGM et leur règlementation au Burkina Faso, 12 May 2015, available at http://www.sciences-campus.info/les-ogm-et-leur-reglementation-au-burkina-faso/ (last accessed March 2017)).

91 Art 10(1) SAGMO Act; Art 4(3) DRAMLB.

92 See EBCP study, note 3, p. 6.

93 BF Third national report, note 13.

94 Ss 5(1)(l) and 6(2) SAGMO Act.

95 See art 4 BFBL; Art 2(e) DRAMLB.

96 See art 82 BFBL; Burkina Biotech, note 16.

97 Burkina Biotech, id; S 5(2)(e) SAGMO Act.

98 S 2 SAGMO Act; Art 1. BFBL.

boundary movement of pharmaceuticals containing GMOs in line with the CP.[99] In both countries, every GMO-related activity requires authorization by the EC and NBA[100] with a renewable permit.[101] They both comprise an appeal mechanism against a rejected permit application.[102]

In both countries, illegal GMOs imported into, produced or used may be confiscated or destroyed at the expense of the operator in line with the CP.[103] Unlike the SAGMO Act, the renewal of a permit under the BFBL is explicitly subject to the respect of conditions under the initial permit.[104] South Africa has different GMO permits with different processing periods[105] while Burkina Faso grants the same permit for all GMO-related activities.[106] Any locally-produced or imported GMO in Burkina Faso is subject to an observation period in line with the DRAMLB whereas there is no observation period for such GMOs in South Africa.[107] Unlike the SAGMO Act, the BFBL explicitly does not authorize the import of a GMO that is prohibited in the country of origin.[108] Unlike the BFBL, the SAGMO Act does not comprise an advanced informed agreement (AIA) required by the CP and the DRAMLB for an informed prior consent to the first intentional transboundary movement of LMOs for intentional introduction into the environment.[109] The South African Agriculture Minister may prohibit GMO-related activities upon the recommendation of the EC by notice in the Government Gazette[110] while the NBA may revoke or suspend any GMO-related activity in the case of any new information regarding risks posed by the respective GMO.[111]

99 South Africa, Third National Report on the Implementation of the Cartagena Protocol on Biosafety https://bch.cbd.int/protocol/cpb_natreports.shtml (hereafter the "SA Third National Report"); Art 1 BFBL; Art 5 CP.

100 S 5(1) SAGMO Act; Art 1 BFBL.

101 Id s 5(2)(d); Id art 48.

102 Id s 19; Reg 11 of the 2010 GMO Regulations; Art 46 BFBL.

103 S 9(b)(i) SAGMO Act; Arts 102-103 BFBL; Art 25 CP.

104 Art 48 BFBL.

105 See EBCP study, note 3, p. 6; E.g. 30 days for the use of GMOs for commodity clearance approval, 90 days for an extension permit, 270 days for a general release of GMOs. See Annexure 1 of the 2010 GMO Regulations.

106 Art 46 BFBL.

107 Id art 20; Art 11(2)(1) DRAMLB; Same procedures are applicable for GM and non-GM food and agricultural products entering South Africa. See South Africa Agri, Exchange Summary of the general requirements and standards for food and agricultural imports into South Africa, Document reference code ZAF1000, 2010, p. 4, available at http://agriexchange.apeda.gov.in/food_standards/Int_document/South_Africa.pdf (last accessed April 2017).

108 Art 53 BFBL.

109 Art 56 BFBL; Art 7(1) CP; Arts 2 and 6 DRAMLB; See South Africa Agri Exchange, note 107, p. 4.

110 S 14 SAGMO Act.

111 Art 49 BFBL.

The NBA is mandated to communicate a copy of its decision on every application for a GMO permit to the BCH in line with the CP and the DRAMLB.[112] By contrast, South Africa has communicated decisions on general/commercial release and commodity clearance of GMOs to the BCH of the CP and not regarding contained use or transit of GMOs.[113] As from 2010, the South African Registrar is required to provide to the BCH, information including legislation, agreements, a summary of risk assessments, final decisions on GMO-related activities in line with the CP.[114] Both countries also provide a notification procedure regarding an affected or potentially affected State due to any unintentional transboundary movement of GMOs.[115]

Altogether, the Burkinabe regime arguably has a better control on GMO-related activities with an AIA, an observation period for local and imported GMOs while being more transparent regarding the communication of all GMO-related decisions to the BCH.[116] As a State party to the CP, South Africa should include an AIA procedure in the SAGMO Act and better transparency regarding the communication of GMO-related decisions to the BCH to comply with the requirements of this protocol.[117] An observation period for local and imported GMOs in line with the DRAMLB would also improve the South African biosafety system.[118]

III. Risk and impact assessment mechanism

The assessment of risks is required by the CP and the DRAMLB to evaluate the probability that particular hazards may occur to prevent harm and enable better risk management.[119] The South African and Burkinabe regulatory frameworks both provide that a risk assessment of the potential adverse effects to the environment, human and animal health is required before a GMO-related activity can be undertaken.[120]

However, the risk assessment mechanism of the two countries differs in quite a few respects. A risk assessment under the BFBL includes the precautionary principle,[121] whereas

112 Art 46 BFBL; Art 20 CP; Art 8(2) DRAMLB.

113 SA Third National Report, note 99.

114 Reg 12 of the 2010 GMO Regulations; Art 20(3) CP.

115 S 5(1)(j) SAGMO Act; Art 70 BFBL.

116 The NBA is required to motivate any rejection. Art 46 BFBL.

117 Art 7 CP.

118 It is unclear whether decisions on approved GMO-related activities from 1996 to 2010 also need to be communicated to the BCH. Reg 12 of the 2010 GMO Regulations; Art 11(2)(1) DRAMLB.

119 See s 4.2.1 Food and Agriculture Organisation (FAO), Oversight Mechanisms, Law and Modern Biotechnology, available at http://www.fao.org/docrep/006/Y4839E/y4839e05.htm (last accessed March 2017); Arts 15-16 CP; Art 10 DRAMLB.

120 S 5(1)(c) SAGMO Act and regs 4(1) and 7 of the 2010 GMO Regulations; Arts 23-24 BFBL.

121 Art 23 BFBL; art 1 CP.

the SAGMO Act does not mention this principle.[122] The risk assessment required for the GMO permit application under the SAGMO Act is nonetheless mainly a paper-based (drawing on research usually conducted outside of South Africa) and field-trial based assessment.[123] The EC examines the permit application before making a decision in consultation with the AC.[124] Unlike in South Africa, a risk assessment in Burkina Faso is undertaken by the permit applicant under the supervision of or carried out by the NBA.[125] The NBA takes the final decision regarding the proposed activity taking into consideration the recommendations of the NSBC.[126] In South Africa, the risk assessment submitted for the GMO permit process is undertaken by the applicant while an environment impact assessment (EIA) is not mandatory.[127] Even when an EIA is required, it consists of a basic assessment report, an environmental management programme and a closure plan.[128] To date, no EIA has been conducted regarding GMO-related activities in South Africa[129] but there have been reports of gene flow from *Bt* maize to non-*Bt* maize, impacts on non-target organisms, insect resistance development and irresponsible management in the country.[130] In Burkina Faso, risk assessments are categorized according to different risk levels[131] while the NBA may set up a simplified procedure in line with the CP if a GMO poses no significant risk for human health and animal health, biological diversity or the environment.[132] The Burkinabe risk assessment mechanism includes the management costs' analysis of identified risks and viable alternatives.[133] It requires not only a study of social and economic impacts but also

122 See note 60.

123 See *Melodie A. McGeoch/James I. Rhodes*, Ecological Risk Assessment of Genetically Modified Organisms in South Africa: An Assessment of the Current Policy Framework, Centre for Invasion Biology Occasional Paper 2, Stellenbosch University, South Africa, 2006, p. 9.

124 Ss 5 and 11 SAGMO Act.

125 Art 23 BFBL.

126 Id art 4.

127 An EIA may be required only in two instances. Where the Environment Minister has reason to believe that the release of a GMO under a GMO permit application may pose a threat to any indigenous species or the environment (s 78(1) of NEMBA; Reg 6(1) of the 2010 GMO Regulations) or if the EC recommends an EIA to be completed (id reg 6(2)).

128 The basic assessment report requirement is applicable for activities in Listing Notice 1 of the EIA Regulations for small-scale activities with less significant environmental impacts than those in Listing Notice 2 of the EIA Regulations. See Environment Impact Assessment Regulations GN R 982 GG 38382 of 4 December 2014 (hereafter the "2014 EIA regulations GN R 982") and Environment Impact Assessment Regulations Listing Notice 1 GN R 983 GG 38382 of 4 December 2014 (hereafter the "2014 EIA regulations Listing Notice 1").

129 *Loretta Feris*, Risk Management and Liability for Environmental Harm Caused by GMOS - The South African Regulatory Framework, Potchefstroom Electronic Law Journal 9 (2006), p. 10.

130 See EBCP study, note 3, p. 1; *Kruger et al*, note 29; *Van den Berg*, note 29, p. 2.

131 Art 9 BFBL.

132 Art 47 BFBL; See Art 11 CP.

133 Art 22 BFBL.

ethical impacts.[134] Unlike the SAGMO Act, the BFBL prohibits any person with direct interests regarding the respective permit application from participating in the risk assessment[135] and the NBA may reject the application for lack of independence.[136] Further, the Burkinabe risk assessment mechanism evaluates GMOs in a category distinct from other plant products and subjects GMOs to a risk assessment based on their genetically modified character.[137] By contrast, with the requirement of a basic assessment report rather than a full EIA,[138] South Africa arguably equates assessment for biotech crops to the one which is applicable to conventionally-bred crops.[139] Until now, no adverse environmental impact regarding GM crops has been noted in Burkina Faso but adverse environmental impacts have been recorded in South Africa.[140] Interestingly, Burkina Faso has quality issues with *Bt* cotton but no quality issue has yet been raised with GM crops in South Africa. In light of adverse environmental impacts identified by scientific studies, a mandatory EIA prior to the release of GMOs is necessary in South Africa as well as the exclusion of any person with direct interests in the risk assessment to be submitted for a GMO permit application. Importantly, both countries should include the requirement of information from previous or current release of the GMO by other countries in the risk assessment report as required by the DRAMLB.[141]

The assessment of socio-economic considerations arising from the impact of LMOs on the biological diversity is discretionary for States parties to the CP while the DRAMLB requires States parties to carry out such an assessment prior to the use or release of a GMO.[142] In South Africa, an assessment of the socio-economic impacts of a GMO-related activity is not mandatory unless requested by the EC when a GMO permit is applied for.[143] Until now, no such request has been made by the EC. However, studies have been undertaken by local scientists.[144] In contrast with the EC, prior to the release of a GMO, the NBA

134 Id art 62.

135 Id art 26.

136 Ibid.

137 Id art 45; See *Nelson Godfrey*, note 20, pp. 429-430.

138 See the 2014 EIA regulations GN R 982 (note 128) and 2014 EIA regulations Listing Notice 1 (note 128).

139 *Nelson Godfrey*, note 20, p.

140 See EBCP study, note 3, p. 1; *Kruger et al*, note 29; *Van den Berg*, note 29, p. 2.

141 Art 6(3)(c) DRAMLB.

142 See art 26(1) CP: Arts 1, 8(7)(c) and Annex III DRAMLB.

143 S 5(1)(a) SAGMO Act and regs 3(3)(d) 4(1) and 5 of the 2010 GMO Regulations; Art 26(2) CP.

144 For instance, see the "Potential Economic Benefits of a Genetically Modified Tubermoth-resistant Potato Variety in South Africa: an Ex-Ante Socio-economic Evaluation for Commercial Producers" and the "Smallholder potato production activities in South Africa: a Socio-economic and Technical Assessment of 5 cases in 3 provinces", available at http://www.acbio.org.za/index.php/gmo-regulatory-issues/110-south-africa/349-submission-on-socio-economic-considerations (last accessed March 2017); for other studies see *Iversen et al*, note 9; *Stephen Morse et al*, The economic impact of genetically modified cotton on South African smallholders: yield, profit and

orders an assessment of socio-economic and ethical impacts on local or neighbouring populations at the cost of the permit applicant.[145] Some studies have also been undertaken on indigenous and local communities in Burkina Faso.[146] A systematic assessment of socio-economic and ethical impacts prior to a GMO release would arguably be beneficial in South Africa and enable appropriate management of the consequences.

Altogether, the main strength of the Burkinabe risk assessment system lies in the independence[147] and thoroughness[148] of the risk assessment to be carried out before the approval of a GMO permit. The main weaknesses of the South African risk assessment system arguably stem from the lack of independence and depth of the risk assessment submitted for a permit application.[149]

IV. Public participation in decision-making

Public participation in GMO decision-making as required by the CP and the DRAMLB provides the opportunity to the public to make comments at a public hearing or in writing on a proposed policy, regulation or activity.[150] In South Africa, there has been no informed public debate or policy process on how to regulate GMOs.[151] The SAGMO Act was developed without adequate public participation, while the Draft Biosafety Policy was published six years after the entry into force of this act.[152] By contrast, Burkina Faso undertook better public consultation to draft its biosafety framework.[153] Both South Africa and Burkina Faso provide for some level of public participation in the GMO decision-making process albeit with different approaches as discussed below.[154]

health effects, Journal of Development Studies 42 (2006), pp. 662–677; *Klara Fischer et al*, Is Bt maize Effective in Improving South African Smallholder Agriculture? Bt Maize in Smallholder Agriculture, South African Journal of Science 111 (2015), pp. 1-2.

145 Art 62 BFBL.

146 See *Brian Dowd-Uribe*, Engineering Yields and Inequality? How Institutions and Agro-ecology Shape Bt Cotton Outcomes in Burkina Faso, Geoforum 53 (2014), pp. 161-171; *Jeff Vitale/John Greenplate*, The Role of Biotechnology in Sustainable Agriculture of the Twenty-First Century: The Commercial Introduction of Bollgard II in Burkina Faso, in: David D. Songstad et al (eds), Convergence of Food Security, Energy Security and Sustainable Agriculture, Biotechnology in Agriculture and Forestry Series 67 (2014), pp. 239-293.

147 Arts 23, 26 BFBL.

148 Id arts 22, 26 and 62.

149 S 78(1) of NEMBA; Regs 6(1) and (2) of the 2010 GMO Regulations.

150 *Gregory Jaffe*, Comparative Analysis of the National Biosafety Regulatory Systems in East Africa, International Food Policy Research Institute, Discussion paper 146, 2006, p. 7; Art 23 CP; Art 7 DRAMLB.

151 *McGeoch and Rhodes*, note 123, p. 10.

152 Ibid.

153 Art 39 BFBL.

154 Id arts 2(8) and 38-41; Reg 9 of the 2010 GMO Regulations.

The South African GMO permit process requires public notification on a proposed release or commodity clearance of GMOs and not for confined uses of GMOs.[155] Such notification consists in a notice published in the printed media with a summary of the activity and a request for comments.[156] The SAGMO Act states which information may not be kept confidential.[157] Since 2010, the GMO Regulations require the publication of the notice in at least three national newspapers with information regarding access to the application.[158] Interested parties may submit comments within a period specified by the notice.[159] The EC has discretionary powers to consider public input before making a decision regarding an application[160] and may invite written comments from any person knowledgeable in a specific field of science.[161]

In Burkina Faso, the NBA decides which information is to be considered as confidential after examining the permit application.[162] Before a final decision is taken on the GMO-related activity, a public consultation is announced in line with the DRAMLB and communicated by all legal means.[163] A public consultation is mandatory for any dissemination or release of GMOs[164] but discretionary regarding the import of GMOs or confined use of GMOs.[165] After the public comment stage,[166] the NBA informs the public of its final decision on the application.[167] The risk assessment report regarding a dissemination or release of GMOs is made publicly available in Burkina Faso whereas only a summary of the risk assessment is publicly available in South Africa.[168]

While there appears to be a higher level of public participation[169] in the Burkinabe GMO permit process, there is room for improvement in both countries' process. In South Africa, interested parties have an opportunity to be involved in decision-making regarding the release of GMOs and commodity clearance of a GMO but not for contained uses of

155 Id reg 9(1).

156 Ibid. reg 9(1).

157 S 18(2)(a), (b) and (c) SAGMO Act.

158 Regs 9(2) and 9(5)(e) of the 2010 GMO Regulations.

159 Not less than 30 days after the date on which the last notice appears in the media. Id reg 9(5)(f).

160 S 5(2)(a) SAGMO Act.

161 Id s 5(2)(h) and (i).

162 Art 38 BFBL.

163 Id art 39. A public consultation refers to "exchanges with the population after being informed regarding a proposed import or use of GMOs" and their positive and adverse impacts. Id art 2(8); Art 7(2) DRAMLB.

164 Art 39 BFBL.

165 Ibid.

166 Id art 40.

167 Id art 41.

168 Id art 38.

169 Id arts 38 and 39.

GMOs.[170] Information provided in the public notice in South Africa is deemed insufficient for the public to engage with and the public has had limited say in decisions regarding GM crops.[171] The Burkinabe public consultation process is nonetheless not defined and would benefit from more procedural details. A legal duty for both the NBA and the EC to respond to relevant comments made under the public notification system with grounds for rejecting comments, would improve decision-making since it is unclear how far public comments influence decision-making in practice.[172]

E. Comparison of the main follow-up mechanisms

This sub-section compares the follow-up mechanisms (access to information through labelling of GMOs, post-approval mechanism, and liability and redress rules for GMO-related damage) that are applicable to GMO-related activities in South Africa and Burkina Faso.

I. Access to information through labelling of GMOs

The traceability of GM products is the backbone of biosafety regulation and access to information regarding GMOs through labelling is in line with basic sanitary requirements and transparency of methods of production.[173] South Africa produces GM crops for food and feed but also for non-food purposes,[174] whereas Burkina Faso produces mainly *Bt* cotton for non-food purposes. Labelling of GM food and feed provides information to the public regarding its GM content and enables the segregation of GM food and feed from non-GM food and feed during processing and storage.[175] As parties to the CP, both South Africa and Burkina Faso may request a label indicating "contains LMOs" to be accompanied by further information for all products that have been clearly identified as transgenic products in

170 Regs 9(1) and 9(5)(f) of the 2010 GMO Regulations; Art 7(2) DRAMLB; By contrast, public consultation with the population is applicable in Burkina Faso. Art 2(8) BFBL.

171 *McGeoch and Rhodes*, note 123, p. 10-11.

172 Id, p. 11; The ACB made substantive comments on at least 30 GMO permit applications, field trials permits, extension permits. See African Centre for Biodiversity (ACB), ACB's Objection to Monsanto's application for an extension permit of drought tolerant GM Maize hybrids: MON 87460 x MON 810 MON 87460 x NK603 x MON 89034 MON 87460 x MON 89034, South Africa, 2015, p. 2.

173 Traceability in general is the ability to follow the movement of a product from its first stage of production to the consumer. *Lim Tung*, note 43, p. 1748; Art 23 CP; Arts 2(g) and 7 DRAMLB; Principle 10 of the Rio Declaration on Environment and Development (UN Conference on Environment and Development, 14 June 1992, U.N.Doc.No.A/CONF/151/5/Rev. 1, 31 ILM 874 (1992)).

174 E.g. GM crops for pharmaceutical purposes. Biowatch South Africa, GM crops available at http://www.biowatch.org.za/list.php?cat=GM%20crops (last accessed March 2017).

175 See safety concerns regarding GMOs (notes 3 and 4); Art 14 DRAMLB.

food shipments.[176] States parties to the CP should take measures to require identification documentation to accompany shipments with LMOs to be used directly as food, feed or for processing (FFPs) and indicate that shipments "may contain GMOs" and that they will not be introduced into the environment.[177]

The South African consumer protection law provides a right to the disclosure of information to consumers regarding products on offer for purchase with specifications for product labelling.[178] Any good or ingredient or component containing at least five per cent of GM material approved for commercialization by the EC, needs to bear GM labels.[179] GM food with an enhanced-characteristic claim is required to use the wording "genetically-enhanced" or "genetically improved" foodstuff.[180] GM labels on food products on the market are nonetheless scarce while GM labels on animal feed are inexistent.[181] A labelling threshold of 1 per cent of GM material is nevertheless applicable for products to be exported with a GMO status certificate issued by the director of the Directorate Genetic Resources.[182] While South Africa has GM labelling standards, it does not have a threshold for the adventitious presence of GMOs as per the DRAMLB.[183]

In Burkina Faso, all imported GMOs intended for intentional release or to be commercialized in the country are required to be labelled in a way which cannot be deleted or falsified.[184] The BFBL specifies that labelling obligations regarding GMOs are meant to safeguard ethical values and avoid risks to the environment, human health and animal health.[185] It covers two types of labels, namely "products derived from GMOs" or which "contains

176 See art. 18(2)(a) CP; For the identification and documentation of cross-border shipments containing LMOs for food, feed and processing under art. 18(2)(a) CP. See Secretariat of the Convention on Biological Diversity, Report of the Third Meeting of the Conference of the Parties to the Convention on Biological Diversity Serving as the Meeting of the Parties to the Cartagena Protocol on Biosafety, Curitiba, Brazil, 13-17 March 2006 (Document UNEP/CBD/BS/COP-MOP/3/15, 6 May 2006).

177 *Lim Tung*, note 43, p. 1750.

178 S 24(6) Consumer Protection Act (CPA) 68 of 2008; Also see ss 13 and 22-28 CPA; See the Regulations relating to the Labelling and Advertising of Foodstuffs GN R146 GG 32975 of 1 March 2010; See the 2011 Consumer Protection Regulations.

179 See regs 7(2) and 7(4) of the 2011 Consumer Protection Regulations.

180 See regs 3 (c) and 3 (d) of the 2004 Labelling Regulations.

181 *Odile J. Lim Tung*, Genetically Modified Food and Feed in South Africa: Labelling and the Right to Disclosure of Information, South African Law Journal 133 (2016), p. 603.

182 See Directorate Genetic Resources, Requirements for the issuance of certificates on the GMO status on consignments, available at http://www.nda.agric.za/doaDev/sideMenu/biosafety/doc/4.%20%20%20GMO%20CERTIFICATE%20REQUIREMENTS%20(2).pdf (last accessed March 2017).

183 Arts 13-15 DRAMLB.

184 Art 65 BFBL.

185 Ibid.

GMOs" as per the supplementary standards to be defined by the NBA[186] albeit with no labelling threshold.[187] Labels may be a logo, a specific trademark or other indications with respect to the presence of GM content.[188]

Both countries' GM labelling systems need improvement. Although the BFBL provides labelling obligations for GM products, there are currently no labelling standards as required by the DRAMLB.[189] As for South Africa, a harmonized labelling threshold for GM food for local use and export is recommended with an effective monitoring of labelling obligations.[190] The introduction of GM labelling for animal feed[191] in South Africa would also facilitate the identification and use of non-GM animal feed by organic farmers.[192] Both countries need to consider including a threshold level for the adventitious presence of GMOs as required by the DRAMLB.[193]

II. Post approval monitoring

Post approval monitoring is required under the CP and the DRAMLB to monitor adverse environmental or health effects as well as compliance with risk management conditions of a GMO-related activity.[194]

The South African National Biodiversity Institute (SANBI) is responsible to monitor the environmental impacts of GMOs that have been released and report regularly to the Environment Minister.[195] The post-market monitoring of GMOs in South Africa is also undertaken by DAFF inspectors mainly in view of GMO permit compliance.[196] According to local studies on environmental impacts of GM crops, better compliance by GMO permit-

186 Id art 66.

187 See art 13(1) DRAMLB; An "adventitious presence or low level presence" of GM content refers to the unintentional commingling of trace amounts of one type of seed, grain or food product with another. Croplife International, Adventitious Presence (AP) or Low Level Presence (LLP), available at https://croplife.org/wp-content/uploads/pdf_files/Fact-Sheet-Adventitious-Presence-or-Low-Level-Presence.pdf (last accessed March 2017).

188 Art 2(13) BFBL.

189 Id art 65.

190 E.g. 1 per cent labelling threshold. See *Odile J. Lim Tung*, Liability and Redress Issues with regard to Genetically Modified Organisms–Related Activities in South Africa, South African Journal of Environmental Law and Policy 18 (2011), p. 125; See the DRAMLB 0.9 per cent labelling threshold for adventitious presence of GMOs. Art 13(2) DRAMLB.

191 *Lim Tung*, note 181, pp. 611-612.

192 *Odile J. Lim Tung*, Organic Food Certification in South Africa: A Private Sector Mechanism in Need of State Regulation?, Potchefstroom Electronic Law Journal 19 (2016) p. 4.

193 See Croplife International, note 187; See arts 13(1) and 13(2) DRAMLB. Unlike the DRAMLB, the CP includes the term "adventitious presence".

194 See FAO, note 119; Art 16 CP; Art 11 DRAMLB.

195 See s. 11(1)(b) of NEMBA.

196 See EBCP study, note 3, p. 16.

holders, complete information transferred to farmers using GM crops and enlargement of *refugia* requirements are necessary.[197] In Burkina Faso, the NBA is empowered to inspect, monitor or take any measure to manage risks with respect to GMO-related activities.[198] Unlike in South Africa, risk management in Burkina Faso involves different stages with obligations for the GMO permit holder[199] and the undertaking of a risk-monitoring study over a period set by the NBA.[200] The assessment of risk management costs and evidence of financial capacity as required in Burkina Faso before a permit approval[201] are important considerations to strengthen the South African risk management system. Under the BFBL, the developer of a GMO or GMO permit holder is legally mandated to recommend to the user of the respective GMO, precautionary measures and risk management measures.[202] Importers or promoters of GMOs in Burkina Faso are responsible for technical and financial assistance with respect to risk assessment and management.[203] There has been no adverse environmental impact recorded in Burkina Faso while the decision for the complete phaseout of *Bt* cotton is mainly due to quality issues.[204] With a slower and stricter introduction of GM crops in Burkina Faso, the Burkinabe monitoring institution has arguably been more adequate in its task than its South African counterpart.[205] South Africa clearly needs a better environmental post-approval monitoring system, a monitoring programme regarding such crops and a strategy to prevent GMO-related accidents.[206]

III. Liability and redress for GMO-related damage

Due to the possible interactions of a GMO that has been released unintentionally or illegally, it is important to have a civil liability regime for GMO-related damage.[207] While the CP only contains an enabling provision[208] for liability for LMO-related damage, the DRAMLB provides a set of rules for liability and redress resulting from the use, release and placing on the market of a GMO as well as a product of a GMO.[209] Liability and redress

197 Id, note 3, p. 20; *Kruger et al*, note 29; See *Van Rensburg*, note 29, pp. 147-151.

198 Art 30 BFBL.

199 Id art 47.

200 Id art 43.

201 Id art 45.

202 Id art 28.

203 Id art 31.

204 Ibid.

205 With mainly *Bt* cotton allowed after field trials in 2003 (GM Watch, note 30) and only 400 000 hectares of GM crops in 2015 (ISAAA, note 24).

206 See EBCP study, note 3, p. 20; Art 29 BFBL; Art 12 DRAMLB.

207 *Lim Tung*, note 190, p. 113; Art 27 CP; Art 1 NSP; Art 19 DRAMLB.

208 Art 27 CP.

209 Art 19 DRAMLB.

rules under the NSP are nonetheless to be implemented at the discretion of States parties.[210] Unlike South Africa, Burkina Faso is a State party to this protocol.[211] This sub-section compares liability and redress rules applicable to GMO-related damage in both GMO regulatory frameworks.

1. Civil liability rules

A civil liability regime may have a fault-based liability or strict liability or a combination of both.[212] Where fault-based liability is applicable, a person conducting a GMO-related activity is liable for damage when he or she is at fault or negligent. If strict liability is applicable, a person conducting a GMO-related activity will be held liable for damage, irrespective of any fault or negligence.[213]

Under the SAGMO Act, liability for GMO-related damage is borne by the "user concerned" defined as a "person who conducts an activity with a GMO".[214] Liability may be held for damage which occurred during an authorized use and/or as a result of this use.[215] However, the SAGMO Act is silent about the applicable standard of civil liability. Strict liability could arguably be adopted as the main applicable standard in South Africa in line with the DRAMLB to promote more diligence when using GMOs.[216] Fault-based liability could apply in South Africa where there is contribution to GMO-related damage through negligence or by premeditation. While the BFBL complies with the term "operator" in accordance with the NSP,[217] the term "user of a GMO" in the SAGMO Act lacks precision. Since different persons may be involved in a GMO-related activity, it may be difficult to interpret who is the user of a GMO in some instances.[218] The SAGMO Act could draw inspiration from the NSP to include the term "operator" for "any person or legal entity who controls a GMO directly or indirectly".[219]

210 See more details on the liability and redress rules set by the NSP. *Lim Tung*, note 45, p69.

211 Burkina Faso acceded to the NSP in 2013 (note 46).

212 *Lim Tung*, note 190, p. 113.

213 Id, p. 114.

214 S 17(2) SAGMO Act.

215 *Lim Tung*, note 190, p. 111.

216 See South African scientific studies reporting irresponsible management (*Van den Berg*, note 29, p. 2; E.g. strict liability could be channelled to the person subject to authorisation. See *Philippe Cullet*, Liability and Redress for Modern Biotechnology, Yearbook of International Environmental Law 15 (2006), pp. 165, 180; Art 19(2) DRAMLB.

217 Art 2(2)(c) NSP; *Lim Tung*, note 190, p. 113.

218 E.g. damage resulting from an unauthorized use of a patented GMO (*Cullet*, note 216, p. 176) or resulting from the theft of a GMO (*Lim Tung*, id, p. 112).

219 *Lim Tung*, id, p. 113; Art 2(2)(c) NSP; Art 19(2) DRAMLB; Arts 2(22) and 74-84 BFBL.

In Burkina Faso, a range of persons[220] involved in GMO-related activities may be the operator and the applicable standard of civil liability can be fault-based[221] or strict liability.[222] Fault-based liability is applicable for the user of a GMO in the case of negligence or lack of precautionary or safety measures prescribed by the developer of the respective GMO.[223] If the user of a GMO[224] has taken all precautionary and safety measures, the developer of this GMO is strictly liable for any damage caused by this particular GMO.[225] Strict liability applies to the developer of the gene or the GMO for damage caused by this gene or GMO.[226] Other persons involved in a GMO-related activity may also be liable.[227]

The NBA is fully responsible when an approved GMO-related activity causes damage whereas the SAGMO Act does not include such provisions for the EC.[228] Joint liability may be applicable in both countries where several persons are involved in a GMO-related activity.[229] Unlike in South Africa, any person, group or private or public organization in Burkina Faso may take legal action and claim compensation for a GMO-related damage in line with the DRAMLB.[230] Under the SAGMO Act, the user of a GMO may be exempted in the case of GMO-related liability but the Burkinabe regime provides more defence options against liability.[231] Inspiration could be drawn from the BFBL to include an act of God or gross misconduct of the injured party or a third party as main exemptions from liability in the SAGMO Act.[232] The requirement of a financial guarantee to operate GMO-related-activities covering civil liability in South Africa as in the Burkinabe regime would arguably promote diligence in the use of GMOs as required by the NSP and the DRAMLB.[233] Burkina Faso's civil liability regime for GMO-related damage is a comprehensive one whereas South Africa provides mainly civil liability rules for such damage without specifying the applicable liability standard.[234]

220 Art 2(22) BFBL.
221 Id arts 74 and 78.
222 Id art 75.
223 Id arts 74 and 78.
224 Any person or legal entity who uses a GMO. Id art 2(29).
225 Id art 74.
226 Id arts 75 and 77.
227 Id arts 78-82.
228 Id art 82.
229 Arts 76 and 86 BFBL; S 17A(4) SAGMO Act; Art 19(3) DRAMLB.
230 Art 85 BFBL.
231 S 17(2) SAGMO Act; Arts 6(1) and (2) NSP; See Burkina Faso's defences. Art 83 BFBL.
232 *Lim Tung*, note 190, p. 122.
233 Art 93 BFBL; Arts 10-12 NSP; Art 8(8) DRAMLB.
234 See arts 72-92 BFBL as opposed to s 17 SAGMO Act.

2. Scope of damage covered

The definition of GMO-related damage in Burkina Faso is more comprehensive than the South African one, comprising damage to biological diversity, to the environment, human health,[235] animal health as well as agricultural production.[236] The BFBL defines damage as an "adverse effect on the conservation and sustainable use of biological diversity, including socio-economic aspects taking into consideration human health risks".[237] It encompasses immediate or delayed adverse effects on human health and animal health due to an unintentional environmental release or transboundary movement of GMOs.[238] More details are provided in Burkina Faso for the definition and evaluation of GMO-related damage in line with the NSP and the DRAMLB unlike South Africa.[239] Drawing inspiration from the Burkinabe regime, the SAGMO Act could also provide for damage caused to agricultural production as well as more details on the evaluation of GMO-related damage. Further, redress measures under the BFBL cover a larger scope than the SAGMO Act.[240] Remedial measures may be taken in view of preventing, minimizing, confining, limiting any damage where necessary.[241]

Unless South Africa adopts a more comprehensive civil liability regime as discussed in this analysis, plaintiffs may find it challenging to seek redress in local courts for GMO-related damage.[242] South Africa should preferably include the contents of the GMO guidelines in the GMO Act or related regulations to have a legally binding effect.[243]

F. Conclusion

While the adoption of GM crops has been moderate in Africa, it is important to regulate GMOs with adequate national biosafety frameworks and the African continent would clearly benefit from the entry into force of the DRAMLB to guide African domestic biosafety rules.[244] This paper compares the South African and Burkinabe GMO regulatory experiences as the two biggest African GM crop producers, highlights their main similarities and differences as well as strengths and weaknesses in light of their international obligations regarding biosafety.

235 Art 89 BFBL.
236 Arts 2(12), 72, 87, 89 and 90 BFBL; S 5(1)(h) SAGMO Act;DRAMLB.
237 Art 2(12) BFBL; S 1 SAGMO Act.
238 Id s 1.
239 Art 2(12) BFBL; Art 2(2)(b) NSP; Art 19 DRAMLB; Ss 1, 5(1)(h) and 5(1)(h) SAGMO Act.
240 Arts 72-73 BFBL; S 17(1A)(a) SAGMO Act.
241 Art 16 BFBL; Art 2(2)(d)(ii)(a) NSP.
242 *Lim Tung*, note 190, p. 124.
243 See the Guideline document for work with GMOs.
244 *Chambers*, note 7, p. 10.

Beyond the conflicts between the US and the EU on GMO regulation and scientific debates about the safety of GMOs, both South Africa and Burkina Faso have known adverse impacts with GM crops (environmental impacts with the insect-resistant GM maize[245] (MON 810) for South Africa and quality issues with the insect-resistant cotton for Burkina Faso). South Africa approved its first GM crops in 1997 before the coming into force of its GMO legislation.[246] The rapid adoption of GM crops in South Africa from 1997 to 2007 and irresponsible management played a role in leaving seed companies and farmers unprepared regarding unintended adverse environmental impacts as noted in local studies.[247] A less stringent screening of GMO-related activities arguably allowed South Africa to become and maintain its leadership in the commercial cultivation of GM crops in Africa.[248] With a slower and stricter introduction of GM crops as well as a more independent risk assessment system in Burkina Faso, the Burkinabe biosafety approach has arguably enabled better screening, risk assessment and monitoring of GMO-related activities. Largely due to its prioritization of modern biotechnology endeavours and trade imperatives, the South African GMO regulatory framework is not fully compliant with its biosafety obligations under the CP and the DRAMLB.[249] Full EIA requirements, a better environmental post-approval monitoring system regarding GM crops and a more comprehensive civil liability regime are necessary in South Africa. Altogether, the main strength of the Burkinabe GMO regulatory framework lies in its compliance with its biosafety obligations under the CP, the NSP and the DRAMLB[250] but its main weakness lies in its lack of GM labelling standards.

Two decades after the introduction of the first GM crop, South Africa approved the latest GM crop (the drought-tolerant GM maize with stacked biotech traits) in Africa despite reports of adverse environmental impacts for its insect-resistant maize.[251] By contrast, Burkina Faso phased out its *Bt* cotton cultivation due to quality issues as from 2016. Whether or not Burkina Faso will engage in the adoption of other GM crops still remains to be seen. The choice to adopt GM crops or not for African countries will doubtlessly be influenced by the biotech industry and African leaders in GM crop production. Insect-resistant cotton being the first GM crop ever introduced in Africa,[252] Burkina Faso's decision to phase out *Bt* cotton could impact negotiations to adopt GM cotton in other francophone African countries with similar concerns over cotton quality. Ghana, Malawi, Swaziland and

245 See EBCP study, note 3, p. 1; *Kruger et al*, note 29; *Van den Berg*, note 29, p. 2.

246 *Iversen et al*, note 9.

247 See EBCP study, note 3, p. 1; *Kruger et al*, note 29; *Van den Berg*, note 29, p. 2.

248 There was nonetheless a restrictive move from 2005 to 2007 on approval of GMO commodity imports, applications of GM sorghum and GM maize for biofuels. See *Falkner and Gupta*, note 18, p. 126.

249 See note 61; South Africa has not signed the NSP.

250 See note 65.

251 See EBCP study, note 3, p. 20; *Kruger et al* note 29; See *Van Rensburg*, note 29, p. 147.

252 *Dowd-Uribe and Schnurr*, note 74, p. 170.

Cameroon seemed set to allow the commercial cultivation of their first GM cotton before Burkina Faso's phase out decision while Nigeria and Ethiopia had similar plans for the next few years.[253] Only time will tell whether other African countries will follow the South African stance on GM crops or the Burkinabe standpoint on phasing out *Bt* cotton.

253 *Swanby*, note 12, p. 3.