Green crimes: the impact of genetically modified organisms on promoting food security in Kenya

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ABSTRACT: Kenya's food insecurity hinders progress towards sustainable development. While the Kenyan Constitution guarantees every person the right to adequate food of acceptable quality, it also prohibits environmental and health endangerment. Whether and how to invest in genetically modified organism (GMO) technology as an alternative food production method is important. In this context, scientists should not be denied the opportunity of harmonising the tension between environmental safety and food security while upholding sustainable development. Scientifically, GMO crops are sustainable, notwithstanding the African Union's rigid social and political setting. However, each state's role in providing sufficient resources and law enforcement personnel is crucial. A GMO regulatory system addresses environmental safety and human health, explicitly adopting the developmental risk notion. Kenya's 2012 cabinet ban on GMO foods derived from the Séralini Report which erroneously claimed that GM maize causes cancer in rodents. The health ministry established a Task Force to review the country's readiness regarding GMO safety and adoption. Despite having been completed in 2014, its Report remains secret. In 2015, the High Court dismissed as premature demands for public participation on whether to unban GMOs. In 2022, President Ruto lifted the ban. Arguably, while permitting GMO experimentation, it is prudent to prescribe criminal sanctions. Beyond anthropocentric notions, green criminology provides a framework to analyse both *illegal* and *legal* environmental harms, and for appraising Kenya's evolving GMO policy. The Constitution provides a right to sustainable use and also establishes enforcement mechanisms to compel cessation and restoration. Yet without punitive consequences, GMO regulations may not deter offenders from environmental contamination.

TITRE ET RÉSUMÉ EN FRANCAIS:

Les crimes verts des organismes génétiquement modifiés et la promotion de la sécurité alimentaire au Kenya

RÉSUMÉ: L'insécurité alimentaire au Kenya entrave les progrès vers le développement durable. Si la Constitution kenyane garantit à toute personne le droit à une alimentation de qualité acceptable, elle interdit également la mise en danger de l'environnement et de la santé. Il est important de savoir dans quelle mesure et comment investir dans la technologie des organismes génétiquement modifiés (OGM) comme méthode alternative de production alimentaire. Dans ce contexte, les scientifiques ne devraient pas se voir refuser la possibilité d'harmoniser la tension entre la sécurité environnementale et la sécurité alimentaire tout en défendant le développement durable. D'un point de vue scientifique, les cultures d'OGM sont durables, malgré le cadre social et politique rigide de l'Union africaine. Cependant, le rôle de chaque État, qui doit fournir des ressources suffisantes et du personnel chargé

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de faire respecter la loi, est crucial. Un système de réglementation des OGM aborde la sécurité environnementale et la santé humaine, en adoptant explicitement la notion de risque de développement. Ceci dit, l'interdiction des aliments OGM par le gouvernement kényan en 2012 découle du rapport Séralini, qui affirmait à tort que le maïs génétiquement modifié provoquait le cancer chez les rongeurs. Le ministère de la santé a créé un groupe de travail chargé de déterminer si le pays était disposé à adopter les OGM. Bien que son mandat soit arrivé à terme en 2014, le rapport du groupe de travail n'a pas été rendu public. En 2015, la Haute cour a rejeté, comme étant prématurées, les demandes de participation publique sur l'opportunité de lever l'interdiction des OGM. En 2022, le président Ruto a levé l'interdiction. On peut soutenir que, tout en autorisant l'expérimentation des OGM, il est prudent de prescrire des sanctions pénales. Au-delà des notions anthropocentriques, la criminologie verte offre un cadre permettant d'analyser les dommages environnementaux légaux et illégaux et d'évaluer l'évolution de la politique kenyane en matière d'OGM. La Constitution prévoit un droit à l'utilisation durable et établit également des mécanismes d'application pour contraindre à la cessation et à la restauration. Pourtant, en l'absence de conséquences punitives, la réglementation sur les OGM risque de ne pas dissuader les contrevenants de contaminer l'environnement.

KEY WORDS: genetically modified organisms, food security, Kenya

CONTENT:

1 INTRODUCTION

1.1 Background

Proponents of the use of restricted technologies in genetically modified organisms (GMO) argue that fewer restrictions are needed because science can develop solutions for GMO harms,[1] and also promote food security to Africa's burgeoning populations.[2] The governments of developing countries reject GMOs for various reasons, including due to foreign ownership of the intellectual property in agricultural products, such as seeds. They claim that if farmers require permits from patent

owners, food sovereignty becomes problematic.[3] Worse still, GMOs pose environmental and health risks.[4] However, risk is a culturally-contingent notion. Africa's inclination to reject agricultural GMOs originally surfaced in 1996 under the Convention on Biodiversity (CBD),[5] during the negotiation of a 'biosafety protocol' to ensure that international trade in GMOs did nothing to compromise the safety of the biological environment.[6] Furthermore, early proposals for criminalisation often reflect anthropocentric notions of what is best. They treat 'nature' as a resource for human exploitation.[7] However, it is necessary to exceed liability under tort law allocated to the GMO manufacturer ('polluter pays'), only if the harm was foreseeable by a reasonable person.[8] Until 2022, Kenya officially banned, but informally permitted, GMO experiments. Consequently, using a responsive green crimes framework, this article critically examines its unbanning.

Kenya's food production falls short of its domestic demand.[9] This food deficit calls for a production system or importation to supplement. Biotechnology has the potential to create more nutritious crops, leading to lower healthcare costs and higher economic performance.[10] Thus for some, frankenfood can save the planet.[11] Biotechnological developments promise to enhance food security and eradicate hunger. Yet detractors propose an immediate moratorium on GM foods until their safety, in all phases, can be properly tested.[12] Prior to a 2012 cabinet ban,[13] Kenya was importing maize from predominantly GM producing countries due to the good quality of the GM maize in terms

1 C Juma & B Sihanya 'Policy options for scientific and technological capacity building' in WV Reid, SA Laird, CA Meyer, R Gámez, A Sittenfeld, DH Janzen, MA Gollin & C Juma (eds) *Biodiversity prospecting: using genetic resources for sustainable development* (1993) 199-221.

2 World Commission on Environment and Development *Report of the World Commission on Environment and Development: our common future* (1987) (Brundtland Commission Report) chapter 2 para 2.

3 V Shiva & R Holla-Bhar 'Piracy by patent: the case of the neem tree' in J Mander & E Goldsmith (eds) *The case against the global economy: and for a turn to the local* (1996) 146-159 at 147.

4 O Owino 'Scientists torn over Kenya's recent GM food ban government cites health concerns as it restricts imports' 3 December 2012 Nature/Sci Dev.Net.

5 UN Convention on Biological Diversity (1992).

6 R Paarlberg *Starved for science: how biotechnology is being kept out of Africa* (2009) 15.

7 R White 'What is to be done about environmental crime?' in BA Arrigo & H Bersot (eds) *The Routledge handbook of international crime and justice studies* (2014) 445-467 at 449.

8 *Overseas Trading (UK) Ltd v Miller Steamship Property Co Ltd (The Wagon Mound no 1)* [1961] AC 388.

9 African Agricultural Technology Foundation *Analysis of effects of ban on importation of GM foods on food security, research and training in Kenya* (2018) 1 https://www.aatf-africa.org/wp-content/uploads/2021/02/gmo-ban-study.pdf (accessed 8 July 2022).

10 C Juma *The new harvest: agricultural innovation in Africa* (2011) 35.

11 J Rauch 'Can frankenfood save the planet?' in LP Pojman & P Pojman *Environmental ethics: readings in theory and application* (2008) 476-483.

12 M-W Ho 'The unholy alliance' in Pojman & Pojman (n 11) 483-492.

of storage compared to maize imported from Tanzania and Uganda.[14] However, a strong anti-biotechnology culture has entrenched itself in African countries, introducing complications with regulation and approval of GM crops that make obtaining commercial licences to grow them difficult.[15] Many of the contemporary environmental harms are related to how the basic means of life of humans is being reconstituted and reorganised through global systems of production.[16] Nonetheless, the reason why GMO foods are pursued so relentlessly is that their introduction and establishment is extremely profitable for powerful corporations.[17] Until green crimes are controlled, these corporations might be working in a legal and political vacuum. Restrictive GMO policies are partly predicated on supposed harmfulness to health and the environment. However, GMO fears are actually attributable to uncertainty of risks of potentially catastrophic harms.[18] GMO detractors, including producers and marketers of organic foods, stand to lose their market shares and profits if alternative cheaper or more nutritious foodstuffs are produced and licensed to compete. To allay fears they espouse, scientific freedom must deepen human knowledge through activities and products that enhance everyone's well-being.

What follows conceptualises a green crimes framework, defines sustainable development, illustrates the tension between environmental safety and food security and sets out the need for green crimes. It deconstructs the tendency for elite interests to promote GMOs/GURTs by ignoring ecological protections. Section 2 shows why reliance on tort liability under civil laws to enforce environmental protection is futile. Rather, administrative regulation and criminal sanctions are imperative. Nonetheless, despite Kenya's law prescribing harsh punishments for GMO harms, they remain unenforced. Section 3 balances competing constitutional rights to life, a clean environment and food. Altogether, section 4 shows increasing political permissiveness towards GMO foods on relaxing Kenya's cabinet ban criminalising GMOs, given its misinformed basis on the Séralini Report. Section 5 makes comparative studies of GMO regulations in some African countries. Section 6 explores viable liability mechanisms for GMO environmental harm to reduce hunger in future. In conclusion, environmental politics determines GMO law enforcement and capacity-building.

13 Citizen TV *Banning of GMOs* video 2012. https://www.youtube.com/watch?v=2qV75NOjsuY (accessed 10 July 2022).

14 AATF (n 9).

15 Juma (n 10) 41.

16 R White *Crimes against nature, environmental criminology and ecological justice* (2008) 158.

17 White (n 16) 160.

18 JLDLC Arzamendi 'Environment protection and manipulation of microorganisms' in CMR Casabona (ed) *Biotechnology, law and bioethics: comparative perspectives* (1999) 299-330 at 300.

1.2 Criminal regulation of green crimes

Crimes are not brute facts, but social constructions of political realities. The 'social construction of environmental crime is dependent on power relations and the social inequality within society'.[19] According to White:

> Green criminology refers to the study by criminologists of environmental harms (that may incorporate wider definitions of crime than provided in strictly legal definitions), environmental laws (including enforcement prosecution and sentencing practices) and environmental regulation (systems of civil and criminal law that are designed to manage, protect and preserve specified environments and species, to manage the negative consequences of particular industrial processes).[20]

Green crimes are not given sufficient attention. Yet, environmental crimes are aggravated by their costs for future generations and the disastrous impact on the environment.[21] White says that 'harmful activities, such as the (over-) exploitation of natural resources, were and still are not criminalized and are therefore often ignored by criminologists'.[22] Notably, this meagre attention resonates with the fact that criminal law is mostly applicable to offenders from a socio-economically poor background 'instead of powerful and large corporations'.[23] Yet, green crimes are perpetrated by powerful actors in organisations which are neither subjected to fines nor warnings.[24]

Green crimes are a composure of a number of aspects: the political, social and economic interests and they almost always conflict with state, private and environmental interests. Consequently, the need for green crimes calls for harmonisation to recognise and appreciate that humans should not be perceived as the only central actors in a complex ecosystem, but the environment may be victimised in a similar way.[25] Thus 'green criminology takes the principle of harm ... not only to transgressions against humans, but also against the environment and non-human species'.[26] Although, such 'harmful activities are not limited to anthropocentric harm approaches but also include ecocentric and biocentric harms',[27] this article focuses on debunking alleged harms GMO foods pose to human health.

Criminalisation of GMOs through fines or imprisonment deters their production, importation and possession. That was the effect of the

19 DP van Uhm 'A green criminological perspective on environmental crime: the anthropocentric, ecocentric and biocentric impact of defaunation' in JLDL Cuesta, L Quackelbeen, N Persak & G Vermeulen (eds) *Protection of the environment through criminal law* (2018) 323-340 at 327.

20 White (n 16) cited in White (n 7) 446.

21 DP van Uhm & D Siegel 'Green criminology and organised crime' (2019) *Researchgate* 729-752 at 731. https://www.researchgate.net/publication/339145864_Green_Criminology_and_Organized_Crime (accessed 11 July 2022).

22 As above.

23 Van Uhm & Siegel (n 21) 732.

24 As above.

25 Van Uhm & Siegel (n 22) 735.

26 Van Uhm (n 19).

27 Van Uhm (n 19) 335.

Kenya cabinet's 2012 ban on GMOs. Arguably, the ban reflected the power relations among competing interests groups. Despite aiming to transform into a newly industrialising economy by 2030, independent Kenya remains an agrarian society with the bulk of Gross Domestic Product accruing from exporting tea, coffee, horticulture and other cash crops.[28] Maize is the staple diet. Given that GMO medicines are acceptable, it follows that the entry of GMO foods onto Kenya's market is not inherently wrongful. Neither does scientific evidence support suggestions that GMO foods are harmful. On the contrary, numerous Western countries produce and consume GMO foods without noticeable or recorded harms. This paper therefore argues that maintaining the ban without scientific justification operated to the detriment of the biotech community whose livelihoods suffered on account of being deprived of opportunities to produce GMO foods. Because 'coercion and corruption are generally unfettered by stable institutional controls',[29] developing countries cannot afford to enforce compliance with environmental laws. Thus, poor countries instead facilitate the corporate business climate.

1.3 Sustainable development

There is a need to satisfy society's current nutrition needs with respect to the need to protect future generations. Developing countries face a dilemma of whether to be extremely precautionary and fail to comply with global standards of competitive trade or to regulate GM production reasonably to secure its benefits for current and future survival. Because people need to assert the importance of living within ecological limits, but still want to include the idea of progress, the sustainable development concept arose.[30] It is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.[31] GM production poses the risk of terminating wild crops or natural biodiversity and as such, in any release, states must be cautious of the environment.

Kenyans have been victims of perennial food shortages since colonial underdevelopment.[32] Solutions range from avoiding overreliance on maize as a staple food to encouraging other foods. GM food now emerges as a possible solution to food insecurity. Although lifting Kenya's ban on GMO or GURT presents a major economic, social

28 S Moyo 'Transformation in Africa and its decolonisation' in F Cheru & R Modi (eds) *Agricultural development and food security in Africa: the impact of Chinese, Indian and Brazilian investments* (2013) 38-56 at 41, 50; J Chege, D Ngui and P Kimuyu 'Scoping paper on Kenyan manufacturing' (UNU-WIDER 2014) 6. https://www.wider.unu.edu/sites/default/files/wp2014-136.pdf.

29 White (n 7) 454.

30 M Redclift 'Sustainable development: needs, values, rights' (1993) 2(1) *Environmental Values* 3-20.

31 Rio Declaration on Environment and Development (1992) principle 1.

32 Moyo (n 28) 39; see also NTV Kenya 'Are GMO crops the solution to ending food scarcity?' video 2018. https://www.youtube.com/watch?v=ncm0RvRmG2k (accessed 11 July 2022).

and environmental opportunity for innovation and food security,[33] developmental activities which in the past governed the race toward just economic superiority,[34] are now focusing on rationalisation.[35] They attempt to explain or justify the use of natural resources and hunger eradication. Nonetheless, development is sustainable in a physical sense if it can be pursued even in a rigid social and political setting.[36] However physical sustainability[37] cannot be secured unless state development policies pay attention to growing concerns, such as changes in access to food and in the distribution of costs and benefits.[38] Therefore, the environmental, cultural, social and economic considerations that contribute to the planning and implementation of development decisions, such as the GMO question, should not be left to market forces. It is the government's responsibility to control the environment by legislative reform and the implementation of national strategic plans for sustainable development and therefore abide by the principle of public environmental order.

The effectiveness of the liberal democratic state rests partly 'upon maintaining an illusion of neutrality, impartiality and plurality,' and sustaining this through *inter alia* implementation of human rights, including environmental protection.[39] However, where this illusion collapses, the result is dictatorship and more blatant self-serving activity on the part of the state and corporate elite. In this regard, irresponsible advancement of GMOs/GURTs harms the environment, privileges sectional class interests and the interests of state elites above universal human interests (such as for an ecological sustainable environment).[40] The World Commission on Environment and Development[41] thus posited the legality of sustainable development at the 1992 Rio de Janeiro UN Conference. Ultimately:

33 Juma & Sihanya (n 1) 200.

34 M Eid 'The ethical reasoning behind sustainable development: a paradoxical opportunity for the reform of developing countries' (2012) 4(2) *Sustainable Development Law Journal* 236-245.

35 United Nations Report on Millennium Development Goals (2015); United Nations, Sustainable Development Goals (2015).

36 J Cameron 'The history and contemporary significance of the precautionary principle' in T O'Riordan & J Cameron *Interpreting the precautionary principle* (1994) 17-18.

37 J Pezzey *Sustainability: an interdisciplinary guide* (1992) 5.

38 United Nations, Report Development and Environment (1971); United Nations, Declaration on the Human Environment (1972); United Nations, Declaration on Environment and Development (1974); United Nations, International Conference on Population and Development (1994); World Summit on Social Development (1995).

39 White (n 7) 450.

40 White (n 7) 449.

41 United Nations Conference on Environment and Development (Earth Summit) at Rio de Janeiro Brazil from 3-14 June 1992. https://www.un.org/en/conferences/environment/rio1992 (accessed 14 October 2022).

> [S]ustainable development is thus not merely a principle of modern international law. It is one of the most ancient of ideas in human heritage. Fortified by the rich insights that can be gained from millennia of human experience, it has an important part to play in the service of international law.[42]

This study explores the tension between food security and health and environmental safety in Kenya. It supports the lifting of the GMO ban. The cabinet ban did not deter any real environmental or health threat. The article's objective is to evaluate Kenya's GMO legislative and policy framework and practices in order to understand whether there may exist more responsive regulation to risks posed by GMO foods. Previously, despite embracing formal environmental protections in international instruments, constitutional principles, statutory provisions and regulations, Kenya nonetheless informally relaxed its 2012 cabinet ban. Was the ban on GMOs empirically justified or politically expedient? Despite Africa's near 'uniform attitude' based on social and political rigidity embedded in the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, and the precautionary principle in our national laws, is it possible for countries to independently create GMO production favourable laws to curb food shortages?

2 GREEN CRIMINOLOGY

2.1 Two models of state intervention

Traditional sentencing options for environmental crimes comprise fines or imprisonment. Their penal purposes were retribution and deterrence, respectively. However, without injunctions and *restitutio in integrum,* environmental protection is not achievable.[43] Hence the need to supplement punishment with civil law remedies aimed at ensuring prevention and restoration. Administrative regulations impose disclosure requirements on manufacturers which require them to incur expenses to prevent pollution by taking precautions (precautionary principle) and internalising the costs of their actions (polluter pays principle).

'These harms include a range of (criminal) activities such as forms of pollution (air, water and soil), deforestation (legal and illegal logging), species decline (poaching and overexploitation) and the abuse of animals (vivisection and intensive livestock farming)'.[44] Further specific types of harm as prescribed in law include illegal transport and dumping of toxic waste, the transportation of hazardous materials and the illegal trade in plants and animals.[45] Thus green criminology extends the harm principle not only to transgressions against humans,

42 *Gabčíkovo-Nagymaros Project (Hungary/Slovakia)* [1997] ICJ Reports 7 (separate opinion of Vice-President Weeramantry) 88.

43 M Faure 'Limits and challenges of criminal justice systems in addressing environmental crime' in Cuesta and others (n 19) 11-36 at 23.

44 Van Uhm (n 19).

45 White (n 16).

but also to transgressions against the environment and non-human species.[46] Significantly, such harmful activities include ecocentric and biocentric harms and are not limited to anthropocentric harm approaches.[47]

Ayres and Braithwaite illustrated the advantages of using a regulatory pyramid of escalating sanctions commencing with administrative responses at the base, civil remedies midway, and criminalisation being reserved for the apex.[48] Accordingly the neo-liberalism tendency has been toward 'softer regulatory' approaches.[49] These approaches range from Environmental Impact Assessments (EIAs) and Environmental Management Systems (EMSs) to voluntary adoption of good environmental practices. Two outstanding models exist for environmental regulation. First, Ayres and Braithwaite's 'self-enforced regulation' is based on a pyramid of escalating responses, where the base emphasises persuasion rising to a peak of harsh punishments. For business transgressions, the sanctions rise as follows: 'persuasion, warning letter, a civil penalty, a criminal penalty, licence suspension, and licence revocation'. Second, to 'produce more efficient and effective policy outcomes', Gunningham and Grabosky's 'smart regulation' recruits 'a range of regulatory actors to implement complementary combinations of policy instruments tailored to specific environmental goals and circumstances'.[50]

Faure recalls that 'environmental crime was captured in environmental laws that had a primarily administrative character'[51] when environmental laws emerged in the 1970s. On breaching permit conditions, an operator would be subject to criminal sanctions. However, preferring green crimes, White complains that '[t]he continuing degradation of the enforcement today is linked to the dominant regulation and framework itself, one that puts stress on self-regulation rather than de-regulation'. He criticises the state's reluctance to impose directive legislation and active enforcement and prosecution, and its preference for education, promotion and self-regulation.[52] Instead of 'persistent and continuous inspections, accompanied by substantive operational powers (including criminal sanctions)' that 'can lead to rapid positive changes in polluting practices' governments 'shed regulatory functions and responsibilities to rely on rhetoric and savings afforded by self-regulation'.[53] Rarely do enforcement and compliance activities attract extensive government

46 Van Uhm (n 19).

47 As above 335.

48 I Ayres & J Braithwaite *Responsive regulation: transcending the deregulation debate* (1992); see also K Ligeti & A Marletta 'Smart enforcement strategies to counter environmental crime in the EU' in Cuesta and others (n 19) 113-149 at 133.

49 As above.

50 N Gunningham & P Grabosky *Smart regulation: designing environmental policy* (1998) cited in White (n 7).

51 Faure (n 43) 12.

52 White (n 16).

53 As above 453.

money, resources and personnel. Rather support is usually provided in the service of large corporations, as a form of state welfare designed to facilitate and enhance the business climate and specific corporate interests. Arguably, the fiscal crisis of the state at the onset of global economic depression 'also brings with it a crisis in the regulatory sector'.[54] Since 'the gravest attacks on determined legal assets – such as environmental – result from business activities and not strictly individual behaviour',[55] and because corporate criminalisation is inherently problematic, environmental protection agencies can be expected 'to struggle with inadequate monies and demoralized officers as departmental belts tighten and priorities are placed elsewhere'.[56]

2.2 The Cartagena Protocol on Biosafety and the precautionary principle

The 2000 Cartagena Protocol on Biodiversity (CPB) superseded the CBD as the desirable approach to environmental regulation. Prioritising the precautionary principle, it urges member states to enact environmental crimes. The precautionary principle was received in Africa to the detriment of GMO foods. Under various regulatory statutes, GMO offences have prevented GMO technology from taking root in the quest for food security. In Kenya, the Biosafety Act of 2009[57] expresses the Cartagena requirements. The precautionary principle aims to safeguard current and future generations in relation to sustainable development. Furthermore, anthropocentricity theory holds that human beings are the epicentre of the world and human interests with regard to sustainable development, are at the centre. Green victimology borrows anthropocentricity notions in that, instead of understanding ecosystems, environment or animals as victims, interpretations depict humans as victims.[58] The Rio Declaration provides that the

> [p]recautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.[59]

To buttress this, the CBD[60] states that 'where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such threat'. Instead, the CPB provides that parties are not restricted to take any action that is more protective of the

54 As above 454.
55 ALL Sá 'Criminal liability of corporate entities in Brazilian law' in Cuesta and others (n 19) 301-320 at 306.
56 White (n 16) 454.
57 Biosafety Act No 2 of 2009 Revised Edition 2018 [2009].
58 Van Uhm & Siegel (n 21) 732.
59 Rio Declaration (n 31) principle 15.
60 CBD (n 5) preamble.

conservation and sustainable use of biological diversity.[61] It 'empowers governments to restrict the release of products into the environment or their consumption even if there is no scientific evidence that they are harmful'.[62] Effectively, the CPD's precaution prioritises the 'need to protect human health and the environment from the possible adverse effects of the products of modern biotechnology'.[63] Nevertheless, the CBD acknowledges that biotechnology has potential to address many environmental and developmental problems, including enhancing food security.[64] Most African countries applying the precautionary principle aim at protecting the 'rights of local communities, farmers and breeders and for the regulation of access to biological resources, and the African Model Law on safety of biotechnology'.[65] This application of the precautionary principle however attracts criticism. It lacks the harmonisation created under article 21 of the CBD. Thus '[s]ome authors argued that this justification is based upon selective application of the principle ignoring the enormous benefits associated with GM technology'.[66]

The precautionary principle demonstrates a problem that lies in its application, rather than the principle itself. Because '[c]itizen dislike for GM foods is stronger in Europe than in the United States',[67] a conservative interpretation has led EU countries to GM restrictions. Consequently '[t]he precautionary principle has been generally integrated into the regulatory and legal frameworks of the EU, but has been less popular in the US. Internationally, the concept is being contested and has 'become a chess piece in the struggles over genetically modified foods, for example'.[68] 'The success or failure of efforts to implement the principle will depend upon the manner and extent to which scientific uncertainty is considered in the decision-making process, not the measures that are ultimately adopted'. Clearly, there is no 'one size fits all' expression of precaution that suits every instance.[69] Ecuru terms an uninformed application as an 'extreme interpretation of the precautionary principle'.[70]

61 Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000) art 2.

62 Juma (n 10) 39.

63 CPB (n 61) 1.

64 CBD (n 5) art 21.

65 N Muzhinji & V Ntuli 'Genetically modified organisms and food security in Southern Africa: conundrum and discourse' (2020) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7553747/ (accessed 13 July 2022).

66 As above.

67 Paarlberg (n 7) 24.

68 White (n 16) 65.

69 As above 67.

70 J Ecuru *A pathway for biosafety regulation of GMOs in Sub-Saharan Africa* (2018) https://www.cambridge.org/core.terms (accessed 10 July 2022) 290.

2.3 Capacity constraints for Africa biotech

To Rodgers, if the regulatory requirements have not been met, then civil law may have a role to play.[71] For example, where the authorisation was itself obtained without providing full information about the GMO in question, or where the farmer ignores the terms of the land management protocols when managing the GMO crop. By linking recovery of natural resource damage exclusively to legally protected habitats, the European Environmental Liability Directive has a narrower approach than the CBD which defines biodiversity in much broader terms.[72] The European Commission rejected a wide approach because the adoption of the variability concept in living organisms as a qualification to defining biodiversity damage would raise difficult questions of how damage would be quantified, and what would be the threshold of damage entailing liability. Similarly, the CPB regulates trade in living GMOs, including a mechanism for the development of a liability maxim.[73] Its design restores damaged natural resources, and resource services, rather than assessing the monetary value of the damage to the resource.

'The global picture with respect to agbiotech is trending toward one of adoption rather than rejection of the technology'.[74] However, on one hand, despite facing serious food insecurity, Africa 'continues to exhibit a cautious rhetoric that follows that of its major historical trade partner, the EU'.[75] On the other hand, 'developing trade and investment opportunities with major new adopters (such as Brazil, China and India) as well as the potential for inter-African trade in GM food and feed crops may affect this dynamic in the future and may catalyse much-needed regulatory harmonisation, but for the moment, attitudes in the EU appear to be the prevailing influence'.[76] The EU's restrictive GM approach seems to influence Africa's policy. This lack of independence was identified by the AU/NEPAD High-Level Panel on Biotechnology as follows: 'Africa needs to develop its own scientific capacity to assess biotechnology related risks through national, regional and continental institutions so that all biotechnology policy is informed by the best available research and knowledge.'[77]

Comprehensively, lack of technical capacity and political will, contradictory attitudes, weak framework of regulatory bodies, weak and inefficient regulatory frameworks, trade concerns, and public

71 CP Rodgers 'Agenda 2000, land use, and the environment: towards a theory of "environmental" property rights?' in J Holder & C Harrison (eds) *Law and geography* (2003) 239-258.

72 CBD (n 5) article 2.

73 As above article 27.

74 JA Chambers, P Zambrano, J Falck-Zepeda, G Gruère, D Sengupta & K Hokanson *GM Agricultural technologies for Africa:a state of affairs* (2014) 6. https://www.researchgate.net/publication/264008147_GM_Agricultural_Technologies_for_Africa_A_State_of_Affairs (accessed 10 July 2022).

75 As above.

76 As above; see generally Cheru & Modi (n 28).

77 As above 38.

misinformation or misperception are presenting a number of challenges that African countries have not been able to overcome.[78]

With an operational biosafety legal framework, and major progress in research, Kenya should be in a better position to compete globally. Kameri-Mbote opines that for Kenya, developing products and eventually placing them on markets is 'a logical investment in light of the fact that its viability as an agricultural country is threatened by limited arable land, increasing population and reduced production owing to unfavourable climatic conditions and pests and diseases'.[79]

Through the CPB's precautionary principle, Africa is ultra-cautious on GMOs. Yet GM foods pioneered into commercial agriculture in the mid-1990s. Since then, they have been planted in all continents except Antarctica.[80] Significantly, '[t]o date, there has been no scientifically documented evidence of human or environmental harm'.[81] In fact, '[a] large number of national and international scientific organisations around the world have attested to the safety of GM technologies'.[82]

Despite all these vindications of biotechnology and specifically GM, Africa applies the stringent precautionary principle. Yet 'there is no compelling evidence of harm from the consumption of approved foods and food products manufactured from biotechnology processes'.[83] The precautionary principle should be invoked in instances where there is uncertainty of harm. Instead, post-2012 permissions in Kenya applied *ad hoc* discretions. Executive orders can be draconian.

3 CONSTITUTIONAL AND POLICY FRAMEWORK FOR ENVIRONMENTAL PROTECTION AGAINST GMOS

Kenya's 2010 Constitution recognises the citizens' self-determination and requires public participation in all policy making and legislation. Moreover, responses to environmental harms must look beyond civil liability. Administrative regulation is necessary where liability cannot be attributed to any single tortfeasor. This is because, sometimes, there are circumstances where the incubation period for a tort (civil wrong) may be up to 20 years. For example, with GMOs the interim harm may not be measurable, hence monetary compensation becomes

78 As above 6.

79 P Kameri-Mbote *Regulation of GMO crops and foods: Kenya case study* (2012) 42. https://bch.cbd.int/en/database/103326 (accessed 10 July 2022).

80 Chambers and others (n 74) 36-37.

81 As above 37.

82 As above.

83 As above 38; see also C Juma & I Serageldin *Freedom to innovate: biotechnology in Africa's development: a report of the high-level African panel on modern biotechnology* (2007) 115. https://www.researchgate.net/publication/268685034_Freedom_to_Innovate_Biotechnology_in_Africa's_Development_Report_of_the_High-Level_African_Panel_on_Modern_Biotechnology (accessed 13 July 2022).

problematic. That is why rather than a liability rule based on the (*ex post*) polluter pays principle, administrators should impose the (*ex ante*) precautionary principle. Yet, ultra-cautious regulations are retrogressive and must be underpinned with criminal sanctions.

3.1 Kenya's 2010 Constitution

Prior to Kenya's 2010 Constitution, the country had accepted environmentally-sound technology limiting genetic engineering, from the global UN conferences embracing the human environment. The Constitution domesticates the general principles of international law and confirms that any law, including customary law, that is inconsistent with the Constitution, and any act or omission in contravention of the Constitution are void and invalid, respectively. As the *grundnorm*, the Republic's supreme law binds all state organs at both levels of government.[84]

The Bill of Rights simultaneously enshrines every person's rights to life,[85] and to a clean and healthy environment.[86] In reference to sustainable development, these two articles (life and environment) should be read in tandem. Additionally, the developmental goal introduces the food dimension. This is because our national values and principles of governance specifically include *sustainable* development.[87] Not only does every person have the right 'to be free from hunger, and to have adequate *food* of acceptable quality',[88] but also 'sustainability should be maintained in the exploitation, utilization, management and conservation of the environment and natural resources'.[89]

To balance these three rights to life, a clean environment, and food, the Constitution constrains state authorities when dealing with public finance to adhere to openness and accountability by embracing public participation.[90] Ultimately, the burdens and benefits of the use of resources and public borrowing shall be shared equitably between present and future generations. Even national security is now guided by equitability, a tenet of sustainable development.[91] Although a second opinion was sought on the Cabinet policy initially banning GMOs, the ban remained in place for a decade. As noted below, a Task Force's Report was completed in 2014.

84 The Constitution of Kenya (2010) art 2(1).

85 As above art 26.

86 As above art 42.

87 As above art 10(2)(d).

88 As above art 43(1)(c).

89 As above art 69.

90 As above art 201.

91 CO Okidi 'Concept, function and structure of environmental law in environmental governance in Kenya' in CO Okidi, P Kameri-Mbote & M Akech (eds) *Environmental governance in Kenya: implementing the framework law* (2008) 1-6 at 3.

To achieve sustainable development, Kenya's Constitution[92] solidifies the precautionary approach strengthening the right to a clean and healthy environment.[93] As a result, a GMO regulatory system has emerged to address safety for the environment and human health in the context of GMOs and explicitly adopts the notion of developmental risk.[94] It advocates for a duty of care, or onus of proof on those who propose changes or introduce a new technology. This includes a proposed policy on biotechnology and biosafety, regulations and guidelines for hands-on work on GMOs. Kenya's Biosafety Act and regulations promulgate risk assessment and management procedures, mechanisms for monitoring and inspection and a system to provide information to stakeholders about the national biosafety framework and for public participation.[95] Nevertheless, 'Kenya has been carrying out trials on biotech maize and cotton engineered to deter pests in a bid to use less pesticides and fertilisers. Kenyan scientists are also conducting field trials with cassava, which is engineered to resist viruses that shrivel and rot the crop'.[96] None are ready for commercialisation.

3.2 Smart administrative regulation

Constitutionally, all persons, whether individuals or corporations, have a right to acquire and own intellectual property, and the state must recognise the role of science in national development.[97] Moreover, the potential of GMO foods to satisfy every person's right to adequate food of acceptable quality is clear and noble. Nonetheless, the right to a clean and healthy environment legitimately constrains manufacturers from pursuing profits at the expense of the public interest in environmental stewardship. However, under criminal law principles of legality, there is no crime without a law and no punishment without a law. Hence 'the state shall not deprive a person of property of any description, or of any interest in, or right over, property of any description' unless doing so is for a public purpose and on prompt payment of compensation as determined by a court.[98] Moreover such compulsory acquisition laws should be enacted by competent institutions[99] and legitimised through public participation and sustainable development[100] and not by cabinet bans. Finally, Kenyan citizens, including scientists and the

92 Constitution (n 84) arts 69(e) & (g).

93 As above art 42.

94 BJ Preston 'The role of the judiciary in promoting sustainable development: the experience of Asia and the Pacific' (10-13 January 2006) A paper presented to the Kenya national judicial colloquium on environmental law, Mombasa, Kenya 40.

95 Constitution (n 84) arts 10(2)(a) & 118(1).

96 S Kedem 'GM foods: the battle for Africa' *African Business* 20 November 2019. https://african.business/2019/11/economy/gm-foods-the-battle-for-africa/ (accessed 23 July 2022).

97 Constitution (n 84) arts 40(5) & 11(2)(c).

98 As above arts 40(3) (b)(i) & (ii).

99 *Nullum juridicum sine lege*.

100 Constitution (n 84) art 10(2)(a) & (d).

biotech community, have a right to life and by extension to livelihood.[101] The cabinet ban constrained them from using their scientific creativity and industry to experiment with GMO technology. It was not subjected to public participation and that hindered sustainable development. In absence of demonstrable environmental and health harms, it served no public purpose. Conversely, it contravened their right to livelihood. To this extent, Kenya's 2012 cabinet ban on GMOs seemed unjustifiable. Yet its unbanning attracts judicial review to determine its constitutionality.

The Environmental and Land Court is established to adjudicate environmental harm matters. It is empowered to make cessation, prevention and compensatory orders.[102] The Environment and Management Coordination Act 1999 is the framework for environmental protection. It requires EIAs on testing of GMOs[103] and creates the National Environmental Management Authority (NEMA), charged with supervising all matters relating to environmental harm. These institutions are a worthy investment in protecting human health and environment welfare as well as interconnecting biotechnology and sustainable development. The legal framework should harness relevant institutions.

4 CABINET POLICIES, STATUTORY PROVISIONS AND JUDICIAL DECISIONS

4.1 The Séralini Report and the GMO Task Force Report

Until November 2012, Kenya was importing GM food and feed. Then the infamous Séralini Report was released.[104] The genesis of the 2012 GMO cabinet ban emanated from research by a team of French scientists led by Professor Gilles-Eric Séralini in September 2012 published in *Food and Chemical Toxicology*.[105] The research analysed a two-year study of rodents on herbicide (Roundup) and Roundup-tolerant GM maize (Roundup Ready).[106] The scientists found tumours

101 As above art 26(1).

102 As above art 162(2); see also section 4 of the Environment and Land Court Act No 19 of 2011 [revised 2012].

103 Open Forum on Agriculture Biotechnology in Africa 'Regulating genetically modified organisms (GMOs) in Kenya' https://africenter.isaaa.org/wp-content/uploads/2020/10/Overlap-between-EMCA-Act-and-Biosafety-Act.pdf (accessed 20 October 2022) 2.

104 Citizen (n 13).

105 AATF (n 9) 9 citing G-E Séralini and others 'Long term toxicity of a roundup herbicide and a roundup-tolerant genetically modified maize' (Nov 2012) 50, 11 *Food Chem Toxicol* 4221-31.

106 As above.

on the rodents caused by genetic modification and glyphosate in the herbicide.[107] The Séralini Report[108] influenced and prompted the Kenyan ban by the then Public Health and Sanitation Minister Beth Mugo. The Report was later retracted in another journal. However, it had already impacted on the trajectory Kenya has taken for the past decade regarding GMOs. The government, in October 2013, subsequently appointed a Task Force chaired by Professor Kihumbu Thairu to advise on GMO.[109] Its work was a prerequisite for possibly lifting the ban. The size and scope of its sample respondents are unknown. That Task Force recommended *inter alia*: adoption of requisite guidelines for testing of GMOs for safety in regard to human health,[110] development and strengthening of the regulatory framework for production, monitoring and marketing of GMOs in the country.[111] However, the Task Force merely elicited superficial debate about whether the ban on GMOs should remain. Following the cabinet decision, the ban on importation of GM crops was initially enforced.[112]

Substantively, 'the ban was not informed by any evidence from competent authorities, including the National Council of Science and Technology, which is mandated to advise the government on research and policy issues'.[113] Procedurally, the ban was not published in the Kenya Gazette as required.[114] Neither was the Biosafety Act invoked in making the decision to ban GMOs. Yet section 51 provides that '[t]he minister may in consultation with the authority, make regulations for the better carrying into effect the provisions of this Act, and in particular for prescribing (a) anything required by this Act to be prescribed; (b) procedure for conducting contained use activities involving genetically modified organisms'.[115]

The cabinet ban was meant to run until the country is able to certify that GMOs have no negative impact on people's health.[116] However, despite the government being pushed to lift the ban no certification has been done to date. Adding insult to injury, the Séralini Report was discredited by the EU, the AU and also the *Food and Chemical Toxicology* journal, on the basis that it lacked sufficient substance that would merit a total ban on GMOs. Séralini's conclusion that rats fed on GMO products developed cancerous tumors attracted criticism.

107 As above.

108 As above citing Séralini and others (2007).

109 As above through Gazette Notice No 13607.

110 As above the Taskforce Recommendations dated 15 November 2013 para 10.5.

111 As above paras 1-5.

112 M Mwaniki 'Experts petition GMO task force boss to quit' *Daily Nation* 2 May 2014 https://nation.africa/kenya/news/experts-petition-gmo-task-force-boss-to-quit-979356 (accessed 26 July 2022).

113 S Macmilan, 'Kenya ban on the import of gm food illegal, not backed by law–Romano Kiome' Blog *ILRI CLIPPINGS* 2013, https://clippings.ilri.org/2013/05/17/kenya-ban-on-the-import-of-gm-food-illegal-not-backed-by-law-romano-kiome/ (accessed 7 July 2022).

114 As above.

115 Biosafety Act (n 57) sec 51.

116 AATF (n 9) 10.

Apparently, his sample size was too small to definitively prove a link between GM foods and cancer, because the Sprague-Dawley rat they used was already cancer-prone. The Report was instantly falsified by formidable criticism. On 24 September 2012, the French government instructed the High Council for Biotechnology (HCB) to provide an opinion on Séralini's Report. HCB found the study failed to establish a nexus between GM foods and the tumours observed in the rats.[117] On 28 November 2013, it was retracted from Elsevier journal following some investigations on the findings by Séralini's team.[118] These investigations found that the Séralini Report was based on tainted data and inaccurate interpretations.[119] These series of events culminated in the Report being republished in May 2014.[120] Notably, in the republication, the journal released a caveat warning that the Report's republication was for purposes of retaining useful discussions from the paper and not to disseminate its contents at all.[121] Unsurprisingly, in 2015, Séralini conceded without duress.[122] In the *PLOS ONE* journal, he says that the tumours observed in the rodents were caused by environmental contaminants in the feeds used, and not from GMOs.[123] Despite this finding by the same scholar and similar findings by other experts, Kenya did not lift the GMO ban. Yet the ban affected food prices, undermined the fragile food security in Kenya, barred local developments of GM crops, and affected the efforts of research.[124] Nevertheless, the government has been permitting tests on certain crops. For example, in 2016, global agricultural producer Monsanto applied to conduct restricted national performance on GM *Bt* (*Bacillus thuringiensis*) or transgenic cotton.[125]

4.2 The Biosafety Act

Even though Kenya was the first country to sign the CPB in 2000, generally we have not enjoyed biotechnology's considerable benefits. In February 2009, the country enacted the Biosafety Act which provides

117 As above 10.

118 As above citing Séralini and others 'Retraction notice to: long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize' (January 2014) 63, *Food and Chemical Toxicology* 244.

119 As above.

120 As above citing Séralini and others 'Republished study: long-term toxicity of a roundup herbicide and a roundup-tolerant genetically modified maize' (2014) 26, 14 *Environmental Sciences Europe* https://doi.org/10.1186/s12302-014-0014-5.

121 As above.

122 NTV Kenya (n 32).

123 AATF (n 9) 10 citing R Mesnage, N Defarge, L-M Rocque, JS de Vendômois, G-E Séralini, 'Laboratory rodent diets contain toxic levels of environmental contaminants: implications for regulatory tests' (2015) 10, 7, *PLoS ONE* https://doi.org/10.1371/journal.pone.0128429.

124 As above 23.

125 F Sunday 'Kenya to introduce GMO cassava' *Standard media* 18 May 2020. https://www.standardmedia.co.ke/business/news/article/2001371738/kenya-to-introduce-gmo-cassava (accessed 7 July 2022).

for supervision of GMO research and commercialisation activities[126] and established the National Biosafety Authority (NBA) in 2010. In 2011, regulations on the contained use, environmental release, import/export, and transit of agbiotech products were published. This Authority under section 7 of the Act, is tasked with general supervision and control over transfer, handling and use of GMOs.[127] Its two main objectives are couched as: safety of human and animal health and provision of an adequate protection of the environment.[128] Additionally, the Authority is mandated to 'advise the government on legislative and other measures relating to the safe transfer, handling and use of genetically modified organisms'.[129] It is expected to work closely with other regulatory agencies[130] like the NEMA, Kenya Plant Health Inspectorate Service, and Department of Public Health. Without the Authority's written approval, a person shall neither import a GMO into Kenya nor expose them to the environment.[131] Within this legal framework, Kenya's biotech was moving towards a progressive direction. In July 2011, GM maize was approved for importation to mitigate the dire food insecurity.[132] Institutionally, Kenya is abreast with the opening of biotechnology and biosafety facilities like the Kenya Agricultural Research Institute (KARI) and BecA-LRI biosciences hub. As stated earlier, the 2010 Constitution provides for competing rights: the right to clean environment and right to food. However, the former right seems to be informing decisions regarding food security in relation to GM predicated on the value of sustainability. Despite these legal and technological advances, in November 2012 a ban on imports of GM commodities was imposed, which created uncertainty among different stakeholders. Curiously, the ban has not been formally gazetted.[133] In Kenya, like many common law countries, liability is apportioned on the basis of tort law. The strict liability creature of the law has been prohibitive in nurturing Agbiotech innovations and research and a search for green crimes could be of assistance. Apart from restoring the environmental harm one has caused, there is no other consequence for unauthorised dealings in GMOs.

In June 2021, the *Business Daily* reported that 'Kenya has approved the release of genetically modified cassava for open cultivation, paving the way for commercialisation after five years of research'.[134] Consequently '[c]assava now becomes the first food crop

126 OFAB (n 103).

127 Biosafety Act (n 57) section 7.

128 As above sections 7(1)(a) & (b).

129 As above sec 7(2)(e).

130 As above sec 38.

131 As above secs 19 and 20.

132 Chambers (n 74) 79.

133 As above.

134 G Andae 'Kenya approves GMO cassava for farming after years of research' *Business Daily* 24 June 2021. https://www.businessdailyafrica.com/bd/news/kenya-approves-gmo-cassava-for-farming-after-years-of-research-3448024 (accessed 21 June 2022).

to be approved for field cultivation'.[135] Under the Biosafety Act,[136] the NBA has approved 'open field farming after years of confined trials'. Apparently, the NBA Board ignored the 2012 cabinet ban on GMOs, as the government turns to technology to address food insecurity. Alliance for Science hailed cassava for becoming 'Africa's fifth biotech crop approved for open cultivation after cotton, maize, soybean and cowpea' describing this breakthrough as 'another big win for its smallholder farmers'.[137] Its resistance to the destructive cassava brown streak disease was approved 'following a comprehensive safety assessment that showed cassava varieties containing event 4046 are unlikely to pose any risk to human and animal health or to the environment when consumed as food or feed or when cultivated in open fields'. Yet in 2006, the African Union resolved that GMOs were unwelcome on the continent.[138] On 8 November 2012, following a Kenya cabinet decision, the NBA banned their use.[139] Apparently, GMO cultivation became selectively permissible, until 3 October 2022 when the ban was lifted by President Ruto '[i]n accordance with the recommendation of the Task Force to Review Matters Relating to Genetically Modified Foods and Food Safety'.[140] The Report is yet to be made public.[141] This article proposes that polluters should face criminal prosecution. Upon infringing the right to a clean and healthy environment, the current civil liability regime only provides for restoration. Yet, GMO offences may cause harm by way of cross pollination, thus contaminating the environment.

4.3 Case law

4.3.1 High Court

In *Kenya Small Scale Farmers Forum v Cabinet Secretary Ministry of Education, Science and Technology & 5 others*,[142] the petitioners sought conservancy orders against a policy statement by the country's then Deputy President William Ruto in August 2015, threatening to lift

135 As above.

136 As above.

137 J Maina 'Kenya approves disease-resistant GMO cassava' *Alliance for Science* 23 June 2021. https://allianceforscience.cornell.edu/blog/2021/06/kenya-approves-disease-resistant-gmo-cassava/ (accessed 21 June 2022).

138 J Njiraini 'The state of GMOs in Kenya' *AgriBusiness Global* 31 March 2020. https://www.agribusinessglobal.com/genetics/the-state-of-gmos-in-kenya (accessed 14 July 2022).

139 National Biosafety Authority website https://www.biosafetykenya.go.ke/index.php?option=com_content&view=article&id=43&Itemid=134 (accessed 21 June 2022).

140 M Chelangat 'GMO food now legal in Kenya after cabinet lifts ban' *Daily Nation*, 3 October 2022 https://nation.africa/kenya/news/gmo-food-now-legal-in-kenya-after-cabinet-lifts-ban-3971466 (accessed 14 October 2022).

141 F Mwalia 'Demand for transparency in Kenya's adoption of GMOs' *Route to Food* 15 November 2018 https://routetofood.org/demand-for-transparency-in-kenyas-adoption-of-policy-positions-on-gm-technology/ (accessed 22 October 2022).

142 [2015] eKLR.

the cabinet ban on GMOs and foods. They were aggrieved by the government's intention to totally deregulate GMOs before there are sufficient notifications and wide public consultation, especially with farmers, particularly given the failure to release the report by the Task Force to review GMO matters. Interestingly, they cited various international reports that 'have all scientifically pointed to the fact that genetically modified foods and organisms are harmful and dangerous to both man and nature'.[143] The government's rebuttal insisted that the Biosafety Act and regulations provide a satisfactory statutory framework to ensure safety of both the environment as well as of each individual. Moreover, Ruto was merely expressing a personal view and no decision had been made to introduce GMOs into Kenya. Newspaper reports on 13 August 2015 quoted the then DP as saying: 'We are going to lift the ban on Genetically Modified Organisms (GMOs) shortly after the cabinet makes a decision'.[144] However the Court held that 'media reports, especially print media reports, have no probative value'.[145] Judge Onguto declined conservatory orders, given that there are in place various regulations touching on GMOs and food and because there is 'no consensus on the benefits, (dis)advantages, risks and effects of genetically modified organisms and foods generally'.[146] Since no decision to lift the ban had been made, the petitioners were merely apprehensive and their application was premature. This decision demonstrates that procedures of matters relating to banning GMO should strictly be followed such as public participation and gazettement as well as publicising the report and recommendations that form their basis. Both the Constitution and the Biosafety Act require public involvement in such decision making.[147] Accordingly 'we must be cognizant that section 54 of the Biosafety Act is in force. The public will have to be involved in the process and absent such consultation or participation the decision may be rendered void'.[148]

4.3.2 Complementarity of environmental criminality for civil liability

Prosecutions for environmental crimes are complex and expensive to undertake. They are only likely to be pursued in four limited circumstances.[149] These comprise situations where the harm is considered serious, where information is withheld or is deceptive, where perpetrators avoid regulations or are repeat offenders. First, prosecutions are likely if people either die or suffer serious harm; or if an act creates endangerment or death of animals; or if the clean-up costs are considerable. Second, if manufacturers withhold information

143 As above 3 para 11.
144 As above 6 para 33.
145 As above 7 para 36.
146 As above 8 para 43.
147 As above 6 para 32.
148 As above 7 para 41.
149 D Uhlmann 'Protection of the environment through criminal law: an American perspective' Cuesta and others (n 19) 63-82 at 71-72.

from authorities or disclose false information. Third, if people are negligent or reckless and avoid regulatory requirements. Fourth, if people are recidivists. While civil or administrative enforcement are suitable for isolated environmental crimes, unless they cause substantial harm, repetitive and prolonged violations require criminalisation.[150] Altogether, because detection, prosecution and conviction depend on expert scientific evidence therefore specialist courts are essential. GMO crimes are hard to prove. Regulation may alternatively proceed through forfeiting profits earned from polluting activities.

A green criminological framework recognises a limited role of liability mechanisms in relation to environmental damage and GMO releases. Where an effective *ex ante* regulatory framework exists, there is either: No need for *ex post* liability mechanisms, at all or, if there is, then their importance will be commensurately reduced, with the result that any serious long-term environmental impacts which emerge should have been unforeseeable at the time the authorisation was granted. Where the terms of the regulatory authorisation of an activity have been met, the allocation of the unforeseen risk will either lie with the authorities or remain unallocated, as civil law systems preclude relief where the damage in question is not reasonably foreseeable. The remoteness of damages principle was stated in the landmark English *Wagon Mound* case.[151] In that case, the defendant was not held liable for all the direct outcomes of their negligent behaviour. Rather, damage was only compensable where that damage could have been reasonably foreseen. Therefore:

> Part of the dilemma for green criminologists is how to sensibly move the debate beyond standard approaches to environmental crime, and how to shift policy and practice in ways that are more effective than conventional forms of environmental regulation. This involves making certain new claims about the nature of harm, and about the nature of human responsibility. The social construction of environmental problems, for green criminology, must incorporate ideas and practices that link together concerns with environmental justice, ecological justice and species justice.[152]

Consequently, we should be seeking green criminology and avoiding reliance on the tort liability system. This is because 'a number of regulatory frameworks have strict liability provisions and unwieldy risk assessment requirements that are not commensurate with the risk currently posed by the technology'.[153] Kameri-Mbote finds the same deficiency. She observes that

> [t]hree torts are relevant to liability and redress for biotechnology are negligence, nuisance and the rule in *Ryland v Fletcher*. Given that these laws predated biotechnology activities and may not cover all kinds of damage likely to arise from biotechnology activities, the issue of efficacy has been raised and the need to work out a sustainable liability and redress system for GMO intimated.[154]

150 As above 72.
151 *The Wagon Mound* (n 8).
152 White (n 16) 46.
153 Chambers and others (n 74) xvi.
154 Kameri-Mbote (n 79) 36.

The unreliability of tort law in regulating GMO offences compels search for criminal regulation sanctions. Loader and Sparks argue that 'the contours of criminological discourse that will comprise an intellectually serious and worldly criminology in the twenty-first century must begin to identify and engage with the emergent landscapes of crime to be found in socio-political analysis of governance, globalisation and risk'[155] such as biotechnology and GM food. Walters suggests that criminological knowledge must be invoked in order to regulate and understand the complexities of the multifaceted dimensions of biotechnology.[156] He concludes that the 'scientific biotech world of GM foods must be placed on the criminological agenda where reported harms, risks and inequalities are examined'.[157]

5 COMPARATIVE ANALYSIS OF REGIONAL JURISPRUDENCE ON LIABILITY MECHANISMS

5.1 Africa in general

Despite various misinterpretations of the CBD and CPB, both seem to have the spirit of acknowledging biotech. The CBD provides that state parties shall 'facilitate access and transfer of technologies (which include biotechnology) that are relevant to the conservation and sustainable use of biological diversity, or make use of genetic resources and do not cause significant damage to the environment'.[158] Similarly, the CPB stipulates that states should use GMOs in a way that is mindful and which reduces the risks to biological diversity and avoids risk to human health.[159]

Even with several successful experiences in 'countries adopting GMO crops and a number of studies estimating the potentially sizable gains from future adoption of GMO crops [...] the progress of research, development and commercialization of GMO crops in these countries have been considered slow'.[160] In Africa, only 'four countries (Burkina Faso, Egypt, South Africa, and Sudan) have planted GM crops commercially' only a few others like (Ghana, Malawi, Nigeria, Kenya,

155 I Loader & R Sparks 'Contemporary landscapes of crime, order, and control: governance, risk and globalization' in M Maguire, R Morgan & R Reiner (eds) *The Oxford handbook of criminology* 3rd edn (2002) 105.

156 R Walters 'Criminology and genetically modified food' (2004) 44 *British Journal Criminology* 151-167 at 165.

157 As above.

158 CBD (n 5) art 16.

159 CPD (n 61) art 2.2.

160 H Takeshima 'Pressure groups competition and GMO regulations in Sub-Sahara Africa: insights from the Becker model' (2011) 9(1) *Journal of Agricultural & Food Industrial Organisation* 1-17 at 1.

Tanzania, Uganda and Zimbabwe) are conducting restricted trials.[161] Apart from the Africa Law Model of precautionary principle, another cause of the few countries endorsing GM is that Africa's 'capacity to innovate, create, adapt, apply, and transform its agriculture sector using the new tools of biotechnology is, at this time, seriously deficient'.[162]

Technology is always in flux. So is the law, as dictated by societal changes at different ages, and material conditions.[163] Yet: 'A number of regulatory frameworks have strict liability provisions and unwieldy risk assessment requirements that are not commensurate with the risk currently posed by the technology'.[164] Economising with space constrains consideration of numerous African countries displaying different policies towards GMO foods, with varying levels of regulation. The AU may sponsor research into the benefits of harmonising national regulations. Some East African examples should bring the debate into relief.

5.2 Kenya

As explained above, GMO regulations in Kenya are not robust. Green criminology is still at its most abstract level. To regulate GMOs in criminological terms means addressing those harms against humanity and against the environment committed by both powerful organisations, for example governments and transnational corporations, and also by ordinary people.[165] Distinguishing this from ecocide ideologies, the causing or threatening to cause harm to the environment through GMO production should be illegal. Yet national biosafety laws are premised on the tort of negligence. The Biosafety Act provides for issuance of a restoration order or cessation order[166] of an approved activity.[167] These consequences seem insufficient to deter GMO importation. Suppose the harm is neither restorable nor reversible? Glaringly, the Act is silent on punishment.

5.3 Tanzania

Genetic modification in Tanzania is still in its fairly nascent age. In 2003, GM tobacco free of nicotine was initiated by a US based organisation. Nevertheless, it did not bear fruits as the trials were halted the same year due to lack of biosafety framework.[168] Institutionally, the country has the Tanzania Commission for Science

161 Chambers and others (n 74) xiv.
162 As above xv.
163 SG Venkata *Jurisprudence and legal theory* 9th ed (1997) 221.
164 Chambers and others (n 74) xvi.
165 Walters (156) 165.
166 Biosafety Act (n 57) sec 40.
167 As above secs 40, 42.
168 Chambers and others (n 74) 85.

and Technology (COSTECH), the National Biotechnology Advisory Committee, the Agricultural Biosafety Scientific Advisory Committee, and the Tropical pesticides Research Institute. Their regulations stem from the Environment Management Act of 2004. Amid these forward steps, '[s]trict liability and redress provisions in the law and regulations are currently a hindrance to advancing biotechnology R&D in the country'.[169]

5.4 Ethiopia

Ethiopia has one of the most prohibitive and precautious biosafety frameworks. For instance, it demands that 'an advanced informed agreement be obtained before a living or dead modified organism (MO) may enter Ethiopia'.[170] This regulation cuts across all other MOs such as food or feeds. Biotechnology is limited to molecular markers, biopesticides, biofertilizers and tissue culture only.[171] Nonetheless, Ethiopia's government recently approved various trials that will lead to the release and growing of GMOs.[172]

6 EXPLORING THE WAY FORWARD

It is discriminatory for policymakers to prevent biotech practitioners from making a living from practicing their science and using their investment in intellectual property to earn a livelihood. Not only does there appear to be lack of scientific evidence to support Kenya's 2012 GMO ban, but also without public participation in decision-making, the cabinet lacked jurisdiction to ban the production and importation of GMOs as doing so did not further the public interest in sustaining a clean environment or promoting public health, leave alone providing food security. It fettered the rights of biotechnologists to earn a livelihood.

Relying on the Thairu Task Force recommendations,[173] President Ruto lifted the GMO ban in October 2022. Yet, despite numerous demands by civil society and the opposition, this Report has not been made public. The opposition opposes its unbanning, principally because 'reintroduction of GMOs will expose farmers to draconian

169 As above.

170 As above 76.

171 As above.

172 D Teshome 'Providing Ethiopian farmers with GMO technology is lucrative option' *AATF* 13 July 2022 https://www.aatf-africa.org/providing-ethiopian-farmers-with-gmo-technology-is-lucrative-option/ (accessed 25 October 2022).

173 A Langat 'Kenya lifts ban on genetically modified foods despite strong opposition' *Inside Development Food Systems* 12 October 2022 https://www.devex.com/news/kenya-lifts-ban-on-genetically-modified-foods-despite-strong-opposition-104170 (accessed 23 October 2022).

intellectual property laws of multinational corporations fronting the system',[174] and the decision is tainted by lack of public participation and transparency. The rights to information and facilitation of public discourse[175] have thus been breached. Similarly, the requirement of a transparent, science-based and predictable process for reviewing and making decisions on transfer, handling and use of GMOs and related activities, is violated.[176] Just as the banning was, so also the unbanning is, procedurally irregular.

6.1 Towards a viable mechanism of liability for GMO environmental harm

Regulating GMO production relies on three principles, namely – the precautionary, polluter pays and preventative principles.[177] The criminal law discourse should harness both risks and rights. The rationale is to pose resistance 'against state and corporate activities that harm humans, non-humans and the natural environment'.[178] There is a need for responsive regulation in relation to potentially harmful GMOs. Tung, in assessing the liability mechanism in Mauritania regarding GMOs related damage, finds that '[o]ne can argue that the general civil liability regime based on fault or negligence would be applicable in such cases, but it may not be easy to prove the causal link between the activity using GMOs and the negative consequences of the respective GMO or GM product'.[179] The Minister responsible is granted the mandate to make regulations for civil liability where 'there is damage caused by activities involving GMOs'. Tung recommends that the GMO Act[180] should have provided that any person undertaking activities involving use or release of GMOs should be presumed liable and they should bear the onus to 'prove that their activity has not caused that prejudice'.[181] Inevitably, since there is 'increased circulation of GM products and increased development of GMO-related activities throughout the world [...], policies, action plans and legislation constantly need to be elaborated and updated to avoid the potential adverse effects of GMOs'.[182] This is precisely why Kenya needs to undertake a process of public participation on GMO foods and their regulation through escalating green crimes.

174 A Mwangi & G Kebaso 'Western MPs oppose lifting of GMO ban' *People Daily* 13 October 2022 https://www.pd.co.ke/news/western-mps-oppose-lifting-of-gmo-ban-153599/ (accessed 21 October 2022).

175 Art 35 Constitution (n 84).

176 Sec 4(c) (n 57).

177 R Walter *Eco crime and genetically modified food* (2011) 92.

178 As above 121.

179 OJL Tung 'The adequacy of the Mauritania biosafety framework' (2014) 58, 1 *Journal of African Law* 109-128 at 126. DOI:10.1017/S002185531300017X (accessed 13 July 2022)

180 Genetically Modified Organisms Act of Mauritius (No 3 of 2004).

181 Tung (n 179) 127.

182 As above 128.

6.2 Overcoming food insecurity by enforcing compliance with environmental law

Arguably, developing countries cannot afford to enforce compliance with environmental laws because 'coercion and corruption are generally unfettered by stable institutional controls'. Poor countries instead facilitate the corporate business climate. There is a need to enact and enforce green crimes to compel political goodwill and policies towards compliance.

'The dynamics of environmental harm cannot be understood apart from consideration of who has the power to make decisions, the kinds of decisions that are made, in whose interests they are made, and how social practices based on these decisions are materially organised'.[183] Crucially, these decisions must accommodate and appreciate global economic, social and political developments. Additionally 'part of the problem has been that the CPB arose from the CBD, hence ministries responsible for the environment frequently take the lead in biosafety; yet biosafety is a cross-cutting issue spanning many institutional mandates and priorities, including health and agriculture'.[184] In Kenya, premium is placed on health considerations. For instance, the 2012 GMO cabinet ban was imposed without consultation with the NBA and other stakeholders, such as agricultural and technology agencies. Ecuru notes that '[w]hile the CBD and CPB are clear on what the outcome of risk assessment should be, namely minimizing risk to biological diversity and human health, in most countries socio-economic, moral and other ethical issues with respect to GMOs appear to be more prominent'.[185] He concedes that '[h]owever, while the morality of using GMOs and questions about social and economic considerations are important societal concerns, they should, arguably, not be the basis for decision-making when one is following a risk-based approach'.[186] Ecuru distinguishes 'issues concerning risks to human health and the environment' which are different from 'socio-economic and moral value judgments, and therefore should be less emphasized in a biosafety regulation that follows a risk-based approach'.[187] Kenya exemplifies mixing of policy making issues. That is partly why an unjustifiable ban can be made without empirical evidence and enforced haphazardly. These two issues affect the commercialisation and embracement of GMO production. On one hand, 'markets would influence and dictate the adoption of GMOs' while, on the other hand, 'societal norms, traditions and beliefs would determine the acceptability of the technology'.[188] Biblically speaking, money changers

183 White (n 16) 56.
184 Ecuru (n 70) 292.
185 As above 290.
186 As above.
187 As above.
188 As above 291.

cannot sell cattle, sheep and pigeons inside God's temple, lest their tables be overturned and those buying and selling be forcibly ejected.[189]

In matters GMO, rather than display righteous anger while objectively confronting the relevant issues, Kenya seemed to be engaging in political doublespeak. While a ban was still entrenched, there was a permissive attitude towards accommodating and encouraging GMO experiments. Take the recent approval of GM cassava.[190] The government was in a 'state of denial',[191] refusing to clarify its set policies towards biotech. Most biosafety regulatory frameworks, including Kenya's 'were conveniently skewed towards socio-economic and moral considerations'[192] by the CPB. This moralist engraving – influenced by the CPB and the Africa Model Law on Kenya's laws has become an obstacle to GM development and use. Consequently, this indecision culminates into food insecurity. Ecuru suggests that the solution to policies that are influenced by a moralist view should be application of 'mechanisms for judicious assessment of risks to human and environment'.[193] If this were the case, a risk assessment test should have informed the policy direction before imposing the cabinet ban in Kenya.

6.3 Prospects of GMO foods in Kenya

Kenya's agrarian sector now has prospects for GMOs. The approval for commercialisation of genetically modified maize no longer lies with the cabinet after scientists concluded the field trials and handed the report to the Kenya Plant Health Inspectorate Service (Kephis) for registration.[194] This indicates that permitted scientists run contained GMOs trials albeit requiring approval for release into the fields.[195] Yet, no imports and no products have been approved by the NBA for placement in the market. Kenya's NBA advised the government to lift the ban to leverage benefits from GM technology.[196] This political permeability is interpreted optimistically.

The AU Model Law on Biosafety stands on par with EU directives influencing African states' decision-making regarding GMOs. Many African countries remain reluctant to defy the set Model Law (which strongly emphasises the precautionary principle). Others, like 'Ethiopia and Tanzania, have recently embarked on reviewing and amending

189 Mathew 21:12; John 2:15-17 *The Bible* https://biblehub.com/matthew/21-12.htm; https://www.biblestudytools.com/john/passage/?q=john+2:15-17 (accessed 13 July 2022).

190 Maina (n 137).

191 S Cohen *States of denial: knowing about atrocities and suffering* (2001).

192 Ecuru (n 70) 291.

193 As above.

194 G Andae 'Scientists in second GMO maize approval bid' *Business Daily* 23 February 2022. https://www.businessdailyafrica.com/bd/economy/scientists-in-second-gmo-maize-approval-bid-3725638 (accessed 26 July 2022).

195 Njiraini (n 138).

196 As above.

their Biosafety regulatory frameworks, making these frameworks a vital part of their gene technology and innovation'.[197]

7 CONCLUSION

Amid the biotechnology dilemma, there was an irrational GMO-phobia reflected in Kenya's cabinet ban which resulted in lost food sufficiency opportunities, wasted livelihoods and contributed to delayed resolution of the food deficit. Technically, having been predicated on the Séralini Report, upon the latter's withdrawal and concession by its author as being inaccurate, Kenya should have swiftly reversed the GMO ban. Decrying a decade's embargo, a new President lifted the ban, only for the High Court to restore it pending the determination of a lawsuit lodged to determine its merits. Social well-being can benefit from firm and clear laws on liability of environmental or health harm related to GM production or use. In biotech, relevant sectoral agencies should be harmonised to work towards sustainable development while still addressing food insecurity. This is achievable by engaging not only health and medical practitioners, but also food standards agencies, environmental protection stakeholders, regulatory authorities, and plant restriction scientists among other relevant stakeholders. In 2015, the High Court dismissed a challenge to the government's intended deregulation of GMO foods. Farmers sought conservatory orders under the Biosafety Act seeking to prevent the state from unbanning GMOs,[198] since there was no public participation before its decision. Indeed, public participation increases domestic capacity to deal with GMO risks and benefits. For enhanced environmental regulation and law enforcement, a common problem is the lack of political will and financial resources being directed to environmental protection.

Second, there is a need to respond to sustainable development challenges quickly enough to avert potential threats. Hence, long-sighted, cooperative interactions under the precautionary principle will be a crucial step to effecting the policy change. Environmental regulation emphasising regulatory strategies that might improve GMO performance include responsive and smart regulation use, non-state actors and private sector participation and resources in fostering regulatory compliance in relation to the goal of sustainable development.[199]

Third, comparative studies indicate that decisions should not be made without an assessment of potential risk and thorough examination to minimise any untold and undiscovered threats. Such case-by-case examination of species protects the risks to the environment, biodiversity, health and socio-economic conditions with an aim of attaining sustainable development and food security with minimal risks. Kenya has sufficient capacity to venture into contained

197 Ecuru (n 70) 287-288.
198 (n 142) 1 paras 2 and 3.
199 White (n 7) 451.

GM trials. Informally, certain scientists have launched restricted laboratory testing of GM crops in contained fields or spaces to avoid contamination of natural crops. This seems to be done discreetly or discriminatorily with an aim of releasing them and approving them for commercialisation once certified.

Therefore, fourth, criminal sanctions are recommendable on failure by manufacturers to conduct long-term field testing prior to commercialising GMO foods. This is because traditional tort mechanisms in liability have been shown not to accommodate GM harms to the environment as they predated the same.

It is therefore recommended, fifth, that the law should shift towards green crimes, with elaborate characterisation of the offences and fines or warnings.

Ultimately, sixth, the Kenya government should implement a standard way of ensuring that decision-making involving GM is preceded by adequate civic education and information before deliberation with all the relevant agencies and stakeholders. Public participation is an essential prerequisite to GMO policy or legislative reforms. For starters, the Thairu Report should be made public. Let's debate it.