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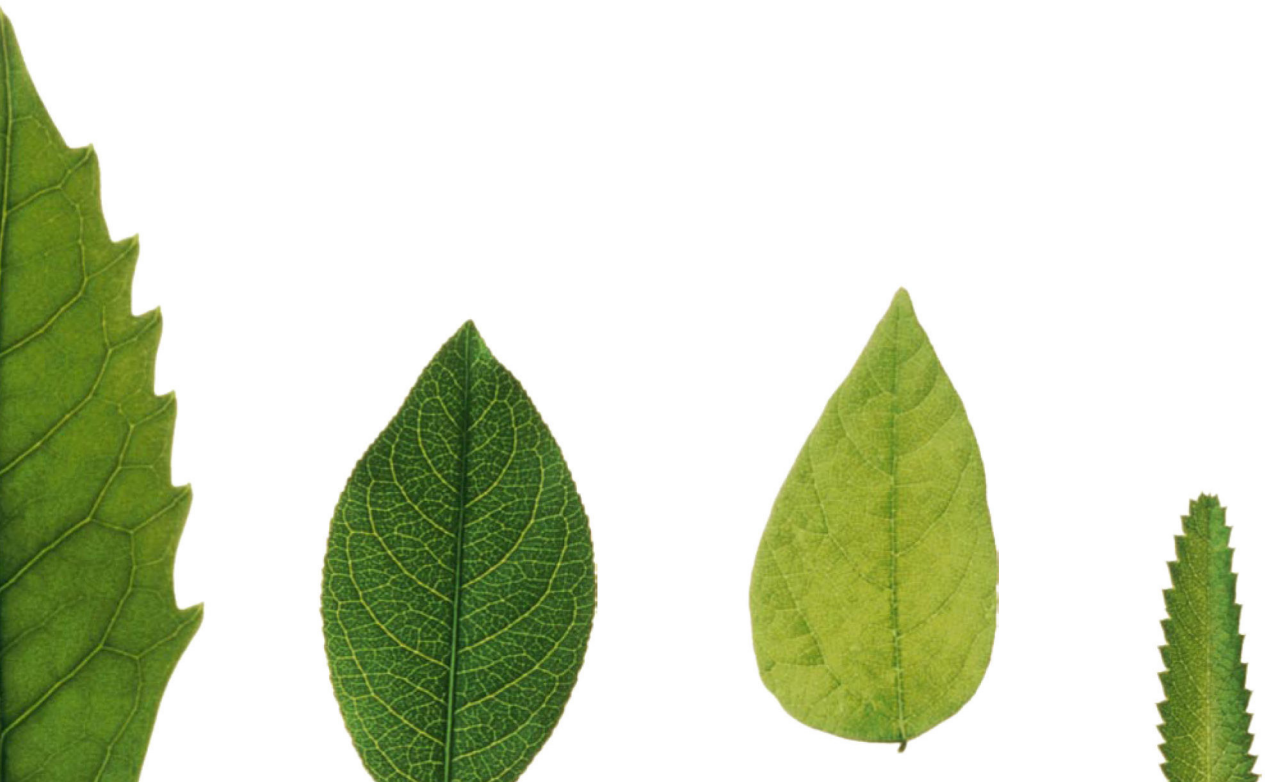

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ARTICLE

AN EVALUATION OF THE IRAQI DRAFT LAW ON THE PROTECTION AND EXCHANGE OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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1 INTRODUCTION

In Iraq, the Draft Law on the Protection and Exchange of Plant Genetic Resource for Food and Agriculture (DLPEP) is currently awaiting the endorsement of Parliament. The proposed law is expected to set out the framework for systematic provisions of access to both *in situ* and *ex situ* plant genetic resources for food and agriculture. The DLPEP, as Article 2 provides, aims at the conservation and sustainable use of plant genetic resources, as well as regulating their exchange for academic purposes, scientific research, training, and plant breeding. Under the proposed legislative framework however, access to, and utilisation of genetic resources other than those of plants, and associated traditional knowledge remain largely unregulated in Iraq.

This paper analyses Iraq's policy on access and benefit sharing in order to identify shortcomings and options for improvement. Section 2 discusses the definitional ambiguities of plant genetic resources which could have implications on defining the scope of the protection that will be provided. It also looks at the objectives of the Draft Law which provides evidence of the conservation goal in its present form. Section 3 examines relevant provisions on access and their scope. It analyses the three different categories of access to plant genetic resources proposed in the DLPEP: access to the MLS material; access for commercial purposes; and access for scientific research. Farmers' rights will be discussed in section 4.

2 GENETIC RESOURCES AND GENETIC MATERIAL

Over the past few years, The DLPEP has been a subject of discussion in Iraq. It is currently under consideration of the Iraqi parliament and is being discussed by different stakeholders, notably the Ministry of Agriculture. The DLPEP contributes to the implementation of Iraq's obligations under the ITPGRFA,[1] and also covers plant genetic resources that are covered by the Convention on Biological Diversity (CBD) and the Nagoya Protocol (NP).[2]

The DLPEP defines genetic material and genetic resources as 'living genetic material of plant origin'.[3] [4] The definition is however, ambiguous as it does not draw a clear distinction between genetic resources and genetic material. This is in part due to translation problems and the technical language of the protected subject matter. It is important to mention that plants are also defined in the Iraqi Agriculture Quarantine Act (76/2012) whose Article 1 defines plants as 'living plants or parts thereof, including seed or plant genetic material'.

Looking at the above definition, the term 'genetic material' has been preceded by the word 'living', and this may make the scope of protection narrow. A broad

1 Iraq became a contracting party on 27 November 2014 to the International Treaty on Plant Genetic Resources for Food and Agriculture, Rome, 3 November 2001, 2400 UNTS 303 [hereafter ITPGRFA].

2 Iraq acceded on 26 October 2009 to the Convention on Biological Diversity, Rio de Janeiro, 5 June 1992, 1760 UNTS 79 [hereafter CBD]. Various steps have been taken in implementation of the country's obligations under the Convention. These include the preparation of a national report to the CBD, the development of a national biodiversity strategy and action plans, and the initiation of designated protected areas. The Iraqi National Biodiversity Strategy and Action Plan (NBSAP) forms an important strategy for the implementation of the CBD and functions as an overall framework for the conservation of biodiversity in the country. The Fourth National Report to the Convention on Biological Diversity (the first for Iraq) sets out a framework for materializing the vision of the NBSAP into practical actions to ensure effective conservation and sustainable utilisation of the country's biological resources. The Fifth National Report on Biodiversity (March 2014) underscores that legislative, institutional and financial rehabilitation are needed on an equal basis. See Iraqi Ministry of Environment, Fourth National Report to the Convention on Biological Diversity (Ministry of Environment, Iraq 2010) 19. Iraqi Ministry of Environment, Fifth National Report on Biodiversity' (Ministry of Environment, Iraq 2014) 1, 17.

3 Draft Law on the Protection and Exchange of Plant Genetic Resources for Food and Agriculture, art 1 [hereafter DLPEP]. Note that the original text is in Arabic and all translations are the author's own.

4 DLPEP (n 3) art 1.

definition of plant genetic resources covers any material of plant origin that contains genetic information of actual or potential value.[5] In fact, genetic resources do not necessarily refer to the full organism, such as a plant, genetic resources may refer to a cell, tissue or a character or the genetic makeup with physiological characteristics which are rare and can be transferred from one object to another.[6] According to Article 2 of the ITPGRFA, plant genetic material means 'any material of plant origin, including reproductive and vegetative propagating material, containing functional units of heredity'.[7] The element of functional units of heredity in the definition of genetic resources entails, however, that some biological products such as gene sequences which are genetic parts and components, are not protected.

Finally, while the ITPGRFA explicitly refers to the scientific and socio-economic value of genetic material, the qualifying element of the concept 'genetic resources' that is not defined in the DLPEP is the specification that genetic material is of socio-economic value.[8]

2.1 Derivatives

The proposed law extends the definition of derivatives to include, in addition to naturally occurring compounds, products that can be developed through the use of plant genetic resources and their genetic composition such as plant varieties and other similar products. The DLPEP defines derivatives 'المشتقات' as 'products which are developed or extracted from plant genetic resources obtained in accordance with this law'.[9] As such, the draft extends the definition of derivatives to include, in addition to naturally occurring compounds, products that can be developed through using plant genetic resources and their genetic composition. Derivatives, however, are not defined in the ITPGRFA, which indeed does not address access to these resources and their utilisation. The NP defines derivatives, but the definition covers only naturally occurring biochemical compounds.[10] It defines derivatives in Article 2(e) as 'a naturally occurring biochemical compound resulting from the genetic expression or metabolism of biological or genetic resources, even if it does not contain functional units of heredity'.[11]

2.2 Is it all about Access?

The proposed law aims at the protection, conservation, and the regulation of the exchange of plant genetic resources for scientific research and training, and plant breeding.[12] It also aims to ensure fair sharing of the benefits arising out of the utilisation of plant genetic resources.[13] According to Article 9(d), it is confirmed that benefits arising from the utilisation of plant genetic resources shall be directed to the conservation of these resources.[14] The link between the conservation and benefit sharing objectives is seen as important because fair and equitable benefit-sharing in itself does not necessarily mean contributing towards the conservation of crop biodiversity.[15] The NP has recently addressed this issue in Article 9, which encourages contracting parties to take measures to ensure that benefits arising out of the utilisation of genetic resources are directed towards the conservation and sustainable use of biodiversity.[16]

5 ITPGRFA (n 1) art 2.

6 Arab Organization for Agricultural Development, 'The Guide to Legislations on Plant Genetic Resources for Food and Agriculture in the Arab World' (Arab Organization for Agricultural Development, Arab League, Al Khartoum 2003)1, 21. [author's translation]

المنظمة العربية للتنمية الزراعية، دليل التشريعات في مجال الموارد الوراثية النباتية للاغذية والزراعة في الوطن العربي (المنظمة العربية للتنمية الزراعية\جامعة الدول العربية، الخرطوم 2003)1،21.

7 According to Article 2 of the CBD (n 2), genetic resources refer to 'genetic material of actual or potential value', and in its turn genetic material is defined as "any genetic material of plant, animal, microbial or other origin containing functional units of heredity'

8 ITPGRFA (n 1) art 2.

9 DLPEP (n 3) art 1.

10 Carlos Correa, 'Implications for Bio Trade of the Nagoya Protocol on Access to Genetic resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization'(United Nations publications, New York and Geneva, 2011) <www.biotrade.org/resourcespublications/unctad _ditc_ted_2011_9.pdf>.

11 Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Nagoya, 29 October 2010, UN Doc. UNEP/CBD/COP/DEC/X/1, art 2(e).

12 DLPEP (n 3) art 2.1.

13 DLPEP (n 3) art 2(c).

14 DLPEP (n 3) art 12(d).

15 Thomas Greiber et al, An Explanatory Guide to the Nagoya Protocol on Access and Benefit-Sharing (IUCN 2012) 125.

16 Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Nagoya, 29 October 2010, UN Doc. UNEP/CBD/COP/DEC/X/1, art 9.

However, it can be observed that the objective of conservation of plant genetic resources is not present in the operative sections of the DLPEP except in Article 2 and in reference to the duty of the Plant Genetic Resources Unit to cooperate with concerned entities in the implementation of the conservation and sustainable utilisation provisions. But the language of Article 2(a) suggests that it only allows the development of new genetic compositions for commercial purposes. It provides that the law aims at 'facilitating access to plant genetic resources for academic and scientific purposes, and the utilisation of these resources to develop genetic compositions for commercial purposes'.[17]

In addition, the proposed law aims to regulate access to plant genetic resources, and their transfer outside the country.[18] It could be argued that the utilisation of genetic material of accessed crops may not require the transfer of these resources outside Iraq as it is possible to conduct the research inside the country. It will encourage domestic research and help human resource development.[19] To conclude, conducting such research in Iraq is important to combat biopiracy and to facilitate the transfer of conservation technology and its corresponding knowhow to Iraq.

3 GRANTING ACCESS

Articles 8 and 9 of the proposed law constitute the core provisions on access, according to which access to plant genetic resources could be put to commercial or non-commercial uses. Three different categories of access to plant genetic resources have been set down by the DLPEP; access to the MLS material; access for commercial purposes; and access for scientific research purposes.[20] In doing so, the proposed law distinguishes between access situations on the basis of the purpose of access and sets different provisions for each access situation.

3.1 Access to Plant Genetic Resources of the MLS

The proposed law provides that access to plant genetic resources of Annex 1 to the ITPGRFA shall be through the Multilateral System (MLS), and the sharing of the benefits arising from their utilisation will be in accordance with the provisions of the ITPGRFA.[21] It provides that other non-food related industrial uses, such as chemical and pharmaceutical uses, are excluded.[22]

According to Article 11.2 of the ITPGRFA, the MLS covers plant genetic resources for food and agriculture listed in Annex 1 to the Treaty which are under the management and control of contracting parties and in the public domain. Correa's analysis of the concept 'management and control' suggests that the word 'management' refers to 'the actual handling' of Annex 1 plant genetic resources and not to the legal status of these resources.[23] The term 'management' means the capacity of a contracting party to carry out acts of conservation and utilisation directly or indirectly through a third party.[24] This explains the reason why Article 11.2 of the ITPGRFA deliberately introduced or added the word 'control', which is a legal qualification.

Therefore, the interpretation of the management and control requirement may become difficult in Iraq as it is a federal state. The decentralised governance in Iraq, created by the new political system of 2003, represents a dramatic shift, especially for those state agencies with

17 DLPEP (n 3) art 2(a).

18 The aims of DLPEP (n 3) art 2 include the regulation of access to plant genetic resources, and the transfer of these resources outside Iraq.

19 Ashish Kothari, 'India's Biodiversity Act: Finally, A step in the Right Direction' <www.iatp. org/files / IndiasBiodiversity_Act_Finally_A_Step_in_the_.htm>; UNCTAD, Facilitating Transfer of Technology to Developing Countries: A Survey of Home-Country Measures (UNCTAD Series on Technology Transfer and Development, United Nations 2004) 11-4.

20 DLPEP (n 3) art 8.2.

21 DLPEP (n 3) art 9.1(a).

22 DLPEP (n 3) art 9.1(b).

23 Carlos M. Correa, PGRFA under Control and Management of the Contracting Parties and in the Public Domain, First Meeting of the Ad Hoc Advisory Technical Committee on the Standards Material Transfer Agreement and the Multilateral System of the Treaty, Doc. IT/AC-SMTA-MLS 1/10/4 (2009) 3-5.

24 Ibid.

no previous experience of decentralisation.[25] For instance, the 2005 Constitution of Iraq vests authority in the federal, regional and governorate governments, and grants significant authority to regional and local governments without specifying the way that the different levels of government should work with each other to achieve the established aims.[26] In addressing the distribution of authority between the federal government and regional and governorate governments, Article 115 of the 2005 Constitution states that all powers that are not assigned exclusively to the central government are retained by the regional governments.[27] Thus, it is argued that the 2005 Constitution creates confusion with respect to the management of natural resources and their revenue.[28]

Practically speaking, focusing on plant genetic resources, the gene bank in Abu Gharib is part of the plant genetic resources unit of the Federal Ministry of Agriculture. Thus, its collections, which include 3000 accessions, some of them collected in 1977, are deemed to be automatically included in the MLS. The Ministry of Agriculture has begun documenting plant genetic resources, and the number of crop gene banks in Baghdad has continued to grow. Plant genetic resources of Annex 1 in the Kurdistan region, including those in *ex situ* conditions, appear *prima facie* to not be covered, and the inclusion of these collections would need to be carried out with the consent of the entities concerned, as stated in the ITPGRFA.

The second criterion for the inclusion in the MLS is that plant genetic resources for food and agriculture of Annex 1 must be in the public domain.[29] The term 'public domain' is defined as a legal qualification referring either to public property (i.e. things that belong to the public and are dedicated to their use), or according to intellectual property law, to plant genetic resources that are not protected by intellectual property rights. In the contemporary state of Iraq, the concept of 'public domain' has a wider ambit when interpreted under administrative law. Over a decade ago, exactly until the 2003 invasion of Iraq, the Interim Constitution of 1970 prohibited claiming private property rights over natural resources. Article 13 of the Interim Constitution stated that 'natural resources and basic means of productions are owned by the people'. However, the 2005 Constitution does not address the legal status of natural resources except for oil.[30]

While the proposed law recognises state property rights over plant genetic resources, it does not prohibit claiming intellectual property rights over the MLS material under the ITPGRFA. This would mean that crop genetic resources received from Iraq in accordance with the MLS can be claimed via intellectual property rights even if they have not been modified in any way. The ITPGRFA and the SMTA however, ban the claiming of intellectual property rights on material accessed in the form received from the MLS.

3.2 Access for Scientific Research Purposes

The proposed law regulates access to plant genetic resources for scientific research providing that access to plant genetic resources is permitted for academic, scientific, and educational purposes, or for plant genetic resources breeding.[31] In setting the provisions for access to plant genetic resources for scientific research

25 Mishkat Al Moumin, 'The Legal Framework for Managing Oil in Post-Conflict Iraq: A Pattern of Abuse and Violence over Natural Resources' in P. Lujala, S.A. Rustad (eds), *High Value Natural Resources and Peacebuilding* (Earthscan 2012) 419.

26 Similarly, Constitution of Iraq, 2005, art 121 assigns the regional government 'the right to exercise executive, legislative, and judicial powers in accordance with this Constitution, except for those authorities stipulated in the exclusive authorities of the federal government'. It also recognises that the regional power has the right to amend the application of national law inside the region if there is a contradiction between regional and national legislation concerning any issue that is outside the exclusive authority of the federal government. Ibid.

27 Constitution of Iraq, 2005, art 115 states: All powers not stipulated in the exclusive powers of the federal government belong to the authorities of the regions and governments that are not organized in a region. With regard to other powers shared between federal government and the regional government, priority shall be given to the law of the regions and governorates not organized in a region in case of dispute.

28 A clear manifestation of this complex legal situation is the oil dispute between the Iraqi central government and the Kurdistan Regional Government. Al Moumin (n 25) 421.

29 ITPGRFA (n 1) art 11.2.

30 Constitution of Iraq, 2005, art 111.

31 DLPEP (n 3) art 9.1(a).

purposes, Article 9.1(a) of the Draft Law prohibits the use of plant genetic resources accessed for scientific research for commercial purposes without the written consent of the competent national authority.[32] It also prohibits, under the non-commercial usage category, claims to intellectual property rights over plant genetic resources and associated traditional knowledge. The practices of public research institutes in Iraq show that they do not generally seek intellectual property rights, as they are non-profit making entities. It is worth noting that the proposed law does not prohibit such claims in respect of access to the MLS material, and access for commercial purposes. In this context, neither the Nagoya protocol nor the CBD prevent claiming intellectual property rights over genetic resources or traditional knowledge.

3.3 Access for Commercial Purposes

The third category in the Draft Law is access to plant genetic resources for commercial uses. The DLPEP permits access to plant genetic resources for commercial uses, but it excludes the MLS material of Annex 1 from its scope.[33] The word "commercial" is critical to the way the Draft Law restricts access to plant genetic resources. The DLPEP does not define the term 'commercial use'. Commercial utilisation of genetic resources is defined by the CBD as "research activities that explore the commercial potential of bioresources or associated traditional knowledge".[34]

However, there are cases where it is difficult to draw a clear distinction between commercial and non-commercial uses of plant genetic resources.[35] It is argued that private and public research institutions may engage in both commercial and non-commercial research. And they normally use similar research methods and processes that may contribute to biodiversity conservation.[36] Greiber et al maintain that the intent and not the form of the research undertaken determines whether the research is commercial or non-commercial.[37] Article 8(a) of the NP requires that state parties create conditions to promote research which contributes to the conservation and sustainable use of biodiversity, particularly in developing countries, to set simplified measures on access for non-commercial research purposes, taking into account the need to address a change of intent for such research.[38]

Besides, the language of Article 9.2 suggests that the Draft Law does not distinguish between access to plant genetic resources and their transfer. The DLPEP provides that access for commercial purposes requires the applicant to sign a material transfer agreement without any reference to procedures of prior informed consent (PIC) or mutually agreed terms (MAT).[39]

4 SCOPE OF ACCESS AND BENEFIT SHARING

One of the key characteristics of the Draft Law is its broad scope in covering plant genetic resources that are subject to the CBD, NP and ITPGRFA. Article 3(a) of the Draft Law makes it clear that the provisions of the law apply to all plant genetic resources within the limits of the territory of Iraq and its territorial waters, as well as to plant genetic resources that have been acquired in accordance with international law.

Although derivatives are defined in the proposed law in Article 1, derivatives are not mentioned in Article 3 in the scope of the draft which explicitly provides that the provisions of this law apply to all plant genetic resources. The sufficiency of the proposed law to establish a framework for access and benefit sharing from which derivatives are extracted is questionable. Indeed, this legislative policy reflects the ITPGRFA provisions on access and benefit sharing, which cover all plant genetic resources for food and agriculture under Annex 1 to the Treaty, but omit Article 2, that includes genetic compositions and parts that define plant genetic resources.[40]

32 DLPEP (n 3) art 9.2(a).
33 DLPEP (n 3) art 9.
34 Secretariat of the Convention on Biological Diversity, Uses of Genetic Resources (2010) 1, 2.
35 Greiber et al (n 15) 119.
36 Ibid 119.
37 Ibid 17.
38 Ibid 119.
39 DLPEP (n 3) art 9.2(b).
40 Greiber et al (n 15) 34.

The proposed law, while defining its own scope refers to traditional knowledge. It provides that the law applies to 'plant genetic resources for food and agriculture … and any information related to these resources'.[41] The phrase 'information related to these resources' can be interpreted as referring to traditional knowledge, considering that the DLPEP recognises farmers' rights to participate in making decisions on matters related to the conservation and sustainable management of PGRFA.

Besides, the potential benefits under the Draft Law are expected to be limited as the law will be in implementation of the ITPGRFA, under which the facilitation of access to plant genetic resources is a major benefit of the MLS.[42] The draft also regulates access to plant genetic resources that are covered by the CBD and its protocol, but access under either entails bilateral negotiations in order to determine benefits, including the benefits to be shared with the provider.

Finally, although Iraq is a federal state, decentralisation principles find no place in the draft's provisions. The DLPEP is expected to be implemented at three functional levels: federal, regional and local. A three-tier institutional structure should be envisaged in the law. In order to implement these provisions, a federal information system needs to be set up. Its functions should be the compilation of information on issues related to the genetic diversity of the country. The implementation of the ITPGRFA with regard to access to crop species covered by the MLS requires these resources to be under the management and control of the governments of the contracting parties, and this involves issues that are not easy to determine.

5 PROPERTY CLAIMS TO PLANT GENETIC RESOURCES

The proposed law recognises state property rights to plant genetic resources and associated traditional knowledge. Article 3(c) of the Draft Law explicitly provides that plant genetic resources and all related information belong to the state.[43] State property rights, also known as public property, are defined as property which is in turn owned by all, but with the state having control over access and utilisation.[44] However, state property rights over plant genetic resources have no basis in the CBD[45] and ITPGRFA, as they both make it clear that plant genetic resources are subject to the principle of state sovereignty. Under the CBD and its Protocol, it is intended that parties exercise more stricter application of their sovereign rights over their biological resources,[46] in a way that a provider country has the right to oversee access to genetic resources and associated traditional knowledge and the power to negotiate and agree on access conditions with potential users.

Under Iraqi law, the possible application of state property rights over plant genetic resources may not be practical comparing to the principle of state sovereignty. According to Correa, state sovereignty is about the power and jurisdiction of states "to establish how the resources and assets (tangible and intangible) existing in its territory are distributed, used and eventually subject to property rights".[47] Although recognising public property over genetic resources is in line with the social and political conceptions of property

41 DLPEP (n 3) art 3.1.
42 DLPEP (n 3) art 6(b)5.
43 DLPEP (n 3) art 3.
44 Kevin Guerin, 'Property Rights and Environmental Policy: A New Zealand Perspective' (Working Paper, New Zealand Treasury, New Zealand 2003) 1, 2-8.
45 Kent Nnadozie, Legal Status of Genetic Resources in National Law, Fifth Meeting of the Open Ended AD HOC Open-Ended Working Group on Access and Benefit Sharing, UN Doc UNEP/CBD/WG-ABS/5/5 (2007) 1-7.
46 Jorge Cabrera Medaglia et al, The Interface between the Nagoya Protocol on ABS and the ITPGRFA at the International Level: Potential Issues for Consideration in Supporting Mutually Supportive Implementation at the National Level (Fridtjof Nansen Institute Report 1, 2013) 31; Gerd Winter, 'Towards Regional Common Pools of GRs- Improving the Effectiveness and Justice of ABS' in Evanson C. Kamau and Gerd Winter (eds), *Genetic Resources, Traditional Knowledge and the Law: Solutions for Access and Benefit Sharing* (Earthscan 2009)1, 21.
47 Carlos Correa, 'Sovereign and Property Rights over Plant Genetic Resources' (Background Study Paper No.2, Commission on Plant Genetic Resources, Rome 7-11 November 1994) 2.

rights in the country, Iraq's freedom to legislate is subject to its obligations under international law. Practically speaking, the establishment of property rights over genetic resources is limited by the intangible nature of its genetic components (their DNA, RNA, gene, and genotype information). These limitations to the proposed legislative framework need to be addressed by future studies.

5.1 Iraqi Farmers: Less or more Rights

The proposed law recognises the right of Iraqi farmers to participate in decision-making in issues related to the conservation of plant genetic resources in their areas, and their right to share benefits arising out of the transfer of these resources.[48] However, the proposed law does not address the customary rights of farmers to use, save, exchange and sell farm saved seeds and propagating material. Its Article 7(a) provides that the state shall ensure and protect farmers' rights with regard to plant genetic resources.[49] This means that core of farmers' rights such as their rights to access seeds are subjected to the discretions of the competent authority. The right to save, use, and exchange farm saved seeds in Iraq has to be seen in the context of seed production where most seeds come from farmers' reserves, while the public sector has been able to fulfil only 4 per cent of the country's demand for improved seeds since 2003.[50]

It can be argued that farmers' rights, if adopted as proposed in the DLPEP, will provide little or no protection to Iraqi farmers. Article 7 of the DLPEP does not protect farmers' rights to use, save and exchange farm saved seeds, even though the ITPGRFA does not exclude the possibility of recognising such rights in the national laws of contracting parties.[51] It establishes that '[n]othing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/ propagating material, subject to national law and as appropriate'.[52] Also, it is unclear why the DLPEP links farmers' rights to share the benefits of plant genetic resources to the transfer of these resources, as potential users may or may not need to transfer the accessed genetic material outside Iraq.[53]

5.2 Other Entitlements Concerning Plant Genetic Resources

In Iraq, agriculture was excluded from being protected by intellectual property rights, and currently there exists no legal system for the protection of plant varieties. The 1970 Interim Constitution of Iraq banned private ownership of natural resources.[54] Intellectual property rights in agriculture arose with the policy changes that followed the invasion of the country where strong protection for plant varieties was introduced, and the patenting of plant genetic resources and enabling technologies was permitted. This was combined with the setting new standards on enforcing intellectual property rights, consisting of civil, administrative and criminal procedures.[55] Thus, one might ask how far farmers' rights are taken into consideration under the condition of private property rights. It can be argued that options adopted by the proposed law to protect farmers' rights are limited due to the broad protection of plant patents and plant breeders' rights in Iraq. For instance, the scope of patentable subject matter can be considered as significantly broad to include plants and animals, while biological processes for their production are not excluded under Order 81 from the scope of patentability. Order 81 allows the patentability of plants, inventions directed to plants (such as plant products, plant cells and genes) and plant varieties. Article 2 of Order 81 defines the scope of patent protection providing that all inventions in all fields of technology that are industrially applicable, novel and involve an inventive step, are patentable. Also, Article 1.4 of Order 81 defines an invention as '…any innovative idea, in any of the fields of technology, which relates to a product or a manufacturing process, or both, and practically solves a specific problem in any of those fields'.[56]

48 DLPEP (n 3) art 7(b).
49 DLPEP (n 3) art 7(a).
50 *FAO Newsroom*, Rebuilding Iraq's Collapsed Seed Industry (2005) <www. fao.org /News room/en/news/2005/ 107246/index.html >.
51 Gerald Moore, Witlod Tymowski, Explanatory Guide to the International Treaty on Plant Genetic Resources for Food and Agriculture (World Conservation Union 2009) 74.
52 ITPGRFA (n 1) art 9(2).
53 DLPEP (n 3) art 7(b).
54 Interim Constitution of Iraq, 1970, art 13.
55 Order 81 on 'Patent, Industrial Design, Undisclosed Information, Integrated Circuits and Plant Variety'.
56 Ibid art 1.4.

The recent legislative developments in Iraq will effectively mean that complex allocation of rights over plant genetic resources could cause conflicts of interest and thereby affect access to these resources. The proposed law recognises plant genetic resources as state property rights, and also acknowledges farmers' rights to these resources.[57] However, simultaneously exclusionary intellectual property rights may be taken out on plant genetic resources in accordance with the provisions of Order 81. There are doubts about the extent to which such conflicting interests would contribute to sustainable agriculture and food security in Iraq.

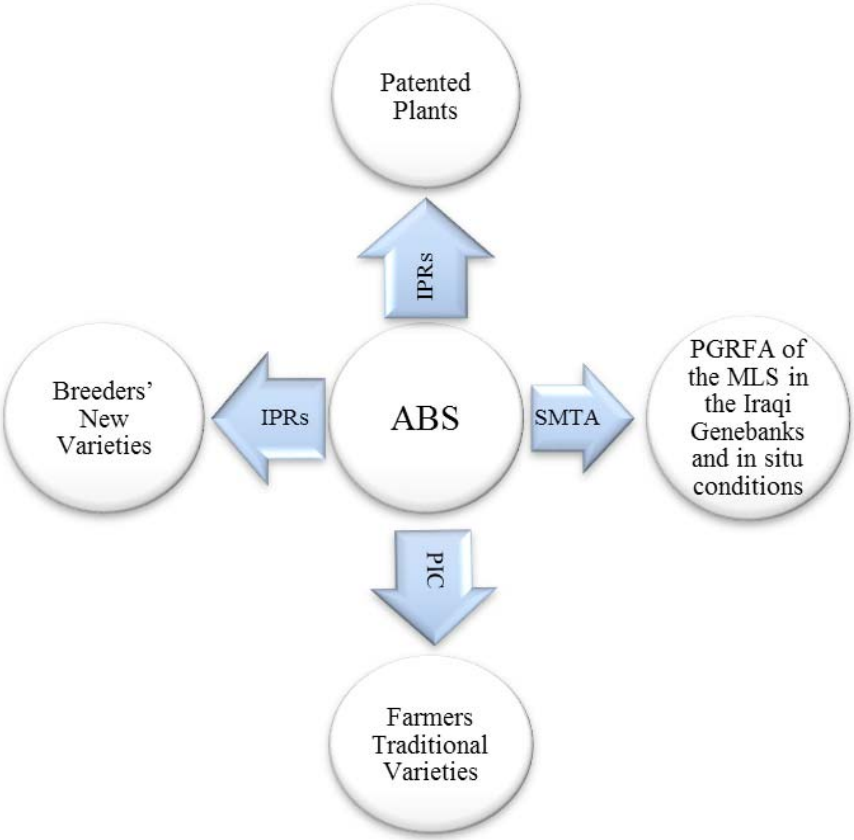

Figure1. Legal status of plant genetic resources and mechanisms for access to different types of these resources

6 CONCLUSION

This paper has analysed key aspects of the DLPEP, including the coverage of the proposed law, access and benefit sharing provisions, implementation agencies, and the different entitlements established in the draft. The broad scope of the DLPEP is no doubt difficult to implement within the current technological, institutional and legal capacities of Iraq. While the law is intended for the implementation of the ITPGRFA, its scope of application covers access to plant genetic resources subject to the CBD and to the NP.

57 DLPEP (n 3) art 3.

In fact, it cannot be overlooked that the legislator of the DLPEP became embroiled in a challenging area of law and that the draft provisions barely address the various difficulties and implications involved. For instance, the definition of plant genetic resources and genetic material in the DLPP is imprecise. Article 1 of the draft does not distinguish between genetic resources and genetic material, as it offers one definition for both terms. This could cause confusion when applying the law. Moreover, although the practices of farming and rural communities reflect a rich agricultural heritage, the DLPEP neither defines traditional knowledge nor protects such knowledge. Iraq is a centre of agrobiodiversity with rich agricultural heritage.

The implementation of the ITPGRFA requires considering policy issues relating to food security and sustainable agriculture. This consideration should also focus on their coherence and the mutual support with the CBD and NP. On this basis, once the DLPEP is adopted and entered into force, what has been considered a public good in Iraq since the earliest times will be divided up into different property rights and will become the subject of claims of conflicting interests. In particular, the DLPEP does not prohibit claims to intellectual property rights over plant genetic resources accessed for the purposes of the MLS, and for commercial purposes.

Article

IMPLEMENTING THE UNFCCC TECHNOLOGY MECHANISM AND THE 5 'PS': PROGRESS, PRACTICALITIES, PRIORITIES, PATHWAYS AND THE PUBLIC SECTOR

Karen M. Sullivan

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1 INTRODUCTION

The concept of obligations on developed countries relating to the transfer of technologies for environmental protection under international law came into being with the Declaration of the United Nations Conference on the Human Environment in 1972. Principle 21 of that declaration stated that 'environmental technologies should be made available to developing countries on terms which would encourage their wide dissemination without constituting an economic burden on the developing countries'.[1] The next decade saw technology transfer become a central pillar of the Montreal Protocol on Substances that deplete the Ozone Layer in 1987, with developing countries demanding technology transfer 'as a condition of participation in the control measures of the Montreal Protocol'.[2] In common with other multilateral environmental agreements, the United Nations Framework Convention on Climate Change in 1992 (hereafter the UNFCCC)[3] also contains provisions pertaining to technology transfer. Since then, there has been increasing recognition of the importance of technology transfer as a hugely influential process in the global efforts to address environmental challenges. In 2005, a UN report from the Department of Economic and Social Affairs on sustainable forest management claimed that 'Policies promoting development and diffusion of technologies are probably among the most important factors affecting environmental protection. Moreover, technology transfer is one of the major factors shaping global income distribution'.[4] The centrality of technology transfer to international efforts towards environmental protection was further illustrated in 2007, when Anderson et al, found that of the nearly 270 environmental treaties extant at that time 'development, commercialisation and transfer of environmentally sound technologies are the crux of these treaties...'[5]

Increasing recognition and acceptance of the scale of the global threat posed by climate change has focussed international attention on the UNFCCC as the framework for interventions to limit climate change and adapt to its impacts on the human environment. As a result, the technology transfer provisions agreed under this convention are of significant international interest. Indeed, the transfer of technologies which may mitigate greenhouse gas (GHG) production in an attempt to limit climate change, or which are designed to aid the most vulnerable nation states in adapting to the effects of such change, is one of the central pillars of the Convention. Article 4 of the Convention sets out the commitments of the parties, and Art.4.1.(c) obliges parties to 'Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors'. Art 4.5. of the convention explicitly recognises the differentiated responsibility of the developed and developing parties and inter alia, requires the developed parties proactively to promote, finance and transfer environmentally sound technologies to developing states.

The ways in which the parties to the Convention may co-operate to give effect to the terms of these provisions have developed over time, and have been

1 P3 Stockholm Declaration (1972) <https://www.soas.ac.uk/cedep-demos/000_P514_IEL_K3736-Demo/treaties/media/1972%20Stockholm%201972%20-%20Declaration%20of%20the%20United%20Nations%20Conference%20on%20the%20Human%20Environment%20-%20UNEP.pdf>.

2 S Anderson, K Sarma and K Taddonio, *Technology Transfer for the Ozone Layer: Lessons for Climate Change* (Earthscan 2007) 5.

3 United Nations Framework Convention on Climate Change (1992) <https://unfccc.int/sites/default/files/conveng.pdf>.

4 Department of Economic and Social Affairs, United Nations Forum on Forests Secretariat, 'Transfer of Environmentally Sound Technologies for Sustainable Forest Management – Framework and Applications', December 2005, [hereafter the DESA Report] https://www.un.org/esa/forests/wp-content/uploads/2015/06/tests1205.pdf.

5 Anderson, Sarma and Taddonio (n 2)1.

articulated in greater detail through successive Conferences of the Parties (COPs),[6] and leading, amongst other technology initiatives, to Decisions on the Technology Mechanism, taken at the Cancun and Durban COPs.[7] The aim of the Technology Mechanism is to facilitate the implementation of enhanced action on technology development and transfer. Activities under this mechanism have, in turn, led to the establishment of a Climate Technology Centre and Network (CTCN),[8] the aim of which is essentially to assist developing countries in identifying their needs with respect to climate change related technologies, and via co-development or transfer, to allow them to successfully adopt such technologies, thereby helping such countries to mitigate or adapt to climate change to the maximum extent that technological solutions allow. The Technology Mechanism comprises the CTCN and the Technology Executive Committee, with the latter analysing and formulating policy interventions whilst the CTCN is the operational am of the Technology Mechanism, responsible for fostering climate technology development and transfer.[9] Whilst other mechanisms under the UNFCCC such as the Clean Development Mechanism, have the potential to effect climate technology transfers, there is much debate about how effective this has been, with evidence putting the percentage of projects resulting in such transfers being as low as 12 per cent in some countries.[10]

The transfer of a technology from one actor to another might seem on first consideration to be a simple task, begging the question of why such entities as the CTCN and associated interventions should be necessary. Given that free market economics are the dominant force in the majority of global economies,[11] providing appropriate funding is made available to poorer countries, should the willing seller/willing buyer principle not enable them to meet their technological needs without recourse to such intermediary organisations? Regrettably, the reality is far from being this simple. The area of technology transfer, particularly where some of the technologies required are yet to be developed or at least customised for the recipient, is a hugely complex field of activity. There are many factors contributing to this complexity, such as the nature of the technology – climate related technologies can range from environmentally cleaner cooking stoves costing a few tens of dollars, to hydroelectric dam installations costing in excess of a billion dollars. Some 'technologies' are more appropriately termed as 'practices', such as sustainable forestry management practice, and are in the public domain, whilst others, such as genetically modified seeds are largely private sector property and heavily IP protected. Some technologies may be completely new to the recipient market, presenting barriers of market education and creation, whilst other may need to displace less environmentally friendly alternatives that enjoy existing subsidies. There are also issues of standards, reliability in use, skills required by end users, maintenance costs and availability of spare parts, as well as connectivity to existing infrastructure where appropriate, or investment needed in new associated infrastructure in other instances. The list goes on, and many laudable endeavours have been made to examine the array of barriers to effective international technology transfer and the types of interventions which may help to overcome them.[12] The CTCN represents one such intervention, and is the result of the conduct of such assessments under the auspices of the UNFCCC.

The aim of this paper is to inform readers on the status of implementation of the CTCN and to provide insights into the degree to which the selected

6 The most comprehensive document in this regard is that 'Framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention' FCCC/CP/2001/13/Add.1.

7 Decision 1/CP.16, paras 133-129 <https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=18>.

8 See <http://unfccc.int/ttclear/templates/render_cms_page?TEM_tcn>.

9 Technology Mechanism – Enhancing climate technology development and transfer available at https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM/0e7cc25f3f9843ccb98399df4d47e219/174ad939936746b6bfad76e30a324e78.pdf.

10 The Department of Economic and Social Affairs (2009) Promoting Development, Saving the Planet: World Economic and Social Survey 2009, New York <https://www.un.org/en/development/desa/policy/wess/wess_archive/2009wess.pdf> 138.

11 As evidenced by a market freedom ranking of over 50 per cent in the 2019 global Index of Economic Freedom available from <https://www.heritage.org/index/ranking>.

12 Intergovernmental Panel on Climate Change Special Report 'Methodological and Technological Issues in Technology Transfer' (2000) ISBN92-9169-112-7.

mechanism addresses the known challenges and reflects lessons learned from previous work in the field of international technology transfer by international organisations ie the extent to which it is able to turn available knowledge into best practice. After an initial review of implementation status, 'Progress', the findings will be used to examine how well the operationalisation of the CTCN has addressed previously identified barriers to successful technology transfer under multilateral environmental agreements, namely the 'Practicalities' of implementation, 'Prioritisation' of objectives, recognition of technology or country specific 'Pathways' in technology transfer and the involvement of the 'Private sector' – hence the 'Five P's'

2 PROGRESS: IMPLEMENTING THE UNFCCC CTCN

The CTCN was initiated via a call for proposals from organisations wishing to establish and deliver the objectives of the new entity, in response to which bids from nine organisations and consortia were received.[13] After initial review the three top ranked bids, from a UNEP led consortium, GEF and Det Norske Veritas, were subject to a detailed and admirably transparent and well documented evaluation, against published assessment criteria. Details of the shortlist assessment were also published[14] and the chosen bid was from within the United Nations family, specifically a joint bid led by the United Nations Environment Programme (UNEP).[15] The Climate Technology Centre, that is the Hub of the Network (CTCN), was subsequently established in Copenhagen, to co-ordinate with the National Designated Entities (NDE's) from the state parties to the UNFCCC, as well as with other organisations from the private, public, or third sectors, wishing to contribute to the working of the CTCN. The CTCN became operational at the end of 2013 and was subject to an independent review of its initial performance in 2017 commissioned by the UNFCCC Secretariat (hereafter the 'UNFCCC Review'), the outcome of which was presented at COP23 in November 2017.[16] This was the first comprehensive review, as a previous review requested by the European Commission and conducted substantially by the UNEP Evaluation Office had only reviewed the CTCN as a Case Study as part of a broader evaluation of the CTCN host organisation (hereafter the 'UNEP Review').[17] The conclusions reached by Ernst and Young, the reviewers chosen to undertake the UNFCCC Review [18], were substantially positive, and three of their main findings were as follows:

- 'The beneficiaries have shown satisfaction regarding the services provided by the CTCN. Interviewees and survey respondents have acknowledged the value added by the CTCN, which is mainly due to the scope of technical assistance it provides and the time frame under which it operates. The CTCN fostered synergies with financial institutions and technical partners to avoid redundancy and leverage the impacts of its technical assistance;

- Overall, UNEP, UNIDO and the consortium partners have effectively implemented successive COP decisions and set up the CTCN accordingly, allowing it to respond effectively to the COP mandate and grow as a recognized institution, acting in a niche of the global climate support ecosystem. The CTCN has consistently adapted the prioritization of its services depending on its financial resources and revised its work programme to implement successive COP decisions;

- The operationalization of the CTCN took time but resulted in the establishment of a

13 'Matters Relating to the CTCN: Selection of the Host and Constitution of the Advisory Board' FCCC/SBI/2012/L.18 para 2.

14 'Report on the Evaluation of Proposals for Hosting the Climate Technology Centre' FCCC/SBI/2012/INF.4 paras 18-47.

15 ibid Annex 2 para 2.

16 'Report on the Independent Review of the Effective Implementation of the Climate Technology Centre and Network' FCCC/CP/2017/3.

17 Evaluation Case Study of the CTCN 2016 <https://www.ctc-n.org/resources/evaluation-case-study-ctcn-2016>.

18 FCCC/CP/2017/3 (n 16) para 3.

> quite efficient organization. The consortium provides a good mix of core and regional expertise, as well as knowledge of United Nations procedures, which have ensured the application of COP decisions and facilitated the deployment of CTCN services'.[19]

These findings confirm the results of the earlier UNEP Review which found that 'an effective, efficient and responsive CTC has been established'.[20] The UNFCCC Review was followed by the so-called 'DANIDA Review' of 2018 commissioned by the Danish Ministry of Foreign Affairs (as Copenhagen is the host location of the CTC in UN City). This review was explicitly based on the two earlier reviews and declared itself to be 'in general agreement with the findings' of those evaluations.[21]

Before proceeding with further findings, it is worth noting at this point that whilst these statements are positive about the early operations of the CTCN, there is an interesting choice of words in the second bullet point above, namely that the CTCN is 'acting in a niche of the global climate support ecosystem'. Given the strength of the statements quoted at the start of this article about the importance and centrality of technology transfer in tackling global challenges such as climate change, can it really be the intention of the UN that the CTCN should be viewed as a mere 'niche' component within the broader range of mechanisms seeking to mitigate or adapt to climate change?

That question may be answered indirectly by the UNFCCC reviewer's observations regarding the level and security of funding provided to support the operations of the CTCN, effectively citing it as a barrier to more effective achievement of its objectives. They state that 'The funding model and consequent limited availability of funding for the CTCN prevents it from delivering services at the expected level. Better predictability and security over financial resources will ensure that the CTCN can continue to successfully respond to its COP mandate and the needs and expectations of developing countries'[22] Referring to funding as 'limited' is diplomatic; the actual level of funding received from voluntary contributions over the operating period 2013-2016 was $38,470,000 (excluding cash and in kind contributions from consortium partners).[23] To put this in context, the amount of funding over the start up and first three years of operation of a mechanism intended to make a contribution of scale to a global challenge, attracted less than half the money from the entire developed world than was spent on building a new art gallery in Dundee.[24] Readers in countries with developed economies are invited to take a moment to think how similar, or even much larger sums are spent locally to them in new buildings, regional economic development schemes or local transport initiatives before reflecting on how realistic it is to expect this level of funding to support activities intended to meaningfully impact climate change. A new cycle path in Cornwall, for example, is attracting a £27 million cash injection from Highways England[25] and yet the world can muster barely more than this to support the operation of what should be a major mechanism for achieving climate change mitigation and adaptation measures. Add to this the fact that even this level of funding is insecure, it becomes yet harder to see that the CTCN is viewed, as the reviewer indicated, as anything more than a 'niche' component of the climate change intervention landscape. This level of funding must therefore be challenged and changed if technology transfer via the Technology Mechanism is to be a significant contributor to the efforts needed to achieve the limitation in global warming that the UNFCCC aspires to.

The DANIDA Review made the limited funding of CTCN their first key observation, concluding that the underfunding and insecurity of budget due to the voluntary nature of donations were critical issues to be addressed. They concluded that 'unless funds are

19 ibid para 83 sub-sections (a) – (c) respectively.

20 Evaluation Case Study of the CTCN 2016 (n 17) Executive Summary, p 6, para iii.

21 Review of the Climate Technology Centre and Network, Review Report, 16 May 2018, DANIDA <https://www.ctc-n.org/sites/www.ctc-n.org/files/ctcn_danida_review_report_2018.pdf>.

22 FCCC/CP/2017/3 (n 16) para 84 (a).

23 ibid Para 64 Table 5.

24 See 'Everything you need to know about the V&A Dundee' *BBC News* (Scotland, 12 September 2018) <https://www.bbc.co.uk/news/uk-scotland-45197154>.

25 See Charlotte Becquart, 'Millions of Pounds to be spent on New Cycle Paths in Cornwall' *CornwallLive* (1 February 2019) <https://www.cornwalllive.com/news/cornwall-news/millions-pounds-spent-new-cycle-2564353>.

increased significantly, it will be difficult for CTCN to function as the intended Global Mechanism, being effective in facilitating the transfer, uptake and scaling of climate technologies and ensuring learning and impact'.[26]

Against this funding baseline, the achievements of the CTCN in its early years of operation are to be applauded. Any shortcomings in operation subsequently discussed in this paper must in fairness be viewed through the prism of the extremely limited level and insecurity of funding available, but it is nonetheless instructive to examine such limitations in performance as may exist, in the hope that they may be addressed should the funding situation be appropriately enhanced in future.

Further findings of the UNFCCC Review of performance were indeed less positive and are discussed below. Relevant to some of these issues, however, is one further fact relating to the availability of funding, namely that 44 per cent of such limited income as there is, is earmarked against specific projects by donors, thereby further constraining the ability of the CTCN to align activities and expenditures with core priorities.[27]

In terms of effectiveness, whilst the UNFCCC Review did note a number of significant achievements in terms of operational start up, network development and capacity building and support for NDE's,[28] it also identified a shortfall in the number of projects undertaken compared to projected Technical Assistance (TA) targets.[29] The DANIDA Review also raised concerns that in 2017, the number of TA requests actually fell compared to the previous year.[30] Whilst the Knowledge Management System and information provision, number of training events and participants trained all met or exceeded targets,[31] the number of technical assistance projects responded to in the first three and a half years of operation was well below that anticipated. Initial targets were based on the anticipation of a cumulative total of 356-515 requests from NDEs in the first four years of operation, and whilst these figures were revised downwards on the basis of successive annual operating plans to 266 – 410 over the same period, the cumulative total of requests was only 185 over the first three and a half years of operation, with only 105 projects completed or under active development or delivery during this period.[32] The report is explicit that this failure to meet target is 'owing to an absence of demand from countries'.[33]

The reasons behind this lack of demand are attributed to shortcomings in the NDE/CTCN axis as follows:

- Lack of resources or local governance issues preventing the NDE's from fully delivering their roles in originating and progressing their requests

- Capacity building programmes to enable and empower NDE's to fulfil their role being initially successful, but time limited due to high turnover of NDE staff, thereby requiring a rolling programme to maintain impact

- The initial guidance from the CTCN on the role of NDE's being insufficiently clear

- Longer than anticipated timelines to action requests due to the complexity of the CTCN structure and decision making processes and the aforementioned limitations of resources. Whilst only a small number of NDE's interviewed expressed dissatisfaction with the length of the process, it is not difficult to imagine that slow response times would negatively impact the flow of requests.

- Failures in extending the network and communicating effectively to necessary stakeholders to ensure greater engagement with the technical assistance function of the CTCN[34]

26 Review of the Climate Technology Centre and Network (n 21) Executive Summary, iii.
27 FCCC/CP/2017/3 (n 16) para 57,14.
28 ibid paras 59 and 60.
29 ibid para 60.
30 Review of the Climate Technology Centre and Network (n 21) 6.
31 FCCC/CP/2017/3 (n 16) para 62, Table 3, 15.
32 ibid para 60 and Table 2, 14.
33 ibid para 62, Table 3, 15.
34 ibid paras 72-74, 18-19.

The DANIDA Review further postulated that the small number of projects undertaken and the large number of developing countries, meant that each country may only have an active project with the CTCN every 5-6 years on average, making it difficult to either build routine or maintain the engagement of such countries.[35]

Whether these shortcomings are best addressed by greater funding of the 'business as usual' approach or an alternative strategy and operational model will be discussed below, but suffice it to say for now, that whatever approach is taken going forward, securing a meaningful flow of technological advice and solutions has to be a priority if the end result of achieving a positive impact on climate change mitigation and adaption is to be delivered on any meaningful scale.

This brings us conveniently to the topic of impact. Whilst there is acknowledgement by the UNFCCC Review of positive impacts on the broader ecosystem of climate change and development interventions, and qualitative examples of programmes which will undoubtedly bear fruit in the future, performance against all outcome targets falls significantly short – by an order of magnitude in some cases.[36] Clearly the longer than anticipated implementation timescale, and limiting finances are contributing factors,[37] as is the fact that technology transfer is a complex and time consuming process, with impacts not necessarily being realised for some time after the role of the CTCN has concluded. The DANIDA Review further recognised the challenge of monitoring and evaluating impact with many small activities over a wide range of themes and countries.[38] The UNEP review, the first conducted, simply felt it was too early in the operational cycle to assess depth of impact.[39] That said, it is only the achievements of quantifiable impacts on climate resilience or reductions in carbon intensity which are truly meaningful in terms of the raison d'etre of the CTCN. Two points are salient here for further consideration; firstly, that the UNFCCC Review notes there is no monitoring or evaluation system in place to capture such macro level impacts[40] and secondly, whether the impact targets as set out for the CTCN are even appropriate? In the absence of the former, targets are reduced to tick box indicators of numbers of various activities which collectively, are arguably indicative of 'the right kind of things being done' and 'things heading in the right direction'. The underlying assumption of this kind of evaluation is that the more of these things that you do, the better you must be doing and the greater impact you must be delivering. There are circumstances where that may be true. If the aim of your organisation is to treat wounded soldiers, then the more you can treat to a given standard of care, the more lives you are likely to save. However, if the aim of your organisation is to stop dams bursting, it is immediately clear that preventing one dam from bursting, if it were the Hoover dam, will have a far greater impact than securing 20 dams on minor rivers which power hydro turbines for individual farmers or home owners. Few projects of scale of impact then become far more meaningful than larger numbers of minor projects. It is clear, to this author at least, that addressing climate change should fall into the second category of operating model at least in relation to mitigation efforts. In this case, impact driven evaluation metrics make more sense than bare numbers of requests actioned.

2.1 Concluding Remarks on Progress

Anyone with experience of the challenge of starting a new entity, in the private, public or third sector, will have some level of understanding of the very many hurdles that need to be overcome to make a new venture operational. When that new entity has a global footprint, with a complex, multi-organisation centre and network, limited, often ringfenced and insecure funding and the objective of making a significant contribution to saving the planet, it is impossible not to feel tremendous admiration for the progress made by the implementing team. Have they achieved all of their targets? No. Have they made an impact of scale? Not yet. What they have done, is create an operating entity against considerable odds which is making

35 Review of the Climate Technology Centre and Network (n 21) iii.

36 FCCC/CP/2017/3 (n 16) para 79 including Table 6, 19-20.

37 ibid para 80, 20.

38 Review of the Climate Technology Centre and Network (n 21) iv.

39 Evaluation Case Study of the CTCN 2016 (n 17) 7.

40 FCCC/CP/2017/3 (n 16) para 81, 20.

progress towards many of the capacity and network building aspects that will be required to meet the future expectations of the organisation. They have also established technological assistance functionality to such a level as to enable detailed performance reviews, and to provide an evidence base of progress and obstacles to date on which analyses such as this one can be founded, in the hope that both can generate recommendations or suggestions that may enhance future operations and achievements.

3 PRACTICALITIES

Amidst the enormity of the task of operationalising the CTCN, it is easy to lose focus on the mandate of the Technology Mechanism of the UNFCCC, namely that of 'enhancing action on climate technology development and transfer'.[41] Rimmer expressed the view that 'the Technology Mechanism is meant to play a pivotal role in encouraging research, development and diffusion of clean technologies to address climate change mitigation and adaptation'.[42] A UNFCCC Expert Working Group anticipated that the CTCN, the operational arm of the Technology Mechanism, would be 'an important part of the UNFCCC climate change architecture'[43]. The mandate agreed by the parties in the Cancun agreement in 2010 set out the context of these operations, requiring that;

- Technology needs must be nationally determined, based on national needs and priorities
- Accelerated action should occur at all stages of the technology cycle from research to transfer and deployment and
- Parties to the agreement able to do so, should enter into bi- or multi-lateral co-operative actions to deliver the country-led defined technological needs to mitigate or adapt to climate change.[44]

Prima facie, it would seem incomprehensible that this process should be anything other than demand led. Surely, no one is better placed to understand the climate change technology needs than the would be recipient country itself. However, experience tells us that it is unwise to leave any assumption unchallenged and there are a number of bases upon which an argument to test this assertion may be founded. The first of these relates to the fact that the cost of development and transfer of the technologies will be supported by the financial mechanisms of the UNFCCC or contributions from donor states or the private sector, so that the recipient state in many cases, is not substantially bearing the full cost of the transaction. On that basis, which of us, if asked what car we needed, would cite the most basic option that would get us from A to B, if we were not paying the full cost of the vehicle ourselves? This is not meant in any way to impugn the integrity of less developed countries – it is purely an observation of human conduct which is applicable to all. The practicality is therefore a need to understand at what part of the process are demand led technology specifications subject to the differentiation between 'best available option' and 'best practicable option, considering cost of delivery' and does that role fall to the CTCN?

The UNFCCC Review indicates that responding to Technological Assistance requests has been more time-consuming than anticipated. Some contributing factors have been discussed above, but in addition, the organisation collaborates with those parties submitting requests for Technical Assistance to 'fine tune' them, but there is no indication whether this applies to the level of technical specification.[45] If not, it is hard to imagine that there is not a stage during implementation where the responding party or funding mechanism, has input to at least refining the technical request to ensure value for money in the balance of impact versus cost.

Another relevant issue in seeking to rely solely on demand led technology transfer is the aforementioned

41 Decision 1/CP.16, paras 133-129 (n 7) paragraph 117.

42 M Rimmer , 'Beyond the Paris Agreement: Intellectual Property, Innovation Policy and Climate Justice' (2019) 8,7 Laws 11.

43 Expert Workshop on the Technology Mechanism FCCC/AWGLCA/2011/INF.2 para 39 p 11.

44 Decision 1/CP.16, paras 133-129 (n 7) paras 114-116.

45 'Report on the Evaluation of Proposals for Hosting the Climate Technology Centre' (n 14) para72, 19.

complexity of the technology transfer process itself. There are excellent and comprehensive works, some by UN agencies, which examine the many barriers to international technology transfer. It is beyond the scope of this article to revisit them all in detail, but they cover matters such as:

- poor macroeconomic conditions associated with uncertain stability of tariffs or subsidies, investment risk, under-developed financial sectors and lack of availability of capital
- Lack of manufacturers
- Poor market confidence in technical performance
- Lack of appropriate industry standards
- Lack of technical skills in recipient industry
- Inappropriate incentivisation of carbon energy sources
- Lack of information on partners
- High transaction costs
- Lack of supporting legal frameworks[46]

Whilst this list is far from exhaustive, it amply illustrates the challenges associated with the technology transfer process. In addition, Sullivan has previously demonstrated that different technologies place hugely varying requirements on the innovation systems between which they are transferred in order for the transfer process to succeed.[47] If technology requirements are specified in the absence of a detailed and sophisticated understanding of what barriers may exist to adoption, and sustainable utilisation, there is a chance that a technological solution is requested that would deliver 100 per cent of perceived demand for carbon mitigation but which has only a 10 per cent chance of successful transfer and adoption. A completely different technological solution may be capable of delivering lower mitigation benefits but have a 90 per cent chance of successful long term adoption. Less developed countries in particular may lack appropriate expertise in the NDE or relevant government department to make such assessments. This rationale presents the case for such expert external review of country specified technological needs prior to attempted technology transfer, but it is unclear whether the CTCN has the capacity or mandate to fulfil such a role. This point was also raised as a concern by the DANIDA Review which expressed the view that isolated technology transfers undertaken in the absence of addressing the relevant enabling factors could have only limited impact.[48]

Moving along to the mandate to engage at all stages of the technology cycle, from R and D to full deployment post technology transfer. Once again this seems eminently sensible. Some technology needs of less developed country may have 'off the shelf' solutions needing little or no modification, which can be provided by the private sector of other parties. Other challenges may have no immediate solution and require innovation of the highest level to meet desired technical performance criteria. The processes necessary to procure these are vastly different, with completely different risk management challenges, time scales and deliverables. As the response mechanisms of the CTCN appear to be a standard tender process or reaching out to the wider Network for solutions, it is not clear, especially in the light of their financial constraints, how well equipped they are to manage both the practical processes and risk across such a broad spectrum of engagement.

This leads conveniently to the third strand of the mandate – enhancing the bi-lateral or multilateral arrangements that will deliver the technological solutions. Whilst the Network has an increasingly large number of subscribers, the extent to which they are active was a matter of concern in the performance review. The UNFCCC Review noted that 'Interactions among Network members and the engagement of local stakeholders have been limited' and 'The CTCN

46 Intergovernmental Panel on Climate Change Special Report (n 12) Section 1.5.

47 K Sullivan, 'Technology Transfer Provisions in Multilateral Environmental Agreements: a Commercial Perspective' (2010) 22(6) *Environmental Law and Management* 290-295.

48 Review of the Climate Technology Centre and Network (n 21) 5.

experienced difficulties in engaging the private sector'.[49] Further, it was stated that 'While the CTCN managed to gather a sufficient number of diversified partners within its Network, it did not manage to create a real community. The majority of members are not active within the Network, providing no contribution to the KMS and no technical assistance' and 'Some Network members are dissatisfied with the commercial opportunities and networking activities provided by the CTCN. During the review, several interviewees questioned the sustainability of and value added by the Network if its level of engagement is not increased.'[50] This exemplifies the huge challenge faced by the CTCN in trying to provide a global service, on limited funding in the absence of a strategic framework that prioritises either territorial or technological focus. The importance of private sector engagement is discussed further below in Section 6. This review further identified that the role of the NDEs in developed countries has not been clear.[51] A lack of understanding of the role of developed countries in certain technology transfers was cited as a barrier by the aforementioned IPCC report on technology transfer nearly twenty years ago, which illustrates the necessity of integrating prior learning in this arena into practical operations.[52]

3.1 Concluding Remarks on Practicalities

The mandate for the Technology Mechanism and CTCN sets out three guiding principles of practical activity which in many ways appear to be unimpeachably sensible. Their combined effect, however, is to cast the CTCN in a role which is both passive and strategically unfocussed. They are to respond to an unlimited technological range of third party requests, across the full spectrum of development stages, and rely upon third party interactions across the global panoply of state and private sector actors to meet such needs. Couched in these terms, the mandate and resulting mission seems far less reasonable and even less achievable. A pertinent recommendation about the requirement for better focus was made by the DANIDA Review which stated that 'Currently, the CTCN provides support to all aspects of adaptation and mitigation, support for small as well as larger interventions: support for readiness activities as well as more focussed TA (Technical Assistance). This carries a high risk of diluting the interventions and makes it difficult to draw replicable lessons learned'.[53]

4 PRIORITIES

The overriding priority of any activities pursued under the auspices of the UNFCCC is clearly stated in Article 2 of that convention: 'The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.[54]

The logical progression of this mandate is that where interventions intended to reduce greenhouse gas production are limited by capacity or finance, then those with the greatest potential for mitigation should be prioritised. It is widely accepted that our climate is now at a point where such mitigation is a matter of utmost urgency.[55] As a result, it is now all the more important that scale of potential impact should be the prioritising factor in ranking possible interventions. However, in 2013 the Advisory Board of the CTCN set out guidance on how the organisation should prioritise which requests to support. Seven prioritisation criteria were

49 Report on the Evaluation of Proposals for Hosting the Climate Technology Centre (n 14) para 63,16.

50 ibid para 71, 18.

51 ibid para 88, 22.

52 Intergovernmental Panel on Climate Change Special Report (n 12) Section 1.5.

53 Review of the Climate Technology Centre and Network (n 21)18.

54 See 'United Nations Framework Convention on Climate Change' <https://unfccc.int/sites/default/files/conveng.pdf>.

55 'UK Government Declares Climate Change Emergency' *BBC News* (1 May 2019) <https://www.bbc.co.uk/news/uk-politics-48126677>, UNFCCC 25th Anniversary: Climate Action is More Urgent than Ever <https://unfccc.int/news/unfccc-25th-anniversary-climate-action-is-more-urgent-than-ever>.

set out, ranging from projects that 'promote endogenous and most appropriate technologies and processes' to those that 'promote and demonstrate gender equality, and empowerment of vulnerable groups, including women and youth'.[56] Whilst intrinsically admirable, neither of these criteria, or any of the others specified, explicitly prioritise the level of impact on GHG mitigation as a prioritising factor. Sullivan has previously noted the challenge UN agencies face in seeking to resolve the tension between equity in development and timely stabilisation of climate change, and this is evident once again in these prioritisation criteria.[57] Given that the level of project requests has been lower than expected, an argument could be made that the need for prioritisation on this basis is obviated to some extent. The failure in this line of reasoning is that is misses the broader point – the Technology Mechanism and the CTCN needs to maximise the important impact that technology transfer can make on addressing climate change. If there is a dearth of high impact requests coming forward, then perhaps there needs to be a strategic change in the operational model of the organisation, from passive/responsive to proactive, where territories, technologies or a mix of both, are prioritised by the CTCN. This is exactly the kind of focussed strategic approach adopted by the Medicines Patent Pool (MPP), a UN backed international organisation founded in 2010 'to increase access to, and facilitate the development of, life-saving medicines for low- and middle-income countries'.[58]

The sole strategic objective of the MPP at the outset of operations was 'Increasing access to HIV treatment through strategic use of intellectual property' driven by an unprecedented demand for HIV medicines.[59] Whilst the founding UN organisation, Unitaid,[60] had additional healthcare priorities of tackling Hepatitis C and tuberculosis, these were not adopted by MPP until it had established and embedded its operational model. Furthermore, even within this first clearly defined priority area, target drugs for licensing were divided into Levels 1-3 in terms of priority of acquisition, depending on a combination of their clinical priority and the scale of market/IP factors that would otherwise present barriers to acquisition by low and middle income countries.[61] As the name of the organisation suggests, this is not a straightforward purchasing model of intervention, but a model based on technology transfer, where IP rights are secured from patent holders and then on-licensed to generic manufacturers to increase lower cost availability of therapeutics in target recipient countries. This combination of strategic clarity and priority of acquisition has led to rapid interventions of substantial scale of impact. In the six years from January 2012 to December 2017, 6.2 billion doses of medicine were delivered via MPPs generic partners, and 553 million $US in savings were delivered to the international community via MPPs licenses.[62]

In many ways, this mirrors the 'Want, Find, Get, Manage' process of open innovation or technology acquisition utilised in the private sector by large industrial actors such as pharmaceutical or food companies.[63] This is widely acknowledged as a well road-tested and effective method of acquiring third party innovation for the benefit of the adopting company ie utilising technology transfer to fill unmet technical need to further the interests of the undertaking concerned. It works for industry, it clearly works for MPP and it has the potential to work more effectively for the CTCN. As things stand, the state parties are determining the 'Want' and CTCN is assisting with the 'Find and Get' on an ad hoc basis. The question has to be asked: If CTCN determined the 'Want' in the same was as the MPP, would it not offer the potential for far greater impact than responding to diverse ad hoc requests for technical

56 CTCN Prioritisation criteria for responding to requests from Developing Country Parties, September 2013 <https://www.ctc-n.org/sites/www.ctc-n.org/files/240bcf259a814482a6b0b3d0f73932a4.pdf>1-2.

57 K Sullivan, 'Technology Transfer and Climate Change: Additional Considerations for Implementation under the UNFCCC'(2011) 7(1) Law, Environment and Development Journal13.

58 See <https://medicinespatentpool.org/>.

59 MPP Annual Report 2010/11 <https://medicinespatentpool.org/uploads/2017/07/Medicines-Patent-Pool-Annual-Report-2010-2011-RevFinal.pdf> 6-7.

60 Unitaid is a global health initiative hosted by the World Health Organisation focussed on ending the world's tuberculosis, HIV/AIDS, Malaria and Hepatitis C epidemics.

61 ibid 24.

62 MPP Annual Report 2017 <https://annual-report-2017.medicinespatentpool.org/pdf/MPP_Annual_Report_2017_global.pdf> 4.

63 M G Martinez, 'The "Want Find Get Manage" (WFGM) Framework for Open-innovation Management and its Use by Mars, Incorporated' Open Innovation in the Food and Beverage Industry (2013) 315 – 331.

assistance? In support of this approach, one might suggest that the state parties have already iterated the demand side of the equation by the preparation of country specific Technology Needs Assessments. The UNFCCC has already undertaken the work of generating synthesis reports that very effectively collate the technology needs of a large group of non-Annex I parties to the UNFCCC (that is countries not considered to be industrialised and hence developing or low income states). By way of example, the third such synthesis report covering 31 non-Annex 1 countries was presented to the UNFCCC Subsidiary Body for Scientific and Technical advice back in 2013, and helpfully included the most commonly required areas of technological need for both mitigation and adaptation, as well as the most commonly stated barriers to technology transfer for each of these.[64] Whilst this would need to be updated and refined, it certainly provides a reasonable evidence base on which to make prioritisation assessments in respect of technology transfer to these countries. What may be far less comfortable for a UN agency, would be the prioritisation of assistance to states where the transferred technology would have the greatest scope for mitigation or adaptation, which, with respect to the former, would almost certainly be the larger developing countries. The DANIDA Review, suggests that due to the limited funding and consequent scope of support the CTCN can realistically provide, it should consider altering it's operating modality of operation to, amongst other options, 'focus on specific countries or sectors'.[65]

Prioritisation sceptics may still feel that comparisons to the private sector are inappropriate given the broader responsibilities of UN agencies, and that the MPP, whilst UN-founded, operates in the healthcare space which is fundamentally different in structure and objectives to the environmental sphere. To address those who may hold such perceptions, it may finally be useful to briefly consider technology transfer under the Montreal Protocol. The phasing out of ozone depleting substances to save the ozone layer from further damage and to allow it to recover, is widely held up as an outstanding environmental success story.[66] Commentators note that this success is in part attributable to the clearly defined nature of the technological challenge, namely a clear priority for technical intervention.[67]

4.1 Concluding Remarks on Prioritisation

Nothing in this section is intended to question the general utility of CTCN operations – only time and appropriate monitoring and evaluation will determine the added value of these activities to the international efforts to mitigate or adapt to climate change. What is questioned, however, is whether, on the basis of limited funding and human resource, the current operating model and resultant activities offer the greatest potential impact in these respective areas. China, India and Russia are respectively the first, third and fourth highest global producers of greenhouse gases.[68] According to its own progress report of CTCN performance thus far, there is no indication that it has provided any technical assistance to any of these countries even at the sub-national level, even though China and India are non-Annex I countries and the Russian Federation is an Annex I Economy in Transition.[69] Only just over 4 per cent of the 137 received requests are for multi-country activity[70] although the report explicitly recognises the benefits of scalability of impact via multi-country requests.[71] Under the current responsive model, the CTCN is largely unable to change these limitations, but if it

64 United Nations, Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention, FCCC/SBSTA/2013/INF.7 <https://unfccc.int/resource/docs/2013/sbsta/eng/inf07.pdf> 5-6.

65 Review of the Climate Technology Centre and Network (n 21) Review, 17.

66 Anderson, Sarma and Taddonio (n 2)XIX.

67 I Rae, 'Saving the Ozone Layer: Why the Montreal Protocol Worked' *The Conversation* (Australia, 9 September 2012) <https://theconversation.com/saving-the-ozone-layer-why-the-montreal-protocol-worked-9249>.

68 'Each Country's Share of CO2 Emissions', *Union of Concerned Scientists* <https://www.ucsusa.org/global-warming/science-and-impacts/science/each-countrys-share-of-co2.html>.

69 CTCN Progress Report (2018) https://www.ctc-n.org/files/resources/ctcn-ar18-book-final.pdf >50, 55 and 60.

70 ibid 68-69.

71 ibid 45. https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM/0e7cc25f3f9843ccb98399df4d47e219/174ad939936746b6bfad76e30a324e78.pdf.

were to take the approach of the MPP and prioritise technology development and acquisition, and states or regions for implementation, still driven of course by state determined Technology Needs Assessments, it could have far greater control over impact than is currently the case. The progress report already states that a key lesson learned to date is that the measurement and communication of impact is vital to the success of the CTCN.[72] Surely being in a position to more actively maximise that impact is also vital.

5 PATHWAYS

Technology transfers, both domestic and particularly international, are not transactions which are easily achieved. Perhaps this article should have articulated a sixth 'P' for 'Problems' in technology transfer, but to keep to more commonly used parlance, there are often many so-called 'barriers' to both the initial transfer, and it's sustainable adoption and wider diffusion. Many researchers and organisations, of which the UN and its agencies are at the forefront, have made tremendous progress in understanding the barriers to technology transfer, in particular in relation to climate change technologies.[73] [74] This understanding has translated into what is often referred to as 'capacity building' efforts, particularly in recipient territories, in order to reduce these perceived barriers. This addresses a very long list of factors, many of which are articulated well in documents already mentioned here, including availability of finance and skills, compatible infrastructure, technical performance requirements, policy issues such as inappropriate incentives for high carbon alternatives, legal framework and so on.[75] Elevating skills or other interventions in capacity building approaches seek to improve the 'innovation system' of human capital, financing, networks, and infrastructure, and the CTCN is making good progress on this front with respect to education and training provision in support of human capital development.[76] However, there is an additional complicating factor in play with respect to climate change technologies. Not only are innovation systems territorially specific, they are also industry sector specific and, in many instances, they are technology specific as well. Climate change technologies encompass the full breath of sectors; energy, transport, food and agriculture, transport, housing, waste management and health, and even within a single sector, such as forestry, innovation needs may range from improved forestry management practices to genetically modified trees, which may have completely different demands of the innovation system into which they are transferring. On this basis it is clear that the variety and combinations of barriers to the transfer of the full spectrum of climate related technologies is on a scale which can initially at least, appear overwhelming. In the absence of technological or territorial focus, the only reasonable approach is to seek to undertake generic capacity building measures – build skills at least in policy makers and provide information on technology and finance – which is exactly what the CTCN has done.[77]

Whilst this approach is undoubtedly useful, it may not significantly assist in removing barriers to the most impactful mitigation or adaptation related technologies in any specific territory. The only way to understand the barriers that may exist to the transfer of any particular innovation or technology, is to generate a transfer pathway, covering development to transfer stage in the donor territory, the transfer itself, then the modification (if any), adoption, diffusion and sustained establishment in the recipient territory, and examining the barriers or hurdles that may come into play at any point in that life cycle. Because individual transfer pathway mapping is not widely undertaken, barriers which may not be encountered until late in the life cycle are often overlooked with the result that the transfer fails or is never utilised. Sadly, some climate change technology transfers have fallen into this category, with failure to address cultural or regulatory barriers in the recipient country until lack of adoption makes such barriers self-evident.[78]

72 ibid 45.

73 J Boldt and others, 'Overcoming Barriers to the Transfer and Diffusion of Climate Technologies' (UNEP 2012).

74 Sullivan (n 47) 288-302.

75 Intergovernmental Panel on Climate Change Special Report (n 12) Section1.5 and (n 55) 15-34.

76 'Report on the Evaluation of Proposals for Hosting the Climate Technology Centre' (n 14) paras 12-13, 4.

77 ibid para 11.

78 Anderson, Sarma and Taddonio (n 2) 7-8 and 17.

If the information on barriers is available in the literature, perhaps the solution is to find better ways to visualise and interpret such information, not only to help practitioners and enablers to foresee obstacles in time to find ways over, or innovate a way round, but also to enable the user to make meaningful comparisons between different options. To those of us experienced in technology transfer, the term 'transfer pathway' makes the whole process sound too easy – quite literally like a walk in the park. In reality, it is far more like a steeple chase – a long process with numerous hurdles, some of which appear initially to be insurmountable. Using this analogy, this paper proposes a means of visualising the transfer pathway by visually mapping the number and scale of hurdles or barriers, and their proximity to the donor or recipient side of the transfer. The following diagram shows a representative transfer pathway for a generic adaptation technology. It shows the barriers identified in the third TNA Synthesis report for adaptation technology transfers; economic and financial; policy, legal and regulatory; institutional and organizational capacity; and technical.[79] The most commonly encountered barriers are shown to be higher to reflect this.

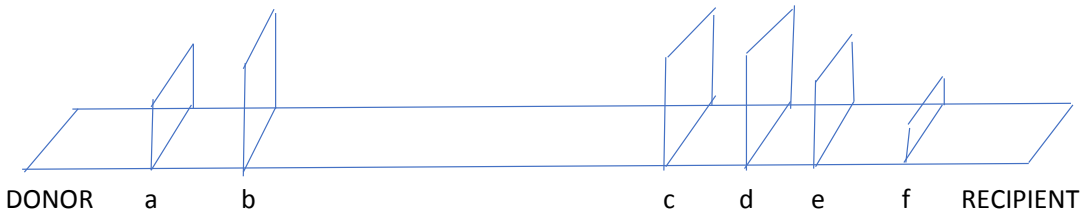

Fig. 1. The transfer pathway shows access to finance and technical issues as barriers for both supply and demand side actors (a and c and b and d respectively) whereas organisational capacity/infrastructure and legal issues (e and f respectively) as relevant to the recipient territory only.

This hypothetical example shows that barriers such as finance or technical standards issues can present a barrier on the supply as well as demand side and in some instances a domestic 'fix' to overcome the donor side barrier may be required in addition to an international community intervention on the recipient side of the transfer. If the supply side company is an SME, for example, they may be unable to accept the financial risk of slow or non-payment and need a domestic government indemnification such as the Export Loan Guarantee Scheme run in the UK to overcome that barrier. Alternatively, they may need investment to scale up to meet increased demand. This is a completely different type of financial barrier and solution to that experienced on the demand side of the equation where financial support from the international community may be required to offset costs of acquisition in whole or in part. Once again, the IPCC report nearly two decades ago, was explicit on the fact that supply side barriers in developed countries should not be overlooked and were particularly relevant to SMEs.[80] Even on such a very simplistic level, this visualisation approach makes the appreciation of the number, scale and the effective 'ownership' of barriers far easier to grasp. Whilst the Technology Needs synthesis report quite rightly suggests a barrier analysis for each technology, with identification of 'enablers' for each, within each country, the implication is that barriers are all demand side based.[81] As noted above, this is not necessarily true, and it is important that at the domestic level in technology supply side countries, an assessment is made of barriers to technology transfer and appropriate policies or interventions implemented to reduce or obviate these. This would appear to be a natural role for the NDEs.

If this approach may have utility for demonstration purposes, is that necessarily transferable to real world transfers? As previously mentioned, technology transfer under the Montreal Protocol to reduce levels of ozone depleting substances (ODS's) was a remarkably successful example of environmental technology transfer, and it provides very helpful demonstrators of the potential utility of this type of visualisation. It demonstrates that the first wave of

79 FCCC/SBSTA/2013/INF.7 (n 64) para 12,6.

80 Intergovernmental Panel on Climate Change Special Report (n 12) Section 1.5.

81 FCCC/SBSTA/2013/INF.7 (n 64) Table 1,5.

innovation and technology transfer occurred within developed countries, with uncertainty about regulatory and private sector (eg insurance industry) standards being a principal barrier along with securing appropriate technological performance of alternatives.[82] This can be illustrated by the following pathway profile.

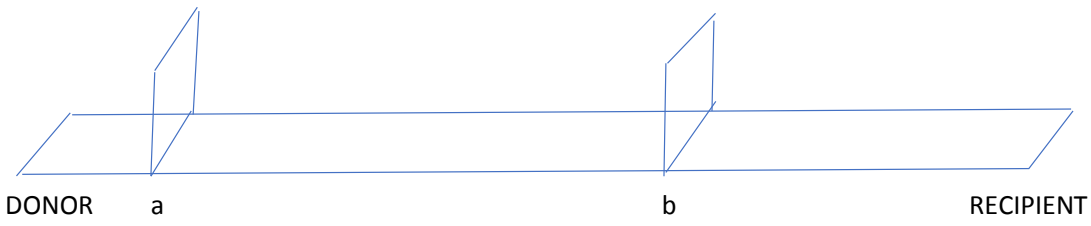

Fig 2a. This illustrates the early principal barriers to transfer. Despite involvement of the US Military research infrastructure, as well as global public and private sector research, the technical barriers were challenging (a) and massive international efforts were needed to identify replacement compounds for ODSs. Even when such compounds were developed, a significant barrier to their adoption was that of regulatory standards lagging behind, so that the use of the new compounds was not reflected in legal standards required of manufacturers (b).

Subsequent transfer of ODS alternatives to countries with economies in transition (CEIT's) identified a completely different profile of barriers. Analysis of over a thousand completed technology transfers under the Montreal Protocol revealed that barriers to technology transfer in CEITs were experienced in a number of categories.[83] Even though these barriers are not ranked, when visualised below, it becomes instantly clear that the transfer process is completely different at this stage.

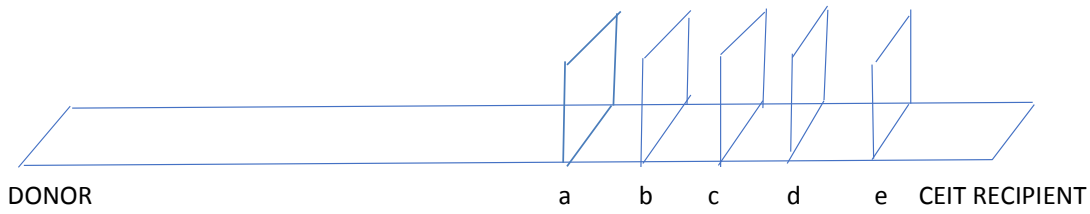

Fig 2b. This shows the transfer pathway for exactly the same technology, but at this stage of the process, the profile is completely different with multiple barriers experienced on the demand side including poor infrastructure and utilities (a) poor regulatory standards and implementation (b), skills shortage (c), weak supporting industry, for example, components production (d) cumbersome financing and high cost of agreements (e).

This emphasises the need to examine the whole life cycle of innovation development, transfer and diffusion to ensure that the most appropriate technological solutions flow as effectively as possible to their required point of use.

5.1 Concluding Remarks on Transfer Pathway Analysis

There are two basic points to be made on this topic. The first is that each innovation and transfer pathway is highly individual, potentially with multiple transfers occurring between different public and private sector actors as well as different territories, possibly in differing stages of development. Each of those transfer stages may face very different profiles of potential barriers, and the better they are understood, the greater the chance of adopting strategies to

82 Anderson, Sarma and Taddonio (n 2) 45.
83 ibid 257.

overcome or circumvent them and achieve efficient and successful transfers. Transfer pathway mapping to identify and quantify those barriers, particularly with tools to assist visualisation of what is often a complex process can only help enablers and policy makers to apply their interventions more effectively. It may also assist in making comparisons regarding the potential ease of transfer of competing options. This leads appropriately into the second point, which is that things are not always as difficult as they look. The same article that identified the numerous observed barriers to transfer of ODS technology to CEITs above, stated that 'It should be noted that many projects were executed without problems, and this study relates only to the projects that mentioned specific problems in their completion reports'.[84] The fact that each transfer is individual, does not mean that many elements of challenge are without parallel, and transferability of learning is still hugely important. Research into the 'without a hitch' projects should progress in parallel with the considerable efforts made to understand the barriers and ways to address them, in those transfers that progress less effectively. Additionally, such research should not overlook the supply side barriers which may be addressed at domestic level to stimulate the willingness and ability to engage in international technology transfer.

6 PRIVATE SECTOR

Sullivan has previously highlighted the disconnect between the facts that whilst states are the signatories to multilateral environmental agreements such as the UNFCCC, and hence the actors making the commitments to technology transfers, the majority of technologies are owned or controlled by the private sector.[85] As such, the role of organisations such as the CTCN must be to actively engage the private sector and the role of the state parties whose private sectors will act as technology donors is to implement policies or public sector support which will incentivise companies to give effect to their technology transfer commitments. There is a long history of such interventions; early regulatory approaches were criticised for having the opposite of the intended effect and actually inhibiting technology transfers and so were replaced by market-based approaches.[86] Whilst this is showing more promising results for some technologies, the OECD has concerns that it may not be a broadly advantageous approach in the field of environmentally sustainable technologies as the latter is aimed at delivering environmental impact rather than fulfilling an unmet market demand – essentially delivering a public good, albeit a much needed one. Their view is therefore that public funding may be essential in stimulating the necessary research and development and subsequent transfers by the private sector.[87] The result is that whilst it is accepted that the private sector is key to delivering climate technology transfers, there is still debate about how to do this most effectively which makes it an even greater challenge for entities such as the CTCN.

The UNFCCC Review stated that 'The private sector appears as a critical partner for the CTCN with regards to developing an enabling environment for climate technology development and transfer and in particular with regards to enabling the scaling up of climate technologies'.[88] It went on to express concern, however, that whilst the CTC had attracted a number of private sector members to the network (some 40 per cent of membership at that time), the feedback from those interviewed was that there had been insufficient engagement with the private sector or industry involvement in the operations and activities of the CTCN.[89] The DANIDA Review was even harsher in it's criticism on this point. It not only rated the level of private sector involvement as 'currently weak' but also raised the issue of the need to address the different roles of the private sector as 'technology provider, technology user, investor and possibly potential funder of climate technology transfer solutions'.[90] They went on to say that whilst there was significant focus on the role of the NDE's, they

84 ibid.
85 Sullivan (n 57) 14-15.
86 Anderson, Sarma and Taddonio (n 2) 8-9.
87 ibid.
88 FCCC/CP/2017/3 (n 16)para 29, 50.
89 ibid para 29, 51
90 Review of the Climate Technology Centre and Network (n 21) iii.

may not have sufficient technical knowledge or landscape awareness to ensure a successful outcome, whereas the project owner should have such capability and should be a the centre of technology transfer programmes.[91] In many instances the project owner will be from the private sector, as the owner or controller of the technology to be transferred, or as the primary recipient.

This issue is further complicated by the long-standing debate around whether conventional technology transfer from foreign companies to developing countries is an appropriate or successful approach. Ockwell et al propose that 'Building up eco-innovation capabilities in developing countries requires a shift away from the current focus on large project based approaches which emphasise the transfer of the hardware aspects of clean technologies, towards approaches that emphasise flows of codified knowledge (know-how and know-why) and tacit knowledge'.[92] This sits uncomfortably with the findings of earlier empirical studies which identify trade and foreign direct investment (FDI) as primary routes of international technology diffusion.[93] More recent work by Pueyo and Linares used quantitative analysis to generate helpful insights into this topic and demonstrated that when it comes to renewable technology transfer to developing countries, one size does not fit all.[94] Analysis of a number of enabling factors amongst technology recipient countries identified four groupings or categories of country:

- Technology Developers
  Countries such as India, China, Mexico, Brazil and Thailand that are able to attract inward transfers of foreign technology, operate and maintain the equipment and use the knowledge gained to drive endogeneous innovation

- Technology Implementers
  Countries such as Jordan, Tunisia, Panama and Lebanon that are small economies with low levels of fossil fuel production so that demand side pull is strong. However, the lack of scale hampers the 'learning by doing' driver of internal innovation, although the relatively high income per capita still drives foreign transfers of clean technologies which the domestic industry base is capable of implementing

- Structural Changes
  Large countries such as Russia, Algeria, Egypt and Oman with abundant domestic fossil fuel supplies, need structural changes to elevate the demand side pull for clean technologies over cheap domestic carbon based fuels. Additionally, their economies do not provide conducive environments for private investment.

- Aid Recipients
  Countries such as Bangladesh, Honduras, Kenya and Madagascar need foreign aid to create the basic conditions for successful technology transfers. This group lacks the technological capacity to implement foreign technologies or to develop their own. Some countries in this group show scarcity-induced innovation within local communities, however, which needs to be nurtured at grassroots level.

This analysis goes a long way towards resolving the apparent discord between the proponents of widely different roles for the private sector in giving effect to technology transfers to developing countries and shows there is not 'right or wrong', but simply 'horses for courses'. This piece of research also provides a stark demonstration of the very different capacity building measures and public policy interventions needed to support and incentivise technology transfer in each category of recipient country.[95] There is recognition

91 ibid

92 D Ockwell and others, 'Enhancing Developing Country Access to Eco-Innovation: the Case of Technology Transfer and Climate Change in a Post-2012 Policy Framework' (2010) OECD Environmental Paper 12 <https://www.oecd-ilibrary.org/docserver/5kmfplm8xxf5-en.pdf?expires=1563286736&id=id&accname=guest&checksum=BF5B4CA1921FB34384524225A0B87F51>.

93 W Keller, 'International Technology Diffusion' (2004) 42(3) J Economic Literature 752-782.

94 A Pueyo and P Linares, 'Renewable Technology Transfer to Developing Countries: One Size Does Not Fit All' (2012) Institute of Development Studies Working Paper 412. https://www.ids.ac.uk/publications/renewable-technology-transfer-to-developing-countries-one-size-does-not-fit-all/.

95 ibid 25-27.

that some countries in the Structural Change and Aid Recipient groups do not provide environments that inspire confidence in the private sector: that the increased levels of risk act as a supply side barrier to FDI for example. Sullivan has previously recommended the use of the insurance asset by technology transfer donor side countries as a possible policy intervention to underwrite risks such as political instability or IPR abuse in the recipient country, in order to incentivise domestic industry to give effect to international technology transfer commitments.[96] This point has been touched on by Pueyo and Linares with respect to the private sector need to rely on long term stability of regulatory environment in technology recipient countries. Specifically, they suggest that guarantees by international insurance entities could provide comfort in respect of commercial reliance on things like long term power purchase agreements.[97]

6.1 Concluding Remarks on the Private Sector

There is a clear evidence from both reviews of CTCN performance and from the broader literature on International technology transfer, that there needs to be greater private sector engagement in the operation of the CTCN and particularly in giving effect to the technology transfers of scale required to make a meaningful impact on climate change mitigation and adaptation. As mentioned previously, incentivising such private sector engagement and mitigating any associated business risks, will require supply and demand side public policy interventions and demand side capacity building measures which are both technology specific and target country specific. This re-enforces previous calls for a greater degree of prioritisation of both technologies and recipient countries.

7 CONCLUDING REMARKS

Evidence indicates that despite the usual challenges of any start-up undertaking, significant organisational complexity and limited financing, the CTCN has made demonstrable progress in implementing its mandate as the operational arm of the Technology Mechanism of the UNFCCC. Those individuals and organisations behind this progress should be heartened by the outcomes of their combined efforts, the positive aspects of which have been recognised in several reviews, in addition to the UNFCCC review referenced most widely in this paper. These reviews have also delivered a series of recommendations for improving the efficiency and effectiveness of future operations and these are helpfully summarised and responded to by the CTCN in a single document.[98] The ten recommendations include the standard fare for such reviews; the need for improved awareness raising of CTCN activities and NDE function, enhanced governance and transparency, strengthening Network engagement and of course, several relate to various aspects of the financing and the need to identify additional sources of secure financial support. Of particular relevance to this article is the need to increase the efficiency of the CTCN's provision of Technical Assistance (Recommendation 6). In responding to this point, the CTCN indicate adoption of a regional approach to deliver higher impact, and the adoption of 'priority themes' allowing replication among countries with common needs. Whilst this approach still falls short of the active strategic priority/ procurement model advocated in this paper, it could certainly be viewed as movement in that direction.

An examination of the mandate of the CTCN and the practicalities this imposes on the operations of the organisation, has revealed that it was structured in such a way as to inevitably cast the organisation in a purely responsive mode in terms of its technical assistance role. There is evidence above of a recognition of the need for greater impact and efficiency in this aspect of operations and perhaps it is time to review the mandate accordingly. The practice of open innovation in industry, and the operating model of the Medicines Patent Pool, a UN founded international organisation, both point to a 'want, find, get, manage' active procurement model. Whilst the 'want' is initially specified in state parties Technology Needs Assessment and associated action plans, there could be a role for

96 Sullivan (n 47) 300.

97 Pueyo and Linares (n 94) 28.

98 CTCN Response to Review Recommendations October 2018 < https://www.ctc-n.org/sites/www.ctc-n.org/files/item_7_-_ctcn_response_to_recommendations.pdf>.

the CTCN in identifying commonly required, high impact technologies and the best practicable option for meeting identified needs. The 'best practicable option' approach can assess all relevant categories of risk as well as value for money considerations. Such prioritisation of a small number of technologies would allow far greater evaluation of the technology transfer pathway for high priority recipient states, ensuring that specific barriers can be identified and addressed via targeted capacity building measures. This is essential if the barriers to large scale private sector engagement are to be addressed. Such focus also allows the bandwidth to apply the extensive knowledge and previous experience of the UN agencies and their partners with respect to technology transfer, to more projects of scale.

The knowledge of barriers to technology transfer, both generically and in respect of specific technologies is extensive but challenging to apply anew with every technology transfer attempted. Tools to visualise the barriers, in terms of their number, nature and proximity to supplier or recipient is a potentially useful approach to ensuring that these matters are meaningfully and timeously considered. Software tools to generate such pathway schematics could easily be constructed to suggest barrier options relevant to specific technology sectors, as well as being underpinned by a database that would suggest enablers or mechanisms via which they have been historically and successfully addressed. Even the very basic schematics illustrated in this article serve as a useful reminder that barriers are not always on the demand side and a useful role for developed country NDEs could be ensuring that where they are acting as the supply side of technology transfers, all domestic endeavours have been made to ensure that any such barriers are addressed by national policies or public sector interventions where necessary.

Whilst this paper advocates consideration of a change in strategic focus and operating mandate, it will inevitably be hampered by limiting funding, if that issue remains unresolved. However, if the centrality of technology transfer to addressing climate change mitigation and adaptation is better acknowledged by the international community and a more appropriate level of secure funding is achieved, there is no reason why a strategic focus on CTCN led technology acquisitions cannot operate alongside the generic, responsive activities undertaken to date, thereby ensuring the widest impact of both approaches. There is a time pressure to achieve this, however, not simply due to the pressing nature of addressing climate change, but due to the fact that the limited scale of operations and potential impact to date is clearly causing concern: Rimmer reported that in response to such perceived limitations 'there has been consideration of alternative mechanisms for technology transfer'. He further stated that despite declarations at the Bonn Climate Conference in 2017 aimed at enhancing technology development and transfer via the Technology Mechanism, developing countries remained unsatisfied that this matter was appropriately resolved.[99] Urgent progress is therefore needed on reviewing the mandate and associated practicalities of operation of the CTCN, allowing prioritisation of technologies and target countries for technology transfers. This will allow for greater focus on the transfer pathways for the chosen technologies, and more targeted capacity building or policy interventions to incentivise more wholesale engagement of the private sector. Addressing the 5 'P's' will increase the potential for the CTCN to make a greater contribution to the global technological response to climate change mitigation and adaptation, but only continued monitoring and evaluation will determine whether this entity occupies nothing more than a niche role in climate technology transfer or evolves to be at the forefront of international transfer and adoption of the technological responses to climate change.

99 Rimmer (n 42) 9.

Article

LITHIUM-ION BATTERIES: HOW TO IMPROVE DUE DILIGENCE GUIDELINES TO ENSURE THE ENVIRONMENTAL HEALTH OF ARTISANAL COBALT MINING COMMUNITIES IN THE DEMOCRATIC REPUBLIC OF CONGO

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INTRODUCTION

On 10 September 2018, California passed Senate Bill 100, which declares that the Public Utilities Commission, State Energy Resources Conservation and Development Commission, and State Air Resources Board should plan for 100 per cent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by 31 December 2045.[1] The bill also establishes the policy that eligible renewable energy resources and zero-carbon resources will supply 100 per cent of all retail sales of electricity to California end-use customers and 100 per cent of electricity procured to serve all state agencies by 31 December 2045 without increasing carbon emissions elsewhere in the western grid.[2] The bill requires the Public Utilities Commission and Energy Commission, in consultation with the State Air Resources Board, to take steps to ensure the transition to a zero-carbon electric system for the State of California.[3] This will require incorporation of energy storage mechanisms for renewable energy into the grid, most likely from batteries.

In conjunction with these policy goals, California seeks to dramatically reduce carbon emissions from transportation.[4] This sector accounts for 50 per cent of the state's greenhouse gas emissions, and 80 per cent of smog-forming pollutants.[5] In January 2018, Governor Jerry Brown issued an executive order calling for a new target of at least five million Zero Emission Vehicles (ZEVs) in California by 2030 to reduce these pollutants.[6]

Similarly, other governments around the world are also looking to phase out petroleum and diesel.[7] The UK announced plans in July 2017 to phase out sales of new petrol and diesel cars by 2040, while the EU tightened its carbon dioxide limits, thus incentivizing shifts to electric vehicles.[8] Similarly, India plans to replace its entire car fleet with electric models by 2030, and China now offers subsidies to consumers of ZEVs, as well as a reward system for manufacturers.[9]

Resultantly, the market for ZEVs is exploding, which, in addition to government initiatives, is due in part to the increasing power and reliability of ZEV batteries.[10] Lithium-ion batteries carry four to seven times the voltage of traditional rechargeable batteries, and some scientists estimate that future 'lithium-air' batteries may be able to produce enough power to rival petroleum.[11] Lithium batteries are expected to make up the vast majority of the total rechargeable battery market by 2025, both within the ZEV and renewable energy storage sectors.[12] Although there are a few promising new alternatives to these types of batteries, there are not yet any viable alternatives to this powerful battery.[13] Subsequently, lithium-ion batteries are the batteries of choice for General Motors, Honda, Tesla, BMW, Ford, BYD and Nissan.[14] Tesla alone is expected to produce 35 GWh worth of batteries in 2018, which is equivalent to the entire world production in 2013.[15]

The major parts of these batteries consist of several types of metals. As the demand for these metals

1 California Senate Bill 100 2018, s 1(b) https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100.
2 California Senate Bill 100 2018, s 5; California Public Utilities Code, s 454.53(a) https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100.
3 ibid.
4 Office of Governor Edmund Brown Jr., 'Governor Brown Takes Action to Increase Zero-Emission Vehicles, Fund New Climate Investments' (Gov.ca.gov, Jan. 28, 2018) https://www.ca.gov/archive/gov39/2018/01/26/governor-brown-takes-action-to-increase-zero-emission-vehicles-fund-new-climate-investments/index.html.
5 ibid.
6 ibid.
7 Anthony King, 'Battery Builders Get the Cobalt Blues' (*Chemistry World*, 12 March 2018) https://www.chemistryworld.com/news/battery-builders-get-the-cobalt-blues/3008738.article.
8 ibid.
9 ibid.
10 Fred Lambert, 'Breakdown of Raw Materials in Tesla's Batteries and Possible Bottlenecks' (*Electrek*, 1 November 2016) https://electrek.co/2016/11/01/breakdown-raw-materials-tesla-batteries-possible-bottleneck/.
11 Andrew W Eichner, 'More Precious than Gold: Limited Access to Rare Elements and Implications for Clean Energy in the United States' (2012) U. Ill. J.L. Tech. & Pol'y 257, 264.
12 Lambert (n 10).
13 'New Battery Technology: Alternatives to Lithium Batteries' (*Sustaining Our World*, 25 January 2018) https://sustainingourworld.com/2018/01/25/new-battery-technology-alternatives-lithium-batteries/.
14 Lambert (n 10).
15 ibid.

increases due to policy shifts toward rechargeable batteries and renewable energy technologies, their prices will increase.[16] However, deposits of these metals are located in a small number of countries around the world.[17] The most expensive of these elements is cobalt, which is currently priced at $27,000 per tonne.[18] Currently, 65 per cent of this cobalt comes from the Democratic Republic of Congo (DRC), a country with a complicated history of corruption and political instability.[19] Many artisanal, or small-scale, cobalt mines in the DRC are linked to human rights abuses, including child slave labor, and environmental destruction.[20] However, as of February 2016, no country legally requires companies to publicly report on their cobalt supply chains.[21] Though regulations exist regarding other 'conflict minerals', such as diamonds, gold, tungsten, and tin, no legislation exists specifically addressing other minerals, including cobalt.[22]

Some scholars have suggested that this issue must be addressed through existing human rights infrastructure, and that soft law, or law without legally binding force, may alone be insufficient.[23] Although these binding international law frameworks may help to address the consequences of these mines pertaining to human rights and labor law violations, they are reactive rather than preventative, and do not account for environmental destruction. Currently, the most directly relevant international laws are those concerning due diligence, which companies adhere to when trading in minerals from conflict zones, such as cobalt from the DRC.[24] Due diligence, similarly to corporate social responsibility, is a soft law mechanism that companies, rather than national governments adhere to when doing business in the mining industry, which seek to prevent any adverse effects of mining at their source.

Accordingly, this paper focuses on improving these preventative soft law mechanisms for mining companies, as well as suggests hard law enforcement solutions to ensure that they effectively prevent adverse effects on the planet and people. As a solution, it proposes the addition of more specific language to the current UN and OECD due diligence guidelines. As stricter enforcement mechanisms, this paper also proposes that nations adhering to due diligence guidelines enact complimentary national legislation, such as the US Dodd Franck Act, as well as that they form and follow an international certification scheme modeled after the Kimberly Blood Diamond certification. To account for the health of both the environments and communities situated in and around artisanal mines for elements such as cobalt, minerals trade laws must expand the definition of 'conflict minerals' to include any minerals the mining of which causes adverse effects on the environment and health of populations working and living in and around mines, including low-conflict and non-conflict zones. Moreover, 'effects' must include environmental pollution and destruction, along with any other adverse health effects of mining activities. The addition of these criteria into due diligence frameworks, as well as expansion of the definition of conflict minerals, is vitally important to guarantee the health of miners for lithium-ion battery supplies as the world transitions into a new age of electric cars and energy storage, with the ultimate goal of simultaneously protecting human rights while reducing greenhouse gas emissions.

In addressing this issue, this paper will explore where international environmental law falls short in ensuring the health and sustainability of artisanal mining communities in the DRC. Part I will look at current due diligence guidelines of the OECD and the UN, and offer suggestions for incorporating language directed at reducing the environmental health risks of the mines for miners and surrounding populations. Part II will examine the Kimberly Blood Diamond Certification solution as an example of an internationally recognized system seeking to reduce and trace conflict minerals, and address how such a

16 ibid.
17 Eichner (n 11) 264.
18 Lambert (n 10); $81,000 per metric tonne. King (n 7).
19 Lambert (n 10).
20 ibid.
21 John M Jacob, 'Amnesty International Wants Cobalt Included in Conflict Minerals Disclosure' (2016) 11(3) Corp. Governance Guide 411912 (C.C.H.), WL 41191232.
22 OECD, 'OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Third Edition' (OECD Publishing, Paris, 2016) http://dx.doi.org/10.1787/9789264252479-en.
23 John Burchill, 'Out of the Heart of Darkness: A New Regime for Controlling Resource Extraction in the Congo' (2010) 10 Asper Rev. Int'l Bus. & Trade L. 99, 119; Josep F Mària SJ & Miho Taka, 'The Human Rights of Artisanal Miners in the DRC' (2012) 3(1) African Journal of Economic and Management Studies 137, 138.
24 OECD (n 22) 3.

system could help ensure the sustainability of cobalt supply lines. Finally, Part III will explore how national legislation such as the Dodd Frank Act, which is directed at reducing the amount of conflict minerals imported into the United States, can serve as an example for other nations to create similar legislation that addresses the rights of miners in low-conflict areas, as well as environmental destruction and pollution.

1 PART I: ROLE OF MINING COMPANIES: OECD DUE DILIGENCE GUIDANCE AND UN DUE DILIGENCE GUIDELINES

1.1 DRC Cobalt in Lithium-ion Batteries

Lithium-ion batteries have three major parts: the anode, cathode, and electrolyte.[25] Many different types of element formulations comprise the cathodes of lithium batteries, all of which contain various combinations of cobalt, nickel, manganese, and aluminum.[26] Over 40 per cent of cobalt is used to make rechargeable batteries, and this is expected to increase to 55 per cent by 2019.[27] Currently, total world cobalt production is around 100,000 tonnes annually, around 48,000 tonnes of which go to the battery industry.[28] By 2025, the battery industry alone will need about 127,000 tonnes of cobalt.[29] Although ZEVs use a lesser percentage of cobalt in their battery cathodes than smartphones and laptops, they still necessitate 1000x more of this metal per battery, requiring between 10-20 kg (22-44 pounds) rather than 10-20 g of cobalt.[30] In order to meet its goal of 5 million ZEVs on the road, California alone will require as much as 100 million kg (around 220.4 million pounds) of cobalt by 2030, 65 per cent of which will likely come from mines in the DRC.[31] [32]

Approximately one fifth of the cobalt mined in the DRC is extracted by hand by artisanal miners, known locally as 'cresseurs'.[33] Within thousands of unofficial, unregulated, unmonitored mines in the southeast Katanga region of the DRC, men, women and children work in slave conditions.[34] In 2012, UNICEF estimated that 40,000 children as young as seven work in artisanal mines across the DRC, many of them carrying loads of cobalt in intense heat.[35]

Cobalt exposure presents a variety of health risks, including damage to the heart, thyroid, lungs, and skin.[36] Although the World Health Organization reported that exposure to cobalt and breathing in its dust fumes can cause these long-term health problems, none of the cresseurs wear gloves or masks.[37] This causes health effects ranging from tumors to mysterious infections, metabolic and respiratory problems, burning sensations in eyes and throat, tumors, genetic deformations, and sterility.[38]

25 Lambert (n 10).

26 The Tesla model S uses a nickel, cobalt, aluminum combination, comprised of 15 per cent cobalt, 5 per cent aluminum, and 80 per cent nickel, while, comparatively, the Tesla Powerwall uses 33.3 per cent cobalt, nickel, and aluminum. In contrast, an Apple iPhone uses a cathode comprised 100 per cent of cobalt, and the Nissan Leaf uses a cathode that is 100 per cent manganese. ibid.

27 ibid.

28 ibid.

29 ibid.

30 King (n 7).

31 Lambert (n 10).

32 This is also equivalent to 100,000 metric tons, 14,285 elephants, 500 blue whales.

33 Alex Crawford, 'Meet Dorsen, 8, Who Mines Cobalt to Make Your Smartphone Work' *Sky News* (28 February 2017) https://news.sky.com/story/meet-dorsen-8-who-mines-cobalt-to-make-your-smartphone-work-10784120.

34 ibid.

35 Artisanal Cobalt Mining in the Democratic Republic of the Congo. Escri. https://www.arcgis.com/apps/MapJournal/index.html?appid=847b1b69cbee471ea75aa06ce5d6c90b.

36 ibid 751.

37 Crawford (n 33).

38 ibid; Jeune Afrique, 'RD Congo : la pollution minière à Lubumbashi en pleine lumière' *Jeune Afrique* (12 August 2016) https://www.jeuneafrique.com/348793/societe/rd-congo-pollution-miniere-a-lubumbashi-pleine-lumiere/.

Furthermore, studies have confirmed that increased concentration of cobalt in the body directly correlates to proximity to cobalt mines.[39]

One of the greatest sources of exposure for these populations is waterways.[40] Though forbidden by the Congolese mining code, cresseurs frequently rinse minerals in streams or rivers, effectively amplifying the cobalt exposure of local populations.[41] Because these streams are often the only source of water for local communities, people have no choice but to drink contaminated water.[42] Some mining companies attempted to build wells to provide residents with a clean water source, but locals report that the quality is often not good, and the wells are not well-maintained.[43] Not only does artisanal mining affect the miners themselves, but it also degrades riparian zones, and creates heavy erosion and water pollution.[44] The erosion often leads to the collapse of houses and the mines themselves.[45] Thus, artisanal mining directly contributes to the deterioration of health of the river systems, wildlife, and people.

Informal and artisanal mining in the eastern Katanga region[46] increased considerably after the two armed conflicts that occurred in the DRC between 1996 and 2002.[47] Starting in 2002, foreign mining companies began exploring, exploiting, and processing the trade of cobalt and copper in this province.[48] Some mining companies own the sites directly, and some merely have processing plants.[49] The former frequently relocate citizens working or living near the site or the plant, often triggering mass protests and violent exchanges,[50] and the latter merely buy the ore extracted by artisanal miners.[51] The companies without sites operate in three basic models: (1) private companies buy ore from artisans, often seeking a monopoly of the ore in question, in exchange lending food and money to the artisans, and restricting the capacity of the artisans to sell ore at higher prices; (2) companies with storage capacities in their own plant negotiate with traders who then negotiate with artisans, normally involving an agent from the company and an agent from the trader, who normally accept lower prices to avoid transporting to a new facility; (3) partnerships between a company and an artisanal co-op for the exploration of a site, normally during which the company uses its technology to explore the site, and the co-op then sells the ore exclusively to the company.[52] In the latter of these models, political parties and gangs control the

39 A Belgian study conducted in the Katanga region compared the concentrations of cobalt in urine samples of people from between 3-10 kilometers away from mining sites to a control group of people 400 km from mining centers, along with the typical concentrations of this element within the United States, EU nations, and Japan. The results showed that 11 per cent and 53 per cent of the subjects residing moderately close and very close to pollution sites exceeded the occupational limit value, with 87 per cent of children in areas closest to mining and smelting sites containing cobalt levels exceeding the occupational limit. The study concluded that the single most important factor determining the variability in urinary excretion of metals was area of residence. Célestin Lubaba Nkulu Banza and others, 'High Human Exposure to Cobalt and Other Metals in Katanga, a Mining Area of the Democratic Republic of Congo' [2009] Environmental Research 109, 745, 747-50.

40 ibid 750.

41 Christophe De Brouwer and Myriam M Elenge, 'Identification of Hazards in the Workplaces of Artisanal Mining in Katanga' (2011) 24(1) International Journal of Occupational Medicine and Environmental Health 57, 61.

42 Andreìs Zaragoza Montejano, 'In Search of Clean Water: Human Rights and the Mining Industry in Katanga, DRC' (Waterlex, IPIS, November 2013) < https://reliefweb.int/sites/reliefweb.int/files/resources/In%20search%20of%20clean%20water%20-%20Katanga%20DRC.pdf> 3.

43 ACIDH, Unheard Voices: Mining Activities in the Katanga Province and the Impact on Local Communities (Centre for Research on Multinational Corporations, November 2011) https://www.somo.nl/wp-content/uploads/2011/12/Unheard-Voices.pdf.

44 'Artisanal Cobalt Mining in the Democratic Republic of the Congo' (Escri. 2018) https://www.arcgis.com/apps/MapJournal/index.html?appid=847b1b69cbee471ea75aa06ce5d6c90b.

45 ibid.

46 It is important to note that in 2015 this province was divided into four separate provinces: Tanganyika, Haut-Lomami, Lualaba and Haut-Katanga. Many works of literature still refer to this region the single Katanga Province. For the purposes of this paper, I will be referring to these provinces, and the region collectively, as the Katanga region.

47 Mària and Taka (n 23) 144.

48 ibid.

49 Mària and Taka (n 23) 145.

50 In October 2004, there was a massacre of 28 individuals, both rebels and civilians, by the Congolese army near the site of Dikulushi, owned by Anvil Mining. During this conflict, Anvil's cars and planes transported Congolese soldiers, who were later accused of war crimes. ibid 145.

51 ibid.

52 ibid 146.

co-ops, often without the artisans' best interest in mind.[53]

Despite the fact that artisanal mining raises serious challenges to the workers' human rights, the environment, and the greater population of mining sectors, this industry is vitally important to the livelihood of countless individuals in the DRC. [54] It is estimated that cresseurs constitute the largest segment of the DRC mining sector, with between 500,000 to two million workers, and, with an average of 4-5 dependents for each artisan, the number of people dependent on this activity is roughly 8-10 million.[55] Thus, it is essential that this sector continue to provide vital employment opportunities for these DRC citizens without putting their health and safety at risk.

1.2 International Due Diligence Standards: OECD Due Diligence Guidance

The most widely accepted international standards used by mining companies are based on the concept of due diligence. The first standard is a non-binding OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD Guidance), which recommend that OCED Members and non-Member adherents actively promote the observance and integration into corporate management systems of the OECD Guidance by companies in the mineral supply chain that supply or use minerals sourced from conflict-affected or high risk areas.[56] Its ultimate goals are to help companies respect human rights and avoid contributing to conflict through their mineral sourcing practices, to cultivate transparency and sustainable corporate engagement,[57] and to serve as a common reference for all suppliers and other stakeholders in the mineral supply chain.[58] The United Nations Security Council supports these recommendations.[59]

The Due Diligence Guidance defines 'conflict-affected and high-risk areas' to include 'the presence of armed conflict, widespread violence or other risks of harm to people', and areas of political instability or repression with widespread human rights abuses and violations of national or international law.[60] The guidance defines due diligence as 'an on-going, proactive and reactive process through which companies can ensure that they respect human rights and do not contribute to conflict'.[61] Specifically, risk-based due diligence refers to the steps companies should take to identify and address 'actual or potential risks' in order to prevent or mitigate adverse impacts associated with their activities or sourcing decisions.[62] These risks encompass the adverse impacts of a company's operations, such as harm to people, reputational damage, or legal liability, that result from its own activities or its relationships with third parties, including suppliers and other entities in the supply chain.[63] [64]

Regarding sourcing, the model policy states that the company will neither tolerate, nor profit from, contribute to, assist with or facilitate the commission by any party of any forms of human rights abuses, forced or child labor, or crimes against humanity.[65] It also states that the company will immediately suspend or discontinue engagement with suppliers linked to or committing these activities.[66] For artisanal miners,

53 ibid.
54 ibid 138.
55 ibid.
56 Mària and Taka (n 23) 9.
57 ibid.
58 ibid 12.
59 ibid 3.

60 OECD (n 22) 13.
61 ibid.
62 OECD (n 22) 13.
63 ibid.
64 It offers a five-part due diligence framework for both OECD members and non-members alike, involving the following five steps: (1) establishing strong company management systems, (2) identifying and assessing risk in the supply chain, (3) designing and implementing a strategy to respond to identified risks, (4) carrying out independent third party audit of supply chain due diligence at identified points in the supply chain, and (5) reporting on supply chain due diligence. Within this framework, the guidelines consistently emphasize public communication and reporting, as well as the creation of a system of checks and controls over the traceability system, which is left to both the specific industry and individual companies. ibid 17-19.
65 ibid 20-21.
66 ibid 21. This section further references the Responsible Jewellery Council, Standards Guidance, 'COP 2.14 Artisanal and Small-Scale Mining', which provides that companies must 'supporting the wider community by locally sourcing the provision of as many goods and services as possible; eliminating child labor as a condition of engagement in the community; improving women's conditions in ASM communities through gender awareness and empowerment programs'. ibid 27.

which include the DRC cresseurs, the guidance's model policy specifies that the company must minimize the risk of exposure of artisanal mining communities to 'abusive practices'.[67] This supplement distinguishes between artisanal and small-scale producers and enterprises,[68] stipulating that only enterprises are expected to carry out due diligence.[69]

1.3 International Due Diligence Standards: UN Due Diligence Guidelines

In 2010, the UN published very similar non-binding Due Diligence Guidelines (UN guidelines) for the responsible supply chain of minerals from 'red flag locations' to mitigate the risk of providing direct or indirect support for conflict in the eastern part of the DRC.[70] Unlike the OECD Guidelines, these guidelines specifically apply to individuals and entities with supply chains in the DRC.[71]

The UN guidelines state that individuals and entities should adopt supply chain policies that require that individuals and entities will not tolerate any direct or indirect support for armed groups from the eastern part of the DRC or criminal networks and perpetrators of human rights abuses within the State's armed forces.[72] To assess the risk of supporting armed groups, the UN guidelines require adherents to compare the factual circumstances of their supply chains with the supply chain policy in the UN guidelines because they often indicate the risks of providing direct or indirect support to armed groups or sanctioned individuals and entities.[73]

The UN guidelines recommend that, at a minimum, refineries and smelters be audited to examine due diligence processes to mitigate the risk of providing direct or indirect support to armed groups from the eastern part of the DRC.[74] The UN Guidelines also recommend that audit organizations act in accordance with international auditing standards.[75] Unlike the OECD guidance, the UN guidelines make no mention of the artisanal mining sector specifically.

1.4 Due Diligence Guidelines: Improvements

Both guidelines fall short of addressing three important considerations regarding the sustainability of mining communities, thus neglecting a large portion of the population of cobalt miners.

First, the OECD definition of 'high risk area' focuses on areas that violate international or national law, as well as areas of conflict, which includes widespread violence or other risks of harm to people. Similarly, the UN guidelines emphasize not exacerbating conflict by providing support for armed groups or perpetrators of human rights abuses. Although it is important to not exacerbate and contribute to armed conflict, 'harm to people' also occurs in low-conflict areas, or areas outside of active war zones, notably within and around the artisanal mines for cobalt, through environmental pollution and land-grabbing[76] In the Katanga region, which is nowadays considered a low-conflict zone,[77] there are nearly 150,000 artisanal miners, and, with an average of 4-5 dependents per artisan, the number of

67 ibid.

68 The guidelines define Artisanal and Small-scale Mining Enterprises as 'Artisanal and small-scale entities that are sufficiently formalized and structured to carry out this Guidance'. It defines Artisanal and Small-Scale mining generally as 'formal or informal mining operations with predominantly simplified forms of exploration, extraction, processing, and transportation… a normally low capital intensive and uses high labor-intensive technology'. OECD (n 22) 65.

69 ibid 64.

70 'Due diligence guidelines for the responsible supply chain of minerals from red flag locations to mitigate the risk of providing direct or indirect support for conflict in the eastern part of the Democratic Republic of the Congo (United Nations, 2013) < https://www.un.org/News/dh/infocus/drc/Consolidated_guidelines.pdf> Similarly to the OECD guidelines, the UN guidelines involve five steps: (1) strengthening company management systems, (2) identifying and assessing risks in the supply chain, (3) designing and implementing a strategy to respond to identified risks, (4) ensuring independent third party audits, and (5) publicly disclosing supply chain due diligence and findings. ibid 1-8.

71 ibid 1.

72 ibid.

73 ibid 4.

74 UN (n 70) 5.

75 Specifically, ISO 19011:2002. ibid 5.

76 See description of types of mining companies in beginning of this section: 'relocate citizens working or living near the site or the plant'. ibid 5.

77 Mària and Taka (n 23) 144.

people dependent on the cobalt artisanal mining sector in this region is nearly 750,000.[78] The overall population of the four provinces in this region is over 10 million, nearly four million of which reside in the southern Haut-Katanga province,[79] which contains substantial cobalt deposits and mining operations.[80] Thus, because hundreds of thousands of people live in and around these low-conflict zones, focusing on only conflict-affected areas disregards not only the cresseurs, but also a substantial amount of the population that is adversely affected by cobalt mines.

To remedy this, some scholars suggest that company policies and due diligence standards should take into consideration different conflict levels, accounting for the human rights of workers both low and high conflict areas.[81] For example, one suggestion is that companies introduce policies centered around peace-building in high conflict zones, while focusing on open and trustful dialogue between companies, local administrations, artisans, NGOs and local communities in low-conflict zones.[82] In doing so, companies can both better understand and address localized issues, as well as adequately frame bottom-up policies around local populations.[83]

Second, because mining operations rely on pollution prone technologies and the controls on the discharge of pollutants from mines and smelters are lax or non-existent, the air, water, soils and vegetation near the mining centers tend to be severely contaminated with toxic metals, which adversely affects the health of those living in the area.[84] As a solution, the guidelines must place greater emphasis on mitigating these effects by conducting frequent environmental assessments, including the health of the local communities, and providing miners with other sources of rinsing water besides streams and rivers in order to ensure that mining activities do not continue to harm local populations.

Finally, despite environmental regulations addressing this problem within the mining code,[85] there is a lack of effective government oversight and assistance to artisanal miners in enforcing these regulations.[86] In addition to environmental regulations, the Congolese mining code requires those working in the artisanal miners sector follow certain regulations relating to safety, environmental protection and hygiene, but there are no specifications regarding the equipment they must use, in line with International Labor Organization Conventions or recommendations.[87] Furthermore, SAESSCAM, the DRC government body created in 2003 to protect artisans, does not have enough resources or transparency, which effectively facilitates the exploitation of artisanal miners by traders, corrupted government officials, customary chiefs and armed groups in conflict areas.[88] Furthermore, as of 2018, the DRC is ranked 161 out of 180 in the corruption perception index, which makes it very difficult for DRC government bodies such as SQESSCAM to effectively enforce its mining code.[89]

The International Labour Organization (ILO) primarily adheres to the 1999 Conclusions of the ILO tripartite sectoral meeting on small-scale mining, which puts primary responsibility of monitoring small scale mines on the local governments. Within the 1999 Conclusions addressing safety and health, child labor, and environmental issues in small-scale mining, the ILO concluded that it is the responsibility of government to establish appropriate legal and regulatory framework, including monitoring and enforcement provisions.[90] It also states that since there is a lack of data on occupational safety and health in

78 Escri (n 44).
79 PopulationData.net, République Démocratique du Congo (November 2018) https://www.populationdata.net/pays/republique-democratique-du-congo/.
80 Geology for an economic sustainable development, Katanga Mining Sector (2013) http://www.geco project.org/?page=mining-sector.
81 Mària and Taka (n 23) 147.
82 ibid.
83 ibid.
84 Banza and others (n 39) 745-6.
85 This code provides for only open-air mining, forbidding the use of explosives, requiring that the miners take care of vegetation and trees and rehabilitate every portion of the exploited area after the end of the activity. Mària and Taka (n 23) 143.
86 ibid.
87 ibid.
88 ibid.
89 'Corruptions Perceptions Index 2018' (Transparency international, 2018) https://www.transparency.org/cpi2018.
90 International Labour Organization, Note on the Proceedings: Tripartite Meeting on Social and Labour Issues in Small-scale Mines (1999) 21 https://www.ilo.org/wcmsp5/groups/public/—ed_dialogue/—sector/documents/meetingdocument/wcms_677992.pdf.

small-scale mines and their communities, governments should establish a regime for effective reporting on safety and health performance in small-scale mining, as well as for the frequency of the use of child labor.[91] It also encourages the ILO to get increase its efforts to further encourage member States to ratify the Safety and Health in Mines Convention, which the DRC has still not ratified.[92]

Thus, because the ILO puts primary responsibility on the DRC government to address regulation of small-scale mining, as well as the inability of the DRC government to effectively enforce its regulations, it is essential that mining companies follow guidelines that adhere to both the local mining code and international mining guidelines.

The UN and OECD guidelines should accordingly place greater emphasis on helping local governments improve their ability to enforce local mining regulations. Though the OECD guidelines emphasize that companies should utilize a third party audit system to ensure that they further due diligence efforts, they could be more effective by instead providing governments within mining communities with guidelines and training to monitor the environmental health effects of the workers, as well as to comply with the already rigorous environmental regulations of the Congolese mining code. One suggestion from a study of workplace hazards for artisanal miners is to introduce a 'minimum of mechanization and modernization' into these mines, which will help to ensure that they stay technologically up-to-date.[93] In essence, this would require companies to provide the tools and technologies to the mines necessary for workers to stay safe and healthy, as well as to continue to mine without destroying the environment. This excellent solution would help to ensure that workers in artisanal mines do not continue to needlessly suffer due to the extended use of outdated and unsafe mining tools and techniques, while also making up for the lack of effective oversight and assistance within artisanal mines.

91 ibid 21-2.

92 ibid 29. International Labour Organization, Ratifications of C176 - Safety and Health in Mines Convention, 1995 (No. 176) https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11300:0::NO::P11300_INSTRUMENT_ID:312321.

93 De Brouwer (n 41) 65.

2

PART II: CERTIFICATION: EXAMPLE OF THE KIMBERLY BLOOD DIAMOND CERTIFICATION SOLUTION, AND ITS POTENTIAL APPLICATION TO COBALT

2.1 Role of Major Corporations: Tesla and Apple

Many companies such as Apple and Tesla are working toward drastically reducing cobalt use in their lithium-ion batteries. Tesla stated in its 2017 conflict minerals report that it has not uncovered human rights abuses in its supply chains.[94] Additionally, it visited many cobalt mines and processing plants of its main supply chain, as well as potential future suppliers throughout the world, to discuss major human rights risks they face and the practices they implemented to mitigate these risks, including third-party audits and engagement with local communities to maintain a positive social license to operate.[95] Tesla CEO Elon Musk tweeted that Tesla's next generation of car batteries will use no cobalt whatsoever.[96] Similarly, in March 2017, Apple announced that it would stop buying cobalt from artisanal mines until it was confident that 'appropriate protections' were in place.[97] Apple also issued guidelines to its suppliers for detailing its policies on human rights, environmental protections, and responsible business practices in its supply chain,[98] as well as conducts regularly auditing

94 Tesla, Tesla Conflict Minerals Report (2018) 6 https://www.tesla.com/sites/default/files/about/legal/2018-conflict-minerals-report.pdf.

95 ibid.

96 Elon Musk (@elonmusk), Twitter (13 June, 2018, 11:38 AM) https://twitter.com/elonmusk/status/1006968985760366592.

97 Todd C Frankel, 'Apple Cracks Down Further on Cobalt Supplier in Congo as Child Labor Persists' *The Washington Post* (3 March 2017) https://www.washingtonpost.com/news/the-switch/wp/2017/03/03/apple-cracks-down-further-on-cobalt-supplier-in-congo-as-child-labor-persists/?noredirect=on&utm_term=.74c1160a0d68.

98 Apple, A Supply Chain that Empowers People and Protects the Planet (2018) https://www.apple.com/supplier-responsibility/.

of every smelter providing cobalt in its supply chain.[99] Apple reportedly may even decide to buy some of the mines to purchase cobalt directly from miners, rather than having to go through a third party supplier.[100] However, an international certification scheme could still be very helpful in order for companies such as Apple and Tesla to more easily verify the sustainability of their minerals supply chains, as well as to ensure that their cobalt suppliers indeed follow due diligence standards and their corporate visions of conflict-free cobalt supplies,.

2.2 Kimberly Blood Diamond Certification: Overview

One of the most widespread international initiatives to ensure due diligence in the mineral trade realm is the Kimberly Blood Diamond Certification solution. This scheme, established in Kimberly, South Africa in 2003, seeks to curb the link between illicit trade in rough diamonds and armed conflict.[101] Blood diamonds are rough, unpolished diamonds, the trade of which directly contributes to armed conflict in nations such as Angola, Liberia, Sierra Leone, and the DRC.[102] In 2005, it was estimated that nearly 85 per cent of Congolese diamonds were smuggled out of the country, robbing approximately $40 million from the DRC's gross domestic product.[103] The 74 countries that participate in the Kimberly certification scheme represent 98 per cent of global rough diamond trade and production.[104]

The scheme requires each participating nation to enact legislation requiring that all imports and exports of rough diamonds are certified under the scheme, and banning the trade in rough diamonds with non-participating countries.[105] Additionally, each import or export of rough diamonds must be transported in a tamper-resistant container and accompanied by a government-validated Kimberly Process Certificate.[106] The scheme also requires each nation to issue an official commitment reflecting and upholding the goals of the scheme, and to meet annually to discuss and monitor the progress of the program.[107] Countries that do not participate face 'isolation' from the diamond-trading world.[108] In this way, the Kimberly Scheme creates a market incentive by requiring nations to participate in the Kimberly scheme in order to fully participate in the international diamond trade.

The Kimberly Certification does not require each participating nation to provide any official means for enforcing this legislation, but several members enacted legislation to enforce the Kimberly scheme's restrictions.[109] For example, in 2003, US the Senate and House of Representatives passed the Clean Diamond Trade Act, which prohibits the importation of diamonds into the United States that do not meet the Kimberly Certification requirements.[110]

2.3 Broader Kimberly-Inspired Scheme for Conflict Minerals

An expanded version of the Kimberly Certification scheme could cover a large variety of minerals. Such a scheme should oblige suppliers to list the country and mine of origin, guarantee that the mine does not violate human rights or contribute to environmental destruction, include a uniform enforcement standard for participating nations with baseline national

99 Vivienne Walt & Sebastian Meyer, 'Blood, Sweat, and Batteries' *Fortune* (23 August 2018) http://fortune.com/longform/blood-sweat-and-batteries/.

100 Anthony Cuthbertson, 'Apple Faces Child Labor Scrutiny as it Looks to Take Charge of Cobalt Mines' *Newsweek* (23 February 2018) https://www.newsweek.com/apple-faces-child-labor-scrutiny-it-looks-take-charge-cobalt-mines-815981.

101 Burchill (n 23) 113.

102 Julie Fishman, 'Is Diamond Smuggling Forever? The Kimberly Process Certification Scheme: The First Step Down the Long Road to Solving the Blood Diamond Trade Problem' (2005) 13 U. Miami Bus. L. Rev. 217, 219.

103 ibid 220.

104 Burchill (n 23) 113.

105 Fishman (n 102) 225.

106 The Certificate reads, 'These certificates seek to ensure that diamonds traded through the "diamond pipeline"' are not the product of rebel groups, and that the diamonds in each 'shipment have been handled in accordance with the provisions of the Kimberley Process Certification Scheme'. It must be resistant to forgery and list the country of origin, tracking number, dates of issuance and expiration, issuing authority, identity of the importer or exporter, carat weight, US dollar value, and a description of the shipment's contents. ibid 225.

107 ibid 225.

108 ibid 226.

109 ibid 225

110 ibid 231.

requirements, and apply to minerals originating in both conflict and non-conflict zones.

There have been some efforts to label minerals beyond diamonds as conflict free through 'bagging and tagging' programs. These usually apply within conflict zones for specific minerals, such as tin.[111] However, sometimes the people tagging the bags of minerals simply lie about the minerals' origins, and companies do not always diligently comply with their own voluntary verification programs.[112] A broader internationally-backed scheme would eliminate this issue by requiring private companies and governments alike to work together to comply with the certification scheme in order to remain in the market for importing and exporting minerals.[113]

To obtain the certification, the company trading the minerals would have to first verify that the minerals neither contributed to armed conflict or the destruction of the environment. It would then be up to the importing country to verify that the certification was not forged, and that the mine of origin indeed complied with the certification's requirements. The certification would have to pay special attention to nations with mineral monopolies, such as the DRC for cobalt, to be sure that they follow the guidelines despite their dominant presence and influence in the market.[114]

However, one of the biggest differences between diamonds and cobalt is that there are international councils for diamonds and jewelry, such as the World Diamond Council, World Federation of Diamond Bourses, and International Diamond Manufacturers Associations, which push for nations to adopt the scheme, and vow to expel traders found dealing blood diamonds in violation of the Kimberly scheme.[115]

No such international councils exist for minerals containing valuable metals, such as cobalt, likely due to the fact that diamonds themselves are the final product traded and bought, while cobalt makes up merely a piece of the final product (i.e. it is one of many different ingredients that compose smartphones and ZEVs). Thus, without this extra layer of both awareness and motivation to comply with a certification scheme, traders would have less to lose if they did not comply with a similar certification for cobalt. There are, however, international councils for the electronics industry, such as the Electronic Industry Citizenship Coalition, which founded a conflict minerals rule encouraging its members to avoid using conflict minerals as part of their codes of conduct.[116] Accordingly, it would be up to the electronics and motor industries, notably those manufacturing lithium batteries, to look out for and refuse to do business with those who do not comply with the theoretical certification scheme's requirements, as well as to ensure the effectiveness of third-party auditing.[117]

Additionally, the proposed minerals scheme should include a baseline monitoring and enforcement system for all participating nations to follow. Currently, there is still no international monitoring system for the blood diamond trade, nor is there a uniform enforcement and punishment requirement for participating nations to enforce the scheme.[118] Without a uniform requirement for non-compliance among nations, as well as without an international watchdog system to police the trading of these minerals, illicit traders deal more frequently within the nations with softer punishments, thus defeating the Kimberly scheme's goals of curbing the blood diamond trade.[119] As a remedy, the scheme should require that all nations adopt the same baseline punishment mechanism, while calling on mining companies and participating nations with greater

111 Jonny Hogg, 'Conflict-free' Tags Help Revive Congo Minerals Trade' *Reuters* (8 November 2012) https://www.reuters.com/article/us-congo-democratic-mining/conflict-free-tags-help-revive-congo-minerals-trade-idUSBRE8A70PG20121108.

112 Jenny McGrath, 'Companies Want to Sell you Conflict-Free Phones, but Certification isn't Foolproof' *Digital Trends* (9 September 2018) https://www.digitaltrends.com/cool-tech/conflict-minerals-responsible-mining/.

113 Eichner (n 11) 265.

114 ibid 259.

115 Fishman (n 102) 226.

116 Chang-hsien Tsaia & Yen-nung Wu, 'What Conflict Minerals Rules Tell Us About the Legal Transplantation of Corporate Social Responsibility Standards Without the State: From the United Nations to the United States to Taiwan' (2018) 38 Nw. J. Int'l L. & Bus. 233, 236.

117 Harry D Gobrecht, 'Technically Correct: Using Technology to Supplement Due Diligence Standards in Easter D. R. Congo Conflict Mineral Mining' [2011] U. Ill. J.L. Tech. & Pol'y 413, 427.

118 Fishman (n 102) 235.

119 ibid 236.

resources to help developing nations, such as the DRC, with enforcement. This will help ensure that all nations have sufficiently similar and harsh punishments to deter the trading of minerals from mines that do not comply with the mineral certification scheme.

As an additional check on compliance with the certification system, another solution is to allow individuals to take action in the local legal system. For the Kimberly scheme, some suggest that individuals should be allowed to bring a private right of action against companies found to be in non-compliance with the scheme.[120] Applied to cobalt, individuals directly affected by artisanal mines could bring suit within their home jurisdictions against companies in noncompliance with the scheme, which would encourage companies to comply with certification requirements in order to avoid prosecution.[121] These individuals could also bring suit against the local government officials should there be evidence of either negligence or corruption in enforcing mining regulations. This is consistent with growing accordance among scholars of the importance of allowing local populations to participate in a more meaningful and influential way in enforcement of the ethical trade of minerals originating in their soil.[122]

Finally, it is essential that participating nations enact legislation to accompany the minerals certification scheme and to guarantee that all minerals from all parts of the nation are certified. Like the due diligence guidelines, the Kimberly Scheme focuses on curbing trade from areas where there is armed conflict, while, as discussed above, harm to people as a result of the mines occurs outside of war and high-conflict zones due to environmental destruction and pollution in surrounding communities. The link between the mines and the destruction of the health of surrounding ecosystems and communities will have to be concretely proven in order to incentivize nations to participate in and comply with such a broad certification, much like the work that was put into uncovering the contribution to armed conflict of the illicit blood diamond trade. Such proof could provide exactly the incentive necessary to create an international certification scheme for all minerals.

3 PART III: ROLE OF NATIONAL GOVERNMENTS: EXAMPLE OF THE DODD FRANK ACT

3.1 Dodd Frank Conflict Minerals Overview

In addition to an international certification scheme to enforce the Due Diligence guidelines, governments should create national enforcement mechanism for the trade of minerals linked to human rights abuses. One example is the 2010 US Dodd Frank Act ('the act'), which addresses 'conflict mineral' trading. This act is one of many great examples of a sweeping legislative scheme by a national government that expands key concepts of the Kimberly Scheme to other minerals beyond diamonds, and can serve as an example for other nations to create and improve upon in their own conflict minerals regulations.

The 'Conflict Minerals' section of the act states that Congress was concerned for the exploitation and trade of conflict minerals originating in the DRC that finance conflict 'characterized by extreme levels of violence'.[123] Thus, the act seeks to promote peace and security in the DRC by supporting international efforts to monitor and stop commercial activities involving the natural resources of the DRC that contribute to the activities of armed groups and human rights violations.[124] It also aims to develop stronger governance and economic institutions to facilitate and improve transparency in the cross-border trade involving the DRC's natural resources, to reduce exploitation by armed groups, and to promote local and regional development.[125]

120 ibid 235.

121 ibid 235.

122 Pacifique Manirakiza, 'Towards an African Human Rights Perspective on the Extractive Industry' (2013) 11 Loy. U. Chi. Int'l L. Rev. 1, 6.

123 Dodd Frank Act 2010, s 1502(a) https://www.govtrack.us/congress/bills/111/hr4173/text.

124 Dodd Frank Act 2010, s (c)(1) (B)(i)(II) https://www.govtrack.us/congress/bills/111/hr4173/text.

125 Dodd Frank Act 2010, s (c)(1) (B)(i)(II) https://www.govtrack.us/congress/bills/111/hr4173/text.

The Conflict Minerals section provides guidance to commercial entities seeking to exercise due diligence when assessing the origin and chain of custody of conflict minerals used in their products. It also lists punitive measures that could be taken against individuals or entities whose commercial activities support armed groups and human rights violations in the DRC.[126] The act further requires that any person must annually disclose whether conflict minerals that are necessary to the functionality or production of a product manufactured by the person originated in the DRC or an adjoining country.[127] If so, the person must submit a report describing the measures they took to exercise due diligence on the source and chain of custody of such minerals, including a certified independent private sector audit.[128]

The act defines 'conflict minerals' as cassiterite, columbite-tantalite (tantalum), gold, wolframite (tungsten), or their derivatives, or any other minerals or their derivatives determined by the U.S. Secretary of State to be financing conflict in the Covered Countries.[129] Cobalt has likely not been added to the list yet because the Secretary of State has not made such a finding for this metal or, subsequently, the minerals from which it is derived. 'Covered countries' are the DRC and adjoining countries, or countries that share an internationally recognized border with the DRC.[130]

Though there are no specified punitive damages within the Dodd Frank Act, the U.S. Attorney General has discretion to bring a civil action under the Foreign Corrupt Practices Act.[131] This act applies to any individual who uses 'any means or instrumentality of interstate commerce' to influence foreign officials to gain an advantage, influence a decision, or influence illegal action, and upon a proper showing, a permanent injunction or a temporary restraining order shall be granted without bond.[132] Similarly, for any domestic concern other than an issuer, any officer, director, employee, agent, or stockholder may be fined up to $2 million for entities, $100,000 for individuals who are US citizens, and $10,000 for individuals who are not US citizens.[133] Thus, in the event that bribery or coercion within the conflict minerals trading realm is discovered under the Dodd Frank Act, the person or entity could be liable under the Foreign Corrupt Practices Act for monetary and punitive damages.

In addition to the Dodd Frank Act, similar regulations now exist within other nations. The European Union's Conflict Minerals Regulation will come into effect on January 1, 2021.[134] This act similarly defines conflict minerals as those used to finance armed groups, fuel forced labor and other human rights abuses, and support corruption and money laundering, and it specifically covers tin, tungsten, tantalum and gold.[135] It will require that EU companies in the supply chain for these minerals ensure they import from responsible and conflict-free sources only.[136] These legislations will

126 Dodd Frank Act 2010, s (c)(1)(B)(ii) & (iii) https://www.govtrack.us/congress/bills/111/hr4173/text.

127 Dodd Frank Act 2010, s 1502(p)(2)(B) https://www.govtrack.us/congress/bills/111/hr4173/text.

128 Dodd Frank Act 2010, s 1502(p)(1)(A)(i) & (ii); s 1502(p)(1)(B) https://www.govtrack.us/congress/bills/111/hr4173/text.

129 Dodd Frank Act 2010, s 1502(e)(4) <https://www.govtrack.us/congress/bills/111/hr4173/text>. Under the Act, the Secretary of State must produce and update every 180 days a 'Conflict Minerals Map', of mineral-rich zones, trade routes, and areas under the control of armed groups in the DRC and adjoining countries. Dodd Frank Act 2010, s (c)(2)(A)(i) & (c)(2)(C). The Secretary of State also must add minerals to the list 'as appropriate' by publishing in the federal registrar notice of intent to declare a mineral as a conflict mineral. Dodd Frank Ac 2010t, s (c)(2)(D). The Secretary of Commerce must report the accuracy of the private sector audits and other due diligence processes, recommend ways to improve accuracy of such audits, and list all known conflict mineral processing facilities worldwide. Dodd Frank Act 2010, s (c)(3).

130 Covered countries include Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia. Dodd Frank Act 2010, s 1502(e)(1). https://www.govtrack.us/congress/bills/111/hr4173/text.

131 According to Investopedia, an issuer is a legal entity that develops, registers and sells securities to finance its operations, which may be corporations, investment trusts, or domestic or foreign governments. Adam Hayes, 'Issuer' *Investopedia* (2018) https://www.investopedia.com/terms/i/issuer.asp.

132 United States Code 1998, s 78dd-1 (a).

133 United States Code 1998, s 78dd-2 (g).

134 European Commission, The Regulation Explained (2018) http://ec.europa.eu/trade/policy/in-focus/conflict-minerals-regulation/regulation-explained/.

135 ibid.

136 ibid 150.

hopefully also serve as effective models for legislation that diminish and expose conflict within the international minerals trade.

Notably, in December 2015 China adopted the Due Diligence Guidelines for Responsible Mineral Supply Chains, based on the OECD Guidance, but it has not yet enacted national legislation to back this up.[137] China has invested considerably in the African minerals trade, especially regarding cobalt. Eight of the 14 largest cobalt miners in the DRC are Chinese-owned, and China produces more than 80 percent of the production of cobalt chemicals needed to make batteries.[138] Most recently, the Chinese companies China Railway Engineering Corporation ('CREC') and Sinohydro, established a $9 billion joint Sino-Congolese venture, named Sicomines, designed to provide the DRC with $6 billion of infrastructure in exchange for copper and cobalt mining concessions, and $3 billion in developing new mining areas.[139] However, this deal was scrutinized under allegations of corruption when the $23 million signing bonus for Gecamines, the Congolese partner involved, disappeared.[140] These sorts of allegations are standard in Chinese-financed programs that typically lack transparency, despite generally increased adherence of Chinese companies to corporate social responsibility principles.[141] Thus, as China's presence in the African minerals trade grows, it is particularly important that it enact additional national legislation to increase transparency and decrease corruption in the cobalt trade.

3.2 Dodd Frank Act: Improvements

The Dodd Frank Act has the potential to serve as an example for future national legislation. However, there is much room for improvement within the future legislation of other nations. Much like the due diligence guidelines, the act focuses mostly on areas of high conflict, and makes no mention of damage to the environment or people living in the surrounding communities of the mines. The definition of 'conflict minerals' also only includes four minerals and excludes many important minerals involved in lithium battery production, such as cobalt. This is one reason why some critique the Conflict Minerals section as being too vague, which creates additional obstacles to effective and efficient compliance.[142] Without defining 'conflict minerals' to include any minerals coming from both low and high conflict regions, there is no check on the environmental destruction and health effects of minerals from artisanal mines coming into the United States. As a solution, the language could be expanded to allow national governments to add to the list of conflict minerals if they fund conflict, violate local laws, and/or causes harm to the environment and surrounding communities.

Furthermore, although the Dodd Frank Act has the potential to expose and hold liable corporations for bribery and coercion within the mineral trading sphere,[143] there are no punitive damages or injunctions for the environmental destruction and adverse health effects that result from artisanal mining operations. Because some criticize the conflict minerals section as placing an unrealistic burden on the SEC to regulate human rights abuses, an area outside of the SEC's traditional scope or regulation,[144] creating liability for environmental destruction and subsequent health effects in the mining context could be much more

137 OECD, OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (2018) http://www.oecd.org/fr/daf/inv/mne/mining.htm.

138 Jack Farchy & Hayley Warren, 'China Has a Secret Weapon in the Race to Dominate Electric Cars' *Bloomberg* (2 December 2018) https://www.bloomberg.com/graphics/2018-china-cobalt/.

139 Jeremy Kelley, 'China in Africa: Curing the Resource Curse with Infrastructure and Modernization' (2011) 12 Sustainable Dev. L. & Pol'y 35, 38.

140 ibid 38.

141 ibid 38. Corporate social responsibility requires that companies meet legal requirements and stakeholder expectations in order to contribute to a better society through workplace actions and public policy advocacy. Almost all Chinese business leaders in Africa surveyed in 2010 were familiar with CSR and generally described CSR 'in terms of contributing to local economic growth and job creation, complying with local laws and caring for the environment, and making philanthropic donations to support schools and hospitals'. ibid 40. EITI compliance requires each country needs to implement EITI compliant regulations and establish a multi-stakeholder group of civil society, government, and private industry representatives to oversee implementation. Kelley (n 139) 39.

142 Karen E Woody, 'Conflict Minerals Legislation: The SEC's New Role as Diplomatic and Humanitarian Watchdog' (2012) 81 Fordham L. Rev. 1315, 1332.

143 Burchill (n 23) 127.

144 Woody (n 142) 1332.

feasible because they can be more directly traced to the mining activities rather than actions of third-party groups and broader civil unrest in the nation in question. This is still an ongoing problem in the cobalt trade that must be addressed by national legislature in order to ensure that no more people are harmed in the making of lithium-ion batteries. Thus, expanding liability within national legislature to any damage to the environment, and subsequently human health, is vital to ensuring that artisanal mines will neither exacerbate environmental destruction, nor continue to cause adverse health effects for local populations situated in and around the mines.

As another improvement to any future national legislation modeled off of the Dodd Frank Act, some scholars suggest that legislation should require companies trading in conflict minerals to create different regulations for individual minerals, rather than simply lumping them all together under the same scheme.[145] For example, since gold is so much more valuable than other currently listed conflict minerals, smugglers tend to fly their supplies over borders to avoid dealing with land-based regulations.[146] Encouraging companies to create specific strategies for each mineral could help ensure that illegal mines and minerals do not fall through the cracks due to generalized protections that allow for loopholes to trade uncertified minerals.[147]

Specifically regarding China, Chinese companies typically do not consider the development of social indicators beyond economic growth, such as socio-political development, as preconditions for economic development assistance and sustainable development.[148] Thus, because it is poised to be a dominant player in the mining industry, particularly in politically tumultuous nations such as the DRC, it is essential that China creates national legislation for its businesses to compliment the due diligence guidelines, and the Dodd Frank Act can serve as a valuable example of such legislation. In particular, Chinese legislation must seek to enhance transparency and strengthen both the socio-political development and economies of the DRC and all other nations known for corruption.

145 Gobrecht (n 117) 426.
146 ibid 427.
147 ibid 426.
148 Kelley (n 139) 36.

3.3 Complimentary Legislature: Tax Incentives

In addition to punitive damages, some suggest that tax incentives designed to reward technological innovation with reduced rare minerals can help corporations to diversify supply chains for rechargeable batteries and, ultimately, to curb their dependence on conflict minerals.[149] Currently, since almost all existing technologies rely on rare elements in order to function, increasing incentives to develop technologies that depend on more abundant elements will help ease the pressure put on mines to produce rare and expensive conflict minerals.[150] Similarly, tax incentives can help encourage companies to design recycling mechanisms for lithium-ion battery minerals in order to curb dependence on cobalt from artisanal mines, such as those in the DRC. Currently, there is very little recycling of rare minerals, and the majority are simply thrown away at the end of the battery's life.[151] Tax incentives can help to bring more attention this issue, as well as to encourage governments and businesses to continue to develop green technologies with less dependence on rare minerals from conflict nations.[152]

However, legislation must also address the impact of reducing trade of conflict minerals on the artisanal miners job security and livelihoods. One article found that diminished corporate interest in the Congolese mineral trade is devastating for local communities because in most mining communities, artisanal mining is the only paid employment available.[153] Often, there is no other work available except subsistence agriculture or joining a militia.[154] In order to avoid leaving affected populations with no safe alternatives to support themselves, as well as perpetuating conflict, some suggest providing monetary assistance to affected mining communities, hiring displaced workers as taggers or otherwise involving them in a minerals tracing program (such as the theoretical program

149 Eichner (n 11) 281.
150 ibid 280.
151 ibid 274.
152 ibid 274.
153 Brian Stuart Silverman, 'One Mineral at a Time: Shaping Transnational Corporate Social Responsibility through Dodd Frank Section 1502' (2014) 16 Or. Rev. Int'l L. 127, 150.
154 ibid 150.

discussed above), as well as collaborating with local participants to implement Dodd Frank's Conflict Minerals requirements.[155]

CONCLUSION

In order for the world to sustainably transition into an age of ZEVs and energy storage without causing further harm to the environment or to people, the international regulations surrounding the trade of minerals for lithium-ion batteries require expansion and precision. The OECD and UN due diligence guideline must incorporate language that accounts for areas where environmental pollution from artisanal mines adversely affects the health of surrounding communities.[156] Specifically, 'harm to people' must include people residing in low-conflict areas, or areas outside of active war zones, notably within and around the mines for cobalt, whose health is at risk due to pollution from the mines. In order to adequately encompass harm to the environment upon which these populations depend, guidelines should require companies to conduct environmental assessments of artisanal mines, regardless if they own them, to ensure that they do not pollute nearby rivers and waterways. In addition, due diligence standards must also require that companies guarantee effective local government oversight of these issues by providing them with resources to monitor the environmental and health effects around the mines, as well as to comply with the local Congolese mining code.[157]

As enforcement mechanisms for these voluntary soft law schemes, an international certification scheme such as the Kimberly Blood Diamond Certification could incentivize companies trading minerals such as cobalt to follow through with due diligence efforts. Similarly, this certification must not only encompass high conflict areas, but also low-conflict areas that suffer from environmental destruction and pollution from the mines. In addition, the certification must also encourage participating nations to enact legislation such as the Dodd Frank Act or the upcoming EU Conflict Minerals Regulation, if they have not already done so. All legislation should include punitive damages for companies that do not follow through with due diligence or otherwise continue to not meet the certification's requirements.

Further research is needed to concretely connect the polluted water in communities surrounding artisanal mines with cobalt mines, as well as to determine whether and which mining companies are already taking environmental destruction into account when issuing their due diligence reports. Alternatives to lithium batteries, especially cobalt, will be essential looking forward, as well as more ways to efficiently recycle these batteries and minerals.[158] However, it is also essential to find a balance between reducing dependence upon conflict minerals for future technologies and the maintenance of the job security and livelihood of local populations who depend on artisanal mining to survive.[159]

In the meantime, legislature and guidelines protecting against human rights abuses and damage to the environment will ensure that artisanal mining communities in low-conflict zones receive the attention that they deserve. In doing so, the world may adopt increasingly rigorous climate change policies that no longer lead to suffering and environmental destruction.

155 ibid 151.
156 Mària and Taka (n 23) 147.
157 Mària and Taka (n 23) 143; De Brouwer (n 41) 65.
158 Eichner (n 11) 274
159 Silverman (n 153) 150.

Case Note

A PARADIGM SHIFT IN COURTS' VIEW ON NATURE: THE ATRATO RIVER AND AMAZON BASIN CASES IN COLOMBIA

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1 INTRODUCTION

The ecocentric rights paradigm – also expressed as 'rights of nature'– gains increasing traction at the national and international levels. While in some countries revolutionary ecocentric laws have been adopted for the recognition and protection of the rights of nature in her entirety; in others an emerging jurisprudence built on ecocentric rights-based approaches to environmental protection is admitting the intrinsic value of non-human elements of nature – such as rivers, mountains and forests – recognising them as subjects of rights. Precisely, one country where such jurisprudential paradigm shift took place recently is Colombia, one of the world's mega-diverse countries.

In 2017, the Colombian Constitutional Court (*Corte Constitucional de Colombia*) gained international attention when, shifting away from traditional paradigms, issued a ground-breaking judgement recognising a river – the Atrato – as a legal subject with rights in order to increase its protection.[1] Although the jurisprudence of the Constitutional Court had previously referred to nature as a 'subject of legal rights' that must be guaranteed and protected,[2] this was the first time in the country's history that a court recognised a specific ecosystem – a river – as a '*sujeto de derechos*' (subject of rights) granting it specific rights.

In April 2018, the Colombian Supreme Court (*Corte Suprema de Justicia de Colombia*) also made a historical move when, following the same ecocentric approach adopted by the Constitutional Court in the Atrato River case, issued another landmark judgement – the second in the history of Colombia – changing the legal status of the Colombian Amazon rainforest and recognising it as an autonomous rights-bearing entity whose rights deserve special protection.[3]

In both cases the Colombian courts were mainly required to protect the fundamental constitutional rights of the plaintiffs, which were being infringed or threatened by the Colombian Government's failure to adopt effective measures against the highly polluting illegal mining in and around the Atrato River and deforestation in the Amazon basin. However, in the light of the recent intensification of such environmental problems, the Constitutional Court and the Supreme Court decided to go further and take a step towards the effective protection of both ecosystems from human activity. Thus, although no legislation on rights of nature had been adopted at that time in Colombia, the courts ruled in favour of such natural entities and through two landmark decisions changed their traditional status and recognised them as rights-bearing subjects, thereby demonstrating that rights of nature/ecosystems can be recognised by both legislative and judicial channels.[4] This jurisprudential paradigm shift, from a human-centred to a non-anthropocentric world view, establishes that nature and her non-human elements – here the Atrato River and the Amazon basin – have an intrinsic value and can no longer be viewed as human property or useful senseless objects, and as such must instead be considered as subjects of rights deserving special protection.

As any step done on the rights of nature paradigm can provide important elements for the global debate

1 *See*, *Tierra Digna y otros v Presidencia de la República y otros*, Colombian Constitutional Court, ruling T-622 of 10 November 2016, Expediente T-5.016.242. The decision was released to the public in May 2017. Full text in Spanish, available at <http://cr00.epimg.net/descargables/2017/05/02/14037e7b5712106cd88b687525dfeb4b.pdf>. All translations from Spanish to English are by the author, unless otherwise noted.

2 *See*, for example, Colombian Constitutional Court's rulings: No C-595 of 27 July 2010 on a constitutional challenge filed by Juan Gabriel Rojas López, Expediente D-7977; C-632 of 24 August 2011 on a constitutional challenge filed by Luis Eduardo Montealegre Lynett, Expediente D-8379; and, Protection Ruling (*Sentencia de Tutela*) T-080 of 20 February 2015 on an action of tutela (*Acción de Tutela*) filed by *Fundepúblico y otros v Sala Civil y de Familia del Tribunal Superior del Distrito Judicial de Cartagena*, Expediente T-4.353.004.

3 *See*, *Dejusticia y otros v Presidencia de la República y otros*, Colombian Supreme Court, ruling STC4360 of 4 May 2018. Full text in Spanish, available at <https://cdn.dejusticia.org/wp-content/uploads/2018/01/Fallo-Corte-Suprema-de-Justicia-Litigio-Cambio-Clim%C3%A1tico.pdf?x54537>.

4 *See*, for example, the case of rivers in Erin L. O'Donnell and Julia Talbot-Jones, 'Creating legal rights for rivers: lessons from Australia, New Zealand, and India' (2018) 23 (1) *Ecology and Society* 6, 8.

on the significance, scope and implications of this emerging legal framework, this case note presents an analysis of two ground-breaking judgements that confront anthropocentric worldviews and set important precedents for rights of nature in Colombia and around the world.

2 FACTUAL AND LEGAL BACKGROUND

The first case, hereafter *Tierra Digna* case, resulted from the illegal mining activities taking place near the Atrato River basin and its tributaries, located in one of the most biologically diverse places in Colombia and on the Planet: *el Chocó*.[5] Given this situation, on 27 January 2015, the non-governmental organisation Center of Studies for Social Justice '*Tierra Digna*' (*Centro de Estudios para la Justicia Social 'Tierra Digna'*), on behalf of several Afrodescendent, indigenous and peasant communities living alongside the Atrato River – the third largest river in Colombia – and in neighbouring territories, filed a *Tutela* action[6] against various agencies of the Colombian government in order to obtain the effective protection of their fundamental constitutional rights which were being breached by illegal mining activities.

The plaintiffs argued that through the use of heavy machinery and toxic substances – such as mercury – illegal mining in the Atrato River basin, which escalated exponentially during the past decades, had produced serious environmental impacts in the region: pollution of and damage to the river, destruction of its natural course, erosion, deforestation, loss of biodiversity, to name but a few. These external disruptions have had severe effects on local ethnic communities, affecting several of their rights (including their right to life, health, water, food security, clean environment, and their right to culture and territory), and even threatening their very survival.[7] According to the plaintiffs, the state authorities, at local or national level, did not undertake effective and comprehensive actions to confront the grave situation in the Atrato River which, exacerbated by the local socio-political context, gave place to a significant and unprecedented humanitarian and socio-environmental crisis.[8]

Considering several national and regional state entities responsible for the infringement of their fundamental rights by their lack of action, the plaintiffs referred to the *tutela* judge. They requested from him to issue a set of orders and measures in order to implement structural solutions to overcome the severe crisis taking place and to protect the Atrato River, its basin and tributaries.[9]

The Court of First Instance refused to grant the *tutela* action via ruling on 14 February 2015. The plaintiffs appealed against this decision, yet it was upheld by the Court of Appeal in April 2015. However, in compliance with the legal procedure of *tutela* actions, the ruling was referred to the Colombian Constitutional Court for a possible review.[10]

Eventually, on 10 November 2016, the sixth Review Chamber of the Constitutional Court (*Sala Sexta de Revisión de la Corte Constitucional*) ruled in favour of the plaintiffs and, acknowledging the alarming situation of the Atrato River, issued a ground-breaking judgement which, for the first time in Colombia, recognised a natural entity – the Atrato River – as a legal subject with concrete legal rights.

The second case, hereafter *Dejusticia* case, refers to a legal action brought by 25 Colombian children and young – ranging in age from seven to 26 – from high-

5 Colombian Constitutional Court (n 1) Ground 5.3.

6 The *tutela* action or *Acción de Tutela* is a constitutional action introduced by the 1991 Colombian Constitution, by virtue of which any person may directly request any judge in the country to protect his/her fundamental constitutional rights when they are being violated by a state agent or an individual. *See* art 86 of the 1991 Colombian Constitution and Decrees 2591 of 1991, 1382 of 2000 and 306 of 1992.

7 Colombian Constitutional Court (n 1) 5-7.

8 ibid.

9 ibid Ground 9.1

10 The Colombian Constitutional Court has among its functions the review of *tutela* actions and, therefore, all decisions resolving them are automatically referred to it for possible review. The Court can discretionally review any *tutela* case. *See* arts 86 and 241-9 of the Colombian Constitution and arts 31-36 of Decree 2591 of 1991.

risk areas affected by climate change, seeking to stop deforestation in the Colombian Amazon basin.[11] Supported by the non-governmental organisation *Dejusticia*, the plaintiffs filed a *tutela* action on 29 January 2018 against several governmental actors – including the President of Colombia, the Ministries of Environment and Agriculture, the National Parks and regional autonomous corporations, and the mayors and governments of the Colombian Amazon – demanding the protection of their constitutional rights threatened by the accelerated deforestation rate of the Amazonian rainforest in Colombia which causes emissions of carbon dioxide and other greenhouse gases (GHG).[12] The plaintiffs argued that, despite the national and international commitments of Colombia to curb the deforestation of the Amazon rainforest, neither the national government nor any other public authority adopted strong measures and actions to stop it.[13] In fact, as they denounced, deforestation in the country's Amazon region had significantly increased recently – by 44% between 2015 and 2016 – as a result of illegal land grabbing, illicit crop cultivations, illegal mining and logging, infrastructure and agricultural frontier expansion for agro-industries, among other causes.[14] For the applicants, the continued deforestation in Colombia's Amazonian territory – generating serious consequences on ecosystems and climate conditions on the entirety of the national territory – together with the government's failure to address it and protect the Amazon basin, jeopardises their future and constitutes a violation of their constitutional rights to life, health, food and water, as well as of the right to a healthy environment for present and future generations.[15]

As a consequence, the plaintiffs, also representing the future generations which will have to face the major implications of climate change, requested the *tutela* judge to order the government to respect and fulfil its national and international commitments and to adopt a series of measures aimed at reducing deforestation in the Colombian Amazon basin and therefore mitigating GHG emissions causing climate change.[16]

On 12 February 2018, without ruling on the merits of the case, the civil division of the High Court of the Judicial District of Bogotá (*Tribunal Superior del Distrito Judicial de Bogotá- Sala Civil*), denied the *tutela* on procedural grounds. Yet, as the plaintiffs were not satisfied with the judgment, they appealed the ruling on 16 February before Colombia's highest court. Eventually, on 5 April 2018, following the approach of the Atrato ruling, the Colombian Supreme Court issued another historic ruling accepting the *tutela* and also recognising Colombia's Amazon basin as an entity subject of rights.

3 THE COURTS' JUDGMENTS AND REASONING

In both cases, *Tierra Digna* and *Dejusticia*, we face groundbreaking courts decisions that, on the one hand, confirmed the protection of the applicants' fundamental constitutional rights, which were being violated by the Colombian government's omission to effectively control illegal mining activities in the Atrato River and deforestation in the Amazon basin and, on the other, as never before in the country, recognised both ecosystems not as objects used for the benefit of humans, but as subjects of law and bearers of rights.

In *Tierra Digna* case, the Constitutional Court issued a comprehensive judgement – over 160 pages – which departs from traditional environmental protection paradigms and takes an ecocentric and biocultural approach to reinforce the protection and ensure the restoration of the Atrato River. After confirming the devastating impacts that illegal mining activities have

11 Colombian Supreme Court (n 3).

12 This was also the first *tutela* action on climate change filed in Latin America.

13 Under the Paris Agreement (adopted by way of the Act 1844 of 2017) and the national Law 1753 of 2015, the Government had committed, *inter alia*, to reduce to zero the deforestation net rate in this region by 2020, meaning that at the time the case was filed, it only remained two years to comply with this target. *See*, Colombian Supreme Court (n 3) 2.

14 ibid 2.

15 ibid 3-4.

16 ibid 5.

had on the river,[17] altering the natural dynamic of the whole region and creating serious threats to present and future generations,[18] the court recognised the Atrato River as a '*sujeto de derechos*' (subject of rights). In this way, the river, its basin and tributaries were granted specific rights, including the right to protection, conservation, maintenance and restoration.[19]

Based on the premise that the earth does not belong to humans but that humans belong to the earth, just as every other species,[20] the Constitutional Court considered necessary to take a step forward in the jurisprudence toward the constitutional protection of the Atrato River, identifying at the same time the significance of a healthy environment, as well as the inextricable links between human beings and nature.[21] In this light, the Court recognised that

> …the biggest challenge modern constitutionalism faces concerning the environment consists in achieving the effective safeguard and protection of nature […] and of her associated forms of life […] not for the mere material, genetic or productive potential they can represent for human beings, but for they form a living entity […] subject of distinguishable rights. As a consequence, they become a new integral protection imperative which must be respected by the states and societies.[22]

As the Court explained, it is about being conscious of the interdependency relationship and deep connection we have with every other living being with whom we share our planet – understood as existences worthy of protection in themselves – and that we acknowledge ourselves as being integral parts of the global ecosystem – the biosphere – rather than as its user and simple masters.[23] Thus, according to the court

> …only from a deeply respectful and humble position toward nature [and] her components […] it is possible to create a relationship with them in fair and equitable terms, leaving behind all concepts limited to utilitarianism, the economy or efficiency.[24]

In this context, given the high level of environmental degradation of the Atrato River – and of the planet in general, to a large extent due to extractive industries such as mining – as well as the constitutional protection of the environment in Colombia, the Court emphasises on the necessity to 'make headways on the interpretation of the applicable law and on the mechanisms of protection for the rights […] and their subjects'.[25] For the Court, the way forward is an ecocentric and biocultural approach seeking to dissolve the human-nature binary interaction in order to reach 'a new socio-legal understanding in which nature and her components are taken seriously and granted with full rights'.[26] As the court states

> … now is the moment to take the first decisions to protect the planet and its resources efficiently before it is too late, or before the ecological damage became irreversible, not only for future generations, but for the human species.[27]

Therefore, from the understanding of human beings as integral and interdependent part of nature, the court insists on the need to establish a legal tool which, based on the progressiveness of the rights and of legal pluralism, 'offers to nature and her relationship with human beings enhanced justice [and equity]'.[28] With this in mind, the court noted that 'justice with and for nature has to be applied beyond the human interest and [recognising her intrinsic value] must allow nature to be subject of rights'.[29] This interpretation, as the court highlights, is justified by the notion of the environment's superior interest as developed by the constitutional jurisprudence and included in various constitutional provisions revealing the transcendence of a healthy environment and the interdependency linkage with human beings.[30]

17 According to the Court, currently it is impossible to determine the Atrato River's original course. Colombian Constitutional Court (n 1) Ground 9.21.
18 ibid Grounds 9.21 and ss.
19 ibid Operative part pt 4.
20 ibid Ground 5.9.
21 ibid Ground 9.31.
22 ibid Ground 9.27.
23 ibid Ground 9.27.
24 ibid.
25 ibid Ground 9.28
26 ibid.
27 ibid Ground 9.29.
28 ibid Ground 9.30.
29 ibid Ground 9.31.
30 ibid.

Following, the court highlighted that the current Colombian mining policy promotes an increased consumption of natural resources over the coming years[31] and that in practice the anthropocentric environmental legislation in force lost its binding force to be endowed with a mere 'symbolic effectiveness'.[32] As a result, the Court decided to take an important step in the jurisprudence and, breaking up with the anthropocentric ideological orientation of rights, ordered that the Atrato River be a subject of law and bearer of rights.

With the purpose of assuring that the Atrato River's rights are guaranteed in practice, the Constitutional Court pronounced a number of points in its judgement's operative part to enforce its decision. It declared that the national government, in conjunction with the ethnic communities living in the Atrato River basin, will become guardians of the river and, therefore, will exercise jointly the guardianship and legal representation of the river's rights.[33] Also, the Court ordered the river representatives to form the Commission of the Guardians of the Atrato River (*Comisión de Guardianes del Río Atrato*) that should be established within three months of the ruling.[34] It will be advised by an Advising Team formed by members of the Humboldt Institute and WWF Colombia – who have prior experience on rivers protection – and can receive support from public and private entities, universities, national and international academic and research centres and environmental organisations, and community-based organisations and civil society which want to be linked to the Atrato River's protection project.[35] Thus, by nominating two specific guardians for the river and facilitating institutional support and collaboration, the court seeks to address the challenges and difficulties of enforcing the Atrato River's legal rights.

In *Dejusticia* case, the Colombian Supreme Court followed the same ecocentric approach adopted by the Constitutional Court in the Atrato case. This is apparent when the court declares that deforestation in the Amazon represents a serious threat to the Colombian people as well as for the survival of native species of fauna and flora. The court adds that the Amazon is ecologically important for the Planet's environmental balance and the regulation of the climate at world scale.[36] On these bases, the court recognised the Amazon Basin as subject of rights.[37]

The court emphasised that in the current context of extremely serious change in the natural conditions of our planet, 'ecosystems are exposed to a situation hampering their survival' just as for humankind.[38] As an example, the court refers to the irrational colonisation of forests and extension of the agricultural, urban, industrial and extractive frontiers, hence increasing deforestation, causing pollution and a rapid transformation of our surroundings.[39]

The first responsible for the situation is, according to the court, the very human species

> …its hegemonic planetary position lead to the adoption of an anthropocentric and selfish model presenting various harmful features for the environmental balance, namely: i) a disproportionate demographic increase; ii) a dizzying development system guided by consumerism; and, iii) the limitless exploitation of natural resources.[40]

Yet, the Court admits that the consciousness of the compulsory reorientation of our behaviour and of the recognition of the intrinsic value of nature is gradually being created. Thus, a new 'ecocentric-anthropogenic' ideology has emerged, which moves away from the purely anthropocentric and utilitarian

31 As the Court noted, the current Colombian mining policy aims at converting the country into a mineral extraction power. Colombia is already among the biggest gold producers at the global level. ibid Ground 7.6.

32 ibid Ground 9.45.

33 ibid Operative part pt 4.

34 ibid.

35 ibid. Moreover, the Court ordered, among other things, the design and execution of: (i) a decontamination plan of the Atrato River basin (Operative part pt 5); (ii) a coordinated action plan to neutralise and eliminate illegal mining in the Atrato River and its tributaries, as well as in all of the *Chocó* department (Operative part pt 6); (iii) an integrated action plan for traditional livelihood and food retrieval (Operative part pt 7); and, (iv) the conduction of toxicological and epidemiological studies in the Atrato River, its tributaries and neighbouring communities to determine the degree of contamination and the possible impact on human health (Operative part pt 8).

36 Colombian Supreme Court (n 3) Ground 11.

37 ibid Ground 14.

38 ibid Ground 4.

39 ibid.

40 ibid.

perspective and places human beings at the same level as nature with the aim to 'avoid the arrogant, dismissive and irresponsible treatment of nature and her components, only to fulfil materialistic purposes without respect for their protection or conservation'.[41]

Moreover, in light of the environmental risks and issues at global scale, the Court underlines the obligation of solidarity with the 'other', including present and future generations, just as nature, animal and plant species living on this planet (the others).[42] Thus, according to the court,

> …all human beings have to stop thinking only in their own interest. We must realise how our daily activities and behaviour have an impact on society and nature.[43]

The court assures that this obligation of solidarity rests on the fact that humankind 'is part of nature, 'being' itself nature'.[44]

In this sense, acknowledging that the conservation and protection of the Amazon – considered as 'a pivotal environmental area on Earth' and dubbed 'the lungs of the planet' – is a national and global imperative,[45] the Supreme Court issued a decision recognising the Colombian Amazon rainforest as a subject of rights beneficiary of the protection, conservation, sustenance and restoration that must be provided by national and local governments.[46] Thus, the representation of and advocacy task for such rights have been given to the Colombian government and the territorial entities of the country's Amazon region.

As in the Atrato case, in order to guarantee the rights of the Colombian Amazon, the court ordered a number of measures in the operative part of the decision. Such measures included the creation, within four months of the decision, of short, medium and long-term plans of action to combat deforestation and deal with the impacts of climate change.[47] It also requested the creation, within five months of the ruling, of an intergenerational agreement: the '*Pacto intergeneracional por la vida del Amazonas colombiano PIVAC*' (*Intergenerational Covenant for the Life of the Colombian Amazon*) incorporating measures to reduce deforestation, mitigate GHG emissions, and to enhance adaptation to climate change.[48] Such plan should be developed by the government, with the participation of the plaintiffs, affected communities, scientific and environmental groups and the concerned Colombian population.[49]

41 ibid Ground 5.3.
42 ibid Ground 5.2.
43 ibid Ground 5.1.
44 ibid Ground 5.3.
45 ibid Ground 10.
46 ibid Ground 14.
47 ibid Operative part pt 1.

4 ANALYSIS

The landmark rulings made by the Constitutional Court and the Supreme Court of Colombia in both *Tierra Digna* and *Dejusticia* cases, are part of a growing number of legislation and judicial decisions that, challenging traditional legal paradigms, adopt ecocentric approaches for the protection of nature. Indeed, in different parts of the world the legal status of a number of ecosystems changed via legislation or court rulings and they were recognised as legal subjects with enforceable rights to improve their protection. For example, this has been the case of the Vilcabamba River in Ecuador,[50] the Te Uruwera forest and the Whanganui River in New Zealand,[51] and the Ganges

48 ibid.
49 ibid.
50 In 2011, the Vilcabamba River lawsuit became the first case worldwide in which the 'rights of nature concept' was applied. Regarding the Ecuadorian experience on rights of nature see Louis J. Kotzé and Paola Villavicencio Calzadilla, 'Somewhere between Rhetoric and Reality: Environmental Constitutionalism and the Rights of Nature in Ecuador' (2017) 6(3) *Transnational Environmental Law* 401.
51 The Te Urewera Forest and the Whanganui River and its tributaries were granted legal personhood in 2014 and 2017 respectively. *See* The Te Urewera Act (Public Act 2014 No 51) and the Te Awa Tupua (Whanganui River Claims Settlement) Act of 2017. In addition, it is expected that the Mount Taranaki, the second highest mountain on New Zealand's north island, will soon become the first mountain in the country to be awarded a legal person status. P. Smith, 'Mount Taranaki: will the New Zealand peak's 'living person' status bring respect?' *The Guardian* (5 June 2018) < https://www.theguardian.com/travel/2018/jun/05/mount-taranaki-will-the-new-zealand-peaks-living-person-status-bring-respect >.

and Yamuna Rivers in India.[52] Together these normative and jurisprudential novel developments demonstrate the increasing relevance of the rights of nature paradigm to enhance the protection of nature and her vulnerable natural entities and to, ultimately, transform the human-nature relationship on the basis of non-anthropocentric world views.

By establishing significant rights of nature precedents in Colombia and worldwide, the Colombian courts' rulings intended to protect both the Atrato River and the Amazon basin from human activities are particularly significant for various reasons. Owing to the length limitations of this case note, only the most relevant of those reasons are discussed below.

First, the courts' judgements bring light not only to the inefficiency of the Colombian government and various local and national authorities to provide and coordinate effective responses to serious environmental problems facing the country, such as those associated to illegal mining activities in the Atrato River and deforestation in the country's Amazon region, but also to the insufficiency of environmental law and policy – in Colombia and in the rest of the world – to ensure the effective protection of nature and her diverse ecosystems. Such deficiencies result from the anthropocentric ontological orientation of environmental law that, without recognising the intrinsic value of nature, values her in terms of short-term economic gains humans derive from her use.[53] Thus, in order to overcome these deficiencies, the Colombian courts decided to adopt an ecocentric approach recognising that both the Atrato River and the Amazon basin are not only mere providers of services and resources, but are rights-bearing subjects of law. Therefore, the recognised legal rights of both ecosystems – including the rights to protection, conservation, maintenance and restoration – can be enforced by local communities and individuals in courts, while their guardians and representatives could also be sued for failing to fulfil their responsibilities.

As the Constitutional Court noted, this paradigm shift from a human-centred to a non-anthropocentric world view, identifying humans as part of nature and not as her masters, is based on the understanding that environmental law is part of a dynamic and evolving concept continuously being updated and submitted to democratic deliberation, following the scientific developments, and should seek to be part of a fair and equitable framework.[54] Based on these premises, in an effort to overcome the current limitations and deficiencies of environmental law, the Colombian courts used the ecocentric approach to halt and reverse the environmental deterioration of the Atrato River and to stop deforestation in the country's Amazon region. This represents an important shift in the legal framework for environmental protection in Colombia and a significant development of environmental law.

Second, while stressing the relevance of the recognition of the rights of nature on paper, both judgements emphasise on the significance of the protection and enforcement of those rights.[55] Precisely, in an effort to operationalise legal personhood granted to the Atrato River and the Colombian Amazon basin and to ensure that their new legal rights are implemented properly, the courts issued a number of important orders. In *Tierra Digna* case those measures included the designation of the Atrato's guardians – which are members of the affected communities alongside with the government – who uphold the river's rights and are allowed to speak and stand for it.[56] Meanwhile, in *Dejusticia* case, the Colombian Supreme Court ordered that the recognised rights of the Amazon rainforest will be represented by the government and the territorial

52 In March 2017, the High Court of the State of Uttarakhand ruled that the Ganges and the Yamuna rivers have the status of a legal person with rights. *Mohd Salim v State of Uttarakhand & others*, WPPIL 126/2014 < http://lobis.nic.in/ddir/uhc/RS/orders/22-03-2017/RS20032017WPPIL1262014.pdf >. After the state government of Uttarakhand appealed that judgement, in July 2017 the Supreme Court stayed the Uttarakhand High Court landmark judgement.

53 *See*, for example, Louis J. Kotzé and Duncan French, 'The Anthropocentric Ontology of International Environmental Law and the Sustainable Development Goals: Towards an Ecocentric Rule of Law in the Anthropocene' (2018) 7 (1) *Global Journal of Comparative Law* 5.

54 Colombian Constitutional Court (n 1) Ground 7.33.

55 On the enforcement of the legal rights of nature or her ecosystems see, for example, O'Donnell and Talbot-Jones (n 4).

56 The guardians of the Atrato River were designated on August 2017. Tierra Digna, 'Hoy se elige en Quibdó el guardián del Atrato de las comunidades' (31 August 2017) < http://tierradigna.org/2017/08/31/hoy-se-elige-en-quibdo-el-guardian-del-atrato-de-las-comunidades/ >.

entities integrating such ecosystem. Moreover, the ruling on the Atrato River case stated that specific institutions – *the Procuraduría General, the Defensoría del Pueblo and the Contraloría General* (the Attorney General, the Ombudsman, and the General Controller's Office) – will form an Expert Panel in charge of monitoring and verifying the compliance of the court's orders.[57] However, one could express doubts over the true commitment to be expected by the government's representatives in these bodies as it has been shown earlier that the Colombian government lacked actions to protect these areas. Also, the guardians and representatives have not been given additional funding to support their new responsibilities. Yet, as it has been noted, the independence of the legal entities holding the legal rights of ecosystems from state and national governments and the provision of funding and organisational support to uphold the rights of nature are key to their enforcement.[58] Despite the above, the courts' rulings provide important elements regarding the enforceability of the rights of nature, as well as of the inter-institutional articulation and cooperation with civil society that could be useful for future experiences – ruling and legislation initiatives – on nature's rights.

Third, while the recognition of the Atrato River and the Amazon Basin as '*sujetos de derechos'* was not something that applicants sought or requested directly in the *tutela* actions they brought, the Colombian courts took the opportunities offered by the cases to make progress on the 'rights of nature' paradigm in the country. Thus, in the absence of a national law providing for the rights of nature in Colombia, the courts ruled in favour of such ecosystems recognising their legal personhood. Both cases, therefore, have shown that legal rights of nature can be recognised by both legislative and judicial channels.[59] In addition, they underlined the key role that courts play to promote the effective protection of nature and her ecosystems, even making use of ecocentric approaches, especially in countries where the legal framework on this emerging legal paradigm is still lacking behind. Even in lawsuits not originally based on rights of nature or not brought on behalf of her, courts can set powerful precedents regarding new approaches on environmental law, such as the rights of nature legal framework, contributing to its understanding and development. This casts light upon three key aspects: i) the importance of science in helping courts understand the threats to nature and the urgency to cope with them, ii) the importance of raising awareness and knowledge among judges – and lawyers – on rights of nature, and iii) the importance of promoting citizens awareness of rights of nature and the implications of related rulings.

While the Colombian courts' rulings analysed in this case note are without a doubt of great significance for the country's people and ecosystems, they neither imply an immediate and effective protection of the Atrato River and the Amazon rainforest, nor ensure their prompt and comprehensive restoration. Certainly, such effective protection will depend on the enforcement of the courts' orders.[60] As a matter of fact, the enforcement of laws and court rulings recognising rights of nature still confronts many difficulties and challenges in jurisdictions where the rights of nature paradigm emerged.[61] It is also not clear what the real implications of recognising the Atrato River and the Amazon rainforest as being rights-bearing subjects will be. For example, if such recognition will be limited to a symbolic effect, or whether it will generate real practical changes in the governance, management and control of these (and others) ecosystems in Colombia or in the current national development model based on the exploitation of natural resources. Similarly, there is no certainty about the results – and their effectiveness – of the collaboration between the governmental entities and the plaintiffs aimed at enforcing the courts' rulings. As this collaboration is currently occurring, only time will reveal if the outcomes are strong enough to ensure the effective protection of both the Atrato River and the Amazon basin.

57 Colombian Constitutional Court (n 1) Operative part pt 9.
58 O'Donnell and Talbot-Jones (n 4) 6-7.
59 ibid 8.

60 Although in both cases there were some initial delays, the Colombian government and the plaintiffs have made steps on the implementation of measures to comply with the courts' judgements. For more detailed information, see the websites of the NGOs *Tierra Digna* www.tierradigna.org and *Dejusticia* www.dejusticia.org

61 This has indeed been the case in Ecuador and Bolivia. *See* Kotzé and Villavicencio Calzadilla (n 50); Paola Villavicencio Calzadilla and Louis J. Kotzé, 'Living in Harmony with Nature? A Critical Appraisal of the Rights of Mother Earth in Bolivia' (2018) 7 (3) *Transnational Environmental Law* 397.

In any case, given the urgency and magnitude of the environmental problems facing the planet, the rulings on both *Tierra Digna* and *Dejusticia* cases challenge the human-centred or anthropocentric orientation of environmental law and highlight the need for innovative and effective legal approaches to environmental protection such as the ecocentric rights paradigm. Thus, by providing new elements on the implementation of ecocentric conceptions of rights, both rulings contribute to the global debate and development of the emerging field of rights of nature and set important precedents for rights of nature law and litigation in Colombia and worldwide. The challenge for the country is now to achieve the successful implementation of the new legal rights granted to the Atrato River and the Amazon rainforest.

Comment

ENHANCING BOTSWANA'S ENVIRONMENTAL PERFORMANCE BY 2023

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1 INTRODUCTION

Presumably in recognition of the fact that Botswana is, in some respects, one the most highly polluted countries,[1] and the fact that the country has not fared as well as would have been preferable,[2] the Botswana government made the claim in 2017 that it intended to enhance environmental performance by 2023. Certainly, if this were to be achieved, it would be a very welcome development considering that the country is home to some of the world's most impressive, and threatened, species of fauna and flora.[3] However, it is quite questionable whether environmental performance can be enhanced by 2023 considering that since 2017, little has been done by the Botswana government to reform the decades-old approach to regulating environmental protection. This same approach, which, by the state's own admission has not driven environmental performance forward in any compelling way thus far, is what is currently relied on to drive environmental protection efforts.[4]

This Comment explores how, in light of the state's claim to enhance environmental performance by 2023, this objective can actually be realised. It does so by first, establishing an objective measure of states' commitment to environmental performance. Following this, the Comment uses the measure established to determine Botswana's commitment to advancing environmental performance. And, by way of concluding the discussion, the paper relies on the levels of commitment to environmental protection exhibited by the state to identify ways in which this commitment can be enhanced so that environmental performance is indeed enhanced by 2023.

1 M Wiston, 'Commentary: Status of Air Pollution in Botswana and Signiûcance to Air Quality and Human Health' (2017) 15 *Journal of Health and Pollution* 8, 10.

2 Ministry of Finance and Development Planning 'Republic of Botswana, National Development Plan 11 (April 2017 – March 2023)' (2016) part 7.4.-7.6.

3 O Yasukawa and KPisa, 'In Botswana, Ecotourism and Conservation Draw Travellers' *CNN Travel* (13 June 2016) <https://edition.cnn.com/travel/article/botswana-ecotourism-mpa-feat/index.html>.

4 Ministry of Finance n (2) part 7.4.

2 AN OBJECTIVE MEASURE

It is obviously difficult to measure anyone's commitment to doing anything, let alone states' commitment to environmental performance. However, various developments over the years have ensured that measuring such commitment to environmental performance is not impossible.[5] Most notably in this regard, the formal turn by states to crafting regulatory frameworks based on sustainable development, which is defined as the pursuit of development in order to meet the needs of the present generation without compromising the ability of future generations to meet their needs,[6] has made it possible to identify whether a state's regulatory framework is framed to pursue environmental protection, social development, or economic development.[7] Once this is apparent, it becomes possible to identify with a marked degree of certainty, states' commitment levels to environmental performance in an objective manner.

To illustrate, in the sustainable development era, states frequently lay claim to pursuing environmental protection, social development, and economic development simultaneously.[8] Practically, however, experience has shown that even the most developed

5 eg AM Burley, 'International Law and International Relations Theory' (1993) 87 *American Journal of International Law* 205. JL Dunoff, 'From Green to Global: Toward the Transformation of International Environmental Law' (1995) 19 *Harvard Environmental Law Review* 241, 243; RN Gardner, 'The Role of the United Nations in Environmental Problems' (1972) 26 *International Organization* 237.

6 eg World Commission on Environment and Development *Our Common Future* (OUP 1987); DB Magraw and LD Hawke, 'Sustainable Development' in D Bodansky, J Brunnee and E Hey, *The Oxford Handbook of International Environmental Law* (OUP 2007) 613, 623; J Martens and K Schilder 'Sustainable Development' in J Krieger and others, *Oxford Companion to World Politics* (2nd edn OUP 2001) 813, 814.

7 See T Scovazzi, 'State Responsibility for Environmental Harm' in G Ulfstein and J Werksman (eds), *Yearbook of International Environmental Law* (Oxford University Press 2001) 43, 47.

8 World Commission on Environment and Development n (6) Chapter 2 part 1..

states do not really pursue advancement of all three simultaneously. Instead, states most commonly pursue economic development in the first instance.[9] And, where this is done, the state's commitment to advancing environmental performance is apparent where the state invests some of the proceeds from the pursuit of economic development into environmental protection.[10] With the exception of those instances common in the developed world states in which green development is often pursued,[11] in most developing world states such as Botswana, such commitment to advancing environmental performance is absent where the state does not invest some of the proceeds from the pursuit of economic development into environmental protection.[12]

However, identifying such commitment is more complicated where a state which is pursuing economic development does not use some of the proceeds generated to invest in environmental protection.[13] Where this happens it is difficult to determine that a state lacks commitment to advance environmental performance because a state may wish to advance such performance but may not have adequate resources to do so.[14] Separately, it is equally difficult to determine a state's commitment to advancing environmental performance where a state looks to develop economically through exploitation of natural resources as in those instances where states look to develop economically through ecotourism.[15] This is most commonly because the commitment to environmental protection so that the environment is kept in a state in which it can continue to generate tourist revenue will often make it appear as if a state is committed to advancing environmental performance generally.[16]

Importantly, under both circumstances, that is, where there is no re-investment in environmental protection and where there is a commitment to environmental regulation in order to protect the pursuit of economic development through ecotourism, thebest measure of a state'scommitment to advancing environmental performance is the quality of that state's environmental protection regulatory framework as a whole. Certainly, it must be conceded that it is difficult to determine the quality of a regulatory framework generally.[17] However, insofar as environmental protection is concerned, it is worth noting that over time it has become apparentthat there are some reliable indicators of a quality regulatory framework with the capacity to secure environmental protection.[18]

To this end, quality environmental protection regulatory frameworks that succeed at securing environmental protection usually feature laws which are crafted on the basis of numerical quality standards

9 OECD 'Environmental Country Reviews' (2019) <http://www.oecd.org/environment/country-reviews/find-a-review.htm>.

10 eg OECD,Environmental Performance Reviews: In-depth chapters' (2019) http://www.oecd.org/environment/country-reviews/chapters.htm#innovation>.

11 OECD, Green Growth Indicators 2017 (Paris: OECD).

12 J Werksman, 'Consolidating Governance of the Global Commons: Insights from the Global Environmental Facility' (1995) 6 *Yearbook of International Law* 47.

13 Recognition of this salient fact explains the turn to solidarity in environmental protection. On solidarity, R St J Macdonald, 'Solidarity in the Practice and Discourse of Public International Law' (1996) 8 Pace International Law Review 259; U Beyerlin and T Marauhn, *International Environmental Law* (Hart Publishing 2011) 35.

14 Recognition of this very fact is the justification behind common but differentiated responsibility. Rio Declaration on Environment and Development, 14 June 1992, UN Doc A/CONF.151/26/Rev. 1 (Vol. I), Annex II (1992), principle 7; Scovazzi n (7) 47; G Handl, 'Transboundary Impacts' in Bodansky, Brunnee and Heyn (6) 531, 532-5; Y Matsui, 'The Principle of "Common but Differentiated Responsibilities"' in N Schrijver and F Weiss, *International Law and Sustainable Development* (Martinus Nijhoff 2004) 73.

15 eg H Ceballos-Lascurain *Tourism, Ecotourism, and Protected Areas: The State of Nature-Based Tourism Around the World and Guidelines for Its Development* (IUCN Press 1996); M Honey, *Ecotourism and Sustainable Development: Who Owns Paradise?* (Island Press 2008); L Wang and others, 'Ecotourism Environmental Protection Measures and Their Effects on Protected Areas in China' (2014) 10 *Sustainability* 6781.

16 I Christie and others, 'Tourism in Africa Harnessing Tourism for Growth and Improved Livelihoods' (Washington, DC: World Bank 2014) 134-5.

17 JF McEldowney and S McEldowney, *Environmental Law and Regulation* (Blackstone Press 2001) 6; R Baldwin, M Cave and M Lodge, *Understanding Regulation* (2nd ed, OUP 2012) 40-9.

18 A Underdal, 'One Question, Two Answers' in E Miles and others(eds), *Environmental Regime Effectiveness: Confronting Theory with Evidence* (MIT Press 2002) 3, 15; F Giner, Regulation and Standards, Monitoring, Inspection, Compliance, and Enforcement <http://siteresources.worldbank.org/INTRANETENVIRONMENT/Resources/GuidanceNoteonEnvironmentalRegulationandStandardsupdate.pdf>.

that are arrived at based on sustainable development analyses conducted with the public's participation.[19] In addition, environmental protection regulatory frameworks that succeed at securing environmental protection are also commonly based on a command and control approach complemented by context sensitive alternatives which address or account for the limitations with the command and control approach.[20] Further, experience has shown that environmental protection regulatory frameworks that succeed at securing environmental protection consistently feature a credible enforcement mechanism.[21] And, environmental protection regulatory frameworks that succeed at securing environmental protection commonly rely on an empowered environmental management agency, rather than a piecemeal approach that is not integrated, to spearhead environmental protection efforts in a state.[22] Lastly, it goes without saying that by now it has been established that successful environmental protection regulatory frameworks encourage, and make abundant provision for, public participation across all facets of regulation.[23]

19 McEldowney n (17) 6;

20 S Elworthy and J Holder, *Environmental Protection: Text and Materials* (Butterworths 1997) 3, 299. NM Moleele and T Ntsabane, 'Environmental Issues and Management in Botswana: Have the National Conservation Plans Worked?' (2002) 5 *OSSREA* 1, 12-7; J Dikgang and M Visser, 'Behavioural Response to Plastic Bag Legislation in Botswana' *Environment for Development Discussion Paper Series* (2010) <http://www.rff.org/files/sharepoint/WorkImages/Download/EfD-DP-10-13.pdf>; The Southern African Institute for Environmental Assessment SADC Environmental Legislation Handbook 2012 'Botswana' (2012) 67 <http://saiea.com/dbsa_hand book_update09/pdf/4Botswana09.pdf>.

21 Institute for Environmental Assessment n (20) 33, 56, 92, 117, 143. MC Kalikawe, Botswana: Integrating Biodiversity into the Tourism Sector (Presentation made to the UNEP International Workshop on Best practices and Country Case Studies, March 2001) <https://www.cbd.int/doc/nbsap/tourism/BOTSWANA(Tourism).pdf>; Moleele and Ntsabanen (20)12-7. Ministry of Finance n (2) 7.23; Wiston n(1)10; Baldwin, Cave and Lodge n (17) 43-45, 107.

22 V Cistulli,*Environment in Decentralized Development - Economic and Institutional Issues* (2002) <http://www.fao.org/docrep/005/y4256e/y4256e05.htm>. JA Lofton, 'The Impact of Cultural Values and Attitudes on Social Regulation' (2001) *Environmental Liability* 167.

23 S Eden, 'Public Participation in Environmental Policy: Considering Scientific, Counter-scientific and Non-scientific Contributions' (1996) 5 *Public Understanding of Science* 183, 187-8; J Ebbeson, 'The Notion of Public Participation in International Environmental Law' (1997)

3 BOTSWANA'S COMMITMENT TO ADVANCING ENVIRONMENTAL PERFORMANCE

Having established that measuring a state's commitment to environmental performance is possible where that state's approach to environmental protection is based on sustainable development, it is important to note that Botswana's environmental protection regulatory framework is based on sustainable development.[24] Indeed, Botswana's National Development Plan notes that it is based on four principles, that is, sustainable development, sustainable environment, rapid economic growth, economic independence and social justice.[25] This fact means that it is possible to rely on the measure of states' commitment to environmental performance established above to measure Botswana's commitment to advancing environmental performance by 2023.

To this end, perhaps the first point to note when measuring Botswana's commitment to enhancing environmental performance by 2023 is that this framework, like other frameworks based on sustainable development, aspires to secure the pursuit of economic development in the first instance.[26] The state has put in place measures that seem to suggest that once such development is secured, attention will subsequently be given toadvancing social development and environmental protection using the gains made from pursuing economic development.[27] For instance, the Wildlife Conservation and National Parks Act provides that 'where the Minister so recommends, any revenue

24 Government of Botswana and United Nations Sustainable Development Framework (UNSDF) for 2017-2021 <http://www.bw.undp.org/content/dam/botswana/docs/Publications/BW_UNSDF%202017.pdf>; Ministry of Finance n(2) 7.1.

25 Institute for Environmental Assessment n(20) 49. Sustainable Development Goals Knowledge Platform 'Botswana' Voluntary National Review (2017) <https://sustainabledevelopment.un.org/memberstates/botswana>.

26 Ministry of Finance n(2) 7.1.

27 Ministry of Finance n(2) Chapter 3.

deriving from the payment of fees for licences or permits to hunt, capture, sell or farm any animals or in respect of any other wildlife activity in its area, other than in a national park or game reserve, shall be paid to the district council concerned'.[28] Similarly, the Finance and Audit Subsidiary Legislation: National Environmental Fund Order notes that proceeds from the sale of hunting quota should be paid into the Fund and these can be used to finance and promote activities designed to conserve, protect and manage Botswana environment.[29] Now, it is obviously difficult to argue with certainty that resources do not get redirected to environmental protection. However, it is quite clear that the country has one of the fastest developing economies.[30] It is also clear that, despite this fact and the fact that there are the provisions above, tailored to ensure reinvestment in environmental protection, there is continued land degradation, loss of biodiversity, the fragmentation of ecosystems, uncontrolled pollution coupled with poor waste management practices, illegal mining, unfriendly environmental construction practices, and unsustainable extraction of natural resources.[31] So, it is not unreasonable to come to the conclusion that it does not appear as if enough resources get redirected to environmental protection.

Separately, when looking to measure Botswana's commitment to advancing environmental performance by 2023, it is also useful to note that the country exhibits a strong commitment to pursuing economic development through promoting ecotourism.[32] To this end, the Botswana Tourism Organisation Act makes explicit reference to the need to enhance ecotourism.[33] Equally illustrative of this is the fact that the state has noted that the Okavango Delta should be relied on to contribute to the growth of the domestic economy through the contribution to the growth of the tourism sector and improved livelihoods for the communities residing in the Delta.[34] In addition, government has committed to continuing to designate more heritage sites in order to promote the tourism sector.[35] Importantly for the present purpose, the success of all these ventures depends on the attainment of basic minimum standards of environmental protection.[36] And so, in looking to measure Botswana's commitment to advancing environmental performance based on the measure established above, the fact that these circumstances subsist means that the state's commitment to environmental performance is ideally measured on the basis of the quality of its environmental protection regulatory framework. Further, as noted above, such quality is measurable based on qualities such as, the numerical standards on which the environmental protection regulatory framework is based, the regulatory approach applied in the state, an enforcement mechanism ideally complemented by the provision of an empowered environmental management agency, and the provision of opportunities for public participation.

3.1 Numerical Standards

In this sustainable development era it is inevitable that in developing states especially, environmental protection concessions will have to be made in order to facilitate development. However, because of the threat that the unfettered pursuit of development can pose to the environment and humanity in the long run, sustainability requires that limits should be established on the extent to which the pursuit of development can be considered justifiable. Arriving at these limits is best achieved through conducting holistic and sustainable development analyses at a central state level after all considerations relevant to attaining sustainability have been accounted for. When this is done, it forms the basis of the formulation of numerical quality standards.[37] These are standards

28 Cap 38:01, s 93.
29 Cap 54:01, s 7.
30 Ministry of Finance n (2) iii.
31 Ministry of Finance n (2) 7.54.
32 Republic of Botswana, Government Paper: Ministry of Environment, Wildlife and Tourism, Wildlife Policy, 2013; Yasukawa and Pisa n (3) 1.
33 Botswana Tourism Organisation Act, 2009, s 4.
34 Mbaiwa n(15) 447. JE Mbaiwa, 'Poverty or Riches: Who Benefits from the Booming Tourism Industry in Botswana?' (2017) 35 *Journal of Contemporary African Studies* 93; J Turpie and others, 'Economic Value of the Okavango Delta, Botswana and Implications for Management' (2006) <http://www.the-eis.com/data/literature/Okavango%20Delta%20Valuation%20Study.pdf>.
35 Ministry of Finance n (2) 7.75.
36 Wildlife Policy n (32) 6; 10; 13, Botswana Tourism Organisation Act, 2009, s 4.
37 McEldowney n (17) 4, 3-6, 36-8, 41-2.

which identify the basic acceptable levels of quality for core environmental media such as air, water, land, and also, sustainable numbers or 'quantities' of particular species of fauna and flora.[38] It is also on the basis of these holistic standards that more specialised and complementary numerical standards, such as process, emission, or product standards, which are critical to regulation on a day to day basis, can be established.[39]

With this backdrop in mind, it is worth reiterating that Botswana has adopted sustainable development as a foundational principle. Despite this, it is quite apparent that there have been none of the typical directives to a central institution such as the Ministry of Environment to conduct sustainable development analyses.[40] As a consequence, pivotal environmental protection laws devoted to the protection of core environmental media such as air, water,land, and particular species of fauna and flora arebased on such analyses or numerical quality standards. At the very best, some of these laws make reference to such standards. For instance, the Waste Management Act recognizes the need for quality standards in waste management to the extent that Schedule 1 of the Act incorporates the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal which makes reference to standards.[41] In the same mould, the Atmospheric Pollution (Prevention) Control Act even directs the Minister to make regulations prescribing or providing for standards of quality or purity of air to be employed in testing.[42] Certainly, it is unusual for primary legislation to carry numerical quality standards as this is often left to subsidiary legislation. However, in Botswana law there is no subsidiary legislation dedicated to the protection of core environmental media such as air, water, land, and particular species of fauna and flora which is based on numerical quality standards. This only makes sense since there have been no relevant sustainable development analyses which would form the basis of the formulation of such numerical standards.

38 ibid.
39 ibid 5, 11.
40 ibid 6-7.
41 Cap 65:06.
42 McEldowney n (17) 6. Ministry of Finance n (2) 7.68; 7.73; 7.80.

3.2 Regulatory Framework

In regulation there has grown to be an established link between numerical quality standards and the approach to regulation. This is because, once standards are formulated, it becomes possible to determine sustainable activities in a regulated area. Once this is done, the standards can be the basis on which commands to act in certain ways can be formulated.[43] In addition, it becomes possible for the regulator to rely on these standards to craft a framework for prior authorisation before undertaking actions with predictable environmental impacts. It also becomes important to empower regulators extensive inspection powers of entry without warrant to perform their duties and for the prevention of this to be criminalized. Further, it becomes important for the regulator to be empowered to use a mix of criminal and/or civil liability penalties as controls for bringing actors into compliance with the law. This is essentially the famed command and control approach to regulation.[44]

For all the benefits that attach to this command and control approach however, weaknesses with this approach have been recognized. These include the fact that the approach is often rigid and not flexible, that it is prescriptive and does not allow sufficient room for innovation in looking to meet environmental protection standards, and that it often focuses more on the activities of business and not individuals.[45] As a reaction to this, alternatives to the command and control approach have emerged.[46] Notable examples include economic incentives, environmental

43 ibid 3.
44 Lofton n (20) 167.
45 Elworthy and Holder n (20) 299. Dikgang and Visser n (20) 1; 8-10. Institute for Environmental Assessment n (20) 61-62.
46 DH Cole and PZ Grossman, 'When is Command and Control Efficient? Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection' (1999) *Wisconsin Law Review* 887. E Fisher, P Pascual, and W Wagner, 'Understanding Environmental Models in Their Legal and Regulatory Context' (2010) 22 *Journal of Environmental Law* 251. A Ogus, 'Nudging and Rectifying: The Use of Fiscal Instruments for Regulatory Purposes' (2006) *Legal Studies* 245. R Macrory, 'Regulating in a Risky Environment' (2001) 54 *Current Legal Problems* 619. N Gunningham and D Sinclair, 'Designing Smart Regulation' (1998) <http://www.oecd.org/environment /outreach/33947759.pdf>.

agreements, self-regulation, and reporting. Importantly, most alternatives are intended to complement the use of the command and control approach by affording regulated parties opportunities through which to act within the objectives of the regulatory framework in innovative ways or, ways that are preferable to them, without worrying about the regulator looking to enforce sanctions at every turn as the regulator focuses on the attainment of objectives.[47]

Against this backdrop it is interesting to note that while the regulatory approach in Botswana is based on the command and control approach, there are not too many alternatives in place to account for, and mitigate, the well-known weaknesses that attach to this approach.The closest 'alternative' has been the Community Based Natural Resource Management Policy[48] which recognises that all members of a community share an interest in improving their livelihoods through sustainable management and equitable utilization of natural resources in their environs.[49] Importantly, the Policy has motivated communities to look for alternative ways of securing environmental objectives consistent with those pursued in terms of the command and control approach.[50] However, its value as an alternative to the command and control approach has seemingly been compromised by the fact that it originates in a Policy which the state has sometimes disregarded in a manner that has derailed community efforts.[51] This is certainly not to discount its value as an alternative. What is more noteworthy for the present purpose is that beyond this alternative, which is prone to being compromised by state action, there has been no apparent effort to complement the use of the command and control approach with other alternatives.

3.3 Enforcement

It has become apparent over time that successful environmental protection regulatory frameworks commonly feature potent enforcement mechanisms administered by the enforcement branch of centralized environmental protection agencies.[52] Centralisation allows the agencies to determine, in a flexible manner, the best way in which to enforce laws consistently.[53] This is particularly important because complexities encountered in regulating environmental deterioration, such as evidential burdens, prosecution problems and views of environmental crimes, mean that enforcement works best when it is responsive.[54] This is a reference to an approach to enforcement whereby enforcement efforts are based on a range of sanctions which extend from persuasion and warnings at the onset, to civil penalties, criminal penalties, license suspensions, and then license revocations following as appropriate.[55] In addition to this, it is well recognised that enforcement is more effective when the public has opportunities to participate in regulation.[56] This is because a public that is empowered to participate in regulation can aid in enforcement by alerting authorities to harmful activity. The public can also enforce laws by exercising their right of access to justice. In addition, the provision of opportunities for public participation means that the public can leverage the threat of bringing adjudicatory action against an actor causing harm to get that actor to comply with laws.[57]

47 Cole and Grossman n (20) 887.

48 Government of Botswana, Community Based Natural Resource Management Policy Government Paper 2 of 2007.

49 ibid.

50 Wildlife Policy n (32) 5.5.

51 J Mbaiwa quoted by K Kgosikebatho, 'Enclave Tourism Kills Community Trusts', *The Patriot on Sunday* (2017) <http://www.thepatriot.co.bw/news/item/3749-enclave-tourism-kills-community-trusts.html>.

52 Lofton n (20) 167. Baldwin, Cave and Lodge n (17) 227-95; A Ogus and C Abbott, 'Sanctions for Pollution: Do We Have the Right Regime' (2002) 14 *Journal of Environmental Law* 281; E Couzens, 'Enforcement of Environmental Law: Good Practices from Africa, Central Asia, ASEAN Countries and China' (2014) <https://wedocs.unep.org/bitstream/handle/20.500.11822/9968/enforcement-environmental-laws.pdf?sequence=1&isAllowed=y>.

53 Baldwin, Cave and Lodge n (17) 43-5, 107.

54 I Ayres and J Braithwaite, *Responsive Regulation* (OUP 1992) 25. Baldwin, Cave and Lodge n (17) 259.

55 Baldwin, Cave and Lodge n (17) 259.

56 J Newig, 'Does Public Participation in Environmental Decisions Lead to Improved Environmental Quality? Towards An Analytical Framework Communication, Cooperation, Participation' (2007) 1 *International Journal of Sustainability Communication* 51-71 <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-431965>. However, the utility of participation to enforcement has been questioned by RA Irvin and J Stansbury, 'Citizen Participation in Decision Making: Is It Worth the Effort?' (2004) 64 *Public Administration Review* 55.

57 B Maripe, 'Development and the Balancing of Interests in Environmental Law: The Case of Botswana' in M Faure and W du Plessis (eds), *The Balancing of Interests in Environmental Law in Africa* (PULP2011) 49, 63-6.

Importantly, enforcement in Botswana is not based on a systematic responsive approach directed by a centralised agency. Instead, enforcement is predominantly left to traditional state enforcement machinery usinga punitive approach.[58] In addition to this, the law identifies how different state agencies,such as the Ministry of Environment, Wildlife and Tourism which has supervisory authority over departments such as the Departments of, Environmental Affairs, Waste Management and Pollution Control, Forestry and Range Resources, Wildlife and National Parks, Tourism, the Botswana Tourism Organisation, and the Department of Meteorology, should contribute to enforcement efforts.[59] Often, this is through record-keeping and the provision of information when requested by state enforcement machinery. In addition to this, legislation such as the Wildlife Conservation and National Parks Act and the Atmospheric Pollution (Prevention) Act[60] has empowered relevant Ministers to appoint Officers who have the power to enforce the law.[61]

Separately, insofar as the potential for members of the public to enforce the law is concerned, it is worth noting that Botswana laws do not empower citizens to prosecute environmental offences.[62] In addition to this, there is no provision for a constitutional or statutory environmental right to a clean environment. At most, such a right to a clean environment can certainly be inferred from the common law.[63] However, in light of the fact that such rights have not been recognised in the Constitution, Botswana's courts have not looked positively on inferring socioeconomic rights, including the right to a clean environment, from other existing parts of the law.[64] All this is important because, in the absence of such a right, the public find it nearly impossible to enforce the law through civil or rights based actions. Effectively then, the two scenarios in which citizens can enforce the law in Botswana are first, when the state fails or refuses to prosecute enabling them to prosecute,[65] or second, when a member, or members, of the public suffers some sort of delictual harmwhich entitles the victim, or victims, to enforce laws in civil court.[66] Reflective of the inadequate attention paid to matters of enforcement at the state level however, both scenarios require citizens to be willing, and able, to bear the costs of litigation that attach to enforcing the law. These are not costs that the average citizen can bear.

3.4 Public P articipation

Public participation, broadly defined, means participation of non-governmental actors in governmental affairs.[67] It is generally recognised that there are three interdependent pillars of public participation, namely, access to information, participation in decision-making, and access to justice.[68] Allowing participation enhances the legitimacy and thus, acceptance levels of decisions taken.[69] Driesen has argued that public opinion has always driven environmental improvement, so dissemination of good and understandable information and opportunities to act on that information are extremely important.[70] Similarly, Newig and Fritsch consider that public participation leads to more ecologically rational decisions than in top-down approaches. They note further that,

58 Environmental Assessment Act Cap 65:07, s 22. Institute for Environmental Assessment n (20) 56.

59 Institute for Environmental Assessment n (20) 53. Kalikawe n (21) 1.3; 2.1; 2.2. Moleele and Ntsabane n (20) 12-17. Ministry of Finance n (2) 7.23. Wiston n (1) 10. Baldwin, Cave and Lodge n (17) 43-45, 107; SE Fink, 'Environmental Law in a Developing Country: Botswana' (2000, LLM Dissertation) 5 <http://uir.unisa.ac.za/bitstream/handle/10500/16784/dissertation_fink_se.pdf?sequence=1&isAllowed=y>.

60 Cap: 65:03.

61 Wildlife Conservation and National Parks Act, Cap 38:01, s 2-3; Atmospheric Pollution (Prevention) Act, Cap 65:03, s 3-4.

62 *Attorney General v Muzila* (2003) 1 BLR 471.

63 T Madebwe, 'A Rights-based Approach to Environmental Protection: The Zimbabwean Experience' (2015) 15 *African Human Rights Law Journal* 110-28. T Madebwe, 'Carving Out a Greater Role for Civil Litigation as an Environmental Law Enforcement Tool in Zimbabwe's 2013 Constitution' (2015) 11 *LEAD Journal* 108-19.

64 *Attorney General v Mwale* (CACGB-096-14, CACGB-076-15) [2015] BWCA 1 (26 August 2015) para 73.

65 ibid.

66 Waste Management Act, Cap 65:06, s 42; O Tshosa, *International Encyclopaedia of Laws, Environmental Law, Botswana* (2005); CM Fombad and J Pfumorodze, *The Law of Delict in Botswana* (Kluwer International 2019).

67 Beyerlin and Marauhn n (13) 234.

68 ibid 234. Ebbeson n (23) 58.

69 J Ebbeson, 'Public Participation in Environmental Matters' in R Wolfrum (ed), *Max Planck Encyclopaedia of Public International Law* (2009) para 3.

70 DM Driesen, 'Thirty Years of International Environmental Law: A Retrospective and Plea for Reinvigoration' (2003) 30 *Syracuse Journal of International Law and Commerce* 353, 366.

participation leads to improved compliance with decisions and thus, better outcomes and impacts in ecological terms than top-down models of governance.[71]

With this backdrop in mind, it is worth noting that, while the impression is created in Botswana that participation is encouraged, as in the Community Based Natural Resource Management Policywhich indicates that it looks to promote partnerships in wildlife management through participation of communities,[72] it is difficult to participate in environmental protection in the country for three broad reasons. First, participation is difficult because it is difficult to get access to environmental information in Botswana.[73] Certainly, some legislation seems to make provision for participation. For instance, section 7 of the Environmental Assessment Act makes reference to *inter alia*, thepublication of information on effects and benefits of activities in the mass media using the official languages for a period of not less than 21 days and holding meetings with people or communities affected by intended activities to explain the nature of the activities and their effects.[74] Importantly though, in this Act as in other legislation, information is only published under strict circumstances that are not frequently occurring. Second, actual participation in decision-making is difficult in Botswana despite the fact that some laws appear to make provision for opportunities the public to participate in the regulation of environmental protection. As an example, the Wildlife Conservation and National Parks Actsuggests that The Director may, after consultation with the appropriate local authorities and land boards, determine the number of animals of each species, or of a particular sex, that may be hunted during any season in any specified controlled hunting area.[75] Importantly though, in this law as in other similar laws, the Director is given the choice to determine whether to invite participation or not. This is hardly consistent with the global trend which has seen states' provision of opportunities for public participation regarded as a compulsory obligation.[76] Third, public participation in Botswana is difficult because there is no real access to justice. Here, it is important to note that Botswana law secures access to justice in those instances where a person is aggrieved by the refusal of a licensing officer or the Director to grant a permit, or by any terms and conditions imposed by them.[77] Access to justice is also assured in those instances where a person has suffered delictual harm and looks to bring the matter to court as a victim of the harm.[78] However, the provision of access to justice is poor overall because,where people do get access to justice, they must bear the same extensive costs that attach to bringing matters to court that were noted earlier. In addition, this restrictive approach to standing which grants access to justice to victims means that there is no access to justice for people who are not directly affected by environmentally harmful activities who wish to act in the public interest.[79] This is despite the fact that it is increasingly accepted in different parts of the world that allowing such people access to justice is critical to the advancement of environmental protection objectives.[80]

4 CONCLUSION

The government of Botswana has, thus far, said and seemingly done all the right things insofar as environmental protection is concerned. When

71 J Newig and O Fritsch, 'Environmental Governance: Participatory, Multi-Level-and Effective?' (2009) 19 *Environmental Policy and Governance* 197, 200, 205-206.

72 See part, 3.2.3; Wildlife Policy n (32) 5.5.

73 eg Constitution of Botswana, 1966, s 12(b) which allows the withholding of information held in confidence. See also the conditions attached to the disclosure of information under the Atmospheric Pollution (Prevention) Act, Cap 65:03, s 13; Maripe n (58) 63-6.

74 Also see Environmental Assessment Act Cap 65:07, sections 7, 10, 11; Environmental Assessment Regulations, 2012, s 9.

75 Wildlife Conservation and National Parks Act, Cap 38:01, s32(2).

76 eg Rio Declaration on Environment and Development, 14 June 1992, UN Doc A/CONF.151/26/Rev. 1 (Vol. I), Annex II (1992) principle 10.

77 eg Waste Management Act, Cap 65:06, s 42.

78 Wildlife Conservation and National Parks Act, Cap 38:01, s 42; Waste Management Act, Cap 65:06, s 27; Fish Protection Regulations, 2016, s 15; Fombad and Pfumorodze n (62) 151.

79 *Botswana National Front v Attorney General* (1994) BLR 385; *Attorney General v Unity Dow* (1992) BLR 119; *Tsogang Investments (Pty) Ltd v Phoenix Investments* (1989) BLR 512.

80 Madebwe n (64) 112.

thoroughly assessed however, their actions tell a different story. There is extensive investment in development which is not mirrored in the pursuit of environmental protection. This is not a fatal flaw, it would be a reasonable stance to assume if the regulatory framework was based on numerical quality standards, incorporated alternatives to the command and control approach, carried a credible enforcement mechanism, and secured opportunities for effective public participation. The preceding discussion has established that the framework does not do these things. And so, if, environmental performance is to be enhanced by 2023 as the government has claimed it intends to do, significant steps will have to be taken to ensure that environmental protection is pursued in earnest.

The most basic, and attainable, step that could be taken towards this goal will have to be the drafting of framework environmental protection legislation which, in the absence of an environmental right, would provide such a right and mandate the creation of an environmental protection agency. This agency would be tasked with formulating numerical standards for the regulation of all environmental protection. The agency would also be charged with formulating and advocating the turn to appropriate alternatives to the command and control approach. The agency would also enforce the law in a centralised and responsive manner while encouraging public participation.

In order for all this to happen however, an emerging network of environmentalists, environmental lawyers, and all other stakeholders will need to work together to educate the public on environmental protection and deficiencies in the environmental protection regulatory framework.[81] This is important since national elections will be held in 2019, well before the 2023 deadline for enhancing environmental performance. Elections afford these environmentalists, environmental lawyers, and all other stakeholders with the opportunity to educate the voting public on environmental protectionand getting them to care about environmental protection. This will, hopefully get the people to demand that politicians commit to enhancing environmental performance by 2023 if they are to receive people's votes.

81 M Finnemore and K Sikkink, 'International Norm Dynamics and Political Change' (1998) 52 *International Organization* 887; HP Schmitz &K Sikkink, 'International Human Rights' in W Carlsnaes, T Risse and BA Simmons (eds), *Handbook of International Relations* (Sage 2007) 517.

Book Review

JOHN A.P. CHANDLER, *PETROLEUM RESOURCE MANAGEMENT: HOW GOVERNMENTS MANAGE THEIR OFFSHORE PETROLEUM RESOURCES* (EDWARD ELGAR 2018)

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This book can be purchased directly online here.

John A.P. Chandler, *Petroleum Resource Management: How Governments Manage Their Offshore Petroleum Resources* (Edward Elgar 2018)

Effective natural resource management requires a robust legal framework. In carefully comparing and analysing the petroleum licensing systems of three select jurisdictions, Chandler sheds light on changes adopted to deal with exploration, development, infrastructure sharing and production of offshore petroleum resources. This book adds to the growing literature examining natural resource allocation, economics and policy from multiple perspectives - improved governance, efficiency, environmental concerns, social impacts and now, licensing arrangements. It is also timely as governments rejig their resource governance frameworks against the backdrop of changing energy needs, depleting resources, climate change concerns and falling prices.

The legal architecture in the form of regulatory policy, institutions and licensing arrangements have a powerful bearing on performance of mineral production. This book is the result of a research project initiated against the backdrop of major offshore producing basins reaching maturation in Australia (Bass Strait in Gippsland Basin), the Norwegian Continental Shelf and the UK Continental Shelf. The changing maturity of the oil fields present a set of dilemmas carefully examined by country reports, which are extensively analysed by the author. The research confirms the author's hypotheses that the problem of interdependence which emerges from the special geology of petroleum and the means of production, as being critical for states to consider in their governance regimes and conflict management.

The book can be read in three distinct parts – chapters dealing with the broader framework of regulatory structures, regulators, resource management policy; chapters dealing with licences and production sharing contracts with a specific focus on exploration, development, production and infrastructure and the final set of chapters that examine critical issues of resource rent, value and stewardship, efficient economic recovery, good oilfield practice. The book does not attempt to provide an analytical or theoretical frame to the comparative study, nor does the work locate the comparative study in the broader global context of mineral resource management. What the book offers instead, is an in-depth study of licensing arrangements and their specificities, producing a richly detailed work with useful practical implications for those working within the field of petroleum resource management. The analysis is layered with insights from field interviews with various stakeholders in the three jurisdictions.

Although licensing agreements form the central analytical theme for the research, the chapter focussing on the license agreements quickly concludes that there is no significant difference in the licensing practices adopted by the three countries. In essence, they grant licenses that confer exclusive rights to conduct petroleum operations in license areas that are mapped on the surface and a single production licence permits exploration, development and production activities. Only Australia has a separate prior licence for exploration. The processes for the marketing and issue of licences also have broad similarities. They invite applications through a formal competitive process called a licensing round (or in Australia an average release). More significant differences can be found in the size of licence areas and the terms and conditions of licence.

While there are many similarities, significant differences also emerge in other areas such as the impact of the political structure on resource management (Australia being a federal structure); the social benefit principle incorporated in Norway's legislation which is significantly different from the focus on the Prudent Production Principle and the UK system which has a clear focus on maximising economic recovery. Perhaps the most insightful chapters in the book are the ones that deal with regulation, regulatory structures and resource rent value and stewardship. Major changes to regulatory structures effected in all three jurisdictions in recent years ensure role clarity. In all three jurisdictions, different regulators manage occupational health and safety and management of the resource. The two primary drivers for these regulatory changes are recognition that conflict of interest in regulatory functions must be avoided and that specialist government expertise is required in relation to oil and gas activities.

Peppered through-out the research are several interesting issues that remain underexplored in the analysis such as the implications for governance the

risk averse nature of International Oil Companies, thus chasing big new projects rather than extracting the last drop out of mature fields. The discussion on social licence to operate and the discussion on sustainability and climate change sit oddly within the chapter discussing companies as a critical stakeholder in the petroleum resource management. More so as these topics find discussion later in the book. These are minor quibbles and do not take away from a worthy exercise of a detailed comparative review that has wider implications for resource governance.

In the chapter on resource rent, value and stewardship, the author sheds light on how governments extract value for the disposal of a public asset and ensure that licensees conduct their operations to an appropriate standard. The idea of stewardship is an important idea in resource governance. Stewardship obligations of companies are set out in the statute, case law and the corporate governance structures, and is primarily directed at upholding the interests of shareholders and increasing the shareholder value. As the author rightly notes, stewardship of governments on the other hand still revolve around the allocation of wealth or welfare derived from the resource base and the distribution of costs of resource conservation. Thus, the states considered approach (or lack thereof) has a direct bearing on resource management and related political objectives. Equally, the role of an independent regulator to effectively balance the specific interests of companies with the larger public interest of the state. The intuitions from these chapters and the book overall, can be extended beyond petroleum resource management, offering lessons for better governance of public assets and resource management. In fact, there is great potential for extending this research to a broader analysis of state re-regulation in the wake of greater privatisation of natural resources.

Detailed in its understanding of licensing in offshore petroleum resources, this book by John A.P. Chandler is a must read not only for practitioners but also students and academics dwelling on tricky questions of appropriate legal structuring and architecture for effective natural resource governance.

Book Review

FRANTZESKA PAPADOPOULOU, *THE PROTECTION OF TRADITIONAL KNOWLEDGE ON GENETIC RESOURCES* (EDWARD ELGAR 2018)

Reviewed by : **Shachi Singh, Assistant Professor, Faculty of Law, University of Delhi, India**

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Book Review: Frantzeska Papadopoulou, '*The Protection of Traditional Knowledge on Genetic Resources* (Edward Elgar 2018)', 15/1 *Law, Environment and Development Journal* (2019), p. 74, available at http://www.lead-journal.org/content/19074.pdf

This book can be purchased directly online here.

Frantzeska Papadopoulou, *The Protection of Traditional Knowledge on Genetic Resources* (Edward Elgar 2018)

Traditional Knowledge (TK) is a subject matter which cuts across different spheres of legal regulation such as international legal framework on conservation of biological diversity, intellectual property rights, human rights, property, plant variety protection etc. Given its very nature, Traditional Knowledge (TK) poses serious difficulties in framing as well as harmonising existing norms pertaining to different fields of law in order to give effect to its smooth regulation. The list of stakeholders includes, researchers, multi-national companies including pharmaceuticals and cosmetic companies, states, indigenous and local communities (ILCs), common people, *inter alia*. In view of the rising awareness amongst different societies about sustainable ways of living, traditional knowledge, as a concept has gained prominence as a matter of economic and ethnic value as well as pride.

The first question that comes to one's mind in relation to TK probably is, regarding the essential ingredients for any knowledge to be referred as traditional. In fact, the international experts working on TK have been boggling their minds in order to arrive at a comprehensive definition so as to cover all its characteristics.[1] This is primarily the concern that has been expressed by the author throughout the book i.e. the issue of entitlement that must be conferred on TK for ensuring its adequate protection and securing the rights of concerned stakeholders including indigenous and local communities who have been conserving and enriching this ancient know-how. Academicians, scholars, researchers, legislators as well as international experts working towards protection of TK must initially address the basic issue of entitlement with respect to TK. In this regard, this collection of information and its jurisprudential analysis is a must read.

The methodology adopted by the author for writing the book is two layered. The outer layer corresponds to chapterization which is sequential in nature. In the introductory chapter, the author invites the readers to understand the basic concepts and the evaluation framework devised by the author. Following which the second chapter provides for an in-depth discussion on legal status of Traditional Knowledge on Genetic Resources hereinafter referred to as TKGR, its commodification and existence of a mosaic of international agreements for its protection. Quite naturally, the next chapter provides its readers with a detailed analysis of two prominent international legal structures i.e. the CBD framework and patent system in relation to protection of TKGR including the regional model laws and national legislations. The succeeding chapter on bioprospecting agreements exposes the inherent weaknesses of this bilateral system by citing various key agreements on access and benefit sharing available for public scrutiny and simultaneously the author expresses her concern that very few of such agreements are actually available in public domain for one or the other possible reasons. The book in its concluding chapter completes the circle by bringing back the reader to the introductory remarks made by the author. The overall point which the author is primarily seeking to make by writing this book is that the endeavour of this book is not to propose the best alternative protection system for TKGR but provide for an alternative form of reasoning in the discussion on possible new entitlement for ensuring protection of TKGR.

The inner layer corresponds to the internal structure of a chapter in the book which is again sequential in nature and is threefold; firstly, the author acquaints its readers with the basic descriptive information on the issue; secondly, she brings into picture the lacunas or difficulties within the current protection systems of TKGR through varied illustrations & examples and thirdly, the chapter sets specific parameters to evaluate the efficacy of key aspects of the legal frameworks on TKGR.

In the opening chapter, the author expresses her apprehension with respect to the current regulatory regimes on TK. Specifically, the book mentions that TKGR is subject to a complex regulatory regime concerning multiple legal institutions with over-lapping rules and therefore, the legal regime related to protection of TKGR remains unclear.

The book has been structured in a simplistic manner wherein the succeeding chapter quite logically follows

1 WIPO Report on Fact-Finding Missions on Intellectual Property and Traditional Knowledge (1998-1999), Intellectual Property Needs and Expectations of Traditional Knowledge Holders < *www.wipo.int/edocs/pubdocs/en/tk/768/wipo_pub_768.pdf* > accessed 18 October, 2018; See, Traditional Knowledge < https://www.wipo.int/tk/en/tk/) accessed 21 October, 2018.

its preceding chapter. The book is divided into six chapters wherein the link between the introductory chapter and the concluding chapter is quite evident.

Traditional Knowledge could in simplest terms be described as our realization of the close association of biodiversity and human body. Based on numerous trial and errors, this knowledge was arrived at over several centuries and has been conserved by generations after generations.

In modern times, it is being utilized across various commercial sectors such as pharmaceuticals, cosmetics, food industry, textile industry and several other areas. The noble concept of climate justice, sustainable ways of living and conservation of biological diversity has raised awareness amongst consumers to consume products which are direct derivatives of components of nature. This rise in demand for natural products has driven the manufacturers and scientists to find out various ways in which natural products of various kinds may be derived out of biological resources. The author points out that the use of TKGR has the potential to increase efficiency in screening plants for medicinal properties by more than 400 per cent (p. 2).

After a brief explanation on international legal framework regulating the status of TKGR, this book primarily investigates the need of a valid recognition of TKGR and further tests a number of variations of possible legal frameworks for its protection.

The author sets the evaluation framework for testing several available forms for protection of TKGR (p. 3). This evaluation framework constitutes of a combination of the Ronald Coases's theorem on economic efficiency and the John Rawl's theory of equity and justice. In this manner, she has provided an inter-disciplinary approach of testing the suitability of different forms of legal title that may be accorded to TKGR.

The author acknowledges the fact that TKGR has been playing significant role in the lives of people since ancient times. She has extensively researched on specific instances in the evolution of human history and shown the manner in which such instances have influenced international relations. In that context, the text traces the manner in which white colonisers made a move from gathering material wealth from their respective colonies to collecting and sending biological resources to their home country (p. 27).

In the above-mentioned context, the book discusses the laws that have regulated access to TKGR from the pharaohs of Egypt to the modern era of bioprospecting wherein multinational companies are hiring scientists and experts on several key bio-technology development projects.

Following this in-depth discussion, the author divides the development of legal framework on TKGR into three phases: the first period begins from ancient years through colonization to FAO (Food and Agriculture Organization of the United Nations) Global Plan for plant genetic resources in the 1980s wherein she draws a comparison of the legal status of TKGR with that of *terra nullius*. The second period begins in the mid-1980s with FAO International Undertaking on Plant Genetic Resources (p. 29). The legal status accorded to TKGR under this international instrument was that of the 'Common Heritage of Mankind' wherein the access was free and therefore the issues of biopiracy including piracy of TKGR is found to be rampant. The developing part of the world which is also the home of large share of biodiversity on this Earth grew sceptical of this system and expressed its concern at the United Nations platform. This concern translated into a treaty i.e. the Convention on Biological Diversity, 1992 hereinafter referred to as the CBD. At this juncture, began the third period with the coming into force of the CBD and IPR Conventions mainly the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement which as very rightly pointed out by the author changed the nature of TKGR from a heritage to commodity and resulted in propagating the concept of commoditisation of TKGR both in theory as well as practical transactions (p. 50).

In expounding the legal status of TKGR, the author has extensively explored and explained the interface between relevant international legal instruments including International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), the Stockholm Declaration, the TRIPS and the Nagoya Protocol on Access and Benefit Sharing to CBD (Nagoya Protocol) which recently came into force.

This book truly is an endeavour where one could find historical as well as socio-legal analysis of all the

international legal instruments including those which might have a possibility of influencing the legal status of TKGR only tangentially. Therefore, this book provides one of the most comprehensive analysis on TKGR which could be found in any written text today.

The discussion in the book then in an obvious sequential manner, proceeds on major international and national level legal structures regulating trade of TKGR. This discussion is very well placed as the cornerstone of both the CBD as well as the TRIPS framework is their dependence on national level implementation measures. The examination of legal status of TKGR and its protection demands a further examination of domestic as well as regional legal frameworks on safeguarding TKGR.

In this descriptive analysis of the implementation initiatives under the broad framework of the CBD, the author classified these implementation initiatives under two categories: firstly, regional implementation initiatives such as Organization of African Union (OAU) Model Law, the Andean Community Decisions, the ASEAN Agreement and secondly, the national legal frameworks which put forth diverse protection schemes available across the world with respect to regulation of TKGR. This study expressed in the third chapter of the book includes a note on the Peruvian and Brazilian legislation. Papadopoulou has been careful in choosing the national jurisdictions on which she has discussed in her study. The justifications for choosing the countries in this regard seems to be based on one or the other following grounds: richness of a country in biodiversity and associated traditional knowledge, their role in negotiation of agreements under the CBD framework, institutional and financial capacity of a country to regulate Access and Benefit Sharing (ABS), their track-record of conservation, their potential of use and their technological advancements to utilize genetic resources.

This piece of literary work is distinct from other available literatures on TKGR especially because the author by citing several instances creates a space within the minds of its readers to be able to appreciate the issues that are still left unaddressed and unresolved as far as this subject matter is concerned.

In line with the above statement, the author in this section of the book draws an inference on how the documentation and disclosure of TKGR might lead to possible negative consequences for third parties' acquisition of IPR as well as rights of indigenous and local communities in protecting their culture and resources. This is indeed a very well thought piece of writing which binds its readers to utilize their analytical minds and to appreciate the fact that such documentation might lead to negative impact on protection of traditional knowledge itself. The author rightly phrases this concern wherein she writes 'no one wants to pay for something that is available to the public' *(p. 36, 37)*.

Very few literatures focus on such negative consequences as mostly it is the positive aspects of documentation that are known to the scholars let alone the layperson. Therefore, the author seems to be successful in maintaining the neutrality and objectivity in her writing and providing voice to different perspectives on the issue.

The disclosure and Prior Informed Consent requirements (PIC) which is a point of compromise as mentioned by the author between the objectives of the CBD and the current Intellectual Property (IP) system is the most debated and discussed matter amongst states precisely between developed and developing countries at various international fora including the ongoing discussions at the WIPO.[2]

Elaborating on this key interface between the Intellectual Property (IP) and Access and Benefit Sharing (ABS), the book reveals the difficulties that would arise out of a legal system which would require evidence of PIC. Again, in this respect, the book is different from usual writings as it provides a different perspective of understanding the link between IP and ABS. The issue seems to be a bit technical to comprehend but the manner in which the author has put forth her imagination using various illustrations which might arise out of requirement of disclosure requirements or designating patent offices as check points under the domestic laws in line with the Nagoya Protocol simplifies those technicalities underlying the ancillary concepts to TKGR.

2 Paul Kuruk, 'Regulating Access to Traditional Knowledge and Genetic Resources: The Disclosure Requirement as a Strategy to Combat Biopiracy' (2015) 17 San Diego Int'l L.J. 1.

Her reliance on illustrations invites the readers to imagine the possible consequences of a system requiring evidence of PIC. For instance, she writes that if designated as check points, *patent offices will have to examine and control compliance with foreign law…On the other hand, the Country of Origin could reach decisions that would be applicable as 'acts of state' and could not be reviewable by the administrative body granting the patent (p. 139).*

Such examples in turn aid the readers to apply their analytical skills to appreciate Public and Private International Law issues that might emanate from the norm of disclosure requirement and then be able to evaluate as to what could be the most appropriate way forward to regulate the TKGR trade ensuring compliance with the domestic regulations of provider countries on access to TKGR. The flow of this illustrative writing opens up the minds of its readers to draw an analogy between the key issues in the context of trade of TKGR and the key issues in the trade of genetic resources facing both, the provider countries and the user countries.

Further, the author explores the compatibility of a disclosure and PIC requirement with relevant international frameworks including Trade Related Aspects of Intellectual Property Rights (TRIPS), International Convention for the Protection of New Plant Varieties (UPOV) and the Patent Cooperation Treaty (PCT). Several nations both as a regional block as well as at individual level have made attempts to provide for disclosure requirements in their domestic IP and Biodiversity Laws. In this regard, this book is a collection of descriptive information about TK which is rare to find at one place.

After a detailed description on regional and selected national disclosure requirements, the text subsequently evaluates these provisions on the parameters of equity and efficiency. It is inferred by the author that such disclosure requirements under national legislations are able to contribute towards the objective of conservation of genetic resources and protection of TKGR only in a limited way due to their lack of uniformity Therefore, she opines that the best way forward would be harmonisation of laws at the international level and to set common standards with respect to the scope and legal impact of the disclosure requirements. Over all, this book addresses and explores each of the possible perspectives in relation to the measure of disclosure requirements.

Further to this detailed analysis on possible impacts of enshrining disclosure requirements under national and regional regulatory framework on TKGR, the author points out at the lack of a comprehensive international agreement on a *sui generis* system for protection of TKGR and refers to this lack of consensus as a major weakness on the part of the international community negotiating on the framework of norms on TKGR.

Similar to the manner in which the author has analysed the pros and cons of enshrining a disclosure requirement within various legal frameworks, she describes the OAU Model on Community Rights (p. 157) and Brazil's legal framework on rights of indigenous people, *inter alia*. Following which such sui generis systems is evaluated on the parameters of efficiency and equity. As evident, the evaluation of disclosure requirements and *sui generis* systems of protections on the parameters of equity and efficiency follows their respective descriptive analysis.

Succeeding the elaborate discussion on international, regional and domestic legal frameworks in relation to TKGR and an in-depth analysis in an effort to identify the legal status of TKGR, is the study of bioprospecting agreements and the protection that such agreements accord to TKGR.

The analysis of bioprospecting agreements has been classified by the learned author in two parts: firstly, bioprospecting agreements prior to CBD era and secondly, bioprospecting agreements in the post CBD era. Coming into force of the CBD has been taken to be the dividing line as it is the first major agreement which provides international recognition to Traditional Knowledge and made a significant mark by providing sovereign rights to states over their resources including biological resources.[3]

Similar to the previous portions of the book, the discussion on bioprospecting agreements is comprehensive and covers a discussion on several

3 The Convention on Biological Diversity, Art 3 < https://www.cbd.int/> accessed 24 September, 2018.

instances of such agreements as well as a doctrinal analysis of various essential components of such bioprospecting agreements.

With respect to the protection of TKGR by means of bioprospecting agreements, the author presents the case studies such as the ICBG Project in Mexico with a different perspective in order to establish the point that there is a lack of certainty and unpredictability as to the issue of protection of TKGR considering the difficulties which the parties come across in enforcing such agreements.

The inference drawn by the author from the extensive study on bioprospecting agreements is that the protection of TKGR by means of such contracts is restricted to trivial matters such as collection fee and other costs of providing for the biological material, and she observes that , such contracts shall however, continue to play a substantial role in the trade of TKGR (P. 203, 204).

The title of the fifth chapter *"To Protect or Not to Protect"* is quite enticing and unusual which creates curiosity in the minds of its readers. In this way, through this piece of literary work, the author has created a space for the inquisitive minds of her authors to indeed flow in an unrestricted manner and reasonably foresee the practical impact of different forms of entitlements which have either been bestowed on TKGR or which could be bestowed on it based on the evaluation of such available forms of protection for TKGR on the parameters of efficiency and fairness.

The author explores that whether a property rights regime or whether other alternative methods of protection namely liability rights or reward systems are appropriate forms of safeguarding TKGR. This chapter provides a jurisprudential as well as economic analysis of evolution of property rights and such multifaceted understanding of property rights as a concept as well as in relation to its applicability to TKGR is a rare read.

Such a jurisprudential discussion seldom precedes the discussion and negotiations on framing of appropriate norms, guidelines and policies at different international fora working on devising appropriate systems for safeguarding TKGR and rights of its holders. It is often neglected by states when framing laws to protect TK within their jurisdictions. This study must be the starting point of the journey of framing appropriate norms for protection of TKGR which in turn would necessarily be based on the choice of appropriate legal entitlement for TKGR. It is indeed a path breaking piece of jurisprudential-economic study on exploring several alternative forms or rights or entitlements for protection of TKGR.

The concluding chapter is titled *'Where Traditional Knowledge meets Modern IPRs'*. The link between an ancient value which was once given the legal status of Common Heritage and is today considered to be a commodity & IPRs which are of recent origin has been elaborated upon in detail by the author.

She opines that the assumption of contractual arrangement based on which biodiversity conservation policies were framed has sadly failed to deliver expected results. The fact of unequal bargaining position of the holders of TKGR and bio-prospectors is one of the major challenges which hinder the possibility of reaching fair and mutually beneficial agreements. The coherence issues between CBD and TRIPS has been discussed extensively in the chapter.

Further, the author expresses her concurrence on the fact that the legal status of certain natural resources is often exposed to complications of being covered under different regulatory regimes mainly because they exist extra-territorially or are found in the territorial waters of different states. The author in this context mentions the case of marine genetic resources (MGRs) which occur in high seas and points out that *the solving the equation of ABS of resources that are found in several jurisdictions is as complicated for MGRs as it is for TKGR*. She cautions that the interface between different international conventions must be taken into account before elaborating specific rights in relation to such resources. Similar analogy could be drawn in case of TKGR as well.

The author then comes back to the discussion on the evaluation framework based on Coasean Efficiency and Rawlsian Fairness mentioned in the opening chapter of the book in context of several form of TKGR protection; and opines that it cannot be claimed that the international regulatory framework on TKGR is inconsistent with these two concepts mentioned above.

The focus of the book is not to provide a new or a fine stitched entitlement for TKGR but it does opens

up the minds of its readers to explore the alternative entitlements that should be discussed at international fora. In fact, this study should act as the initial point of the sessions relating to protection of TKGR at several international platforms working on this issue.

After providing an in-depth understanding of entitlements focussing on property rights, this study leaves the discussion on the question as to what would be the most suitable form of TKGR protection as open ended for the readers to ponder upon. It provides for a caution that an approach of '*autopilot type procedure* or *one size fit all kind of method*' including the usual practice of copying and pasting from other sui generis rights models must be avoided when it comes to elaborating upon protection of TKGR. To sum it up, this book tests different possible protection frameworks of TKGR and this theme makes it one of the most relevant read of its time.

Book Review

JAMES R. MAY AND ERIN DALY, EDS., *HUMAN RIGHTS AND THE ENVIRONMENT: LEGALITY, INDIVISIBILITY, DIGNITY AND GEOGRAPHY* (EDWARD ELGAR 2019)

Reviewed by : **David Takacs, University of California Hastings College of the Law & IELRC**

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available at http://www.lead-journal.org/content/19081.pdf

This book can be purchased directly online here.

James R. May and Erin Daly, eds., *Human Rights and the Environment: Legality, Indivisibility, Dignity and Geography* (Edward Elgar 2019)

May and Daly, professors at Widener University Delaware Law School in the United States, have long been at the forefront of chronicling and promoting constitutional environmental rights. Of their current 'Dignity Rights Project' they have written that dignity 'is not an attribute or an interest to be protected or advanced, like liberty or equality (…) Rather, human dignity is the essence of our being, without which we would not be human.'[1] In this volume of 44 essays by legal scholars and practitioners from six continents, May and Daly present a state-of-the-art compendium of the ways we now think of environmental sustainability as a human rights issue essential for our individual and communal dignity.

Any collected volume that attempts to corral a disparate field such as this will face organizational challenges. The editors have admirably framed their essential collection of essays around four central concepts: Legality (what *is* the law?), Indivisibility (the essential synergistic bond between environmental protection and human rights), Dignity (the essential underlying goal for human rights), and Geography (how place shapes realization of these rights and the relationship between environment and human dignity). Of course, each essay can't necessarily be shoehorned into one of the four categories, but I give the editors and authors credit for trying.

The essays in the volume admirably chronicle both what the status of what the law *is*, as well as where the symbiosis between human rights and the environment *ought* to be heading. Some contributions – like the 'Geography' presentations on the European[2] and Inter-American[3] legal systems or the editors' essay on global environmental constitutionalism[4] – present empirical summaries of the state of the law. Some – like essays on the proposed International Covenant on the right of human beings to the environment[5] or human rights and the gender dynamics of climate change[6] — pose normative frameworks advocating for how the synergies between human rights and the environment ought to be. And many of the essays are both empirical and normative. For example, in his contribution, Adelman covers the history of the legal norm of Permanent Sovereignty over Natural Resources, albeit with a normative goal of circumscribing sovereignty. Our system of international law applies human rights responsibilities to sovereign states, but is less adept at applying responsibilities to manage vital ecological chronicles. Adelman opines: 'We can bequeath a habitable planet to future generations or we can choose to perpetuate national interests through sovereignty, but we cannot have both so long as sovereign prerogative trumps common good'.[7]

The essays cover what we might have human rights *to*: e.g. water,[8] landscape,[9] sustainable urban ecologies,[10] environmental information,[11] and what we have human rights to be protected *from*: e.g. climate change[12] (with a focus on Bangladesh in Ch. 40).[13] Several chapters confront particular groups' special rights and challenges with degrading environments: e.g. women,[14] children,[15] and indigenous peoples.[16]

1 https://delawarelaw.widener.edu/prospective-students/jd-program/jd-academics/signature-programs/dignity-rights-project/.

2 Ole. W. Pederson, European Court of Human Rights and Environmental Rights, ch. 35.

3 Juan Manuel Rivero Godoy, *Vida Digna* and Environmental Human Rights in the Inter-American System, ch. 36.

4 James R. May & Erin Daly, Human rights developments in global environmental constitutionalism, ch. 6.

5 Michael Prieur, Mohamed Ali Mekouar, & Erin Daly, An International Covenant on th Right of Human Beings to the Environment, ch. 3.

6 Ryan Jeremiah Donato Quan, Human Rights and the Gender Dynamics of Climate Change, ch. 17.

7 Sam Adelman, Sovereignty and environmental human rights, ch. 8 p.123.

8 Daphina Misiedjan & Scott O. McKenzie, The Human Right to Water, ch. 25.

9 Michel Prieur, The Human Right to Landscape, ch. 26.

10 Natalie Osborne, Anna Carlson, & Chris Butler, Human Rights to the City: Urban Ecologies and Indigenous Justice, ch. 33.

11 Rebecca Bratspies & Sarah Lamdan, The Human Right to Environmental Information, ch. 9.

12 Michael Burger & Jessica Wentz, Climate Change and Human Rights, ch. 15; Christel Cournil & Emnet Gebre, Climate Change, Mobility, Law and Human Rights, ch. 16.

13 Md. Abdul Awal Khan, Human Rights and Climate Change Displaced People: Bangladesh Perspective, ch. 40.

14 Ryan Jeremiah Donato Quan, Human Rights and the Gender Dynamics of Climate Change, ch. 17.

15 Karen E. Makuch, Environmental Rights of Children, ch. 29.

16 Alexander Solntsev, Indigenous Peoples and Environmental Rights, ch. 30; Ritu Dhingra, Indigenous Peoples and Conservation of Biodiversity, ch. 31.

Some of the most interesting and contentious essays fall under the heading of 'Indivisibility.' It is impossible to fully enjoy 'traditional' human rights in a degraded environment: thus environmental rights are indivisible from other human rights. But the Editors note that tension underlies 'Indivisibility' as 'environmental rights are intrinsically supportive of some human rights and detrimental to others, depending on the circumstances of each case'.[17] Petersmann chronicles 'Conflicts between environmental protection and human rights,' claiming that 'in most circumstances, environmental protection concerns are granted precedence over human rights',[18] as when DDT is banned despite its potential curbs on malaria transmission or when anti-wildlife poaching sacrifices the right to life of human poachers in favour of protecting biodiversity. These authors may overstate tensions that do not, or at least need not, exist. For example, in their concluding remarks on the South African Constitutional Court's *Mazibuko v. City of Johannesburg*,[19] the first case of a high court of any nation to adjudicate the human right to water, Daly & May write, 'this victory for human rights may be a defeat for environmental rights: to secure a certain amount of water may very well require irrigation towards the population center that will have adverse environmental consequences on the surrounding watershed area'.[20] But as I've written, and as South African water law envisions, fulfilling the human right to water for a burgeoning population means managing critical ecosystems with ecological techniques to create more water so that human and non-human needs are both met, and are genuinely indivisible.[21] That is to say, I would have liked more focus on successful legal and practical synergies that demonstrate and implement the indivisibility.

There are clarifying gems sprinkled throughout. For example, Rajan, Davies & Magallanes provide a helpful primer on five different ways environmental protection has been situated in a human rights legal framework.[22] First, existing human rights – such as environmental democracy rights – may be used as tools for citizens wishing to prevent environmental degradation. Second, we can 'green' existing human rights protections – e.g. to life, food, health, and culture – to curb environmental degradation that also degrades enjoyment of these rights. Third, as many nations have done, we can declare new rights to a healthy environment, or to subcomponents (air, water, a stable climate system). Fourth is the current movement to grant rights to nonhuman entities. Fifth and finally, we can elaborate on responsibilities – who must do what when – to uphold any existing rights.

Several of the pieces take up Rajan et al's fourth and fifth categories, at the cutting edge of honouring and furthering the symbiosis between cultural and environmental rights. This is how Magallanes, in 'Human rights, responsibility and legal personality for the environment in Aotearoa New Zealand,' situates devolution of responsibility for the Whanganui River and the former Te Urewera National Park to appointed Mâori guardians.[23] It is part of a systematic attempt of the New Zealand government to make reparations for past wrongs by honouring Mâori notions of their people's place in nature through legal constructs that reflect those notions: Form mirrors content. Each colonial power's depredations on the colonized are situated in specific histories; the New Zealand example is unique to that nation's history, but the spirit animating the new legal forms serves, *mutatis mutandis*, as an example for how to honour a symbiosis between cultural and environmental rights that repairs past wrongs and builds sustainable ecological futures.

Similarly, Maldonado describes new Constitutions in Ecuador and Bolivia where 'Pachamama,' or Mother Earth, has been granted status as a subject of rights that the government and citizens must uphold.[24] Ideally this blends plurinationality – the recognition

17 Erin Daly & James R. May, Indivisibility of Human and Environmental Rights, Ch. 12, p.171.

18 Marie-Catherine Petersmann, Conflicts Between Environmental Protection and Human Rights, ch. 21, p. 293.

19 *Mazibuko v. City of Johannesburg* 2010 (4) SA 1 (CC) (S. Afr.).

20 Erin Daly & James R. May, Indivisibility of Human and Environmental Rights, Ch. 12, p.181.

21 David Takacs, South Africa and the Human Right to Water: Equity, Ecology, and the Public Trust Doctrine. 34 *Berkeley J. Int'l L.* 56 (2016).

22 S. Ravi Rajan, Kirsten Davies, & Catherine Iorns Magallanes, Conflicts Between Environmental Protection and Human Rights, ch. 21.

23 Catherine Iorns Magallanes, Human rights, responsibility and legal personality for the environment in Aotearoa New Zealand, ch. 44

24 Daniel Bonilla Maldonado, The Rights of Nature and a New Constitutional Environmental Law, ch. 23.

of multiple (including indigenous) legal systems — with a notion of 'buen vivir' that cherishes indigenous traditions of living in harmony with the nonhuman world. Nature thus defined as a subject of legal rights is imbued with indigenous cultural understandings, but situated in a matrix of modern legal norms. Maldanado also points out that despite these emancipatory legal forms, the rights to development that simultaneously exist in these Constitutions means that a 'battlefield' exists between the human right to development and the rights of a nonhuman nature.

So, for example, I recently travelled in Ecuador through the most ravaged, oil-flared hellscape imaginable to the Yasuni National Park, one of the most lovely, biodiverse ecosystems in the world. Ecuadorian law enables these to exist side by side, for now; but the habitat destruction, water and air pollution, and climate change abetted by fossil fuel exploitation means biodiversity, and the humans that depend upon it, will eventually lose. Rights for Mother Earth remain only so many empty words on a page without law giving those rights reality. The 'implementation gap' (to cite the title of Paul Martin's piece),[25] or *how* to synergize environmental protection and human rights for the dignity of all of us — remains. That is the ongoing challenge if we are all to live dignified lives on an ecologically healthy planet.

25 Paul Martin, Human Rights and Human Benefits: The Implementation Gap, ch. 7.

Book Review

STEPHEN C. MCCAFFREY, CHRISTINA LEB, RILEY T. DENOON, EDS., *RESEARCH HANDBOOK ON INTERNATIONAL WATER LAW* (EDWARD ELGAR 2019)

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Stephen C. McCaffrey, Christina Leb, Riley T. Denoon, Eds., *Research Handbook on International Water Law* (Edward Elgar 2019)

Transboundary water cooperation is set to determine the future of water resources globally. Climate variability, increased demand, over-exploitation, pollution, seasonal changes remain ever present as challenges to effective water resource management. But the extension of river basins and aquifers across human boundaries of nation states pose a challenge to regional stability, in the absence enforceable legal principles that determine the cooperative model to be adopted between nations. The international water law arena is a complex arena of customary law, conventions, treaties, court rulings but at its very core is a set of regional cooperation agreements, both bilateral and multilateral, that survive despite ongoing regional tensions.

This book is a timely addition to the discourse on transboundary water management and is an excellent collection of interrelated papers written by academics and practitioners exploring and analysing international water law from diverse perspectives. In the range of topics that this compilation covers, it is a definitive guide to the rapidly growing areas of concern of international water resource allocation, water management and dispute resolution. It is difficult to do justice to all the 29 chapters, carefully curated and compiled by the editors, but a few sections stand out both in terms of content and the novelty it offers for future thinking in the arena of international water law.

Part I compiles a series of articles that map the history and evolution of International Water Law. Rieu Clarke explores in some depth the evolution and expansion of the watercourses treaties.[1] Dellapenna and Tanzi capture the significant contribution of international legal expert bodies in the evolution of international water law, the global water treaties and their interrelationship.[2] As Dellapenna significantly notes, [t]he Berlin Rules does not merely review the transboundary issues that formed the body of the Helsinki Rules and the Watercourses Convention, but went beyond to survey the emergent body of international environmental law, international human rights law, and international humanitarian law to assess the extent to which those rules have become customary international law and the extent to which those rules have become customary international law and the extent to which those rules apply to all waters and not just to transboundary waters.[3]

This interrelationship is critical for the evolution of the law, both internationally and in the domestic arena. The other contribution in this section by Larson and Tarlock outline is some depth the United States federal relation with regard to water distribution, while also providing a brief snapshot of federal relations with regard to water in other countries, particularly Australia and China.[4] Taken as a whole, some aspects in this section may appear to overlap in terms of content but it is worthwhile to revisit them as the perspective and approaches taken by each author is new and refreshing.

The core traditional areas of international water law, the human right to water and dispute settlement, are at Parts IV and V respectively. The human rights framework provides the broad aspirational goals and guidance to states in setting standards for local water governance. Winkler provides an excellent overview of the evolution of the rights framework to water, explaining the normative content and linking it to other related rights such as the human right to sanitation.[5] Russell examines the human right to water in a transboundary context highlighting the need to focus on and protect individual rights in the management of transboundary watercourses.[6] This section would have benefitted from an examination of the domestic application of the human right to water and its contribution to taking forward the international rights discourse within the national context.

1 Alistair Rieu-Clarke, From Treaty Practice to the UN Watercourses Convention, Chapter 1, 11-25.

2 Joseph W Dellapenna, The Work of International Legal Expert Bodies, Chapter 2, 26- 43; Atilla Tanzi, The Global Water Treaties and Their Relationship, Chapter 3, pp 44-58.

3 Dellapenna (n 2) 43.

4 Rhett Larson and A Dan Tarlock, Inter-jurisdictional Water Allocation in Federal Systems: Lessons for International Water Law, Chapter 4, 59-81.

5 Inga T Winkler, The Human Right to Water, Chapter 14, 242-54.

6 Anna FS Russel, The Human Right to Water in a Transboundary Context, Chapter 15, 255-72.

The next important section dealing with dispute settlement and its compliance along with the section on regional approaches provide an excellent insight into the much fraught arena of water conflicts. Boisson de Chazournes examines the role of the Permanent Court of International Justice as it was an important forum for resolving water disputes, laying out and clarifying important legal principles, particularly with regard to navigation.[7] Parseglian and Guthrie provide rare insights into the role of scientific and technical experts with a focus on cases involving the prevention of transboundary environmental harm.[8] They examine (a) how tribunals integrate technical experts into the dispute resolution process; (b) how should parties and counsel work with, and present technical experts in order to effectively make their own case, and (c) given past practice and disagreement regarding the role of experts, point towards how tribunals can be expected to handle scientific and technical aspects of complex cases.

Lammers dwells in some detail on the implementation mechanisms and the working of the committee established under the UNECE Convention on Protection of Transboundary Watercourses and International Lakes.[9] He notes that in the four years of its existence, 'the Committee has not been able to perform its most important task namely, to consider specific issues of implementation of and compliance with the Convention and to take measures to facilitate and support implementation and compliance and to address cases of non-compliance'.[10] For instance, he notes that

> [t]he committee has made use of its mandate to request information on possible difficulties in the implementation of the Convention by Kazakhstan and the Russian Federation as a result of alleged water withdrawals from the Irtysh and Illi River Basin by non-party China, to which it had been altered to by information received from an NGO in Kazakhstan. …. Although the established implementation and compliance mechanism appears to have been well designed and equipped, its limitations have also become apparent.[11]

Some of the more interesting contributions illuminate unexplored or underexplored areas in international water law. In an excellent analysis of a much under studied area of water law, Milanes-Murcia examines the tricky domain of internationally shared groundwater resources.[12] Tignino explores issues of water in international humanitarian law,[13] while Magraw and Padmanabhan examine the complex terrain of water and international trade law.[14] Tanzi and Farnelli, in a brief piece look at the UNECE London Protocol on Water and Health for the implementation of the right to drinking water and sanitation.[15] An interesting aspect highlighted here is that the Protocol was the forerunner to efforts establishing a human right to water. They note that '[d]espite its duty oriented approach, the case has been made that, through detailed due diligence standards, the Protocol significantly contributed to defining the contents of the human right to water'.[16] As the focus shifts from rights to duties, it may be worthwhile to return to this document for more guidance in the future.

The last section dealing with the different regional approaches to transboundary water cooperation is a treasure trove. It is an excellent collection of articles that shed light on little known regional arrangements - beginning with the African region (South, West and the Nile Basin), it moves to Europe, Central Asia, South Asia, China, Russia and ending with Latin America, Canada and the United States. This section

7 Laurence Boisson de Chazournes, The Permanent Court of International Justice, The International Court of Justice and International Water Law: Versatility in consistency, Chapter 17, 285-300.

8 Cicely O Parseglian and Benjamin K Guthrie, The Role of Scientific and Technical Experts, Chapter 18, 301-18.

9 Johan G Lammers, The Implementation Mechanism and Committee Established Under the UNECE Convention on the Protection of Transboundary Water Courses and International Lakes, Chapter 19, 319-40.

10 ibid 338.

11 ibid 338-9.

12 Maria Milanes-Murcia, The Application of the General Principles and Key Obligations to Internationally Shared Groundwater, Chapter 9, 147-65.

13 Maria Tignino, Water in International Humanitarian Law, Chapter 13, 224-41.

14 Daniel Magraw and Deepika Padmanabhan, Water and International Trade Law, Chapter 12, 205-23.

15 Attilla Tanzi and Gian Mania Farnelli, The UNECE Protocol on Water and Health for the implementation of the right to drinking water and sanitation, Chapter 16, 273-84.

16 ibid 283.

alone is worth its weight in gold, as it provides insights into regional arrangements that remain as a scattered focus in journal articles but is brought together here as a worthy collection. As a quick referencer, it is a useful compilation for students, researchers and practitioners alike.

More particularly, these chapters highlight the cooperative elements of arrangements that riparian states have arrived at but also bring to light areas that need improvement, limitations of existing frameworks and the gradual application of universal principles for sustainable and integrated management of transboundary water courses. While some regional cooperation arrangements are headed in a more positive direction (eg Europe), others point towards a pause (eg Aral Seas Basin), a rejig and a relook at the arrangements being drawn up regionally. This section on regional approaches provides critical insights for future research and contribute to a better understanding of the global frameworks and principles.

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