MEASURING THE EFFECTIVITY OF ENVIRONMENTAL LAW THROUGH LEGAL INDICATORS IN THE CONTEXT OF FRANCOPHONE AFRICA

Medindo a efetividade do direito ambiental por indicadores legais no contexto da África francófona

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ABSTRACT

The paper aims to analyze existing legal indicators experiences to assess the effectivity of environmental law in francophone Africa through qualitative literature review. It is premised on the findings of an IFDD-sponsored study, which had put forward a set of legal indicators to scrutinize the different phases of the legal process of environmental law application. In reviewing the existing indicator experiences, surprisingly no detailed discussion of the methods employed to convert the data collected into indicators was found. For this reason, the paper advocates for the setting up of science-based legal indicators that aim to evaluate accurately the effectivity of environmental law at national, regional and global levels. Once established and operational, environment-specific legal indicators should represent key tools for rigorous evaluations of environmental policies.

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Keywords: Effectivity of environmental law; legal indicators; francophone Africa

RESUMO

O presente artigo objetiva analisar as experiências existentes com indicadores legais para medir a efetividade do Direito Ambiental na África francófona. Ele se baseia nos resultados de estudo comissionado pelo IFDD que expõe um conjunto de indicadores legais para examinar as diferentes fases do processo legal de implementação do Direito Ambiental. Na revisão dessas experiências, surpreendentemente *não foram encontradas discussões detalhadas sobre os métodos empregados para converter os dados coletados em indicadores.* Por isso, o presente artigo advoga pelo estabelecimento de indicadores legais com base científica que objetivem avaliar acuradamente a efetividade do Direito Ambiental em nível nacional, regional e global. Uma vez estabelecidos e operacionais, esses indicadores tornam-se ferramenta-chave para avaliação rigorosa de políticas ambientais.

Palavras-chave: Efetividade do Direito Ambiental; indicadores legais; África francófona

"When you can measure what you are speaking about and express it in numbers, you know something about it."

Lord Kelvin (natural scientist), 1883

PRELUDE

Traditionally, gauging the effectivity of law has mainly been the realm of legal theory and legal philosophy, around the fundamental question: what is the purpose of the law?[3] According to the legal philosopher Henri Lévy-Bruhl (1935, p. 141), the knowledge of the legal facts "can not do without precise and methodically established numerical data". A similar view was expressed back in the 18th century by Nicolas de Condorcet (1819), philosopher, mathematician and politician who maintained that the progress of quantification should go hand in hand with the design of a uniform and universal legal system,

[3] In this connection, see for example Leroy (2011); Richard (2003).

one in which it should be possible to 'calculate' the legal rules applicable to all humankind.[4]

This approach appears to be particularly suitable for assessing the effectivity of environmental law, considering the universal character of the latter and its applicability to humanity as a whole. However, no in-depth research work has been conducted in the past for the creation and use of legal indicators intended to evaluate the effectivity of environmental law. Empirical studies undertaken in recent years have only partially dealt with particular phases of law enforcement procedures,[5] which did not allow all the legal steps involved in the implementation process of environmental law to be embraced. Hence, so far the effectivity of environmental law has not yet been methodically investigated and measured, owing principally to the lack of specific legal evaluation tools.

Addressing this methodological gap, the 1st International Symposium on Environmental Law in Africa, held in 2013 in Abidjan, Côte d'Ivoire innovatively called for the development of legal indicators to assess the effectivity of environmental law in Africa (PROCEEDINGS…, 2014, p. 17). This pioneering recommendation was reiterated in 2016 at the 2nd International Symposium on Environmental Law in Africa[6], which took place in Rabat, Morocco.

Acting upon this recommendation, the *Institut de la Francophonie pour le développement durable* (IFDD), in partnership with the International Union for the Conservation of Nature (IUCN) and UN Environment, commissioned a study for the design of proper tools on the effectivity of environmental law, which was carried out in the second half of 2017 (PRIEU, 2017)[7] and provisionally peer-reviewed and validated in the course of a symposium held in February 2018 in Yaoundé, Cameroon.[8]

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[4] Also quoted by Supiot (2015, p. 153).

[5] For an illustration of such studies, see: Zakane (2008).

[6] Rapport final et recommandations du Colloque droit de l'environnement en Afrique, Rabat, Maroc, 25-27 juillet 2016. Available at: https://www.ifdd.francophonie.org/ifdd/nouvelle.php?id=427. Accessed on: 15 Apr. 2018.

[7] The terms of reference of this study are at: https://www.ifdd.francophonie.org/programmes/operation.php?id=400. Accessed on: 15 Apr. 2018.

[8] A communiqué on the outcome of the International Symposium on Effectiveness and Judicial Education of Environmental Law in Francophone Africa, Yaoundé, 5-7 February 2018 is at: https://www.iucn.org/fr/news/world-commissionenvironmental-law/201802/effectivit-et-ducation-judiciaire-du-droit-delenvironnement-en-afrique-francophone. Accessed on: 15 Apr. 2018.

The study put forward a set of legal indicators to scrutinize the different phases of the legal process of environmental law application. Creating these new tools should make it possible to statistically and mathematically measure, on scientific grounds, the various factors that contribute to the effective implementation of national and international environmental law.

In this article, we deliberately use the term 'effectivity', rather than the word 'effectiveness'. For the sake of clarity, the notion of 'effectivity' is intended to denote what produces real and concrete effects. 'Effective' law is law in action, which is translated into reality through actual implementation. It is 'real' law or 'living' law, beyond formal law or law on the books. In its legal meaning, 'effectivity' is the intersection of the law and the fact, which ideally leads to unity of the law and the fact. This implies that a legal rule should not only exist, but should also be applicable, respected, enforced and possibly sanctioned by the administration or the court.

Using the term 'effectiveness', on the other hand, would entail the risk of semantic confusion and substantive inaccuracy, as its common equivalent is generally '*efficacité*' in French and '*eficacia*' in Spanish, which in turn both typically translate as 'efficiency'.[9] The latter obviously bears a quite different connotation: usually a rule is considered 'efficient' if it ends up being socially relevant and beneficial. 'Efficiency' refers to the useful impact of a legal norm on *society*, that is, its contribution to achieving a positive result that lies *outside* the legal system, whereas the 'effectivity' of law is measured *within* the legal system.

In this specific sense, 'effectivity' does not carry the same significance in domestic law and in international law. In domestic law, it is a non-legal concept questioning the conditions of application of the law (BÉTAILLE, 2012). In international law, it is a legal criterion conditioning the application of the law through identification of the subjects of law and the appropriation of territories (COUVEINHES-MATSUMOTO, 2014; WOLFRUM, 1999). To take 'effectivity' out of this conceptual elusiveness, it is necessary to develop legal indicators

[9] For instance, in the 2015 Paris Climate Agreement and in Decision 1/CP.21 whereby it was adopted, the French and Spanish translations used for 'effective', 'effectively' and 'effectiveness' are systematically '*efficace*', '*efficacement*' and '*efficacité*' or '*eficaz*', '*eficazmente*' and '*eficacia*', except in some cases. The same terminology is found in the English, French and Spanish versions of the 2030 Agenda for Sustainable Development, here again with a few exceptions.

for its objective assessment, both in domestic law as well as in international law.

Premised on the findings of the aforementioned IFDD-sponsored study and on previous research by the International Centre for Comparative Environmental Law,[10] the present contribution to the essays in honour of Professor Charles Odidi Okidi advocates for the setting up of science-based legal indicators that aim to evaluate accurately the effectivity of environmental law at national, regional and global levels.

1 THE NEED FOR ENVIRONMENT-SPECIFIC LEGAL INDICATORS

At present, official assessments of environmental policies through regular reports on the state of the environment do not allow the existence or the effectivity of environmental laws to be accounted for. These documents, whether national, regional or global, only refer to scientific, economic or social indicators. Legal indicators are never singled out for the simple reason that they do not yet really exist.[11] Such a glaring absence of law in formal state-of-the-environment reports leads policy makers and public opinion to underestimate or deny the weight of law and its usefulness. Lacking precise data on the law as actually applied, decision-makers are somehow forced to act almost blindly.

Once established and operational, environment-specific legal indicators should represent key tools for rigorous evaluations of environmental policies. In turn, these assessments should help to draw the attention of policy makers, the public and its elected representatives

[10] The International Centre for Comparative Environmental Law, in brief CIDCE (*Centre International de Droit Comparé de l'environnement*), initiated a project in 2013 for the development of environmental legal indicators. The preliminary result of this initial effort was presented at the Meeting of the Focal Points of the Mediterranean Pollution Assessment and Control Programme (MED POL), held in Rome on 29-31 May 2017. CIDCE is an academic international NGO based in Limoges, France since 1982. Working towards the development of environmental law through a network of legal experts in 65 countries, it has consultative status with ECOSOC and observer status with the UN Environment Assembly, among others. Its website is at: https://cidce.org. Accessed on: 15 Apr. 2018.

[11] For instance, since 1992, the Organisation for Economic Co-operation and Development (OECD) has conducted over 90 Environmental Performance Reviews of its member and partner countries. While environmental law is generally mentioned in these reviews, it is not the subject of in-depth evaluations. See: OECD (2017).

to gaps in or regressions of the law. Appropriate legal indicators should also enable law enforcement officers and the public generally to be better informed about the extent to which environmental law is a contributing factor in the success or failure of environmental policies.

According to Antoine Jeammaud (2005, p. 70), a labour lawyer, the effectivity of law turns out to be a "falsely simple" concept and its measurement should be seen as a "primary task for legal sociology", implying that the time has come for lawyers to take up the effectivity issue by looking for assessment indicators of a legal nature. In this connection, several scholars have recently reflected on whether and how law can be measured. In other words: can we measure the immeasurable in a scientific way?[12]

In exploring this question, Mathias M. Siems (2011) conceptualized what he termed the 'numerical comparative law' method. In this approach, he submits, apart from benchmarking (performance indictors), the types of indicators that can be combined for measurement purposes specially include: functional indicators for issues to be considered in a comparative law perspective; indicators to determine the quality of political institutions or judicial systems; and indicators to survey public and private perceptions of the conditions of law enforcement. Setting a numerical level of the effectivity of a piece of law, he concludes, would require the aggregation of performance figures and perception data. Hence, approaches such as 'numerical comparative law' appear to be unavoidable for proper measurement of law, quantitatively and qualitatively.[13]

However, few environmental legal texts, either domestic or international, explicitly allude to the need for such indicators. Country-level illustrations from Africa include the 2014 laws of Burkina Faso and Côte d'Ivoire on sustainable development, both prescribing the creation of specific indicators to monitor progress in attaining sustainable development,[14] as well as the Rwandan law on biodiversity of 2013, providing for invasive species control plans that include "indicators

[12] See the references cited by Siems (2011).

[13] The author discussed this approach at length in a previous paper: Siems (2005).

[14] Pursuant to Burkina Faso's law, relevant actors should use such indicators to report actions undertaken in support of sustainable development (Art. 9), in: http://extwprlegs1.fao.org/docs/pdf/bkf139544.pdf. Accessed on: 15 Apr. 2018. Under the law of Côte d'Ivoire, the indicators should be used as "an assessment and decision support tool for measuring progress in the area of sustainable development" (Art. 1), in: http://extwprlegs1.fao.org/docs/pdf/ivc140677.pdf. Accessed on: 15 Apr. 2018.

to measure progress towards achieving objectives".[15] At the regional level, the 2008 Protocol on Integrated Coastal Zone Management in the Mediterranean requires Parties to define suitable indicators to evaluate ICZM strategies, plans and programmes, along with progress in implementing the Protocol (Art. 18-4), but without specifying the scientific, socioeconomic or legal nature of such indicators. Globally, the 2006 International Tropical Timber Agreement calls for criteria and indicators to assess, monitor and promote progress towards sustainable forest management (Preamble, § g), here again without characterizing the indicators as being scientific, economic, social, legal or otherwise. As it where, the indicators referred to in these cases seem to be more indicators of 'efficiency' than indicators of 'effectivity'.

With a view to forging environment-specific legal indicators, similar existing indicators were identified and reviewed for reference and inspiration, both outside and within the field of the environment. The results of this research, which revealed 36 indicator experiences, are summarized below selectively.[16]

1.1 INDICATORS NOT PERTAINING TO THE ENVIRONMENT

Some 14 categories of indicators not directly related to the environment have been identified. Examples of such indicators are outlined in this section, namely the following: Rule of Law Indices, Human Development Index, Human Rights Indicators, and Ibrahim Index of African Governance.[17]

United Nations Rule of Law Index. In 2011 the Department of Peacekeeping Operations and the Office of the United Nations High Commissioner for Human Rights (OHCHR) published a set of 135 indicators focused on the delivery of criminal justice in conflict and post-conflict situations (UNITED NATIONS, 2011). These rule of law indicators are intended to measure, through questionnaires, the capacity,

[15] Art. 25-5 of Rwanda's law, in: http://extwprlegs1.fao.org/docs/pdf/RWA131764.pdf. Accessed on: 15 Apr. 2018.

[16] For a full presentation of all those indicator initiatives, see Prieu (2017).

[17] Other indicator initiatives not covered here include: (i) indicators related to 'Law and Economics', such as the World Bank *Doing Business Index* and *Worldwide Governance Indicators*; (ii) labour indicators of the International Labour Organization; (iii) financial transparency indicators of the Global Transparency Initiative; (iv) rule of law indicators of the Vera Institute of Justice.

performance, integrity, transparency and accountability of three key institutions: the police (41 indicators), the courts (51 indicators) and the prisons (43 indicators). Each rated indicator is expressed as a numerical value ranging from 1 to 4 – 1 being the lowest negative score and 4 the highest positive score. While most indicators mirror the content of a legal rule, they do not directly characterize its implementation process and only reflect the respective roles of the institutions evaluated.

World Justice Project Rule of Law Index. Founded in 2006 by the American Bar Association, the World Justice Project (WJP) is a Washington-based non-profit organization mandated to advance the rule of law around the world (BOTERO; PONCE, 2011). Published annually, the WJP Rule of Law Index is a quantitative assessment tool designed to measure the extent to which countries adhere to the rule of law around nine factors: limited government powers; absence of corruption; order and security; fundamental rights; open government; regulatory enforcement; civil justice; criminal justice; and informal justice. They provide together, through a total of 47 performance indicators, a comprehensive picture of rule of law compliance. The 2016 edition of the Index ranks 113 countries based on an assessment of their compliance with the rule of law. Particularly relevant to this discussion, the regulatory enforcement factor is divided into five general indicators that seek to determine the effectivity of law enforcement, including in respect of environmental protection. However, no specific indicator addresses the legal conditions for environmental law enforcement.

Human Development Index. 'Human development', a new approach for advancing human wellbeing, was introduced in 1990 by UNDP' first Human Development Report (HDR).[18] Since then, HDRs have been published almost annually, each with a thematic focus. The Human Development Index (HDI), originally presented in the 1990 report and subsequently embodied in successive HDRs, is a summary measure of average achievements in three key dimensions of human development: health, assessed by life expectancy; knowledge, gauged by years of schooling; and decent standard of living, measured by gross national income per capita. The environment and sustainable development became stable entries of the HDRs as of 1992, to a greater or lesser extent depending on the years. For example, the 2011 HDR, subtitled 'Sustainability and Equity', devoted a section on the constitutional

[18] A dedicated UNDP webpage on the HDRs is at http://hdr.undp.org/en/humandev. Accessed on: 15 Apr. 2018.

recognition of the right to the environment, and environment-related indicators were incorporated in 3 of its 10 statistical tables.[19] However, these data were not used to try and measure the effectivity of the right to the environment.

Human Rights Indicators. Numerous initiatives on the possibility of measuring the application of human rights law through indicators have been taken over the years. As part of these efforts, OHCHR (2012) carried out several studies to develop evaluation indicators of the effective implementation of the International Covenant on Economic, Social and Cultural Rights. Their outcome was the publication in 2012 of *Human Rights Indicators: A Guide to Measurement and Implementation*. Intended to better monitor State application of international conventions on human rights, such indicators have been initially tested in respect of certain rights that are somehow linked to the environment, like the right to life, the right to food and the right to health. They include three categories of indicators: (i) structural indicators reflecting the commitment to ratify a treaty and create the legal and institutional tools necessary to implement it; (ii) process indicators measuring duty bearers' efforts to transform their human rights commitments into the desired results; and (iii) outcome indicators capturing individual and collective attainments that echo the level of enjoyment of human rights.

In this connection, various UN Special Rapporteurs on human rights called for the development of sector-specific human rights indicators in their respective work areas. For example, in 2015 the Independent Expert (then Special Rapporteur) on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment pointed to the growing relevance of environmental indicators for assessing the fulfilment of these rights. In his report on good practices, he noted the significance of such indicators particularly with regard to: procedural rights; public participation; environmental constitutionalism; compliance monitoring; and sustainability reports (HUMAN RIGHTS COUNCIL, 2015). Furthermore, *Guidelines for the Preparation of Progress Indicators in the Area of Economic, Social and Cultural Rights* were produced in 2008 by the Inter-American Commission on Human Rights (2008). Covering structural, process and outcome indicators, this document is apparently the first to mention 'rights indicators', actually meaning

[19] Available at: http://hdr.undp.org/sites/default/files/reports/271/hdr_2011_en_complete.pdf. Accessed on: 15 Apr. 2018.

legal indicators such as: constitutional recognition of rights; functioning of justice; institutions, programmes and services for rights enforcement; participation, transparency and accountability mechanisms.[20]

Ibrahim Index of African Governance. The Mo Ibrahim Foundation was established in 2006 with a focus on governance and leadership in Africa.[21] Since 2007 it publishes the Ibrahim Index of African Governance (IIAG), an annual statistical tool that measures and monitors governance performance in African countries. Governance delivery is assessed across four components that provide indicators of a country's performance: safety and rule of law; participation and human rights; sustainable economic opportunity; and human development. In the 2017 IIAG report,[22] a total of 100 indicators provide quantifiable measures of the overarching dimensions of governance. There are 9 'welfare' indicators for the human development component, with 2 indicators on 'environmental sustainability' and on 'environmental policy', but environmental law is not considered as such.[23]

1.2 ENVIRONMENT-RELATED INDICATORS

Out of the 22 initiatives concerning these types of indicators that have been identified through this research, 8 are described below, that is: EU indicators; IMPEL initiatives, OECD indicators, UN SDG indicators, ECLAC indicators, Mediterranean Sea indicators, TAI indicators, and INECE indicators.[24]

[20] Other agencies working on human rights indicators include *inter alia*: (i) the European Union Agency for Fundamental Rights, tasked to monitor implementation of the EU Charter of Fundamental Rights (Available at: http://fra.europa.eu/en. Accessed on: 15 Apr. 2018). (ii) the Venice Commission for Democracy through Law of the Council of Europe, which drew up a list of criteria regarding the rule of law that can serve as a theoretical reference base for the creation of environmental legal indicators (Available at: http://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-AD(2016)007-e. Accessed on: 15 Apr. 2018).

[21] Available at: http://mo.ibrahim.foundation. Accessed on: 15 Apr. 2018.

[22] Available at: http://s.mo.ibrahim.foundation/u/2017/11/21165610/2017-IIAGReport.pdf?_ga=2.194755693.1959711590.1523513508-1611990928.1523513508. Accessed on: 15 Apr. 2018.

[23] An inventory of the world's governance indicators, conducted in 2003, identified at the time 47 tools for quantifying such indicators. See: Besançon (2003). A list of similar online evaluation indicators is also provided by Martin, Boer and Slobodian (2015, Appendix 1).

[24] Other indicators not described in this section include those developed by: (i) the European Environment Agency (Available at: http://www.eea.europa.eu/

EU indicators. Adopted in 2010, the *Europe 2020 Strategy* is EU's current decade agenda for growth and jobs.[25] Among the nine headline indicators that support its monitoring, only one is related to the environment: the climate change and energy indicator, which has policy objectives to reduce GHG emissions by 20% and to increase the share of renewable energy by 20% (EU, 2017). Still, there is no indicator for the environment in general, let alone a legal indicator. Yet, as rightly observed in its 7th Environment Action Programme to 2020,[26] the European Union has "a broad range of environmental legislation […] amounting to the most comprehensive modern standards in the world". However, acknowledging the "insufficient implementation" of existing legislation, the same document calls, as a matter of priority, for the maximization of its benefits by improving its implementation (Art. 2-1-d), which should be informed by "indicators used to monitor progress in achieving existing environment and climate-related legislation" (Art. 4). In this regard, the European Commission issued *Better Regulation Guidelines* covering the whole policy cycle – design, adoption, implementation, evaluation and revision (EUROPEAN COMMISSION, 2017). Monitoring and evaluation arrangements include the definition of a set of indicators to measure the extent to which the objectives of community law have been achieved by Member States. Nevertheless, such indicators are not explicitly qualified as "legal".

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publications/digest-of-eea-indicators-2014); (ii) the European Network of the Heads of Environment Protection Agencies (Available at: http://epanet.pbe.eea.europa.eu); (iii) UNEP (Available at: web.unep.org/geo); (iv) FAO (1999); (v) the World Bank (2017)); (vi) the International Finance Corporation (Available at: www.ifc.org/wps/wcm/connect/c8f524004a73daeca09afdf998895a12/IFC_Performance_Standards.pdf?MOD=AJPERES); (vii) Bertelsmann Stiftung and Columbia University (Available at: http://datatopics.worldbank.org/sdgs); (viii) the Praia Group on Governance Statistics (Available at: https://unstats.un.org/unsd/methodology/citygroups/praia.cshtml); (ix) Gerd Winter (2014); (x) Peter Sand (2017); (xi) Chris McGrath (Available at: http://envlaw.com.au/wp-content/uploads/delw.pdf); and (xii) Yale University, Columbia University and World Economic Forum in Hsu et al. (2016).

[25] Available at: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_en. Accessed on: 15 Apr. 2018.

[26] Decision 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013D1386. Accessed on: 15 Apr. 2018.

IMPEL initiatives. Established in 1992, the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) is an international non-profit association of the EU environmental authorities. Its main objective is to promote a more effective implementation of environmental legislation within the European Union.[27] To this effect, IMPEL developed in 2006 a *Checklist for assessing legislation on practicability and enforceability* in order to enhance environmental law implementation in the Member States. Intended as a tool to assess practicability and enforceability issues in a structured way, the checklist helps to gather information that can improve the effectiveness of EU environmental legislation.[28] Under a project on *Performance Indicators for Environmental Inspection Systems* completed in 2012, IMPEL defined a list of indicators to assess the strength and weaknesses of environmental inspectorates, but without characterizing their effectiveness.[29] IMPEL also published in 2015 a study on the challenges faced in implementing EU environmental law. The report found that a major challenge to the effectivity of legislation is "insufficient data, evidence and information to support effective implementation". It therefore recommended that "self-assessment tools and indicators" be developed "to measure progress with implementation" (IMPEL, 2015, p. 18).

OECD indicators. Through its Working Party on Environmental Information, OECD has a long history of work on environmental indicators (OECD, 1991, 2005). However, it has not yet made active efforts at clearly linking law and indicators, including in the *Environmental Performance Reviews* of its member countries that have been regularly undertaken since 1992.[30] Although these appraisals usually cover various aspects of environmental law, the performance assessments they provide are not based on any specific legal indicators. From an environmental law enforcement perspective, OECD issued in 2009 a report on compliance in the area of pollution control, which signalled the desirability of developing a limited list of indicators to assess the performance of compliance assurance programmes that

[27] Available at: https://www.impel.eu. Accessed on: 15 Apr. 2018.

[28] Available at: http://www.impel.eu/wp-content/uploads/2016/06/pe_checklist.pdf. Accessed on: 15 Apr. 2018.

[29] Available at: https://www.impel.eu/projects/performance-indicators-for-environmental-inspection-systems. Accessed on: 15 Apr. 2018.

[30] Available at: http://www.oecd.org/environment/country-reviews/about-env-country-reviews.htm. Accessed on 15 Apr. 2018.

would lend themselves to comparative analysis and could be used for international benchmarking (OECD, 2009). Although based on a legal review, the proposed indicators were not meant to be of a legal nature. This approach of designing quantitative indicators to assess compliance of anti-pollution regulations was illustrated further in ensuing OECD studies of 2010 (MAZUR, 2010) and 2011 (MAZUR, 2011).

United Nations SDG indicators. In adopting the 2030 Agenda for Sustainable Development in 2015 through Resolution 70/1, the United Nations General Assembly (UNGA) (2015) prescribed a review the SDGs and their targets "using a set of global indicators", to be complemented by regional and national indicators. It also mandated the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) to develop a global indicator framework, for subsequent endorsement by the UN Statistical Commission and adoption by UNGA.[31] Resolution 70/1 did not specify the nature of the indicators to be put in place, but invited Member States to involve national parliaments in conducting regular reviews of progress on the SDGs.[32] An initial list of 232 indicators,[33] produced by the IAEG-SDGs and agreed by the Statistical Commission in March 2017, was adopted in July the same year by UNGA in Resolution 71/313.[34] The Statistical Commission was requested, through the IAEG-SDGs, to refine the global indicators annually and to review them compressively in 2020 and 2025.[35] Early efforts towards SDG implementation have been reported against selected indicators for which sufficient data exist (UNITED NATIONS, 2017b). For now, however, the SDGs remain

[31] Paragraph 75.

[32] Paragraph 79. To support parliamentarians in assessing progress on the SDGs, the Inter-Parliamentary Union published in 2016 *Parliaments and the Sustainable Development Goals: A Self-assessment Toolkit* (Available at: http://archive.ipu.org/pdf/publications/sdg-toolkit-e.pdf. Accessed on: 15 Apr. 2018. While recognizing the need for adequate indicators, this document does not qualify them as being legal or otherwise.

[33] The full number of indicators in the global indicator framework is 244, but nine of them repeat under two or three different targets, so the actual total number of individual indicators is 232.

[34] Available at: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E. Accessed on: 15 Apr. 2018. The global indicator framework is appended to this resolution.

[35] Paragraphs 1 and 3 of the resolution. At its meeting in November 2017, the IAEG-SDGs proposed four annual refinements for indicators 1.4.2, 6.2.1, 16.1.3 and 17.17.1; see: United Nations (2017a). In March 2018, the Statistical Commission approved those proposed refinements; see: United Nations (2018).

orphaned by real legal indicators. SDGs 2, 3, 6, 7 and 11 to 16 are those most relevant to environmental issues and for which legal indicators ought to be worked out.

ECLAC indicators. The UN Economic Commission for Latin America and the Caribbean began in 2003 one of the first research studies on environmental indicators incorporating legal data, which focused on environmental standards for air, water and vegetation. The publication of its results for Brazil in 2007 (CEPAL, 2007) led to the setting up, under the Brazilian National Environment Council, of a working group aimed at establishing guidelines for the definition of indicators of enforcement of, and compliance with, environmental standards, comprising entries on applicable legal rules. At the same time, following the creation of the Latin America and Caribbean Initiative for Sustainable Development in 2002, a Working Group on Environmental Indicators was set up in 2003 (METTERNICHT; GRANADOS, 2010). Its mandate did not cover environmental law per se, but included relevant institutional aspects. In 2016 the Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean acknowledged the progress achieved by this working group and requested it to update existing indicators or propose new ones, taking into account "the science-policy interface on all issues related to sustainable development",[36] but without referring to any legal indicators.

Mediterranean Sea indicators. In 2016 the Parties to the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean adopted the *Mediterranean Strategy for Sustainable Development 2016-2025* (UNEP, 2016), whose implementation is to be monitored on the basis of 49 sustainability indicators (UNEP, 2017a). Interestingly, seven of these indicators relate to legal matters, e.g. protected areas or threatened species mentioned in legal texts, public participation mechanisms. To help monitor implementation of the Mediterranean Strategy, a compendium of indicator factsheets is progressively posted on its website. Some factsheets address legal issues such as compliance under the Barcelona Convention, the Aarhus Convention or World Heritage sites (UNEP, 2017b). Although such indicators are purely quantitative and static, they represent a first step towards a real consideration of the law within the Mediterranean Strategy.

[36] Decision 2 on indicators. Available at: http://www.pnuma.org/forodeministros/20-colombia/documentos.htm. Accessed on: 15 Apr. 2018.

TAI indicators. Established in 1999, The Access Initiative (TAI) is a global network of 250 civil society organizations dedicated to promoting environmental democracy in the framework of Principle 10 of the 1992 Rio Declaration, with the World Resources Institute serving as its Secretariat.[37] As such, TAI supported the development process of the Escazú Regional Agreement on Access to Information, Participation and Justice in Environmental Matters in Latin America and the Caribbean, adopted on 4 March 2018.[38] Under this new convention, Parties are urged to encourage independent environmental performance reviews that take into account "common indicators" for the evaluation of "the efficacy, effectiveness and progress" of their national environmental policies (Art. 6-8). Earlier in 2015, TAI launched the *Environmental Democracy Index* (EDI), a virtual platform that tracks progress in enacting laws on public engagement in environmental decision-making.[39] EDI consists of 75 legal indicators and 24 practice indicators developed under the 2010 UNEP Bali Guidelines. While legal indicators measure the strength of law, practice indicators provide insight on implementation performance (WRI, 2015). Designed to evaluate the legal texts governing environmental management, pollution control, terrestrial biodiversity and extractive industries, those legal indicators do not cover marine, coastal, fisheries and energy laws. They have 4 scoring options, ranging from 0 (lowest) to 3 (highest). The scores are arithmetically averaged to generate a country's overall score (WORKER; DE SILVA, 2015).

INECE indicators. Founded in 1989, with the Environmental Law Institute as its Secretariat, the International Network for Environmental Compliance and Enforcement (INECE) is an informal partnership of enforcement and compliance practitioners from more than 150 countries that contribute to the rule of law, protection of ecosystem integrity and sustainable use of natural resources through effective implementation of environmental laws at global and domestic levels.[40] At its 6th conference held in 2002, INECE was requested to assist in developing environmental compliance and enforcement (ECE) indicators. It

[37] Available at: http://www.accessinitiative.org. Accessed on: 15 Apr. 2018.

[38] CIDCE also contributed inputs to this process at two meetings of the Negotiation Committee held in Buenos Aires and Brasilia in 2017.

[39] Available at: http://www.environmentaldemocracyindex.org. Accessed on: 15 Apr. 2018.

[40] Availableat:https://sustainabledevelopment.un.org/partnership/?p=2211;www.basel.int/Default.aspx?tabid=2920. Accessed on: 15 Apr. 2018.

formed a working group to help with their design, which met in 2003 to agree its roadmap for the process (INECE, 2003), and later produced a guide to support practitioners in identifying and implementing ECE indicators (INECE, 2008). The Strategic Implementation Plan 2006-2009 of INECE, adopted at its 7th conference in 2005, encouraged the creation of specific indicators to measure compliance and enforcement of environmental standards. In 2008, INECE's 8th conference further called for the development of performance measures, including indicators of effective compliance and enforcement of environmental law. However, despite intensive follow-up work, INECE has not yet really tackled the issue of legal indicators.

Some conclusions can be drawn from the above summary account of indicator experiences: (i) although numerous lawyers have reflected on the effectivity of environmental law, 'measuring' the conditions of its enforcement has not yet been seriously considered; (ii) outside the environment, two sectors have been the subject of significant studies and tests related to legal indicators: human rights and the rule of law; (iii) the very term 'legal indicator' is rarely used in literature and was found only a few times through this research on indicators, e.g. in the 2008 guidelines of the Inter-American Commission on Human Rights or the 2015 index of The Access Initiative; (iv) while major studies on environmental law evaluation generally cover three levels – global, regional and national –, legal indicators should be dealt with separately at the international and domestic levels; (v) legal indicators of effectivity can only be relevant if they complement purely legal data with institutional and social behavioural data.

2 THE QUEST OF ENVIRONMENT-SPECIFIC LEGAL INDICATORS

In light of these findings, an effort was made to design, on an experimental basis and subject to peer-review and scientific validation, an initial set of legal indicators on the effectivity of environmental law. Based on Julien Bétaille's PhD thesis (BÉTAILLE, 2012), 127 legal indicators have been identified in theory, and preliminarily articulated in 17 indicator sheets, including 8 for international law and 9 for domestic law. At this stage, the proposed indicators are enunciated but not measured. Measuring their respective weight requires further work, to be carried out with strong inputs of a non-legal nature by mathematicians and statisticians.

The suggested indicators have been tested, through detailed questionnaires, by environmental law experts from four pilot French-speaking countries, selected on the basis of balanced geographical representation from North, Central, East and West Africa, namely: Benin, Cameroon, Madagascar and Tunisia. The indicators put forward are of two types: general indicators and special indicators.

2.1 GENERAL INDICATORS

While past work on the effectivity of environmental law has focused more on international law than on national law, the proposed general indicators cover the national, regional and global levels. The indicators related to international law include those linked to environmental treaties and those connected with the SDGs.

Indicators linked to environmental conventions. This first list of indicators is intended to assess the legal factors contributing to the effective enforcement of the legal requirements set out in international conventions. To be complete, additional factors regarding the effectivity of the general principles of international law, of customary international law, of soft law instruments and of international case law should also be developed.

Formulated in plain terms, these indicators are meant to be handled by lawyers familiar with the jargon used. They aim to assess the formal mechanisms and procedures which make it possible to consider that the evaluated convention is actually applied. The convention's substantive content is not addressed. The formal issues covered are clustered around: (i) institutional matters (secretariat, conference of parties, national focal points); (ii) implementation monitoring (reporting system, compliance committee); and (iii) dispute settlement (arbitration, recourse to the International Court of Justice). A yes/no answer allows a simple and fast treatment of the questions asked under each cluster of issues.

Indicators connected with the SDGs. The political, strategic and financial importance of the SDGs, adopted in 2015 as part of the 2030 Agenda for Sustainable Development, is reflected in the need to closely monitor their implementation both internationally and domestically. The tools of SDG implementation should surely include the law, especially environmental law. However, the targets of the 17 SDGs pay minor attention to the law. Only human rights and the rule of law are referred to as basic requirements, while environmental law is not specifically mentioned.

On the other hand, as indicated above, a robust global indicator framework was formally agreed in 2017 to support monitoring of progress on the SDGs. Through this quest of environment-specific legal indicators, the global indicator framework could be enhanced by strengthening the role of environmental law as an operational tool for sustainable development. Among the 17 SDGs, those with the most environmental linkages and with the highest demands for legal implementation are SDGs 2, 3, 6, 7 and 11 to 16. Proposed draft indicators have been sketched out by the experts from the four African countries associated with this study, which could serve as a basis for future collaboration with the UN Statistics Division and the Statistical Commission to develop appropriate legal indicators for environment-related SDGs.

Indicators related to national law. Owing to the existence of a sizeable number of international treaties on the environment, the important question of the effectivity of international law in domestic national law needs to be tackled. The indicators envisaged in this regard address the following matters: (i) ratification process; (ii) incorporation into national law; (iii) national implementation of international conventions; (iv) NGO involvement and public participation; (v) national applicability of customary international law; (iv) non-legal conditions of effectivity (e.g., readability or understanding; technical capacity; pressure from interest groups to prevent enforcement).

To develop these indicators, the 11 criteria of the effectivity of domestic law set forth by Julien Bétaille in his thesis, as outlined in the following box, served as a theoretical reference.

Table 1 – Criteria of the effectivity of domestic law

1	Indicators related to the internal coherence among legal systems
2	Indicators related to the coherence of the national legal system
3	Indicators related to the sanction of national norms
4	Indicators related to the judicial review of the legality of national norms
5	Indicators related to the liability of public authorities for breaching environmental law rules
6	Indicators related to the knowledge of the norms
7	Indicators related to the quality of the norms
8	Indicators related to the legitimacy of the norms
9	Indicators of implementation of the norms
10	Indicators of reception of the norms by their addressees
11	Indicators of reception of the norms by the courts

Source: Adapted from BÉTAILLE, 2012.

As environmental law is a complex set of interconnected legal instruments, the value scale of its various branches was also considered. Each State, according to its culture, its resources and its level of development, has different priorities in terms of legal protection of the environmental. Hence, it seemed pertinent to put together, as an indicator of a State's ecological sensitivity, a list of areas of environmental law to be ranked in order of importance. The experts from the four African States who contributed inputs to this study were invited to grade those areas hierarchically, according to their perceived legal benefit for a better environment in their country, which made it possible to test the relevance of the suggested indicator model through a sample of informed respondents.

The proposed ecological sensitivity list contains approximately 30 areas of environmental law, including the following: environment in the constitution; Minister of the Environment; information and the environment; participation and the environment; EIA law; law on pure ecological damage; law on liability for damage caused by pollution; law on nature protection and biodiversity; forest law; law on soils; coastal zone management law; mountain law; hunting law; fisheries law; climate change law; pollution law; law on wastes; law on chemicals; law on air pollution; law on water pollution; law on noise; law on GMOs; landscape law; law on cultural and historical heritage; land use planning law; law on natural disasters; nuclear law; law on energy efficiency and renewable energies. Besides statutory law, pertinent customary rules should also be considered in view of their continued relevance for the environment, particularly in Africa.

Using the proposed legal indicators, together with non-legal indicators to assess the causes of non-effectivity of the law, an overall evaluation of the effectivity of environmental law at the national level can be undertaken. Such assessment is intended to provide a global vision of the effectivity of environmental law in a given State, with a view to setting priority action areas for improved effectivity in environmental law. Three entries were selected for this process: (i) institutions (e.g., line ministry, environment agency, commission or committee; inter-ministerial body); (ii) legal instruments (e.g., environmental code, environmental plan); and (iii) judicial system (e.g., access to justice, free legal aid, environmental law cases, environmental courts). As to non-legal factors limiting effective enforcement, they include: poverty, corruption, political patronage, administrative instability, technicality of the norms, lack of NGOs, etc.

2.2 SPECIAL INDICATORS

As Chris McGrath (2010) put it, evaluating the effectivity of environmental law is a "Herculean task". Indeed, the development of legal indicators for the whole of environmental law is clearly a massive effort requiring extensive collective work. Thus, only a limited number of environmental law tools and sectors were chosen for the purposes of this study. Since environmental law is both national and transnational, the legal indicators address both levels. In international law, two global treaties and four regional conventions were selected to examine their effectivity at country level. In national law, besides some general principles of environmental law, two special topics were picked out: protected areas and EIAs.

Assessing domestic implementation of international conventions. The legal indicators' first focus is on the effectivity of national implementation of two global treaties: the Ramsar Convention on Wetlands of International Importance and the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage. Next is the evaluation of the effectivity in national law of four regional conventions of relevance to the four countries involved in this research: the Algiers/Maputo African Convention on the Conservation of Nature and Natural Resources; the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean; the Abidjan Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern Africa Region; and the Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region.

The indicator model is the same for all selected conventions, as the legal issues linked to their effectivity are identical. The following elements are proposed as legal indicators: (i) legal existence of the convention (signature, ratification, publication); (ii) applicability of the convention (instrument of incorporation in domestic law); (iii) organic content (implementation institutions and procedures); (iv) substantive content (legal measures taken to implement the substantive provisions)[41]; (v) enforcement conditions (control bodies, assigned

[41] With regard to the substantive content entry, convention articles for which implementation indicators are foreseen are as follows: (i) Ramsar Convention: Arts. 1 to 5; (ii) UNESCO Convention: Arts. 1 to 6; (iii) original Algiers Convention: Arts. 2 to 15; revised Maputo Convention: Arts. 2 to 21; (iv) Barcelona Convention:

officers, allocated budget, penalties provided, remedies available, court decisions); and (vi) non-legal factors hindering implementation (poverty, corruption, political instability, etc.).

Assessing the effectivity of national law. Five evaluation areas relating to the general principles of environmental law, both in legislation and in judicial decisions, have been selected for effectivity evaluation purposes, that is: (i) the environment in the constitution; (ii) the right to information; (iii) the right to public participation; (iv) access to environmental justice; and (v) the non-regression principle. In addition to these, two sectoral fields are also to be assessed: (i) protected natural areas; and (ii) EIAs of projects and activities that are harmful to the environment.

For each evaluation area, the indicators seek to address the following six questions: (i) Does the right in question exist? (ii) Is this right applicable? (iii) What is its institutional framework? (iv) What is its substantive content? (v) Is it enforced by the courts? (vi) What are the non-legal factors obstructing its implementation?

PROSPECT

Environmental law, more than other legal disciplines, tends to deliberately display its concern for effectivity, as if its enforcement represented an urgent social imperative. However, while no one is unaware that, for more than half a century, countless national laws and international treaties dealing with the environment have burgeoned across the globe, who can today confidently explain why, here and there, the state of the environment has sometimes improved, sometimes deteriorated, owing to the implementation of such laws and treaties or lack thereof, or even independently of their existence?

In trying to contribute to closing this knowledge gap around the effectivity of environmental law, an attempt was made through the pilot study portrayed here to develop a preliminary list of 127 proposed legal indicators intended to objectively measure the range of factors affecting the effective implementation of environment-related legal instruments, be they domestic or international.

Considering the novelty of this issue in theory and practice, coupled with the wide scope and inherent complexity of environmental

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Arts. 1 to 15; (v) Abidjan Convention: Arts. 1 to 11 and 13; and (vi) Nairobi Convention: Arts. 1 to 10 and 13.

law, the initial set of proposed legal indicators was put forward on experimental grounds. Although peer-reviewed provisionally in early 2018, the future indicators need further elaboration and validation. In particular, beyond their intrinsic formulation, the method to be used for their measurement is yet to be fully worked out.

In reviewing the existing indicator experiences, surprisingly no detailed discussion of the methods employed to convert the data collected into indicators was found, as if that information needed to be kept confidential as trade secrets. In the present case, the measurement method of the legal indicators is work in progress. Requiring the involvement of mathematicians and statisticians, together with environmental lawyers, it should involve a three-phase process of design, testing and implementation.

The initial design phase comprises: (i) collection of the raw data gathered by the lawyers from the four African countries associated with the study, followed by their interpretation, classification and weighting in order to define the measurement system scales; (ii) analysis of the quantitative and qualitative data collected, sample validation for each data class to ensure representativeness of the measure, and gauging of uncertainty by data class, eventually leading to data aggregation; (iii) finally, representation of the legal indicators allowing the results to be shown in terms of their effectivity.

The ensuing testing phase includes: (i) training of lawyers on legal data collection to help them grasp and use the measurement system; (ii) delineation of the sampling perimeter to either confirm or broaden the areas covered by the legal indicators, and thereafter digitalization of data collection and analysis; (iii) final validation of the measurement system, with any methodological adjustments, and then drafting of its reference framework.

The last implementation phase consists of: (i) overall use of the effectivity assessment tools for all international environmental agreements; (ii) progressive extension of the evaluation exercise to domestic environmental law in all African countries, then gradually worldwide; (iii) full integration of the legal indicators into national and international assessment reports on the state of the environment, bringing about accordingly a global harmonization of all indicators.[42]

[42] Christophe Bastin, an expert mathematician, assisted with the conceptualization of the measurement method. His support is gratefully acknowledged.

The innovative creation of such science-based legal indicators will make it possible to recognize and measure effective application of environmental law. It can also help to invigorate environmental law at a time when, in many countries, the proliferation of environmental norms has given rise to critical voices of an alleged 'punitive ecology', which often ask for the abolition or oversimplification of environmental laws, thus running a serious risk of regression in the ambitions and achievements of the environmental policies put in place from the 1970s to the 1990s. To be able to track this threatening regression of environmental law, it is essential to give greater visibility to the steady progress it keeps accomplishing, making good use of proper legal indicators to this end.

Important as they may be, such legal indicators are merely a source of information for better decision-making and cannot in any way be seen as having a legally binding effect on policy makers or judges. Nor can they be viewed as a miracle solution to fill the enforcement gaps in environmental law that, to varying degrees, are the common lot of all countries. They represent, though, a crucial evaluation tool allowing to:

- make the role of law in environmental policies readable and discernible;
- demonstrate the usefulness of environmental law at a time when it is called into question;
- assess, quantitatively or qualitatively, the extent to which environmental law is complied with;
- give the public a concrete perception of the effectivity level of existing environmental law;
- provide evidence-based insight on the enforcement level of international treaties and domestic laws to members of parliaments, government officials and other policy makers to support them in conducting reform processes of environmental legislation;
- aggregate legal indicator data with scientific indicator data in order to assess the effectiveness of environmental policies, that is: the adequacy of the objectives pursued in relation to the results achieved.

The benefits derived from the creation of legal indicators that actually measure the effectivity of environmental law should be all the more valued as the cost of non-compliance with existing laws is

considerable. In the European Union, for example, it has been estimated at around a staggering Euro 50 billion a year (IMPEL, 2015, p. 11). Hence, costing the effectivity – or lack thereof – of environmental law, based on reliable legal indicators, does make a great deal of economic sense.

By assessing the effectivity of environmental law through suitable legal indicators, countries will be able both to enhance their performance in implementing existing legislation as well as to target the priority legal reforms to be carried out, thus continuously improving the legal frameworks for environmental protection. This will ensure progression and avoid regression of environmental law, a prerequisite to sustaining livelihoods in harmony with nature.

REFERENCES

BESANÇON, M. **Good Governance Rankings:** The Art of Measurement. Cambridge: World Peace Foundation, 2003.

BÉTAILLE, J. **Les conditions juridiques de l'effectivité de la norme en droit public interne**: illustrations en droit de l'urbanisme et en droit de l'environnement. 2012. PhD thesis, Limoges, 2012.

BOTERO, J. C.; PONCE A. **Measuring the Rule of Law**. The World Justice Project: Working Paper Series 001, 2011.

CEPAL. **Indicadores de aplicação e cumprimento da norma ambiental para ar, água e vegetação no Brasil**. Santiago: United Nations, 2007. Available at: https://www.cepal.org/pt-br/publicaciones/3607-indicadores-aplicacao-cumprimento-norma-ambiental-ar-agua-vegetacao-brasil. Accessed on: 15 Apr. 2018.

CONDORCET, N. Observations de Condorcet sur le vingt-neuvième livre de L'Esprit des lois. *In:* COMMENTAIRE sur L'Esprit des lois de Montesquieu: suivi d'observations inédites de Condorcet sur le vingt-neuvième livre du même ouvrage. Paris: Delaunay, 1819. p. 456-462. Available at: https://ia801407.us.archive.org/9/items/commentairesurle00destuoft/commentairesurle00destuoft.pdf. Accessed on: 15 Apr. 2018.

COUVEINHES-MATSUMOTO, F., **L'effectivité en droit international**. Brussels: Bruylant, 2014.

EU. **Smarter, greener, more inclusive?**: Indicators to support the Europe 2020 strategy Luxemburg: European Union, 2017. Available at: http://ec.europa.eu/eurostat/documents/3217494/8113874/KS-EZ-17-001-EN-N.pdf/c810af1c-0980-4a3b-bfdd-f6aa4d8a004e. Accessed on: 15 Apr. 2018.

EUROPEAN COMMISSION. **Better Regulation Guidelines**. Commission Staff Working Document. Brussels: European Commission, 2017. Available at: https://ec.europa.eu/info/sites/info/files/better-regulation-guidelines.pdf. Accessed on: 15 Apr. 2018.

FAO. **Indicators for sustainable development of marine capture fisheries**. Technical Guidelines for Responsible Fisheries 8. Rome: FAO, 1999. Available at: www.fao.org/3/a-x3307e.pdf. Accessed on: 15 Apr. 2018.

HSU, A. et al. **The 2016 Environmental Performance Index Report**. New Haven: Yale Center for Environmental Law and Policy, 2016. Available at: www.researchgate.net/publication/308022559_Global_Metrics_for_the_Environment_2016_Environmental_Performance_Index_Report. Accessed on: 15. Apr. 2018.

HUMAN RIGHTS COUNCIL. **Report of the Independent Expert on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, John H. Knox**: Compilation of good practices. A/HRC/28/61. Geneva: Human Rights Council, 2015.

IMPEL. **Challenges in the Practical Implementation of European Union Environmental Law and How IMPEL Could Help Overcome Them**. Brussels: European Union Network for the Implementation and Enforcement of Environmental Law, 2015.

INECE. **INECE-OECD Workshop on Environmental Compliance and Enforcement Indicators**: Measuring What Matters. Discussion Paper. Paris: OECD, 2003. Available at: https://www.oecd.org/env/outreach/26739891.pdf. Accessed on: 15 Apr. 2018.

_____. **Performance Measurement Guidance for Compliance and Enforcement Practitioners**, 2. ed. Washington: INECE, 2008.

INTER-AMERICAN COMMISSION ON HUMAN RIGHTS. **Guidelines for the Preparation of Progress Indicators in the Area of**

Economic, Social and Cultural Rights. OEA/Ser.L/V/II.132, Doc. 14 rev. 1. Washington: OEA, 2008.

JEAMMAUD, A. Le concept d'impact des normes sociales européennes, quels indicateurs?. *In:* IMPACT et perspectives des normes sociales européennes – Egalité de traitement et restructurations dans neuf pays de l'Union européenne. Lyon: Centre de recherche en droit social, 2005. Available at: http://www.metiseurope.eu/content/pdf/n8/12_pinse.pdf. Accessed on: 15 Apr. 2018.

LEROY, Y. **L'effectivité du droit au travers d'un questionnement en droit du travail**. Paris: LGDJ, 2011.

LÉVY-BRUHL, H. Note sur la statistique et le droit. *In:* LA STATISTIQUE, ses applications, les problèmes qu'elles soulèvent. Paris: PUF, 1935.

MARTIN, P.; BOER, B.; SLOBODIAN, L. (Eds.). **Framework for Assessing and Improving Law for Sustainability**: A Legal Component of a Natural Resource Governance Framework. [*S. l.*]: IUCN, 2015.

MAZUR, E. **Environmental Enforcement in Decentralised Governance Systems**: Toward a Nationwide Level Playing Field. OECD Environment Working Paper 34. Paris: OECD, 2011.

_____. **Outcome Performance Measures of Environmental Compliance Assurance**: Current Practices, Constraints and Ways Forward. OECD Environment Working Paper 18. Paris: OECD, 2010.

METTERNICHT, G.; GRANADOS, J. **Environmental indicators of the Latin American and Caribbean Initiative for Sustainable Development**. Santiago: International Association for Official Statistics Conference, 2010. Available at: www.researchgate.net/profile/Graciela_Metternicht/publication/301628036_ENvIRONMENTAL_INDICATORS_OF_THE_LATIN_AMERICAN_AND_CARIBBEAN_INITIATIvE_FOR_SUSTAINABLE_DEvELOPMENT_ILAC/links/571eb8bc08aeaced7889e74f/ENVIRONMENTAL-INDICATORS-OF-THE-LATIN-AMERICAN-AND-CARIBBEANINITIATIVE-FOR-SUSTAINABLE-DEVELOPMENT-ILAC.pdf. Accessed on: 15 Apr. 2018.

OECD. **Ensuring Environmental Compliance:** Trends and Good Practices. Paris: OECD, 2009. Available at: http://www20.iadb.org/intal/catalogo/PE/2009/03570.pdf. Accessed on: 15 Apr. 2018.

_____. **Environment at a Glance 2015**: OECD Indicators. Paris: OECD, 2015.

_____. **Environmental Indicators: A Preliminary Set**. Paris: OECD, 1991.

_____. **Environmental Performance Reviews**. Paris: OECD, 2017. Available at: http://www.oecd.org/environment/country-reviews/OECD_Environmental_Performance_Reviews.pdf. Accessed on: 15 Apr. 2018.

OHCHR. **Human Rights Indicators**: A Guide to Measurement and Implementation. New York: Office of the United Nations High Commissioner for Human Rights, 2012. Available at: http://www.ohchr.org/Documents/Publications/Human_rights_indicators_en.pdf. Accessed on: 15 Apr. 2018.

PRIEUR, M. **Elaboration d'outils de l'effectivité du droit de l'environnement**: Les indicateurs juridiques. Québec: Institut de la Francophonie pour le développement durable, 2017.

PROCEEDINGS of the First International Symposium on Environmental Law in Africa. **Revue de droit de l'environnement en Afrique**, Dakar, n. 01, 2014. Available at: https://www.ifdd.francophonie.org/media/docs/publications/656_RADE_no012014.pdf. Accessed on: 15 Apr. 2018.

RICHARD, V. **Le droit et l'effectivité: contribution à l'étude d'une notion**. 2003. PhD thesis, Paris, 2003.

SAND, P. The Effectiveness of Multilateral Environmental Agreements: Theory and Practice. *In:* LEWIS, M.; HONKONEN, T.; ROMPPANEN, S. (Eds.). **International Environmental Law-making and Diplomacy Review 2016**. UNEP Course Series, n. 16, p. 1-15. Joensuu: University of Eastern Finland, 2017. Available at: www.researchgate.net/publication/311717128_The_Effectiveness_of_Multilateral_Environmental_Agreements_Theory_and_Practice?ev=prf_high. Accessed on: 15 Apr. 2018.

SIEMS, M. M. Measuring the Immeasurable: How to Turn Law into Numbers. *In:* FAURE, M.; SMITS, J. (Eds.). **Does Law Matter?**: On Law and Economic Growth. Cambridge: Intersentia, 2011, p. 115-136.

_____. Numerical Comparative Law: Do We Need Statistical Evidence in Order to Reduce Complexity?. **Cardozo Journal of International and Comparative Law**, [*s. l.*], 13, p. 521-540, 2005.

SUPIOT, A. **La gouvernance par les nombres**. Paris: Fayard, 2015.

UNEP. **Mediterranean Strategy for Sustainable Development 2016-2025**: Investing in Environmental Sustainability to Achieve Social and Economic Development. Mediterranean Action Plan. Athens: UNEP, 2016. Available at:https://planbleu.org/sites/default/files/publications/mssd_2016-2025_final.pdf. Accessed on: 15 Apr. 2018.

_____. **Mediterranean Sustainable Development Dashboard**. UNEP(DEPI)/MED WG.441/Inf.3. Athens: UNEP, 2017a. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/21191/17wg441_inf3_eng.pdf?sequence=1&isAllowed=y. Accessed on: 15 Apr. 2018.

_____. **Monitoring the implementation of the Mediterranean Strategy for Sustainable Development 2016-2025**. Valbonne: Plan Bleu, 2017b. Available at: http://obs.planbleu.org/images/recueils/en/PDF/suivi_SMDD_EN_13avril2017_web.pdf. Accessed on: 15 Apr. 2018.

UNITED NATIONS GENERAL ASSEMBLY. **The 2030 Agenda for Sustainable Development**. Resolution 70/1. New York: United Nations, 2015. Available at: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E. Accessed on: 15 Apr. 2018.

UNITED NATIONS. **Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators**: Note by the Secretary-General. E/CN.3/2018/2. New York: ECOSOC, 2017a.

_____. **Rule of Law Indicators**: Implementation Guide and Project Tools. New York: United Nations, 2011. Available at: http://www.un.org/en/events/peacekeepersday/2011/publications/un_rule_of_law_indicators.pdf. Accessed on: 15 Apr. 2018.

_____. **Statistical Commission Report on the forty-ninth session (6-9 March 2018)**. E/2018/24-E/CN.3/2018/37. New York: ECOSOC, 2018.

_____. **The Sustainable Development Goals Report 2017**. New York: United Nations, 2017b. Available at: https://unstats.un.org/sdgs/files/report/2017/TheSustainableDevelopmentGoalsReport2017.pdf. Accessed on: 15 Apr. 2018.

WINTER, G. **Assessing law as a factor towards the Aichi Biodiversity Targets, with illustrations of Target 6 (Fisheries)**. [*S. l.*]: IUCN Natural Resource Governance Framework, 2014. Available at: www.iucn.org/sites/dev/files/assessing_law_as_a_factor_toward_the_aichi_biodiversity_targets_0.pdf. Accessed on: 15 Apr. 2018.

WOLFRUM, R. **Means of Ensuring Compliance with and Enforcement of International Environmental Law**. Collected Courses, n. 281, Académie de Droit International (1999). The Hague: Martinus Nijhoff Publishers, 2001.

WORKER, J.; DE SILVA, L. **The Environmental Democracy Index**. Technical Note. Washington: World Resources Institute, 2015. Available at: www.environmentaldemocracyindex.org/sites/default/files/files/EDI_Technical%20Note%20Final%207_9_15.pdf. Accessed on: 15 Apr. 2018.

WORLD BANK. **World Development Indicators 2017**. Washington: World Bank, 2017.

WRI. **Measuring, Mapping, and Strengthening Rights**: The Environmental Democracy Index. Washington: World Resources Institute, 2015. Available at:www.accessinitiative.org/sites/default/files/edi_brochure_english_10_2015.pdf. Accessed on 15 Apr. 2018.

ZAKANE, V. Problématique de l'effectivité du droit de l'environnement en Afrique: l'exemple du Burkina Faso. *In :* GRANIER, L. (Ed.). **Aspects contemporains du droit de l'environnement en Afrique de l'ouest et centrale**. Gland: Centre du droit de l'environnement de l'UICN, 2008, p. 13-34.