BLUE ECONOMY: THE FUTURE OF INTELLECTUAL PROPERTY?

Pablo FERRERA*

SUMMARY: I *Introduction*. II. *Blue Economy Basics*: *Theorizing, Clustering & Modelling*. III. *The Fundamentals of Marine Biodiversity*. IV. *Modelling Emerging Scenarios for Biodiversity Development: Blue Economy Planning*. V. *Closing Remarks*. VI. *References*.

I. INTRODUCTION

It is possible to assert that economy has been deployed —that is, practiced, promoted, and regulated— from onshore areas (land), through offshore areas (oceans), all the way through time into the outer space.[1] It is also possible to assert, simply, that regulatory frameworks are dyadically divided in all three areas into private and public norms —depending on a broad number of direct and indirect conditions.

When referring to offshore areas' exploitation, economic models can be divided between artisanal and hyper-industrial. In between these two extremist models evolved a new theory of harmonic, sustainable development: *Blue Economy.* As recalled by O. Gbadegesin and S. Akintola:

> The term "blue economy" was first used by professor Gunter Pauli in his book *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs* to describe a wealth creation strategy using nature-inspired derivatives on the basis of environmental correctness. According to Pauli, the "blue economy" broadly encompasses activities geared towards achieving economic growth and deve-

* Professor at Universidad del Salvador (Buenos Aires, Argentina). UNCLOS arbitrator. E-mail: *ferrara.pablo@usal.edu.ar*.

[1] Ferguson, Nail, *The Ascent of Money: A Financial History of the World*, London, Penguin, 2018.

lopment based on ocean activities whilst also considering the social and environmental outcomes of these activities.[2]

Although not originally, Blue Economy suits the United Nations *Sustainable Development Goals (SDGs)* (*a.k.a.*, the "United Nations 2030 Agenda").[3] Of course, SDGs are a rather newly-schematic and marketing-oriented way to promote the United Nations basic milestones, but they are also rather useful for the industrial and business approach.[4] Why? Because they are both innovative, sustainable, clustered, and —of course— they can be modelled.[5]

Clustering and modelling, as well as tagging and *#hash-tagging*, became a fashionable way of deploying explanations with a colourful scientific-alike tan.[6] Also, as mentioned elsewhere, any modelling in social sciences is only that: modelling. This means social sciences modelling is nothing more than a way of theorizing. [7]

Now, when referring to economic clusters —biodiversity, in this case— three milestone should be particularly fundamental: *i)* the product's and economy's essentials to be considered (*e.g.*, GDP incidence, governance, political and financial risk, etc.); *ii)* the product's prospective role for a particular country's economic model (*e.g.*, Is the country simply looking for self-supply? Is it looking to become an export titan? Is it looking for product replacement?); and *iii)* the product's industrial and trade standing points. Only a clear and precise understanding of these criteria will countenance the next stage: discussion, selection, and implementation of the most suitable cluster development model.

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[2] Opeyemi A. Gbadegesin, Simisola Akintola, "Charting the Course for a Blue Economy in Nigeria: A Legal Agenda", 1 *Journal of Environmental Law and Policy* 7, 2021, *https://doi.org/10.33002/jelp001.01*.

[3] Sustainable Development Goals, available at: *https://www.un.org/sustainabledevelopment/sustainable-development-goals/*.

[4] Already in 2014 developing nations met in Abu Dhabi to explore the BE approach within the UN Sustainable Development Knowledge Platform. Based on the discussion, a document including a "framework for sustainable development" was presented. The participating nations stated that safeguarding the socioeconomic development from environmental degradation is at the basis of BE and that the value of the blue capital in the economy should be assessed (United Nations, 2014). Since then, BE has gained recognition at the global level confirming the role of the ocean in many of the global challenges faced by the planet, such as food security and climate change (OECD, 2016). Gianluca Sampaolo, Dominique Lepore, Francesca Spigarelli. 2021. "Blue Economy and the quadruple helix model: the case of Qingdao". 4 *Environ Dev Sustain* 2. available at: *https://doi.org/10.1007/s10668-021-01378-0.*

[5] Sustainable Development Goals, *op. cit.*

[6] Goodin, Robert E., *The Oxford Handbooks of Political Science*, London, OUP, 2018.

[7] Ferrara, Pablo, *Don't be Afraid, it's Nature: A theory of Thermodynamic Pragmatism*, São Paulo, Arraes, 2020.

Methodologically, this work shall follow four stages: *i)* start by reviewing the basics of Blue Economy; *ii)* review of the foundations of biodiversity according to the United Nations Convention on the Law of the Sea and its related documents; *iii)* review and compare possible modelling and *iv)* present findings and conclusions.

II. Blue Economy Basics: Theorizing, Clustering & Modelling

Within normal and reductionist frame-working, undertaking to analyse *offshore* (*a.k.a.*, *maritime*, as opposed to *marine* and *oceanic*) *development models* and *operating policies* raise an endless succession of queries.[8] Conventional approaches —even worse when compounded by undue haste— could simply lead to considering a model's convenience.

1. *Theorizing*

First of all, it is essential to understand Blue Economy is tempting not only because of the inconvenient of onshore business development, but also because it is an increasing profitable activity with an annual 8% rate.[9]

Blue Economy theorizing does also allow *clustering*. For the purpose of this work, it is possible to recognize or define a minimum of twenty (20) needful clusters.[10] Some of these economic clusters (biodiversity; transportation; mining; fisheries; telecom) have enormous incidence in the total global gross development product (global GDP; see table 1).

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[8] This paper defines the model as a set of political, regulatory and trade measures implemented as part of the offshore energy activities.

[9] Ellsmoor, J, "Rethinking Our Oceans: Investing in The Blue Economy", *FORBES*, 2019, available at: *https://www.forbes.com/sites/jamesellsmoor/2019/01/26/rethinking-our-oceans-investing-in-the-blue-economy/?sh=26de41423531*.

[10] Those clusters are: *i)* Administration of coasts; *ii)* Administration of ports; *iii)* Maritime space planning (MSP); *iv)* Ports' infrastructure; *v)* Ports' urban planning and infrastructure; *vi)* Logistics planning (rails, roads, and infrastructure); *vii)* Shipping and maritime transport routes planning and development (shipping & transportation); *viii)* Fisheries, fishing farms (fisheries and seafood); *ix)* Cables and pipelines submarine laying (submarine laying; telecommunications; oil & gas transportation); *x)* Exploration and exploitation of offshore hydrocarbons (oil & gas); *xi)* Deep seabed mining; *xii)* Marine environmental and development planning (environment) *xiii)* Planning and development of bio-diversity (biodiversity); *xiv)* Geology; *xv)* Oceanography; *xvi)* Cartography; *xvii)* Finance; *xiii)* Policy making and normative regulation (public policy & law); and *xix)* Management.

TABLE 1. BLUE ECONOMY INDUSTRY WORLD GDP INCIDENCE

	Total Global GDP[1]	*Pharma Industry* [2]	*Cosmetology Industry* [3]	*Shipping Industry* [4]	*Fisheries Industry* [5]	*Telecommunications Industry* [6]	*Mining Industry* [7]
GDP	84.705T	1,27T	532B	8,7B	159,32B	1,657.7B	159,74B
GDP%	100%	1.5%	0.63%	0.01%	0.18%	1.9%	0.18%

(1) Available at: *https://data.orldbank.org/indicator/NY.GDP.MKTP.CD?start=2020&view=chart.*
(2) Available at: *https://www.statista.com/statistics/263102/pharmaceutical-market-worldwide-revenue-since-2001/.*
(3) Available at: *https://www.forbes.com/sites/pamdanziger/2019/09/01/6-trends-shaping-the-future-of-the-532b-beaty-business/?sh=36f7934d588d.*
(4) Available at: *https://www.statista.com/statistics/1097059/global-shipping-containers-market-size/.*
(5) Available at: *https://www.statista.com/statistics/821023/global-seafood-market-value/.*
(6) Available at: *https://www.grandviewresearch.com/industry-analysis/global-telecom-services-market.*
(7) Available at: *https://www.grandviewresearch.com/industry-analysis/mining-equipment-industry.*

SOURCE: self-made.

According to table 1, *biodiversity* industries (*Pharma & Cosmetology*) —as it is defined by the *Convention on Biological Diversity*—[11] represent the highest World GDP incidence of the economic clusters reviewed with 2,13% —even over telecommunications (1.9%).[12] This provides a hint of the potential of an exponential sustainable development of *offshore biodiversity* industry, considering "[o]nly about 0.0001 percent of the deep-seafloor has been subject to biological investigation" (United Nations Environmental Program, 2007).[13]

2. *Modelling*

Before *modelling* it is necessary to understand *standing points*. In this sense, *world trade statistics (WITS)* provide an idea of current trade and production scenarios, allowing to evaluate future Blue Economy models worldwide and understanding their *potential trade development power* (*PTDP*):[14]

[11] "«Biological diversity» means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems". *CBD*, Article 2, available at: *https://www.cbd.int/convention/articles/?a=cbd-02*.

[12] Covering sixty-four percent of the surface of the ocean, and providing nearly 95% of its volume, marine areas beyond national jurisdiction (ABNJ) are home to an important part of the world's biodiversity, support significant fisheries, and play a critical role in stabilizing global climate. Modalities for Advancing Cross-Sectoral Cooperation in Managing Marine Areas Beyond National Jurisdiction. UNEP (DEPI)/RS.12 /8.

[13] Weaver, P.P.E. *et al.* (2011). *The impact of deep-sea fisheries and implementation of the UNGA*, Resolutions 61/105 and 64/72. Report of an international scientific workshop, National Oceanography Centre, Southampton, pp. 45, available at: *http://hdl.handle.net/10013/epic.37995*.

[14] Available at: *https://wits.worldbank.org/trade-visualization.aspx?lang=es*.

Table 2. Blue Economy Products Scenarios

Country	*GDP* [1]	*Per Capita GDP* [2]	*Risk Classification* [3]	*Control of Corruption (-2,5 to +2,5)* [4]	*Trade Diversification (+50% / 3 Products)* [5]	*Rate of Technology per Product*	*Rate of Investment per Product*	*Government System*
World	84.705t	10,925	n/a	n/a-	n/a	n/a	n/a	n/a
Argentina	383,066.98M	8,441	7	-0,07	Low (3 Products)	Low	Low	Federal Constitutional Republic
Australia	1,330,900.93M	51,812	n/a	1,81	Low (3 Products)	Low	Low	Federal Constitutional Monarchy
Brazil	1,444,733.26M	6,796	5	-0,33	Medium (4 Products)	Medium	Medium	Federal Constitutional Republic
China	14,722,730.70M	10,500	2	-0,32	Low (2 Products)	High	High	Socialist Unitarian Uni-party Republic
France	2,603,004.40M	38,625	n/a	1,30	Low (3 Products)	High	High	Constitutional Republic
Germany	3,806,060.14M	45,723	n/a	1,90	Low (3 Products)	High	High	Federal Constitutional Republic

Country	*GDP*	*Per Capita GDP*	*Risk Classification*	*Control of Corruption (-2,5 to +2,5)*	*Trade Diversification (+50% / 3 Products)*	*Rate of Technology per Product*	*Rate of Investment per Product*	*Government System*
India	2,622,983.73M	1,900	3	-0,23	Medium (4 Products)	Medium	Medium	Federal Constitutional Republic
Indonesia	1,058,423.84M	3,869	3	-0,42	Medium (4 Products)	Medium	Medium	Constitutional Republic
Japan	5,064,872.88M	40,113	n/a	1,48	Low (2 Products)	High	High	Parliamentary Monarchy
Korea	1,630,525.01M	31,489	n/a	0,76	Low (2 Products)	High	High	Constitutional Republic
Madagascar	13,720.63M	495	7	-1,01	Low (2 Products)	Low	Low	Constitutional Republic
Mexico	1,076,163.32M	8,346	3	-0,82	Low (2 Products)	High	High	Federal Constitutional Republic
Netherlands	912,242.34M	52,304	n/a	2	Medium (4 Products)	High	High	Parliamentary Monarchy
Nigeria	432,293.78M	2,097.1	6	-1,09	Low (1 Product)	Low	Low	Constitutional Republic
Portugal	231,255.59M	22,439	n/a	0,76	Medium (4 Products)	High	High	Constitutional Republic

Country	*GDP*	*Per Capita GDP*	*Risk Classification*	*Control of Corruption (-2,5 to +2,5)*	*Trade Diversification (+50% / 3 Products)*	*Rate of Technology per Product*	*Rate of Investment per Product*	*Government System*
Russia	1,483,497.78M	10,126	4	-0,83	Low (1 Product)	Medium	Medium	Federal Parliamentarian Republic
Singapore	339,998.48M	59,797	0	2,16	Low (2 Products)	High	High	Parliamentary Republic
South Africa	301,923.64M	5,090	4	0,08	Medium (4 Products)	Medium	Medium	Parliamentary Republic
Spain	1,281,199.09M	27,057	n/a	0,65	Medium (4 Products)	High	High	Parliamentary Monarchy
UK	2,707,743.78M	40,284	n/a	1,77	Medium (4 Products)	High	High	Parliamentary Monarchy
USA	20,936,600.00M	63,543	n/a	1,22	Medium (4 Products)	High	High	Federal Constitutional Republic

(1) Available at: *https://data.worldbank.org/indicator/ny.gdp.mktp.cd?start=2020&view=chart.*
(2) Available at: *https://data.worldbank.org/indicator/ny.gdp.pcap.cd?view=chart.*
(3) Available at: *https://www.oecd.org/trade/topics/export-credits/documents/cre-crc-current-english.pdf.*
(4) Available at: *https://info.worldbank.org/governance/wgi/home/reports.*
(5) Available at: *http://wits.worldbank.org/es/visualization/detailed-country-analysis-visualization.html.*

SOURCE. Self-made.

Blue Economy modelling, like any other public policy, also implies choosing a viable business corporative model for a particular country according to the particularities of its society, the analysed cluster, and the global momentum of the analysis. Therefore, it is possible to deduct preliminarily that every modelling will allow a more or less centralized, regulated, and monopolized models —not to mention the degree of development of each cluster—.[15] In other words, every country can engage in Blue Economy, but their engagement will be more or less difficult according to its current development, evolution capacities, and public policy orientation (table 2).

III. The Fundamentals of Marine Biodiversity

1. *Biodiversity Business*

As Gbadegesin and Akintola recall:

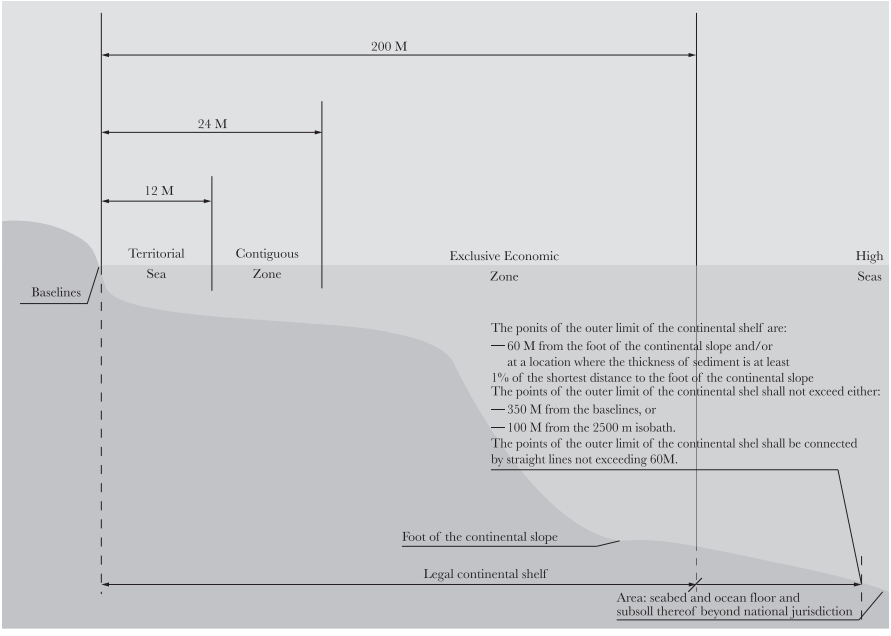
> Oceans and seas are the source of a huge variety of life forms including macro and micro-organisms. Living marine resources have huge potential for developing new food, biochemical, pharmaceutical, cosmetics and bio-energy applications. According to Suttle, the growing commercial interest in marine bioprospecting to discover new plants and animal species from which medicinal drugs and other commercially valuable compounds can be derived is expected to increase with developments in science, technology and innovation since the first drugs from marine organisms were commercialized over a decade ago. The Nigerian marine environment is rich in biodiversity with a wide range of novel species of microorganisms. This rich biodiversity if harnessed and commercialized through the application of scientific and engineering principles has the potential to become a potent revenue source. Devoting resources to the development of technology to aid bio-prospecting in Nigeria has the potentials for poverty eradication and national development through marine sustainable aquaculture and fisheries, providing sustainable alternative sources of energy, pharmaceutical discoveries that would improve human health amongst others.[16]

[15] Disponible en: *https://wits.worldbank.org/trade-visualization.aspx?lang=es*; *http://wits.worldbank.org/es/visualization/detailed-country-analysis-visualization.html*.

[16] Gbadegesin, Opeyemi A. y Akintola, Simisola, "Charting the Course for a Blue Economy in Nigeria: A Legal Agenda", *Journal of Environmental Law and Policy*, vol. 1, 2021, available at: *https://doi.org/10.33002/jelp001.01*.

In UNCLOS terms, offshore economy may be understood to cover from a coastal states' Territorial Sea through its Exclusive Economic Zone (EEZ) and Continental Shelf (CS), all the way into the area and the high sea:

IMAGE 1. UNCLOS MARINE AREAS: TERRITORIAL SEA-EEZ-CONTINENTAL SHELF-HIGH SEA



SOURCE: UNCLOS.

It has also been asserted:

> One of the most challenging issues in ocean affairs today is managing marine genetic resources in the high seas. Discussions on biodiversity beyond national jurisdictions is complex and vast, encompassing fundamental questions such as the meaning of conservation and management of biodiversity, the meaning of marine genetic resources, transfer of technology, benefit sharing, the meaning and implication of a legally binding instrument, and many other rather complex matters.[17]

[17] Nordquist, Myron H., and Norton Moore, John, *Marine Biodiversity of Areas Beyond National Jurisdiction,* Leiden, Brill Nihjoff, 2021; Ardron, Jeff A. *et al.*, "The sustainable use

Why is it so complex? Because:

> …activities in the areas beyond national jurisdiction will have a direct impact on areas under our jurisdiction and also *vice versa*. Conservation and management of living resources as well as pollution are of particular concern, because the marine environment as an ecosystem will affect them regardless of legal boundaries established in accordance with UNCLOS 1982. Fish have no passports.[18]

In addition:

> …although our planet Earth has more waters than lands, we do not have a single organization that deal with ocean. We have UNGA, ITLOS, ISBA, DOALOS, IMO, FAO, IOC, regional fisheries organizations in many regions, and many others.[19] Core normative regarding marine biodiversity can be found in 1982 UN Convention on the Law of the Sea (UNCLOS). It is relevant to have a minimum understanding of these UNCLOS definitions, rights and obligations of coastal and outer (*i.e.*, *flag ship*) States.[20]

Thus, there is a different set of biodiversity *corpus juris* per State and for the international community that regulates different maritime spaces.[21]

2. *The United Nations Convention on the Law of the Sea (UNCLOS)*

The jurisdiction of coastal states is determined by the provisions of UNCLOS, which preserves for the benefit of all states the freedom of navigation, overflight, and of the laying of submarine cables and pipelines, as well as other internationally lawful uses of the sea related to these freedoms. In the exclusive economic zone, the coastal state has sovereign rights for the purpose of exploring and exploiting, conserving, and managing the natural resources of the seabed and subsoil. Similarly, in connection with the con-

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and conservation of biodiversity in ABNJ: What can be achieved using existing international agreements?", *Marine Policy*, vol. 49, 2014, available at: *http://dx.doi.org/10.1016/j.marpol.2014.02.011*.

[18] Nordquist, Myron H., and Norton Moore, John, *op. cit.*, p. XXXX.

[19] *Idem.*

[20] Ardron, Jeff A., *op. cit.*

[21] *Ibidem*, p. XXX.

servation of the living resources, and as provided in Article 61 and related articles of UNCLOS, provides as follows:

> 1. The coastal State shall determine the allowable catch of the living resources in its exclusive economic zone.
>
> 2. The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation. As appropriate, the coastal State and competent international organizations, whether subregional, regional or global, shall cooperate to this end.
>
> 3. Such measures shall also be designed to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors, including the economic needs of coastal fishing communities and the special requirements of developing States, and taking into account fishing patterns, the interdependence of stocks and any generally recommended international minimum standards, whether subregional, regional or global.
>
> 4. In taking such measures the coastal State shall take into consideration the effects on species associated with or dependent upon harvested species with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may become seriously threatened.
>
> 5. Available scientific information, catch and fishing effort statistics, and other data relevant to the conservation of fish stocks shall be contributed and exchanged on a regular basis through competent international organizations, whether subregional, regional or global, where appropriate and with participation by all States concerned, including States whose nationals are allowed to fish in the exclusive economic zone.[22]

Article 58 deals with the rights and duties of other States in the exclusive economic zone:

> 1. In the exclusive economic zone, all States, whether coastal or land-locked, enjoy, subject to the relevant provisions of this Convention, the freedoms referred to in article 87 of navigation and overflight and of the laying of submarine cables and pipelines, and other internationally lawful uses of the sea related to these freedoms, such as those associated with the operation of ships, aircraft

[22] UNCLOS, article 1, available at: *https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf*; Proelss, A., *UNCLOS: A Commentary*, London, Hart-NOMOS, 2016.

> and submarine cables and pipelines, and compatible with the other provisions of this Convention.
>
> 2. Articles 88 to 115 and other pertinent rules of international law apply to the exclusive economic zone in so far as they are not incompatible with this Part.
>
> 3. In exercising their rights and performing their duties under this Convention in the exclusive economic zone, States shall have due regard to the rights and duties of the coastal State and shall comply with the laws and regulations adopted by the coastal State in accordance with the provisions of this Convention and other rules of international law in so far as they are not incompatible with this Part.[23]

Again, there must be compliance of UNCLOS, coastal State's regulations, plus additional *ad hoc* normative. In addition, special treatment is provided to the Area, which:

> …is the area outside the territorial jurisdiction of States. According to article 153 of UNCLOS, activities in the Area shall be carried out and controlled by the [International Seabed] Authority on behalf of mankind as a whole. The article contains rules about the manner in which these activities shall be carried out. In article 170 we find rules about the so-called Enterprise, which shall be the organ of the Authority which shall carry out activities in the Area.[24]

Lastly, to provide a common understanding of its international legal meaning, a general definition of dumping and pollution is provided with in Article 1.[25]

It is evident that marine space division and regulation leads to a problematic treatment of biological elements, especially in relation to biodiversity beyond national jurisdiction (BBNJ):

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[23] *Idem*.

[24] Nordquist, Myron H. and Norton Moore, John, *op. cit.*, p. XXX.

[25] "(4) «pollution of the marine environment» means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities". UNCLOS, available at: *article 1, available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf;* Proelss, A., *UNCLOS: A Commentary*, London, Hart-NOMOS, 2016.

> This specific concern has to be addressed because it leaves a gaping question with regard to the legal status on the biodiversity and genetic resources in those related areas with two different regimes. There must be a clarity in this particular situation whereby the biodiversity or genetic resources in the water column may have their life cycle starting from the subsoil and seabed or the other way around, as well as biodiversity or genetic resources that do have uninterrupted and well-connected biological linkage between the seabed and the water column in areas where overlap between extended continental shelf and BBNJ exist.[26]

The treatment of biodiversity is linked both to the Law of the Sea and Environmental Law. Following these criteria, it received special treatment in a specific treaty, pursuant which a specific conference on BBNJ was organized.

3. *Convention on Biodiversity & Conference on Biodiversity Beyond National Jurisdiction*

The legal framework currently governing ABNJ is complex. The key agreements relevant to marine resources management and the conservation of biodiversity in ABNJ are over ten:

[26] "The possible solution is to assign the water column above the seabed beyond 200 nautical miles that have been recommended by the Commission on Limits of the Continental Shelf to the coastal countries concerned. This may create fewer complications on the management of the biodiversity beyond national jurisdiction. The assignment may be followed with transparent monitoring by an international organ. However, some may consider this approach unfair because the coastal countries with extended continental shelves gain access to the resources in the water column. It is indeed an issue that has not been dealt with thoroughly at the intergovernmental conference (*igc*) discussion in New York. A specific arrangement, a *sui generis*, may be considered in this unique overlapping situation of extended continental shelf and the water column above it which may be included as abnj. In this geographic situation of direct boundary with abnj, an issue of pollution or side effects coming from economic activities in the abnj going into the Exclusive Economic Zone or continental shelf of a coastal nation, especially small archipelagic and island developing States, must also be taken into consideration. As a matter of fact, many small island developing countries have become the epicentre of marine biodiversity in the world". Nordquist, Myron H. and Norton Moore, John, *op. cit.*, p. XXXX.

Table 3. Agreements Relevant to Marine Resources Management and the Conservation of Biodiversity in ABNJ

Short name	*Full name*	*Year/in force*	*Parties*
Global framework agreement			
LOSC (UNCLOS)	United Nations Convention on the Law of the Sea (also known as: Law of the Sea Convention)	1982/94	166 (including the European Union - EU)
Global sectoral agreements (to manage marine narural resource exploitation and maritime activities)			
Part XI Agreement	Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982	1994/96	145
Fish Stocks Agreement	The United Nations Agreement for the lmplementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Managment of Straddling Fish Stocks and Highly Migratory Fish Stocks	1995/01	81
MARPOL and other agreements	lnternational Convention for the Prevention of Pollution from Ships, and other shipping other Agreements	1972 and 78/83 (Annex VI protocol 1997/05)	74a.
LC/LP	Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter 1972 and 1996 Protocol Thereto	1972/75 (Protocol 1996/06)	87-42

Short name	*Full name*	*Year/in force*	*Parties*
IWC	International Convention for the Regulation of Whaling	1946/48	88
Global conservation agreements (primarily to protect species, habitats, and/or biodiversity)			
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora	1973/75	178
CMS	The Convention on the Conservation of Migratory Species of Wild Animals	1979/83	119
CBD	Convention on Biological Diversity	1992/93	193 (including the EU)
WHC	Convention for the Protection of the World Cultural and Natural Heritage	1972/75	190
Regional agreement bodies (summarised - see Rochette et al. *this issue)*			
RFMO/As	Regional fisheries management organisations/agreements	Various	Various
RSA/Ps	Regional Seas Agreements and Programmes	Various	Various
CCAMLR/ATS	Convention for the Conservation of Antarctic Marine Living Resources/Antarctic Treaty System	1982/82; 1959/61	36

SOURCE: Ardron, Jeff A. *et al.*, *op. cit.*, p. XXX; Govan, H., *The Pacific Islands and Biodiversity Beyond National Jurisdiction*, 2014.

Although not specifically referred to ocean or marine, Article 2 of the Convention on Biological Diversity defines:

> "Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
>
> "Biological resources" includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.
>
> "Biotechnology" means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.
>
> "Country of origin of genetic resources" means the country which possesses those genetic resources in in-situ conditions.
>
> "Country providing genetic resources" means the country supplying genetic resources collected from in-situ sources, including populations of both wild and domesticated species, or taken from ex-situ sources, which may or may not have originated in that country.
>
> "Domesticated or cultivated species" means species in which the evolutionary process has been influenced by humans to meet their needs.
>
> "Ecosystem" means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
>
> "Ex-situ conservation" means the conservation of components of biological diversity outside their natural habitats.
>
> "Genetic material" means any material of plant, animal, microbial or other origin containing functional units of heredity.
>
> "Genetic resources" means genetic material of actual or potential value.
>
> "Habitat" means the place or type of site where an organism or population naturally occurs.
>
> "In-situ conditions" means conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.
>
> "In-situ conservation" means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.
>
> "Protected area" means a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.
>
> "Regional economic integration organization" means an organization constituted by sovereign States of a given region, to which its member States have transferred competence in respect of matters governed by this Conven-

> tion and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it.
>
> "Sustainable use" means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.
>
> "Technology" includes biotechnology.[27]

Most importantly, pursuant to Articles 1, 10, 15 and 15 of the Convention on Biological Diversity, sovereignty principle applies in relation to exploration, research, development, and exploitation of biodiversity, existing contractual basis for prospective agreements between States in order to pursue biotech and biodata exchange.[28] This basis was further developed in relation to access and benefit sharing by the Nagoya Protocol.[29]

Since 2015 a *PrepCom*[30] worked on the process of recommendations to UNGA in relation to BBNJ.[31] Several conferences have been held under UN mandate, dealing with sub-issues that constitute the core areas of development and conflict. Thus, it is possible to conclude that exploration and exploitation of Biodiversity remains to be highly convenient for industrialized and financially developed States. In addition, it is probably also convenient for those States' corporations to promote foreign direct investments (FDI) in former colonial insular States in order to develop their Biodiversity industry with lower costs.[32]

IV. Modelling Emerging Scenarios for Biodiversity Development: Blue Economy Planning

Due to the extremely high levels of capital and technology requirements as well as the high risk of investment scenarios and strategically related clusters

[27] CBD. Disponible en: *https://www.cbd.int/convention/articles/?a=cbd-02*.

[28] CBD. Disponible en: *https://www.cbd.int/convention/text/*.

[29] CBD. Disponible en: *https://www.cbd.int/abs/*.

[30] Nordquist, Myron H. and Norton Moore, John, *op. cit.*, p. XXX.

[31] "In 2015, UNGA Resolution 69/292 officially launched the two-year PrepCom process to make recommendations to the UNGA on elements of a draft text for an international legally binding instrument, implementing UNCLOS and open to non-UNCLOS parties as well". Payne, Cymie, "Biodiversity in the High Seas: An Integrated Approach", *American Cociety of International Law*, vol. 21, issue 9, 2017, available at: *https://www.asil.org/insights/volume/21/issue/9/biodiversity-high-seas-areas-integrated-legal-approach*.

[32] Ardron, Jeff A., "Transparency in the operations of the International Seabed Autho rity: An initial assessment", *Marine Policy*, 2016, vol. 75, 2018, availabla at: *https://www.sciencedirect.com/science/article/pii/S0308597X16303281*.

such as telecommunications, mining resources, and energy resources, BEPs will increase their feasibility by mixing private and public funding and management. These can be achieved, for example, through mixed participation projects (joint ventures; mixed corporations) or public-private partnerships (PPP), always trying to comply with United Nations 2030 Agenda.[33]

1. *Public Policies and Regulations*

BEPs public policies determine fiscal burden (taxes, royalties, etc.), benefit or production sharing, the treatment of foreign investments (including special schemes for procurement and local content policies),[34] any restrictions on the amount of production (due to market or environmental reasons).

Regarding the regulatory framework, States can wilfully adopt and implement international law normative. Consequently, laws, decrees and regulations constitute the regulatory framework for the hydrocarbon industry (both nationally and sub-nationally), mainly including:

a) The ownership of IP.
b) The system of right to explore and research.
c) The system of licenses and authorisations.
d) The system of contracts and operations (including risk sharing clauses, transfer clauses, operation, financing, confidentiality, corruption, termination, settlement of disputes, applicable law, etc.).
e) The fiscal and management of income (including taxes, fees, royalties, payment in kind option, currency and banking system, etc.) regime.
f) The environmental regime (including risk analysis, insurance, etc.).
g) The labour system (rights and obligations of workers, safety standards at work).
h) The guarantee scheme (insurance, etc.) and responsibilities (contractual and tort).

2. *A Simple & Feasible Model*

Professional practice in developing countries shows that high tech-high cost private start-ups are uncommon. Programs like these imply regional or

[33] Mathur, K., *Public Private Partnerships and Public Accountability*, New Delhi, Centre for Democracy and Social Action, 2013.

[34] For a detailed policy to promote local contracts, see Ngoasong, Michael Zisuh, "How International Oil and Gas Companies to Respond Local Content Policies in Petroleum-Producing Developing Countries: A Narrative Inquiry", *Energy Policy*, vol. 73, 2014, pp. 471-479.

global financing authorities (*e.g.*, World Bank, Inter American Development Bank, BICE, etc.). In those cases, a simple BEP model employed to reduce risks, increase stakeholders' interventions, and include social development may include the following:

a) Actions can be deployed by a mixed consortium or public-private partnerships (PPPs) (participation of companies and foreign and national research entities, on the one hand, and public and scientific research entities, on the other) through development agreements to carry out the general purposes which are divided in: stages of work, topics of work, and objectives of work.
b) It is provided with a three (3) stages work: *i)* evaluation of the project, call for international tender and the composition of the joint venture; *ii)* execution of the R+D Programme (research and development of the marine area potential); and *iii)* the implementation of the final BEP.[35]
c) The corporations constituting the JV must be specialized in each of the mentioned twenty (20) clusters.
d) The corporations shall create the JV from a financial contribution and a technical contribution (*know-how, qualified labour skills,* or *assets*) in order to implement the project.
e) The profit to be received by the corporations participating in the JV is the priority on the bidding rounds within each cluster (e. g., operation of ports, ports construction, housing construction, etc.), that is to say, when implementing the final development plan, the corporations that contributed and worked for their creation shall have priority in the bidding process against their competitors.

Additionally, it is important to point out that:

a) The main purpose of the plan is to achieve a sustainable economic and social development that has not yet existed in the country or area, achieving the training of specialists and technicians in sectors until now little developed or not developed at all, labour forces, small and medium-size enterprises and generators of public policies.
b) The fulfilment of the first purpose entails the readjustment of the maritime coast in socio-economic, urban, infrastructural, etc., means.

[35] Carried out by the administrative branch with competence, according to the reports of the R+D stage based upon an international public tender in which priority will be given to companies that have participated in the R + D stage.

V. Closing remarks

Traditional public policy analysis show any State must move cautiously and prudently when implementing or changing an offshore development model. Attempts to implement segregation of duties in countries where institutional prerequisites are absent can be very counterproductive. These reforms can be useless and even harmful to the market and industry, for example, in the following:

a) Initiatives which are overly broad and unworkable can displace more gradual reform efforts which could actually be substantive and sustainable, and only serve the interests of those who benefit from the status quo.
b) Reform efforts focused on the creation of new organs of government can distribute better the limited financial and human resources.
c) Multiplying the points of engagement with government officials can increase opportunities for corruption.
d) Corruption can preclude future reforms.

The following considerations are also relevant:

a) Separation of functions is rarely feasible in states where there is little stability or political change.
b) Regimes with little support from public opinion simply have little inclination to allow a government agency to develop the independent regulatory authority.
c) The ability of a country to implement the separation of functions meaningfully depends largely on the bureaucratic-administrative maturity of their state apparatus and its level of institutional development.
d) The countries which lack institutional capacity development (both in terms of their industrial sector and bureaucracy) can benefit from not establishing a model of separation of functions early.
e) The existence of a strong system of checks and balances can provide fundamental stability and resistance against political or economic shocks, even if the separation of functions does not seem necessary, while political change remains low.

There is some debate on the merits of a gradual rearrangement improving many institutional factors. The latter approach, for example, might

allow better coordination of reforms with political considerations, and may also yield benefits more quickly to provide credibility and maintain the momentum for reform. On the other hand, it is worth mentioning there are current scenarios where WGI conditions should affect performance negatively (*e.g.*, China). Nevertheless, government centralization and strong political interests promote efforts to improve BE development with a heterogeneous package of measures seems to be prospectively positive. Something similar happened in Singapore's transitional period towards its current condition, where measures had to be extremist due to the socio-economical and historical linkage of oil with the nation's economic evolution.

Lastly, countries such as Argentina —with high local marine resources availability— remain at the bottom of BE development due to extremely low WGI rates, lack of promotional public policies, and very low private sectors eagerness to be up-starters.

Concluding, with a new-born area of economy and legal business practice, the potential of IP in Blue Economy is yet to be exercised, though its potential is evidently more than worth the try —particularly considering its unregulated scenario—. Insular States with strong colonial liaisons already understood it. It is time for self-reliant States with technological and financial capacity such as India and Brazil to follow up.

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