

The Multiple Functions of Insurers in the Blue Economy



Lucrezia Anzanello

1 Our Common Future

1.1 *The Brundtland Report*

The first attempt to provide an accomplished definition for the concept of sustainable development is dated 1987, specifically with the United Nations-World Commission on Environment and Development Report of 20 March 1987 signed in Oslo by Norwegian Minister Gro Harlem Brundtland, who chaired its drafting.

The report called precisely “Our Common Future,” starts from the assumption that although the contingent situation at the time reflected a situation of increasing environmental degradation, the future could have been different, and it also could have led to further economic growth.

But this WAS believed to be possible only in the presence of economic policies able to protect, on one side, environmental resources, and, on the other side, support development and enable human progress, thus recalling the dual meaning of sustainability—derived from the Latin origin of the term (*sustinentia*)—of the interrelationship between support and resistance.

Not only that. The concept of sustainability, thus understood, is also projected toward the protection of future generations:¹

¹This concept is taken up, in a rather accentuated way, in some constitutional texts: Art. 66, c. 2, lett. D of the Portuguese Constitution where reference is made to the principle “da solidariedade entre gerações”; Art. 24, c. 1 of the Greece Constitution “The protection of the natural and cultural environment constitutes a duty of the State and a right of every person. The State is bound to adopt special preventive or repressive measures for the preservation of the environment in the context of

L. Anzanello (✉)
University of Milan-Bicocca, Milan, Italy
e-mail: lucrezia.anzanello@unimib.it

27. Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth. The Commission believes that widespread poverty is no longer inevitable. Poverty is not only an evil in itself, but sustainable development requires meeting the basic needs of all and extending to all the opportunity to fulfil their aspirations for a better life. A world in which poverty is endemic will always be prone to ecological and other catastrophes.

So, it is a dynamic concept that does not aspire to a permanent state of harmony but involves an ongoing evolutionary dynamic that has to conform to present needs, and it has to shape itself for future needs.

It is of immediate evidence that this notion takes its cue from the natural sciences by seeking the balance of the three Es: ecology, equity, economics. This presupposes the carrying capacity of the environment² which measures the maximum level of crowding, as well as the need to use the planet's natural resources in such a way as to meet the needs of present generations without jeopardising the ability of future generations to meet their own, in compliance with intergenerational equity.³

The Brundtland Report, in addition to exemplifying virtuous behaviours, ends with concrete action consisting of the enactment of legal principles for environmental protection and sustainable development among which, of particular interest, are the following:

- *Inter-Generational Equity - 2. States shall conserve and use the environment and natural resources for the benefit of present and future generations.*

the principle of sustainability"; Art. 7 of the Czech Republic Constitution "The state shall see to it that natural resources are used economically and natural wealth is protected"; Art. 72 of the Slovenian Constitution "Everyone has the right in accordance with the law to a healthy living environment. The state shall promote a healthy living environment"; Art. 45 of the Spanish Constitution "Todos tienen el derecho a disfrutar de un medio ambiente adecuado para el desarrollo de la persona, así como el deber de conservarlo. Los poderes públicos velarán por la utilización racional de todos los recursos naturales, con el fin de proteger y mejorar la calidad de la vida y defender y restaurar el medio ambiente, apoyándose en la indispensable solidaridad colectiva"; Arts. 5, 74 and 86 the Polish Constitution "The Republic of Poland shall (...) ensure the protection of the natural environment pursuant to the principles of sustainable development (...) Public authorities shall pursue policies ensuring the ecological security of current and future generations. Protection of the environment shall be the duty of public authorities. Everyone shall have the right to be informed of the quality of the environment and its protection. Public authorities shall support the activities of citizens to protect and improve the quality of the environment (...) Everyone shall care for the quality of the environment and shall be held responsible for causing its degradation. The principles of such responsibility shall be specified by statute"; and Art. 56 of the Turkey Constitution "Everyone has the right to live in a healthy, balanced environment. It is the duty of the state and citizens to improve the natural environment, and to prevent environmental pollution."

²La Camera (2003).

³Silvestri (2015).

- *Conservation and Sustainable Use - 3. States shall maintain ecosystems and ecological processes essential for the functioning of the biosphere, shall preserve biological diversity, and shall observe the principle of optimum sustainable yield in the use of living natural resources and ecosystems.*
- *Sustainable Development and Assistance - 7. States shall ensure that conservation is treated as an integral part of the planning and implementation of development activities and provide assistance to other States, especially to developing countries, in support of environmental protection and sustainable development.*

Resilience, protection and future. These are the key themes in which the above principles can be summarised.

1.2 New Perspectives on Sustainability

Subsequently, the concept of sustainability was expanded and acquired a multidimensional meaning by including issues on both environmental protection and preservation of natural resources and concerning also of economic development and social progress as the right to development of the poorest countries with an active participation of the signing states.

The new conception of this term—together with precise behavioural action intended for the signing states—was first affirmed in 1992 during the Earth Summit of the First United Nations Conference on Environment and Development which resulted in the Rio Declaration on Environment and Development and in the local implementation tool called Agenda 21.

Particularly:

- *Principle 1 - Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.*
- *Principle 3 - The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.*
- *Principle 25 - Peace, development and environmental protection are interdependent and indivisible.*

The Rio Declaration reaffirms many principles from the Declaration of the United Nations Conference on the Human Environment, adopted in Stockholm on 16 June 1972.

The Stockholm Declaration represents, indeed, a first taking stock of the global human impact on the environment, an attempt at forging a basic common outlook on how to address the challenge of preserving and enhancing the human environment.

But, as a result, the Stockholm Declaration espouses mostly broad environmental policy goals and objectives rather than detailed normative positions.⁴

The Stockholm Declaration identifies 26 principles on human responsibilities in relation to the environment, among them one of the most important principles is that of intergenerational equity meant as the right of access to natural resources by all human communities and responsibility to future generations.⁵

This is an ethical principle that proceeds in parallel with that of sustainable development and introduces the theme of the rights of future generations, highlighting the close link between poverty and environmental degradation.

The multidimensional character of sustainability was reaffirmed during the World Summit on Sustainable Development in Johannesburg in 2002 through the Declaration on Sustainable Development and particularly in the Plan of Action in which emerges more clearly the meaning of the triangle of (1) environmental sustainability as protection of the ecosystem, (2) economic sustainability as productive growth of resources, and (3) social sustainability as defence of human rights, fight against poverty, distributive equity of resources and safeguarding health.

Sustainable development is the only way to achieve growth taking into account both economic, social and environmental aspects and to constitute a more equitable social structure for future generations:

- *5. Accordingly, we assume a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development—economic development, social development and environmental protection—at the local, national, regional and global levels.*
- *11. We recognize that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development.*
- *26. We recognize that sustainable development requires a long-term perspective and broad-based participation in policy formulation, decision-making and imple-*

⁴Handl (2012). Of the same author see also—Handl (1995). See also Marchisio (1992); Panjabi (1993).

⁵“Every generation receives a natural and cultural legacy in trust from its ancestors and holds it in trust for the future descendants.”

Thus Weiss (1989), the leading exponent of intergenerational equity theory, summarises its essence; each generation receives an inheritance, in cultural and natural terms, which it preserves in a trust for future descendants. This means that in the head of each generation arise both rights relating to receiving as an inheritance an environment (and a cultural complex) preserved in its resources, and duties to protect these riches for future generations; however, the theory of intergenerational equity argues that the aforementioned duties and rights are not individual, but collective, referring to generational classes and not to individuals’ part of society. For a further analysis —Brunnée, (2008).

mentation at all levels. As social partners, we will continue to work for stable partnerships with all major groups, respecting the independent, important roles of each of them.

In the community dimension of the European Union, the Single European Act of 1986 gives the European Community shared competence in environmental matters and, while it does not yet mention the concept of sustainable development, entrusts it with the task of “ensuring the prudent and rational utilization of natural resources.”

An initial and new definition of the term occurred with the 25/26 June 1990 Dublin Declaration of the European Council through which Member States:

As Heads of State and Government of the European Community, we recognise our special responsibility for the environment both to our own citizens and to the wider world. We undertake to intensify our efforts to protect and enhance the natural environment of the Community itself and the world of which it is part. We intend that action by the Community and its Member States will be developed on a coordinated basis and on the principles of sustainable development and preventive and precautionary action.

With the 1992 Maastricht Treaty, the aim “to promote balanced and sustainable economic and social progress” is included under B among the objectives of the European Union, while in the Treaty of the European Community reference is made in Article 2 to the promotion of “sustainable and non-inflationary growth which respects the environment.”

The principle of sustainable development, in the 1997 Treaty of Amsterdam, qualifies as definitively a “legal principle” and foundation for Community policies and actions, thus not only as a guiding principle of an ethical nature.

In the preamble, it states that the Member States are “determined to promote the social and economic progress of peoples, taking into account the principle of sustainable development in the context of the completion of the internal market and the strengthening of cohesion and environmental protection” and in Article 2 the Treaty reaffirms that the primary objective of the European Union is to promote economic and social progress, a high level of employment and to achieve balanced and sustainable development.

Finally, in 2007, the Treaty of Lisbon specified that the Union’s action is to “foster the sustainable development of developing countries in economic, social and environmental terms, with the primary aim of eradicating poverty” as well as “contribute to the development of international measures to preserve and improve the quality of the environment and the sustainable management of the world’s natural resources in order to ensure sustainable development.”

However, the transition from the declaration of principles to the assumption of precise obligations to implement environmentally preservative behavioural patterns has taken several years in both the EU and international context.

At the international level, in December 2015, the Paris Agreement was signed by 195 countries and then entered into force in November 2016. This agreement assigns precise environmental goals to the signatory states:

This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of

sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development. 2. This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

From a programmatic standpoint, the certainly most concrete action is that represented by the Agenda2030 for Sustainable Development, which highlights seventeen global goals and no less than 169 targets (“a call for action”) to be achieved by 2030.

The document is the result of a complex preparatory process, where the goals achieve universal character, they are addressed to both developing and advanced countries, and are based on the integration of the three dimensions of sustainable development (environmental, social and economic) as a prerequisite for eradicating poverty in all its forms.

The Agenda consists of four parts [(1) Declaration, (2) Goals and targets, (3) Implementation instruments, (4) Implementation monitoring and review] and touches on several, interconnected areas that are fundamental to ensuring the well-being of humanity and the planet: from combating hunger to eliminating inequality, from protecting natural resources to urban development, from agriculture to consumption patterns.

Of particular interest is Goal No. 14 called “Conserve and sustainably use the oceans, seas and marine resources for sustainable development.”

Specifically, it highlights the essentiality of marine and coastal biodiversity for human life as well as for the environment due to the ability of the oceans to absorb carbon dioxide produced by humans without considering the number of people employed thanks to fishing industries.

It is of immediate evidence; therefore, how proper management of the oceans and seas is fundamental to sustainable development.

1.3 The Link Between Sustainability and the Environment

The very strong connection between environmental protection and the fulfilment of duties of environmental solidarity, in the past years, was made explicit through the various principles that govern EU and international environmental policy, precisely from the goal of sustainable development.

However, the two aspects—environmental solidarity and sustainable development—always maintain their specific physiognomy, finding their essential point of contact in the circumstance that the duty of environmental solidarity also addresses and is addressed to future generations, “beyond the horizon of present

generations”⁶ to “ensure the continuity over time of economic and social development, with respect for the environment, without compromising the natural resources indispensable to human activity.”⁷

The link between sustainable development and the benefits of the present and future generations and the environment is strengthened by the social idea that the latter is no longer the object of individual appropriation, but the interest of the collective.⁸

Therefore, the present generation has the duty to not unreasonably use environmental resources, in order to remove all obstacles that prevent the full development of the human person with respect to the environment and to preserve the right of future generations to see the natural heritage reasonably used.

Then, the foundation of ethicality that distinguishes the duty of environmental solidarity and that requires the “global renunciation of continuing to contend for the earth’s limited riches in unbridled competition,”⁹ or that, more modestly, leads to the protection of the plant even if it does not serve economic or social purposes and even if, in an ecocentric view of the environment, it is not used to satisfy a material human need, highlights the content of that duty that is not economic, political or social in nature.¹⁰

And this although the characteristic of international environmental law has been, since its origin in the early 1970s, to deal with environmental problems in a very sectoral way.

It has dealt with air and marine pollution, trade in protected animals, hazardous waste, and protection of certain geographical areas from nuclear damage....

In more recent times, this sectoral approach has been followed by a comprehensive approach to problems affecting the environment as a whole. In this context, the principle of sustainable development can serve to give unity on the substantive level to environmental governance that on the formal level remains sectoral and fragmented mainly because of its origin in treaty norms that, however important, remain unenforceable against third states.

As for the gap between theoretical enunciations of the principle of sustainable development and the actual arrangements for economic development, it is due to the circumstance that states put the value of environmental sustainability before the need to sustain the economic growth and consumption of their citizens.¹¹

⁶Frumento E, Lo stato ambientale e le generazioni future: per una tutela del diritto fondamentale all’ambiente, www.ambientediritto.it.

⁷Fifth Environmental Action Programme.

⁸Maddalena (1990).

⁹Jonas (2000).

¹⁰Grasso (2003), p. 581.

¹¹This is evident in the 2005 UNDP (United Nations Development Programme) Report in which it is reported that more than 60% of countries consider environmental protection to be an obstacle to development rather than a component of it. This is not surprising when one considers that 60% includes poor countries that certainly do not look favourably at environmental protection policies whose costs fall on their shoulders. But despite this, it is precisely economic and consumption

It is in this search for a unity of action, overcoming the old environmental sectionalism, and for coherence between abstract proclamations and the real economic policy choices of states that the principle of sustainable development can play a unifying role with respect to already established or emerging principles of international environmental law.¹²

1.4 Intergenerational Equity and Jurisprudential Approach

In the judgments of the International Courts, it is difficult to discern a situation in which the rights related to intergenerational responsibility have been individually or collectively acted upon.

However, the issue was first dealt with by Judge Weeramantry's dissenting opinion, within the discussion on the use of nuclear weapons.

Indeed, he also includes among the effects of the possible use of nuclear weapons the harm to future generations:

This Court, as the principal judicial organ of the United Nations, empowered to state and apply international law with an authority matched by no other tribunal must, in its jurisprudence, pay due recognition to the rights of future generations. If there is any tribunal that can recognize and protect their interests under the law, it is this Court.

It is to be noted in this context that the rights of future generations have passed the stage when they were merely an embryonic right struggling for recognition. They have woven themselves into international law through major treaties, through juristic opinion and through general principles of law recognized by civilized nations.

Among treaties may be mentioned, the 1979 London Ocean Dumping Convention, the 1973 Convention on International Trade in Endangered Species, and the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage. All of these expressly incorporate the principle of protecting the natural environment for future generations and elevate the concept to the level of binding State obligation.

growth that is dramatically accelerating environmental degradation and now posing the question of the sustainability of economic development in terms of "global security." This new relationship between environmental sustainability and collective security is the basis for initiatives to reform the United Nations system. It emerges in the Report of the High-Level Panel on Threats, Challenges and Change, which insists on the need for new initiatives to go beyond the Kyoto Protocol, which is deemed insufficient to counter the global climate change crisis, and especially in Secretary-General Kofi Annan's March 2005 report, which proposes measures targeted at specific areas such as desertification, biodiversity protection and atmospheric warming.

¹²This is especially in application of the principles developed by the Working Group on Environmental Law of the European University Institute (1) the principle of prevention, (2) the principle of responsibility of non-state actors, particularly multinational corporations, with respect to compliance with international environmental standards, (3) the precautionary principle, (4) the principle of equity in the distribution of benefits derived from the exploitation of natural resources, (5) the principles of information and participation of affected populations in decisions affecting important environmental issues.

Juristic opinion is now abundant, with several major treatises appear in upon the subject and with such concepts as intergenerational equity and the common heritage of mankind being academically well established.

Moreover, there is a growing awareness of the ways in which a multiplicity of traditional legal systems across the globe protects the environment for future generations. To these must be added a series of major international declarations commencing with the 1972 Stockholm Declaration on the Human Environment.

When incontrovertible scientific evidence speaks of pollution of the environment on a scale that spans hundreds of generations, this Court would fail in its trust if it did not take serious note of the ways in which the distant future is protected by present law. The ideals of the United Nations Charter do not limit themselves to the present, for they look forward to the promotion of social progress and better standards of life, and they fix their vision, not only on the present, but on “succeeding generations.”

This one factor of impairment of the environment over such a seemingly infinite time span would by itself be sufficient to call into operation the protective principles of international law which the Court, as the pre-eminent authority empowered to state them, must necessarily apply.¹³

As for other Courts—such as the European Court of Justice or the European Court of Human Rights—they have not expressed directly about intergenerational equity.

Notwithstanding, the Courts, both international and EU, carry out their role in protecting the environment from the perspective of future generations also through the application of the principle of sustainable development.

An emblematic case in which there was a reference to the principle of sustainable development, also related to future generations, is *Gabčíkovo-Nagymaros*.

The facts consisted of the suspension of a pact between Czechoslovakia and Hungary, concerning the construction of a hydroelectric power plant, by the latter, due to concerns about the environmental impact of the project, which had been followed by unilateral actions by Czechoslovakia.

Once again, it is the knowledgeable opinion of Judge Weeramantry that needs to be taken into consideration.

First, Judge Weeramantry declares that the principle of sustainable development is an integral part of modern international law¹⁴ and it could be used to settle the proceeding, as accepted by both states involved in the dispute.

This case offers a unique opportunity for the application of that principle, for it arises from a Treaty which had development as its objective and has been brought to a standstill over arguments concerning environmental considerations.

The people of both Hungary and Slovakia are entitled to development for the furtherance of their happiness and welfare. They are likewise entitled to the preservation of their human right to the protection of their environment. Other cases raising environmental questions have been considered by this Court in the context of environmental pollution arising from

¹³ Separate Opinion of Vice President Weeramantry.

¹⁴ “The principle of sustainable development is thus a part of modern international law by reason not only of its inescapable logical necessity, but also by reason of its wide and general acceptance by the global community.”

such sources as nuclear explosions, which are far removed from development projects. The present case thus focuses attention, as no other case has done in the jurisprudence of this Court, on the question of the harmonization of developmental and environmental concepts.¹⁵

Furthermore, Judge Weeramantry traces some historical major steps in environmental protection¹⁶ showing the idea of the rights of future generations being served through the harmonisation of human developmental work with respect for the natural environment and concluding that “Sustainable development is thus not merely a principle of modern international law. It is one of the most ancient of ideas in the human heritage.”

On the outcome of the dispute, the International Court of Justice concluded that both parties committed internationally wrongful acts, and it has noted that those acts gave rise to the damage sustained by the parties; consequently, Hungary and Slovakia are both under an obligation to pay compensation and are both entitled to obtain compensation and the issue of compensation could satisfactorily be resolved in the framework of an overall settlement if each of the parties were to renounce or cancel all financial claims and counterclaims.

Another paradigmatic and domestic case to be mentioned is *Minors Oposa v. Secretary of the Department of Environmental and Natural Resources*¹⁷ argued before the Supreme Court of the Philippines and having as an instrument cited the constitution of the Philippines.

The plaintiffs’ complaint concerns the ongoing deforestation in the country. A group of children, including those of renowned environmental activist Antonio Oposa, brought this lawsuit in conjunction with the Philippine Ecological Network, Inc. (a non-profit organisation) to stop the destruction of the fast-disappearing rain forests in their country.

The plaintiff children based their claims on the 1987 Constitution of the Philippines, which recognises the right of people to a “balanced and healthful ecology”¹⁸ and the right to “self-preservation and self-perpetuation” (see Section 16, Article II). Oposa also raised the idea of “intergenerational equity” before the court, which is the idea that natural resources belong to people of all ages and that if adults were to harvest all of a country’s resources, they would be stealing from their children, their children’s children, and all future generations.

¹⁵ Separate Opinion of Vice President Weeramantry.

¹⁶ Brohier (1934) and Masao (1974).

¹⁷ G.R. No. 101083 July 30, 1993.

¹⁸ As a result of scientific research, the need was identified to maintain a balance between the use of environmental areas as free forests (in the majority) and for industrial, housing or any exploitation purposes (in the minority). The alteration of this balance, which the plaintiffs complain about, would lead to major consequences for both local and planetary ecosystems; there could be “environmental tragedies.” The plaintiffs attach documentary, photographic and satellite evidence that would show how the administration was not concerned with the maintenance of resources, but rather disrupted them by licensing various companies for logging instrumental to the acquisition of timber.

The Supreme Court ruled in favour of the children, and made several ground-breaking and powerful statements, finding:

- The right to a clean environment, to exist from the land, and to provide for future generations are fundamental.
- There is an intergenerational responsibility to maintain a clean environment, meaning each generation has a responsibility to the next to preserve that environment, and children may sue to enforce that right on behalf of both their generation and future generations.
- The Philippine Constitution requires that the government “protect and promote the health of the people and instill health consciousness among them.”

The uniqueness of this case is clearly related to the fact that the plaintiffs were minors representing their generation as well as generations yet unborn,¹⁹ and this allowed for the extension of the time limit relating to the damage that the actions complained of had created and were creating to the environment and to the circumstance whereby the Court acknowledged that the class of members represented not only their own interests, but also those of future generations.

There is no lack of jurisdiction over the minors, indeed the action is admissible.²⁰ This is justified by the same by referring precisely to intergenerational responsibility, arguing on the one hand on the right to a balanced and healthy environment and, on the other hand, that each generation must respect such, it is said, “rhythm and harmony” of nature; in essence, it is not only affirmed that the claim of the minor class members consisted in the exercise of their prerogative, but also the fulfilment of their duty, to future generations.

The Court’s reasoning is also based on the citation of some direct references to future generations in Philippine law itself; particularly, the text of a 1977 Presidential Decree forming the so-called Philippine Environment Code is cited, which expresses itself with respect to the responsibilities of each generation by defining them as

¹⁹This case, however, has a special and novel element. Petitioners’ minors assert that they represent their generation as well as generations yet unborn. We find no difficulty in ruling that they can, for themselves, for others of their generation and for the succeeding generations, file a class suit. Their personality to sue on behalf of the succeeding generations can only be based on the concept of intergenerational responsibility insofar as the right to a balanced and healthful ecology is concerned. Such a right, as hereinafter expounded, considers the “rhythm and harmony of nature.” Nature means the created world in its entirety. Such rhythm and harmony indispensably include, inter alia, the judicious disposition, utilisation, management, renewal and conservation of the country’s forest, mineral, land, waters, fisheries, wildlife, off-shore areas and other natural resources to the end that their exploration, development and utilisation be equitably accessible to the present as well as future generations. Needless to say, every generation has a responsibility to the next to preserve that rhythm and harmony for the full enjoyment of a balanced and healthful ecology. Put a little differently, the minors’ assertion of their right to a sound environment constitutes, at the same time, the performance of their obligation to ensure the protection of that right for the generations to come.

²⁰“Plaintiffs have a clear and constitutional right to a balanced and healthful ecology and are entitled to protection by the State in its capacity as the *parens patriae*.”

“responsibilities [...] as trustee and guardian of the environment for succeeding generations.”

It clearly echoes the theory of intergenerational equity by defining present generations as trustees of the environment for succeeding generations.

2 Blue Economy: A Terminological Investigation

2.1 *A New Business Model*

The Italian Treccani dictionary defines the Blue Economy as “An economic form in which production techniques aim to create a sustainable ecosystem, characterized by total absence of carbon emissions, through the use of energy sources and natural resources, eliminating the traditional cycle leading from product to waste, whether polluting or recyclable.”

It is therefore and foremost an economic model that, aware of the primary role of oceans and seas in terms of sustainability and progress and natural heritage, aims to research and apply new techniques that can generate a positive and long-term impact.

The author who coined the terminology Blue Economy is Gunter Pauli, a Belgian economist.

In his book,²¹ Pauli highlights the potential benefits of linking and combining seemingly disparate environmental problems with open-source scientific solutions based on common physical processes in the natural world to create solutions that have environmental, economic and social benefits. The book suggests that we can change the way we manage our industrial processes and address the resulting environmental problems by moving away from the use of rare, high-energy cost resources and instead seeking solutions based on simpler, cleaner technologies. It also proposes to focus on generating more value instead of blindly cutting costs. Finally, he aims to inspire entrepreneurs to adopt their own insights, demonstrating ways in which this can create economic benefits through job creation and reduced energy consumption.

In a further moment, Pauli proposed some examples of virtuous blue economy such as producing edible mushrooms from coffee waste and making natural surfactants from orange peels. Or the construction of buildings designed on the basis of termite mounds for better thermal management.

Again, global intentions have been well identified in guiding principles first enunciated in 2018²² that are the subject of a United Nations initiative involving the global community “Sustainable Blue Economy Finance Initiative.”

²¹ Pauli (2010).

²² Sustainable Blue Economy Finance Principles: (1) Protective: We will support investments, activities and projects that take all possible measures to restore, protect or maintain the diversity,

Obviously, they, and especially number 8, are extremely connected to Agenda's goal 14 above (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) by promoting its implementation and setting standards specific to oceans, enabling the financial sector to integrate sustainability of ocean-based sectors.

The Blue Economy has gained traction in international and regional scenarios and governance throughout the past decade.²³ Despite the prominence of the term in

productivity, resilience, core functions, value and the overall health of marine ecosystems, as well as the livelihoods and communities dependent upon them. (2) Compliant: We will support investments, activities and projects that are compliant with international, regional, national legal and other relevant frameworks which underpin sustainable development and ocean health. (3) Risk-aware: We will endeavour to base our investment decisions on holistic and long-term assessments that account for economic, social and environmental values, quantified risks and systemic impacts and will adapt our decision-making processes and activities to reflect new knowledge of the potential risks, cumulative impacts and opportunities associated with our business activities. (4) Systemic: We will endeavour to identify the systemic and cumulative impacts of our investments, activities and projects across value chains. (5) Inclusive: We will support investments, activities and projects that include, support and enhance local livelihoods, and engage effectively with relevant stakeholders, identifying, responding to, and mitigating any issues arising from affected parties. (6) Cooperative: We will cooperate with other financial institutions and relevant stakeholders to promote and implement these principles through sharing of knowledge about the ocean, best practices for a sustainable Blue Economy, lessons learned, perspectives and ideas. (7) Transparent: We will make information available on our investment/banking/insurance activities and projects and their social, environmental and economic impacts (positive and negative), with due respect to confidentiality. We will endeavour to report on progress in terms of implementation of these Principles. (8) Purposeful: We will endeavour to direct investment/banking/insurance to projects and activities that contribute directly to the achievement of Sustainable Development Goal 14 ("Conserve and sustainably use the oceans, seas and marine resources for sustainable development") and other Sustainable Development Goals especially those which contribute to good governance of the ocean. (9) Impactful: We will support investments, projects and activities that go beyond the avoidance of harm to provide social, environmental and economic benefits from our ocean for both current and future generations. (10) Precautionary: We will support investments, activities and projects in our ocean that have assessed the environmental and social risks and impacts of their activities based on sound scientific evidence. The precautionary principle will prevail, especially when scientific data is not available. (11) Diversified: Recognising the importance of small to medium enterprises in the Blue Economy, we will endeavour to diversify our investment/banking/insurance instruments to reach a wider range of sustainable development projects, for example in traditional and non-traditional maritime sectors, and in small and large-scale projects. (12) Solution-driven: We will endeavour to direct investment/banking/insurance to innovative commercial solutions to maritime issues (both land- and ocean-based), that have a positive impact on marine ecosystems and ocean-dependent livelihoods. We will work to identify and to foster the business case for such projects, and to encourage the spread of best practice thus developed. (13) Partnering: We will partner with public, private and nongovernment sector entities to accelerate progress towards a sustainable Blue Economy, including in the establishment and implementation of coastal and maritime spatial planning approaches. (14) Science-led: We will actively seek to develop knowledge and data on the potential risks and impacts associated with our investment/banking/insurance activities, as well as encouraging sustainable finance opportunities in the Blue Economy. More broadly, we will endeavour to share scientific information and data on the marine environment.

²³ Mulazzani and Malorgio (2017) and Patil et al. (2016).

international and national programs the blue economy as a concept remains poorly defined and largely under-implemented at a national level.²⁴ This renders the blue economy at risk of becoming a political tool rather than a tool to achieve practical objectives and advance ocean health, economic development, and social equity.²⁵

Today's Blue Economy transcends traditional sectors, with the exponential growth in recent years of new innovative and emerging sectors, such as wind energy and biotechnology. These sectors offer significant potential for growth and employment, especially in renewable energy. Pollution of the seas could have disastrous consequences through not only the impact on climate change and rising costs to mitigate its consequences, but already on marine litter on the surface and seabed. Indeed, these already generate lost costs and revenues in sectors such as fisheries, aquaculture and tourism, in an estimated amount of nearly 11 billion euros per year. The Blue Economy is interconnected with many other activities in the economy and its impact goes beyond the sectors mentioned above.

Given the increasing urgency of addressing the decline in ocean health, and the continued growth of ocean industries, translating high-level conceptualisations of the blue economy into operational implementation and reviewing this implementation for future adaptation should be a high priority.

2.2 *From Blue to Ocean Economy*

Protecting our oceans is not a luxury. It is a necessity that contributes to our economy, our climate and our way of life. Working together, we can change the current course and chart a sustainable future.²⁶

A new common definition of “Blue Economy” stressed the promotion of economic benefits of “good for the ocean” industries and activities, while ensuring truly sustainable development.

Blue Economy evolves in Ocean Economy.

There is still no universally accepted definition of the ocean economy.

For example, the ocean economy is defined by the OECD as the sum of the economic activities of ocean-based industries, together with the assets, goods and services provided by marine ecosystems. These two pillars are interdependent, in that much activity associated with ocean-based industry is derived from marine ecosystems, while industrial activity often impacts marine ecosystems.

For the European Commission “the maritime economy consists of all the sectoral and cross-sectoral economic activities related to the oceans, seas and coasts. This includes the closest direct and indirect supporting activities necessary for the

²⁴Voyer et al. (2022), p. 5. For a further analysis—Colgan (2018).

²⁵Brent et al. (2020) and Louey (2022). See also - Voyer et al. (2018); European Commission (2022).

²⁶US Secretary of State, John Kerry (2014).

functioning of these economic sectors, which can be located anywhere, including in landlocked countries.”²⁷

A similar definition is suggested by the doctrine²⁸ after conducting a meta-study about the different worldwide existing definitions of the ocean economy: “The ocean economy are the economic activities that take place in the ocean, receive outputs from the ocean, and provide goods and services to the ocean. In other words, the ocean economy can be defined as the economic activities that directly or indirectly take place in the ocean, use the ocean’s outputs, and put the goods and services into the ocean’s activities.”

Although there is not a univocal definition, it is possible to observe that, nowadays, the human relationship with the ocean is changing, and the old ocean economy is adapting to respond to new demands, ecological needs, and the dynamics of global climate change.

Global awareness of the climate and biodiversity crises continued to rise, with commitments from numerous governments raising hope for progress towards goals contained in the Paris Agreement and the post-2020 Global Biodiversity Framework and to fulfil the commitments made in 2015 across the 17 SDGs.

As mentioned above, Goal 14—“Conserve and Sustainability Use the Oceans, Seas and Marine Resources for Sustainable Development”—outlines seven targets and three means of implementation relating to the sustainable use of the ocean.

Particularly noteworthy in this context is target 14.7, which declares, “By 2030 increase the economic benefits to small island developing states and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.” This focus on economic development is starting to create a shift in the management and protection of marine resources and their social and economic impact.

Furthermore, it has to be mentioned also target 14.c focused on “Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in United Nations Convention on the Law of the Sea,”²⁹ which provides the legal framework for the conservation and sustainable use of oceans and their resources.”

The interdependency of ocean-based industries and marine ecosystems combined with increasingly severe threats to the health of the ocean, have led to a growing recognition of the need for an integrated approach to ocean management.

The blue economy is so about unsustainable versus sustainable. Are there traditional ocean activities that generate economic returns but that are benign or regenerative for our coasts and ocean?

²⁷ Wolters et al. (2013). See also Davis and Gartside (2001).

²⁸ Park and Kildow (2014).

²⁹ The UN Convention was adopted in 1982. It lays down a comprehensive regime of law and order in the world’s oceans and seas establishing rules governing all uses of the oceans and their resources.

Many new emerging technologies designed to address climate change through the development of alternative sources of energy are increasingly being deployed in marine ecosystems even if the private sector and industry engagement in investment for a sustainable ocean economy transition remains a challenge, and innovative incentives and measures to minimise risks are needed.

The new “ocean economy” is so driven by a combination of population growth, rising incomes, dwindling natural resources, responses to climate change and pioneering technologies.

2.3 Concrete Application of a New Model

Coastal flooding is one of the major challenges of global climate change for humanity. It is estimated that by 2070, approximately 150 million people and \$35,000 billion of assets will be exposed to a 1 in 100-year flood event.³⁰ Storm surges and oceanic waves are the major cause of extreme sea levels and devastating coastal impacts along many coastlines around the world with significant human and economic costs.

To improve the ability to assess the potential change of storm surge, it is critical to have a well-established baseline of the storm surge climate, based on consistent techniques.

The sciences-based products developed in this use case will help to enhance the safety of coastal communities by supporting the decision-making process related to planning coastal defences and emergency response to severe coastal flooding.

They could also be used by insurers.

The insurance industry and insurers have, indeed, a critical role to play in finding solutions to some of the world’s biggest challenges both as risk managers and risk carriers protecting society’s assets as well as institutional investors funding the economy.

Climate change is clearly having an impact on the insurance industry and is causing an increase in the frequency and severity of claims. The financial impact has worsened by the fact that there is more wealth concentration, therefore claims are costlier, and insurers are more exposed. In 2022, the insurance sector has paid out over \$120 billion to cover losses from natural catastrophes.³¹

The future needs to develop insurance-led solutions to risks caused by a changing ocean, with a focus on using nature to build resilience.

³⁰ Wenhai et al. (2019).

³¹ Source Munich Re.

3 The Positive Impact of Insurance

3.1 Sustainable Insurance

Sustainable insurance could be considered as a strategic approach where all activities in the insurance value chain, including interactions with stakeholders, are done in a responsible and forward-looking way by identifying, assessing, managing and monitoring risks and opportunities associated with environmental, social and governance issues.³²

Sustainable insurance aims to reduce risk, develop innovative solutions, improve business performance, and contribute to environmental, social and economic sustainability.³³

Nowadays, the impacts of climate change are causing warmer temperatures, rising sea levels, and erratic rain patterns, as well as other extreme weather conditions. The disasters that may occur can lead to losses in the socio-economic sector. These risks cannot be avoided, especially if they are exacerbated by the occurrence of climate change. Insurance plays an important role in the event of a disaster or as a means of economic recovery. The existence of insurance guarantees the availability of funds for economic recovery.³⁴ Thus, with insurance, the large-scale, planned, timely, and targeted sustainable financing needs can be met, which are managed transparently to protect state finances.

Well-designed insurance products help to reduce the economic impact of and facilitate quick recovery after natural catastrophes.³⁵ In turn, it can help protect livelihoods from catastrophic events and in combination with mitigation and risk prevention measures, risk transfer can help to strengthen resilience to climate change.

Insurers need to act for three reasons: (1) as good citizens given the magnitude of the impact of climate change on the economy and society, (2) given the insurance industry's significant role in mitigating impact and fostering transition and (3) also due to their manifold exposure to climate change risks.

Insurance is an intangible product: there are no direct emissions attached to its production. The “greenness” of an insurance product is therefore linked to the object or activity that is insured. Thus, the fulfilment of the promise, the claims handling, becomes much more material. Taking into account the life cycle of an insured object or activity, and the choices consumers make along the way, the roadmap for green insurance products consists of four major aspects and one overarching dimension:

1. Cover of green insurance objects with specific tariffs to promote eco-friendly objects.

³²For a further analysis, in this volume, see Vercher-Moll.

³³Principles for Sustainable Insurance, UNEP, 2012.

³⁴Kaushalya et al. (2014).

³⁵Churchill (2006).

2. Adding green insurance features to conventional objects or activities, as part of the core product or related service, or as independent service. Products or services can cater to specific sustainability themes or related risks.
3. Support the sustainability transition after a claim with ecological repair, replacement, or upgrades.
4. Set up incentives, ecosystems and communication to promote environmentally friendly behaviour, characteristics and transition outside a claim.
5. Lead regular dialogue with customers on critical issues, and provide incentives and risk advice to support their risk mitigation and efforts of transition.

3.2 Climate Risk Management

Managing the risks from climate change requires urgent action to adapt to the changes in climate at a local level to minimise risks and maximise potential opportunities. Once again, the role of the insurance industry is crucial.

Adaptation, or lack thereof, is particularly critical to the insurance industry as it directly affects the risk landscape that they insure and the concept of “insurability” itself. The insurance industry has traditionally based its view of risk on historical records of hazard occurrences. Insurability depends on several criteria, including actuarial, market-based and societal factors, many of which may potentially be affected by climate change.

An increase in the magnitude or frequency of weather hazards with future climate change could also lead to an increase in the risk of correlated losses, for instance from coastal or inland flooding.

Adaptation (or risk mitigation) can have significant benefits in terms of helping existing private insurance markets to continue to function. The insurance industry has an opportunity not only to contribute to the formulation of public policy on adaptation, but also to directly influence adaptation through its business practices.³⁶

Insurers can harness their competencies in climate risk management and risk transfer to develop a variety of services that help businesses, investors and the public sector to adapt to climate change. Potential services include assessments of the physical risks from climate change, identification of priorities for risk mitigation, advice on risk transfer options and business continuity or disaster response planning.

Insurers can also play a significant role in informing and educating customers about the risks of climate change that they face, and, importantly, about how best to reduce them. The Insurance industry can play a leading role in guiding society’s adaptation to the impacts of climate change with a constructive relationship with policy-makers, regulators, public sector organisations and other stakeholders in the private sector.

³⁶Herweijera et al. (2009).

3.3 *Ocean Risk*

As seen, a diverse array of ocean-related phenomena occurs today and more are expected to emerge in the future as ocean risk evolves in response to the observed and accelerating warming, acidification, oxygen depletion and other man-made threats to the ocean.

The ocean and the many ecosystem services it provides are key natural resources for the Blue Economy. The rise of the Blue Economy is being driven by rapid growth of marine transport and tourism, industrial use of coastal and seashore areas and extraction of resources from the ocean and marine environments. Since insurance penetration covers only minor parts of today's blue economy this presents a significant business opportunity for the insurance industry.³⁷

The ocean and the marine ecosystems that support the blue economy are shifting. The ocean is showing a sustained and accelerating upward trend in sea-surface temperature, ocean heat content and sea levels in almost all ocean basins and, at the same time, ocean acidity is increasing, and oxygen concentrations are decreasing. The changes in the ocean have the potential to trigger catastrophic consequences, which can be termed as "ocean risk."

Ocean risk is a function of exposure and vulnerabilities to hazards arising from ocean change, which may or may not be avoided, reduced or adapted to through pre-emptive action. Ocean risk encompasses well-known phenomena, such as storm surge from tropical and extra-tropical cyclones, or other extreme weather events strongly influenced by oceanic modes of variability. But ocean risk also encompasses lesser-known and potentially surprising phenomena that are associated with the observed regime shifts in marine ecosystems such as outbreaks of marine-mediated diseases or economic shocks and/or food security crises due to sudden changes in marine ecosystems.

Ocean investments often have high risks but the enabling regulatory environment for attracting investors is not in place. Overcoming the higher risk profile associated with the ocean sector will require addressing a number of challenging enabling conditions to attract investments and new forms of finance. These challenges include human capacity constraints, data challenges and higher risk of operation. In addition, structural challenges related to the ocean make scale and replication more complex than in more familiar terrestrial sectors (notably related to tenure and ownership, monitoring, and enforcement). To attract large-scale investments, it is critical to find ways to de-risk the enabling environment associated with ocean-based sustainable development projects and activities. While traditional marine insurance is a strategy for managing commercial risks for shipping, aquaculture, fishing, and other offshore industrial activities, it does not cover all risks to the ocean economy (e.g. blue carbon and nature-based infrastructure investments).

³⁷ Insurance has always been concerned with water and the seas. In fact, insurance began as a form of protection against the dangers of the sea.

The impact of ocean risk on the insurance industry has three main components: (1) increasing loss potentials for many property and casualty (P&C) lines due to sea-level rise, increasing precipitation extremes and changing ocean-atmosphere modes; (2) changing loss potential in various insurance lines such as health, aquafarming, political risk or product liability; and (3) an implied asset risk that could potentially strand entire regions and global industries, leading to direct and indirect impacts on investment strategies and liabilities. Quantifying the financial impacts and managing emerging ocean risk requires new risk modelling solutions that go beyond the better representation of the effects of ocean warming and climate change into traditional risk models of extreme weather events.³⁸

In addition, there is a need for risk models that quantify the probability and economic impact of losing marine ecosystem services. Such ecosystem risk models would have the potential to unlock new insurance markets in the space spanned by ocean risk, international development programs and the blue economy. Business opportunities for the insurance industry will arise in the form of new insurance solutions to transfer ocean risk.

Another relevant measure for the insurance industry could be to reduce or delete pirate fishing or illegal, unreported & unregulated (IUU) fishing which costs the global economy USD 10 to 23.5 billion yearly. In fact, IUU fishing contributes to overfishing and destruction of marine habitats and ecosystems, and marine pollution. Furthermore, the proliferation of illegal activities related to fishing leads to heightened risks for insurers in relation to other insured parties. There is also a problem of possible linkage with other crimes and consequently, two main critical issues arise. The first criticality coincides with an increased risk of fraud against insurers. The second criticality concerns the exposure of the insurers themselves to strict legal liabilities also in relation to the violation of international standards.

Insurance could be also useful in improving the viability of insurance in coastal regions through a mechanism of coordination across governments and insurers.

Governments around the world are increasingly searching for innovative solutions to effectively manage the growing financial exposures and damages resulting from natural disasters. Residents of coastal regions are particularly prone to the economic and financial damages of extreme weather events, such as hurricanes, floods, winter storms and climate change-driven sea-level rise and storm surges. The expansion of property insurance has been identified as a key strategy for strengthening pre- and post-disaster management.³⁹

Coastal communities face significant challenges that limit the deployment of insurance. Research on flood insurance, for example, identifies risk concentration as a factor that increases uncertainty within insurance markets and can limit the availability and affordability of coverage.⁴⁰ Risk concentration is intrinsic to coastal areas since risk increases in relation to the proximity to the coastline. The closer

³⁸ Ocean Risk and the Insurance Industry, (2018), AXA Report.

³⁹ Krieger and Demerit (2015).

⁴⁰ Botzen and Van Den Bergh (2008).

properties are to the coastline, the more at risk they are of suffering damages from coastal flooding, storm surges and high winds. Federal government policy, however, can play a significant role in reducing insurance uncertainty and expanding its role in local risk mitigation and disaster recovery acknowledging the insurers' strategic role in the present blue/ocean economy.

4 Conclusions

Sustainability is a key point of the action "Agenda2030 for Sustainable Development" which highlights seventeen global goals and no less than 169 targets to be achieved by 2030.

Particularly, the Agenda takes into consideration, from the perspective of sustainable development, the use of oceans, seas and marine resources.

This provision reflects the present idea of a link between sustainable development and the environment in order to preserve the benefits of the present and future generations.

As said, the present generation has the duty to not unreasonably use environmental resources to remove all obstacles that prevent the full development of the human person with respect to the environment and to preserve the right of future generations to see the natural heritage reasonably used.

The relationship between sustainable development and the environment also related to future generations has been also promoted by Courts, such as in the analysed cases *Gabčíkovo-Nagymaros* or *Minors Oposa v. Secretary of Department of Environmental and Natural Resources*.

The environmental issues concerning the use of oceans, seas and marine resources inspired the reflections on the blue economy and its evolution in the Ocean Economy.

Whereas there is no universally accepted definition of the ocean economy, the Ocean Economy concerns the economic activities of ocean-based industries, together with the assets, goods and services provided by marine ecosystems.

In this context, the insurance industry has the potential to play three important roles risk managers, risk carriers and investors.

As risk managers, insurers can communicate recommendations for more sustainable practices to their clients and within the communities they serve. As risk carriers, insurers can choose to exclude or restrict access to insurance to clients or projects that engage in unsustainable or illegal practices. Finally, insurers are also major institutional investors, and in this role, they can elect to support only those clients or projects that contribute to a sustainable ocean economy and divest from those that do not. There is also an opportunity for all levels of government—local, national or international—to work with the insurance industry to promote the development of a sustainable ocean economy. At the local level, this could involve making improvements in risk modelling, and at national or international levels, policy and regulatory frameworks could be reshaped to incentivise responsible and sustainable maritime industry practices.

Sitography

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Lucrezia Anzanello is a researcher at the University of Milan-Bicocca.

Lucrezia's main areas of research and practice are comparative and commercial law with a focus on sustainable development and ESG criteria.

She is a legal counsel specialising in commercial law and she has been enrolled in the Milan Bar Association since 2016.

Lucrezia is a co-leader of the Jean Monnet Module in Private Comparative Law: Animal Law in Comparative and Global Perspective.

She graduated full votes in Law at the Catholic University of Milan and she holds a PhD in Private Comparative Law from the University of Milan-Bicocca.

Lucrezia has been a visiting scholar at the Université Paris IX-Dauphine and the UConn School of Law, and she has been a visiting lecturer at the Université de Toulon.

She is a member of the scientific association SIRD (società italiana per la ricerca nel diritto comparato).

Author of academic papers in Italian and English on comparative private law.

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