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The application of the Principle of Prevention to land-based sources of marine pollution: an International Law approach

Zastosowanie zasady prewencji do zanieczyszczenia morza generowanego na lądzie: podejście prawa międzynarodowego

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Abstract: Despite being a major environmental issue, marine pollution from land-based sources has not been addressed through a clear and coherent international legal framework. The aim of this article is, therefore, to reconduct such fragmented framework to a single international rule, with the potential of effectively tackling the issue. This led the investigation to focus on the Principle of Prevention, which, despite being a cornerstone of international environmental law, has remained quite evanescent as to its normative content. With this in mind, the article attempts to reconstruct the actual content of the rule with specific regard to the issue at stake. In order to do so, it has been essential to identify the standard of "diligence" States are held to in such regard and to verify how such "due diligence" interacts with the primary rule and contributes to fill it with normative content. The result is a single legal rule with a renewed potential, especially in terms of enforcement opportunities.

Keywords: Marine environment; marine pollution; prevention; due diligence; environmental damage.

Abstrakt: Pomimo faktu, że sprawa zanieczyszczenia mórz, którego źródłem jest aktywność człowieka na lądzie, stanowi jeden z głównych problemów środowiskowych, do tej

pory nie doczekała się jasnego i spójnego międzynarodowego ujęcia prawnego. Dlatego też celem niniejszego artykułu jest sprowadzenie wielu fragmentarycznych ujęć do jednej regulacji o statusie międzynarodowym, która byłaby w stanie skutecznie rozwiązywać ten palący problemu. Taka intencja prowadziła autora do skupienia się na zasadzie prewencji, która – chociaż jest fundamentem międzynarodowego prawa – wciąż pozostaje niedookreślona, jeśli idzie o treści normatywne. Mając powyższe na względzie, autor podej muje próbę zrekonstruowania rzeczywistej treści tej zasady, ze szczególnym uwzględnieniem tematyki podjętej w pracy. W tym celu podstawą działania było zidentyfikowanie standardu staranności państw w tej kwestii oraz zweryfikowanie, w jaki sposób taka „należyta staranność" współgra z podstawowymi zasadami i przyczynia się do wypełnienia treści normatywnych. W rezultacie wypracowano jedną prawną regulację z odnowionym potencjałem, szczególnie jeśli idzie o możliwości egzekucyjne.

Słowa kluczowe: środowisko morskie, zanieczyszczenie morza, prewencja, należyta staranność, zniszczenie środowiska naturalnego

1. Introductory remarks

The present article stems from a wider and still in-progress academic research aimed at reconstructing and assessing the effectiveness of the legal framework addressing marine pollution from land-based sources in the European regional context[1] as well as at identifying the role and potential, especially in terms of policy and enforcement implications, of the Principle of Prevention in tackling this issue.

According to UNEP,[2] land-based sources[3] are accountable for about 80% of the total marine pollution. Targeting such sources is essential not only for human health and livelihoods,[4] but especially for the well-being of the marine

[1] By European regional context, the present article intends to refer, in accordance with a reconstruction of the international definition of *marine region*, to Europe and its marine areas under a geographical perspective. In this respect, it must also be specified that the European Union and its legal order (specifically addressed in the wider research) fall outside the scope of the present article and, therefore, although very relevant, will not be taken into account for the purposes of the analysis.

[2] United Nations Environment Programme, Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, *Protecting Coastal and Marine Environment from Land-based Activities: A Guide for National Action* (2006), p. 3; United Nations General Assembly, *Oceans and the Law of the Sea: Report of the Secretary General*, 18 August 2004, A/59/62/Add. 1, 29, paragraph 97.

[3] Land-based sources of marine pollution are exemplified in Article 207(1) UNCLOS, which provides that "States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, taking into account internationally agreed rules, standards and recommended practices and procedures."

[4] As explained by the Food and Agriculture Organization of the United Nations (2021), for instance, billions of people rely on the oceans as a primary source of food. However, please note that social and economic concerns are beyond the scope of this article.

environment.[5] Land-based sources, as a matter of fact, are, alongside with threats such as climate change and overfishing, one of the most relevant pressures facing the oceans, especially coastal areas.[6] Indeed, despite legal instruments adopted at global and regional level, the marine environment continues to be significantly exposed to pollution[7] from onshore activities, also via subterranean, riverine and atmospheric vectors (European Commission 2021; Osborne 2015: 95).

In this picture, the present article starts from the assumption, investigated in the wider research, that the international legal framework applicable to land-based sources of marine pollution presents significant shortcomings and is, therefore, not adequate to address the issue (Section 2). In light of this assessment, the article then discusses the opportunity of reconducting such fragmented framework to a single international rule, the Principle of Prevention, which – theoretically – has the potential to effectively tackle such environmental issue, but – in practice – has remained quite evanescent as to the obligations it entails. After having outlined the background (Section 3) and main features (Sections 4 and 5) of the Principle, the article thus reflects on how to fill the same with clear normative content, reconstructing the "*due diligence*" standard and the relevant duties States are held to in preventing marine pollution from land-based sources (Section 6). The article finally provides inputs for reflection, in connection with the potential of a "renewed" international obligation to address land-based sources of marine pollution, particularly in terms of enforcement (Section 7).

2. What are land-based sources of marine pollution and a critical overview of the regulatory framework

As anticipated in the introduction, marine pollution from land-based sources is among "the most serious causes of marine degradation and the most difficult to regulate" (Harrison 2017: 64). The legal framework addressing the issue, in fact, is particularly vast and complex to reconstruct. This analysis, as hinted above, falls outside the scope of the present article. That said, it is in

[5] United Nations, *World Ocean Assessment* ("WOA I") (2016), available at http://www.un.org/depts/los/global_reporting/WOA_RegProcess.htm. The latter has now been superseded by the second *World Ocean Assessment* ("WOA II"), published in 2021 and available at https://www.un.org/regular-process/woa2launch.

[6] United Nations Environment Programme, *State of the Environment and Development in the Mediterranean* (2020), pp. 160 *et seq.*

[7] United Nations Environment Programme, *Strategic Action Programme to Address Pollution from Land Based Activities (SAP-MED) and related National Action Plans (NAP), Implementation Status 2000-2015* (2015), p. 32.

any case worth mentioning that, at global level, various sources of regulation can be identified: rules of international customary law, general (Articles 192 and 194) and specific (Articles 207, 212 and 213) provisions contained in Part XII of the UNCLOS, as well as soft law instruments (in particular, the GPOA). At European regional level, as the legal framework enacted by the European Union in this regard is not going to be discussed, the main focus of analysis has been represented by Regional Seas Conventions, which attempt to address the issue with reference to different marine areas.

Even if certain Regional Seas Conventions, for instance, do provide a definition of "land-based sources",[8] the UNCLOS refrains to do so, merely specifying, in Article 207, that land-based sources include "rivers, estuaries, pipelines and outfall structures". This is because while the main contaminants causing marine pollution can be reconnected to a few general categories (*e.g.*, sewage, POPs, radioactive substances, heavy metals, hydrocarbons, pesticides and nutrients, or emerging contaminants[9]), the sources responsible for such pollution are almost uncountable. The latter are generally classified into three different types: point sources, diffuse sources, and atmospheric deposition.[10] However, multiple activities can be subsumed under these categories, each of them with specific applicable regulations defining the legal regime for their exercise.

From the global perspective, degradation of the oceans and coastal areas has, in the last decades, continued and, in some places, even intensified. According to a comprehensive assessment carried out by GESAMP,[11] as well as to the most recent area-targeted material, especially pertaining to the scientific analysis performed by Regional Seas Conventions, the most serious issues associated with land-based sources in European seas appear to be water contami-

[8] See, in this regard, Article 1(e) of OSPAR Convention, Article 2(2) of Helsinki Convention, Article 2 of the (not in force yet) Bucharest Protocol on the Protection of the Black Sea Marine Environment against Pollution from Land-Based Sources.

[9] According to the United Nations Environment Programme, *State of the Environment and Development in the Mediterranean* (2020), p. 162, the terms *emerging contaminants* or *contaminants of emerging interest* describe a heterogenous set of thousands of molecules and metabolites whose presence in the environment had not been detected in the past and whose study and monitoring are relatively recent. These substances can be found in personal care products, synthetic musk, flame retardants, additives in plastic, in pesticides and herbicides, bisphenol A (used in plastic wrap), plasticisers such as phthalates, nanoparticles (measuring less than 100 nano-meters, used in food, medicine, construction and textiles), phytoestrogens (plant-derived substances), perfluorocarbons, pharmaceuticals and non-halogenated substances (carboxylic acid and formaldehyde).

[10] This categorisation is commonly adopted in the frame of the GPOA. In this regard, please refer, for instance, to the relevant report published by UNEP in 2021.

[11] Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, *Protecting the Oceans from Land-based Activities, Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment* (2001).

nation from hazardous substances (with particular attention to specific as well as emerging contaminants, such as marine litter),[12] widespread and increased eutrophication (especially in the Baltic Sea),[13] the alteration and destruction of habitats and ecosystems. This identification finds punctual confirmation in the strategic actions undertaken at regional level and, in particular, in the frame of the revised 2021 Baltic Sea Action Plan,[14] as well as in the OSPAR North-East Atlantic Strategy for 2030,[15] adopted in 2021.

Despite the relevance of land-based sources in connection with the pollution of the marine environment (Osborne 2015: 81), an analysis of the applicable regulatory framework (which, as already specified, falls outside the scope of the present article, but is addressed in the frame of the wider research) shows how this phenomenon still lacks a clear, thorough and coherent regulatory framework, especially at global level. Indeed, the extreme variety of sources of degradation connected to activities carried out onshore,[16] together with, especially, the reluctancy of States to accept an erosion of their sovereign domain (Takano 2017: 93-97; Boyle, Freestone 1999: *passim*), has hindered, mainly at international level, the development of a precise framework, with general, shared and definite rules comprehensively addressing land-based sources of marine pollution. As a matter of fact, the available legal framework has a limited outreach (Sands, Peel 2018: 477) and is not always coherent (Osborne 2015: 103). The same, also, appears to be articulated, at the global/regional level, into "modest" (Dupuy, Viñuales 2018: 104; Takano 2017: 93) and broadly formulated provisions,[17] complemented by technical rules and recommendations on specific aspects, which are, however, most often non-binding (Takano 2017:

[12] In this respect, refer to United Nations Environment Programme, *State of the Environment and Development in the Mediterranean* (2020), p. 160. Moreover, refer to the 2017 Intermediate Assessment carried out under the 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") as well as, as mentioned above, to the 2021 update of the Baltic Sea Action Plan.

[13] In this regard, please refer to the 2021 update of the Baltic Sea Action Plan adopted in the frame of the 1992 Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea (the "Helsinki Convention"). The Helsinki Convention entered into force on 17 January 2000 between Denmark, Estonia, the European Union, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

[14] Helsinki Commission, *Baltic Sea Action Plan – 2021 update* (2021). Available at: https://helcom.fi/wp-content/uploads/2021/10/Baltic-Sea-Action-Plan-2021-update.pdf.

[15] OSPAR Commission, *North-East Atlantic Environment Strategy 2030, OSPAR Agreement 2021-01* (2021). Available at: https://www.ospar.org/convention/strategy.

[16] United Nations Environment Programme, Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, *Protecting Coastal and Marine Environment from Land-based Activities: A Guide for National Action* (2006), p. 3.

[17] Which have, therefore, little enforcement potential.

93; Mensah 1999: 297). That is evident, for example, from the content of the GPOA in comparison with the "parent" provisions included in the UNCLOS, whose rules on the protection of the marine environment have been described as "too imprecise, qualified or ambiguous to be effective" (Churchill 2015: 29). At the global level, regulation concerning land based marine pollution has thus been considered weak (Tanaka 2006: 148), mainly due to the lack of uniform, detailed and enforceable provisions capable of facing the problem.[18]

For these reasons, especially in connection with the fact that land-based sources of marine pollution have the most impact at regional level (Schumacher *et al.* 1996: 102), this latter layer of regulation has been considered (*ex multis*, Harrison 2017: 75-89; Tanaka 2016; Freeston, Salman 2008: 348; Birnie, Boyle, Redgwell 2021; Hassan 2021: 2) the one with the highest potential to effectively address the issue. Nonetheless, upon a close scrutiny of Regional Seas Conventions, it can be argued that, besides a few binding provisions, which indeed play a significant role in defining – as better outlined below – the obligations borne by States in view of preventing marine pollution from land-based sources, the vast production of declarations, decisions and recommendations lacks substantive effectiveness (Pallemaerts 1998; Nollkaemper 1998; Ehlers 1993: 191 *et seq.*), often resulting in symbolic instruments incapable of achieving significant progress in depolluting marine waters. The same considerations can be raised upon an assessment, developed in the frame of the wider research, in relation with the potential of the enforcement powers granted to treaty Commissions within Regional Seas Conventions, whose role risks to be downgraded to that of mere technical bodies.[19]

3. The Principle of Prevention (background)

Realizing the limits of the legal framework and reflecting on possible solutions both at policy and enforcement level, it appears essential to investigate the presence of regulatory principles with the potential to bring the field to consistency and coherence. In order to do so, the present article (as wider research) explores the opportunity to identify a single rule, complemented

[18] According to the doctrine (Tanaka 2006), the reason for this is mainly connected to three different factors: (i) the complexity of sources and substances which characterise land-based marine pollution; (ii) geographical and ecological difference; and (iii) economic and technological gaps between developed and developing countries.

[19] This topic (together with the relevant literature) has been assessed in the frame of the wider research. For an interesting reading in this general regard, please refer to M. Gilek and K. Kern, *Governing Europe's Marine Environment: Europeanization of Regional Seas or Regionalization of EU Policies?* (2015).

with clear normative content, with the potential to effectively address the discussed issue.

Following this objective, it proves almost axiomatic to consider that environmental law and policy are, in general, based on the ultimate will to avoid causing harm to the environment (Duvic-Paoli 2018: 1). Recalling the words of the Dutch philosopher Erasmus (1466-1536), according to whom "Prevention is better than cure," protection of the environment is the most effectively and efficiently ensured by preventing the occurrence of harm rather than by repairing the damage and restoring the previous conditions of the relevant environmental compartment.[20]

The specific features of environmental harm, in fact, as explained by L.A. Duvic-Paoli, dogmatically require a preventive approach. As emphasised by the International Court of Justice in the *Gabčíkovo-Nagymaros* case (de Sadeleer 2020: 85),[21] damage to the environment is, in fact, very often irreversible. Also, restoration to the situation prior to the occurrence of the harm is often impossible[22] or, in any case, entails burdensome costs (Strasser 1997: 7). This is even more true considering the intrinsic characteristics of pollution at sea, which is *per se* diffuse, in light of which these considerations can only exacerbate.

All these progressively caused the Principle of Prevention to arise and consequently convert from a policy objective into an international obligation (Duvic-Paoli 2018: 24), eventually assuming, especially after the Stockholm Conference in 1972, the role of a cornerstone rule in international environmental law (Sands, Peel 2018: 211; Kiss, Shelton 2004: 113). A role that has become so critical to make commentaries define it as the *golden* principle of environmental policy (de Sadeleer 2002: 89; Kiss, Beurier 2010: 152; UNEP 2006: 32). This process has been referred to as a paradigm shift (Duvic-Paoli 2018: 27) from a reactive to a preventive approach in addressing environmental harm-related issues.

In line with this, the Principle of Prevention requires the adoption of measures intended to prevent environmental damage to arise (de Sadeleer 2020: 85). Nonetheless, the same is mostly perceived as an "axiom" and, consequently, "tends not to be investigated further" (Duvic-Paoli 2018: 2; de Sadeleer 2020:

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[20] On a side, practical note, it is in any case worth mentioning that, if this is true under a theoretical standpoint, given the levels of pollution sea waters actually face, clean-up and restoration programmes also remain of utmost importance as far as addressing the situation is concerned.

[21] *Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, International Court of Justice, Judgement of 25 September 1997, ICJ Rep. 7, par. 140.

[22] In this regard, International Law Commission, *Draft Articles on Prevention of Transboundary Harm from Hazardous Activities (with Commentaries)*, in *Yearbook of the International Law Commission*, 148 (2001), par. 2.

85), thus making its outlines particularly difficult to discern. These defining traits become even more shaded when conjugated to the regulation of marine pollution of onshore origin. As clearly stated by P. Birnie, A. Boyle and C. Redgwell (2021: 477), in fact, "the obligation to prevent marine pollution from land-based sources has remained essentially general in character, with little objective content."

4. The Principle of Prevention in International Law

As classic International Law gives predominant relevance to relations among States and, in this picture, to good neighbourliness, customary law initially developed around the *sic utere tuo ut alienum non laedas* principle (also known as "no-harm" rule), which basically prohibits States to use their own territory in a way that might cause damage to the environment of another State.

This principle, as widely known, was first recognised in the 1941 *Trail Smelter* arbitration case between United States and Canada[23] and later enshrined, *mutatis mutandis*, in Principle 21 of the 1972 Stockholm Declaration (further transposed into Principle 2 of the 1992 Rio Declaration).[24]

The formulation of Principle 21 of the 1972 Stockholm Declaration, however, placed a "greater emphasis" on the obligation of States to "prevent" damages, rather than on the damage itself (de Sadeleer 2020: 88). That, in line with the always growing interest in the protection of the environment, allowed the Principle of Prevention to emerge as a separate rule (Handl 2008: 539), with an autonomous rationale (*i.e.* the protection of the environment) and objectives which transcended the necessarily inter-State dimension of the *sic utere tuo ut alienum non laedas* principle. The scope of the Principle of Prevention, in fact, is to protect the environment irrespective of the location of the damage (Sands, Peel 2018: 212-213; Duvic-Paoli 2018: 258; Singh 1987: xi-xii).[25] Consequently, the focus is on the obligations borne by States to prevent environmental damage to occur and the subsequent measures to be taken. In this frame, it can be affirmed that the Principle of Prevention requires the prevention of environmental

[23] *Trail Smelter (United States v. Canada)*, Tribunal established under the Convention of Ottawa of 15 April 1935, Arbitration award of 16 April 1938 and 11 March 1941, 3 RIAA 1905.

[24] There, it was stated that "States have […] the responsibility to ensure that activities within their jurisdiction do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction".

[25] This does not mean that the location of the damage becomes irrelevant, as Principle 21 of the Stockholm Declaration and Principle 2 of the Rio Declaration, and – in general – international case law on the Principle of Prevention, still give relevance to a transboundary dimension ("States have […] the responsibility to ensure that activities within their jurisdiction do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction").

damage *per se* and, therefore, the adoption by States of anticipatory measures (Ragni 2020: 63) capable of reducing, limiting or controlling activities which might harm the environment beyond their frontiers (as specified under Principle 21/Principle 2) and, arguably, also within their own jurisdiction (Sands, Peel 2018: 211). Further considerations on the relationship between the special scope of the Principle of Prevention and the specific features of marine pollution will be explored in Section 5 below.

Under the Principle of Prevention, States are required to exercise "due diligence" in connection with the activities susceptible of producing such harm. As confirmed by the International Court of Justice, in fact, the Principle of Prevention "has its origin in the due diligence that is required of a State in its territory."[26] As explained by S. Forlati (2018: 49), the concept of "due diligence" can be defined as a constituent element of certain State obligations: "un seuil, un *threshold*, indiquant le degré d'engagement demandé à l'Etat par rapport à certaines obligations primaires". As a consequence, in connection with the Principle of Prevention, "due diligence" can be regarded as the standard which a State must comply with, through the adoption of measures aimed at preventing possible damages to the environment, deriving from activities carried out under its control. Such measures must be those reasonably capable of preventing the occurrence of the event. It is evident, in this regard, how the obligation of prevention, as consisting in the duty of the State to act with "due diligence", must be regarded as an obligation of means and not of results.[27] A violation of the Principle of Prevention, therefore, is triggered when the State has not put in place the measures considered adequate to prevent environmental damage, thus demonstrating failure to act according to the required standard of "due diligence".

The Principle of Prevention is commonly considered as having a customary nature (de Sadeleer 2020: 88).[28] Such a conclusion is largely based on the jurisprudence of the International Court of Justice. The same, in particular,

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[26] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14, paragraph 101.

[27] *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, Advisory Opinion of 1 February 2011, No. 17, 50 ILM 458, paragraph 110.

[28] In this regard, it has been argued (Bodansky 1995: 105; Conforti 2018: 240) that there is however a significant discrepancy between the position of international Courts and Tribunals and the actual States' practice. Nevertheless, according to L.A. Duvic-Paoli (2018: 94), such discrepancy does not jeopardise the customary nature of the Principle of Prevention, merely showing implementation challenges which are quite common in the field. Although it falls outside the scope of the present article, the problem of the assessment of the customary status of the rule at stake is relevant. The same is addressed in the context of the wider research.

recognised for the first time the customary character of the Principle of Prevention in its 1996 advisory opinion on the *Legality of the Threat or Use of Nuclear Weapons*.[29] In the 2010 *Pulp Mills on the River Uruguay* case,[30] it then had the occasion to further specify how the Principle of Prevention has a "due diligence" nature, in light of which a State is obligated to use all the means at its disposal to avoid environmental harm.[31] This not only includes "the adoption of appropriate measures and rules, but also a certain level of vigilance in their enforcement and the exercise of administrative control applicable to public and private operators, such as the monitoring activities undertaken by such operators."[32]

Under the Principle of Prevention, therefore, States are bound by a duty to prevent environmental harm from activities taking place under their jurisdiction or control. According to the doctrine (Ragni 2020: 63), the obligation to prevent environmental harm translates in a series of behaviours which can be summarised in two key passages: firstly, the correct appreciation of the possible risks of an activity on the environment, and secondly the identification and effective implementation of the measures considered appropriate to avoid/limit the risks triggered by such an activity. Failure to comply with this duty triggers the responsibility of the State, irrespective of the occurrence of damage (de Sadeleer 2020: 88; Dupuy-Viñuales 2018: 65).

In general, the Principle of Prevention is structured as a framework rule, whose content is informed by specific subsidiary obligations, which can be found in a mix of different instruments, which encompass customary and treaty obligations, as well as international standards. Such subsidiary obligations contribute to the construction of the degree of "due diligence" States are held to, as far as the obligation to prevent damage to the environment is concerned.

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[29] *Legality of the Threat or Use of Nuclear Weapons*, International Court of Justice, Advisory Opinion of 8 July 1996, ICJ Rep. 226.

[30] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14

[31] According to the International Court of Justice (*Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, paragraph 197), "the obligation to preserve the aquatic environment, and in particular to prevent pollution by prescribing appropriate rules and measures is an obligation to act with due diligence in respect of all activities which take place under the jurisdiction or control of each party". According to literature (Sands, Peel 2018: 211), this approach appears to be in line with the one adopted by the International Law Commission in its 2001 draft Articles on Prevention of Transboundary Harm from Hazardous Activities, where a strong focus is dedicated to the *due diligence* nature of the obligation of preventing environmental damage, with confirmation that the same is an obligation of means and not of result.

[32] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14, para 197.

5. The Principle of Prevention in the framework regulating land-based sources of marine pollution

In light of the above considerations, to render the Principle of Prevention effective, it appears essential to define its substantive content. Otherwise, the Principle of Prevention would convert in an empty obligation, a mere statement without the potential of being practically applied (Duvic-Paoli 2018: 2). There is thus a strong need to investigate the specific obligations which constitute the content of the Principle and, therefore, contribute to inform the degree of "diligence" States are bound to in preventing environmental harm.

As hinted in Section 2 above, despite the vast normative production which characterises the discipline of marine pollution from land-based sources, the relevant legal framework appears to be constellated of provisions which, especially at the global level, show, in case their nature is binding, a weak and vague normative disposition, while at regional level result in fragmented and not always coherent obligations. Hence, the need to bring to consistency the duties which contribute to reconstruction of the content of the Principle of Prevention, as applied to land-based marine pollution.

This need can be easily understood taking the UNCLOS as an example. The customary obligation to prevent damage to the (marine) environment, in fact, is codified into a series of provisions which, despite their almost undisputed correspondence to general international law (Forteau, Thouvenin 2017: 788; Birnie, Boyle, Redgwell 2021: 798; Wolfrum 1998: 2; Freestone 1996: 91-107), add little specification to the duties which can be extracted from the general principle. The Principle of Prevention, in particular, find its codification in Article 192 of the UNCLOS, which, opening Part XII of the Convention, claims that "States have the obligation to protect and preserve the marine environment." This provision has been described in case law as a fundamental principle of international law. More specifically, in paragraph 941 of the *South China Sea* Arbitration (2010),[33] the Tribunal had the opportunity to clarify how Article 192 of the UNCLOS "entails the positive obligation to take active measures to protect and preserve the marine environment, and by logical implication, entails the negative obligation not to degrade the marine environment." Moreover, always in paragraph 941, the Tribunal underlined how the content of Article 192 of the UNCLOS is informed by the "corpus of international law relating to the environment", thus confirming that the content of the Principle of Prevention has to be retrieved recurring to other provisions. It failed, however,

[33] *South China Sea Arbitration (The Republic of the Philippines v. The People's Report of China)*, Permanent Court of Arbitration, Award on the Merits of 12 July 2016.

to add further specifications to this conclusion, likewise confirming, the need of the present investigation.

Furthermore, without neglecting the importance of the *Advisory Opinion on the Area* (2011), it should be mentioned that the ITLOS, in the *Advisory Opinion on the Sub-Regional Fisheries Commission* (2015), finally took the occasion to crystallise the relevance of Article 192 of the UNCLOS and, consequently, of the obligation to prevent damage to the marine environment.

As far as land-based marine pollution is concerned, Article 192 of the UNCLOS is further detailed, as anticipated above, through Articles 194 and 207 of the same Convention.[34] Even though their analysis, as explained, falls out of the scope of this article, it can be said how these provisions, despite being as well recognised of customary nature (Forteau, Thouvenin 2017: 789; Sands, Peel 2018) and specifically targeted on land-based sources of marine pollution, are not determinant in resolving the issue investigated here. These rules, in fact, on the one hand, merely positivise the content of Principle 21 of the Stockholm Declaration (declined to marine pollution), and, on the other one, manifest a clear intention of the UNCLOS to renounce regulating the issue at global level, delegating the burden directly to States.

The investigation, in this regard, appears to be quite complex, as the Principle of Prevention, as confirmed above, is structured as a framework obligation, which incorporates further subsidiary obligations, which all stem from the general duty to prevent damage to the (marine) environment. According to the scholarship (Duvic-Paoli 2018: *passim*), such a subsidiary obligation can be both of substantial and procedural nature, the first manifesting the environmental objective of the rule (*i.e.* preventing the harm), the other – the actual procedural steps States have the duty to comply with to achieve such an objective.

Another issue which must be taken into consideration is the spatial dimension of the Principle of Prevention. In fact, one could reflect on whether the Principle of Prevention has to be constrained in the spatial limits of the *sic utere tuo ut alienum non laedas* principle (from which it derives), as enshrined in Principle 21 of the Stockholm Declaration as well as in Principle 2 of the Rio Declaration, thus being triggered only in case transboundary inter-State damage occurs or in case pollution from land-based sources causes damage to areas beyond national jurisdiction. This circumstance could potentially cause a series of applicative problems: having to trace marine pollution from onshore

[34] As emphasised in *South China Sea Arbitration (The Republic of the Philippines v. The People's Report of China)*, paragraph 942, Article 192 is also further detailed by specific obligations set out in other international agreements, as provided for in Article 237 of the UNCLOS. This further confirms that the content of "due diligence" has to be reconstructed using other international law provisions.

origin and, at the same time, to prove that the responsible source has caused damage to the marine environment to another State or, in any case, in international waters might render the application of the Principle of Prevention to land-based marine pollution almost impracticable.

Without excessively focusing on this possible short-circuit, one could also consider that, unlike the *sic utere tuo ut alienum non laedas* principle, the Principle of Prevention is not necessarily tied to the occurrence of damage (although its violations are most likely triggered in such cases), but to the need to put in place the measures required to prevent damage, regardless of its verification. Also, irrespective of the fact that the Principle of Prevention finds application at a much earlier stage than its parent rule (Sands, Peel 2018: 213),[35] one could also argue that marine damage is, by its nature, always potentially transboundary, thus making spatial-application issues merely theoretical. Case law, in this regard, appears to have adopted a much more radical solution, stating that Article 192 of the UNCLOS – which, as said above, is the codification of the Principle of Prevention in international marine environmental law – should be interpreted as applying to all marine areas. That confirms, although with an approach arguably excessively focused on the *ex post* consequence of the violation of the Principle of Prevention, that States bear an international law obligation to prevent harm to the marine environment in their territorial sea and in their Economic Exclusive Zone, irrespective of the external impact of the damage. Similarly, in the *South China Sea* Arbitration it has been stated that the obligations in Part XII of the UNLCOS apply to State with respect to all marine areas, both inside and beyond national jurisdiction. In line with this, questions of sovereignty appear to be irrelevant to the application of Part XII of the UNCLOS.

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[35] The Principle of Prevention, in fact, ontologically focuses on the measures that should be enacted to avoid the occurrence of environmental damage *per se*. Therefore, failure to enact such measures constitutes a violation of the Principle of Prevention irrespective of the occurrence of damage. On the contrary, the application of the *sic utere tuo ut alienum non laedas principle* is triggered only in case a State causes significant damage to the environment of a different State, without intervening in case the environmental damage does not affect another State. This, as widely known, responds to the traditional approach of classical international law, according to which the use of the environment is considered part of the reserved domain of a State and its permanent sovereignty over natural resources. Hence, the international legal order refrains from being interested in the use made by a State of its natural resources, as long as no damage is caused to the environment of another State. On the other hand, the Principle of Prevention requires that action is taken prior to the occurrence of environmental damage. As specified by the International Court of Justice in the 1997 Gabčíkovo-Nagymaros case, prevention is required "on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage." In addition to the primacy of the preventive rationale over the curative approach, this statement clearly shows how the location of damage progressively loses importance, as preventive measures assume a key role in the application of the Principle of Prevention.

6. Defining specific obligations and reconstructing the degree of due diligence States are held to

The Principle of Prevention requires prevention of environmental damage and, therefore, adoption by States of anticipatory measures (Ragni 2020: 63) capable of reducing, limiting or controlling activities which might cause such environmental damage (Sands, Peel 2018: 211). In the case of land-based marine pollution, evidently, such measures shall be applied to activities susceptible of causing environmental damage to the marine environment.

As already outlined, the Principle of Prevention applies as a framework obligation, whose content is filled with subsidiary obligations of both substantial and procedural nature. As far as the international legal order is concerned, such subsidiary obligations might have a different nature. Some of them, as hinted above, can be reconducted to the manifestation of the Principle of Prevention at customary level,[36] while further more detailed duties stem from treaty systems,[37] which contribute to specifying the content of the Principle of Prevention as declined to the relevant sector (Ragni 2020: 78).

As clarified by C. Ragni (2020: 63), the subsidiary obligations which constitute the Principle of Prevention can be generally traced back to a few basic steps: first of all, it is necessary to correctly appreciate the possible risks which the good (in the case at stake, the marine environment) is exposed to *vis-à-vis* the activity likely to cause such risks; secondly, upon such assessment, States shall identify and implement the appropriate measures for avoiding such risks. Essential, in this regard, are EIA procedures and monitoring activities (Birnie, Boyle, Redgwell 2021: 159; Redgwell 2015: 16; Hands 2008: 539), which, respectively before and after the exercise of an activity, are both core manifestations of the Principle of Prevention as well as, especially the latter, irreplaceable means to guarantee its effectiveness and enforcement. Emphasis in this regard has been placed by the International Court of Justice, which,

[36] In particular, *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14.

[37] As also confirmed in light of the wording of Article 237 of the UNCLOS, according to which the provisions contained in Part XII "are without prejudice to the specific obligations assumed by States under special conventions and agreements concluded previously which relate to the protection and preservation of the marine environment and to agreements which may be concluded in furtherance of the general principles set forth in this Convention". In this regard, it is also worth reminding that in the *South China Sea Arbitration (The Republic of the Philippines v. The People's Report of China)* (paragraph 941) it is highlighted how the content of Article 192 of the UNCLOS (which codifies the Principle of Prevention in relation to the marine environment) is informed by "the corpus of international law relating to the environment."

both in the *Gabčíkovo-Nagymaros*[38] and in the *Pulp Mills*[39] cases, affirmed the importance of vigilance and administrative controls on activities likely to have an impact on the environment.

In addition to customary obligations and treaty-based duties, soft law instruments also play a crucial role in the definition of the content of the Principle of Prevention, as applied to land-based marine pollution. Upon an analysis of the applicable legal framework, in fact, it can be argued that the most precise rules are contained into non-binding instruments, such as declarations, programmes of action and, more importantly technical recommendations. The latter, in particular, are usually drafted by treaty Commissions in view of orienting States on the behaviours to be followed for the purposes of reaching the objectives established under the relevant treaty, contained in more general obligations empowered with normative force. Such recommendations, usually formulated by scientific experts, play a fundamental role in defining the "due diligence" which is expected by States in preventing marine pollution of on-shore origin[40] and, therefore, in shaping the content of the primary norm. To do so, while the Principle of Prevention as a rule of customary law is at stake, it is also essential, under a methodological standpoint, to establish whether such instruments are a manifestation of States' *opinio (juris sive) necessitatis* in relation with the customary provision. This is, in fact, a decisive condition for considering soft law instruments able to escalate and consequently define, through "due diligence", the content of the Principle of Prevention. In this respect, it is possible to argue – without broadly delving here into the topic – that there is indeed a tendency according to which States generally accept such recommendations and standards. In line with this, it is also worth mentioning that such soft law instruments, furthermore, are intimately connected to the concept of Best Available Science (not addressed here, but developed in the context of wider research), which sectorial treaties are used to refer to (in binding provisions) for the purposes of identifying the standards States shall conform to in order to be in compliance with the conduct rules contained in the relevant treaties. "Due diligence", in fact, implies that States shall ad-

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[38] *Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, International Court of Justice, Judgement of 25 September 1997, ICJ Rep. 7, para. 140.

[39] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14, para 197.

[40] In this regard, it is interesting to mention that this has already been done by national Courts (whose decisions constitute State practice in connection with the assessment of the customary nature of an international rule) in relation with the definition of obligations regarding climate change. The reference here is to the *State of the Netherlands v. Urgenda Foundation* case (2019), where the Supreme Court of the Netherlands made use of the IPCC expert opinions to define the content of the obligations contained in the Paris Agreement.

dress environmental issues according to an evolving standard of technology and regulation. Environmental policy shall therefore evolve in harmony with the change of technologies and operating techniques.[41] In support of such interpretation, it is worth mentioning that the Seabed Disputes Chamber of ITLOS had the opportunity to confirm how "due diligence is a variable concept. It may change over time as measures considered sufficiently diligent at a certain moment may become not diligent enough in light, for instance, of new scientific or technological knowledge."[42]

Using the words of the International Court of Justice, it can thus be said that the "diligence" required of States in addressing (land-based) marine pollution is constituted by the adoption of appropriate measures and rules as well as by vigilance in their enforcement and the exercise of administrative control, including monitoring activities.[43] Such rules and measures, which – therefore – come to represent the living content of the Principle of Prevention, can be retrieved from the international legal framework applicable to land-based sources of marine pollution, as developed at global and regional level. Even though an analysis of such a framework falls outside the scope of the present article, certain relevant remarks appear necessary.

At global level, as far as customary law is concerned, the obligations to cooperate and, more importantly – to carry out an EIA, should particularly be emphasised. The latter (although, under a customary law perspective, still focused on a transboundary dimension) is essential to fully appreciate the environmental risks triggered by a specific activity and, consequently, to identify and adopt the adequate measures/prescriptions to ensure that such an activity does not cause damage to the (marine) environment. Further measures can be found in treaty-based systems, among which, of course, a crucial role is played by the UNCLOS, as well as in non-binding instruments, including the above-mentioned GPOA, which are filled of technical rules and standards which can also be reconducted to the concept of Best Available Science. The latter instruments are expressly recalled in the UNCLOS which provides – in Articles 207 and 212 – that States shall act in the framework of international agreed rules and standards.

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[41] The point was faced by the International Court of Justice in the *Pulp Mills* case, where it argued that Uruguay's newly realized mills could operate in compliance with the most advanced international standards, while Argentina's old mills could not be expected to do so.

[42] *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, Advisory Opinion of 1 February 2011, No. 17, 50 ILM 458, paragraph 117.

[43] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14, para 197.

In line with the "Russian doll effect" (Sadowski 1997: 109) of marine protection regulation, regional level normative production shall be also considered. As mentioned above, such a level of regulation is widely regarded by commentators (*ex multis*, Harrison 2017: 75-89; Tanaka 2016; Freeston, Salman 2008: 348; Birnie, Boyle, Redgwell 2021; Hassan 2021: 2) the one with the highest potential to effectively address marine pollution of onshore origin, as they are able to take into account and consequently regulate "the special needs and varying circumstances of a range of seas with diverse oceanographic and ecological characteristics within a global international law of the sea" (Boyle 2000: 31). In this latter regard, it is also worth reminding that regional agreements on the protection of the marine environment are expressly sought by UNCLOS (Articles 197 and 207) to implement the obligations it establishes at global level. With regard to the European regional context, the treaty system is based on four instruments (with the related implementing protocols, where applicable): the OSPAR Convention (on the North-East Atlantic); the Helsinki Convention (on the Baltic Sea); the Bucharest Convention (on the Black Sea); and the Barcelona Convention (on the Mediterranean Sea). The latter is the only system directly administered by the United Nations Environment Programme, in the frame of its Regional Seas Programme, launched in 1974.

Bringing to coherence the analysis of such Regional Seas Agreements, the measures they contain, due to the mutual sharing of experiences and practices, can be regarded as broadly comparable and can be reconducted to main areas of regulation:[44]

(i) The regulation of substances and discharges, with the adoption of the so-called "uniform approach" (Tanaka 2016: 152) (particularly influenced by the European Union system) and the established principle that discharges of harmful substances into the marine environment shall be subject to a prior special permit, or in any case, to regulation by the competent national Authorities, based on certain criteria and guidelines (Harrison 2017: 77).

(ii) The requirements to use BATs and BEPs, which, being expression of the concept of Best Available Science, represent a pillar of marine protection regulation as well as of the "due diligence" character of the duty to prevent marine pollution from land-based sources. BATs and BEPs are dynamic and developing concepts, as they require States to implement measures that evolve over time in accordance with the increasing capability of new technologies of tackling pollution. They have been considered the key items (Pallemaerts

[44] The following points are broadly addressed in the frame of the wider research and concisely presented here to support the conclusions, without aiming to develop them in an exhaustive way.

1998: 429) for translating the goals of the assessed regimes into operational requirements.

(iii) The requirement to carry out EIAs and to comply with monitoring obligations. For the purposes of verifying the impact of projects, plans and activities on the marine environment, both under *ex ante* and *ex post* perspectives, the requirement to carry out EIA proceedings and to comply with monitoring and reporting obligations are essential. With regard to the first, regional treaties addressing marine pollution from land-based sources dedicate significant attention to the duty to priorly assess the impact of a plan or a project on the marine environment, emphasising at the same time the need of cooperation among State actors in carrying out these kinds of proceedings. Being the environment a "dynamic natural system" (Tanaka 2016: 162), the impact of a project on the marine environment must be assessed not only prior to its realisation, but also after activities have commenced. Hence, the necessity for an EIA to be supplemented with monitoring obligations. The interdependence between EIA and monitoring obligations was, in particular, recognised in the 2001 *MOX Plant* case.[45]

(iv) The implementation of area-based measures, which represent a further technique envisaged in regional treaties addressing land-based marine pollution. As thoroughly explained in the literature on the subject (Harrison 2017: 80), area-based measures find their origin either because of the significant amount of pollution in a specific area or of its sensitive features in terms of natural characteristics. With regard to the first, certain regimes provide for the obligations upon the Parties to adopt a list of the so-called "hot spots" which require priority measures in light of the excessive load of pollution. With reference to the second, the institution of MPAs represents the most common measure which has been enacted in order to protect areas which appear to be particularly vulnerable *vis-à-vis* land-based activities. Evidently, MPAs are closely interrelated to instruments relating to the protection of marine biodiversity. Nonetheless, they also play a significant role in the frame of measures taken for the purposes of addressing marine contamination of onshore origin which may reach these areas that are in a specific need of protection.

As mentioned above, such provisions are accompanied by a vast production of recommendations, most of which being of a technical nature. Such recommendations, as strongly emphasised in the literature (Harrison 2017: 83), "by providing practical guidance on the steps that should be taken by States in order

[45] *MOX Plant case* (*Ireland v. United Kingdom*), International Tribunal for the Law of the Sea, Order of 3 December 2001, No. 10, para. 89(1)(b). In line with that, please also refer to *Case concerning Land Reclamation by Singapore in and around the Straits of Johor (Malaysia v. Singapore), Provisional Measures*, Order of 8 October 2003, No. 12, para. 106(1)(a)(i).

to comply with their obligations," play a crucial part in the development of the regulatory framework regarding land-based sources of contamination and, again, in defining what can be regarded as "due diligence" in tackling marine pollution of onshore origin.

In any case, in general, it can be argued that all the above body of regulation contributes to reconstruct the content of the Principle of Prevention, as applied to land-based marine pollution in the European regional context. On the one hand, in fact, as the Principle of Prevention is considered a framework obligation, such a body comes to represent its substantive content and, on the other one, being the same Principle an obligation of "due diligence", the same acts as a parameter of scrutiny to verify whether a State, in preventing damage to the marine environment, has acted in coherence with the required degree of "diligence".

On a side note, it is worth reminding that the analysis of the framework belonging to the system of the European Union (as well as its relationship with Regional Seas Conventions) does not fall within the scope of this article. Nevertheless, the major importance of its action in terms of environmental policy and of its rules and regulations, especially in terms of normative power, cannot be neglected and must be considered essential in defining the standard of "diligence".

7. Preliminary reflections on enforcement opportunities and conclusions

As mentioned in the introduction, the analysis of the supra-national legal framework applicable to land-based marine pollution shows a fragmented and not always coherent *corpus* of rules. Also, it has been proved how the rules both at global and regional level present several shortcomings in terms of effectivity and enforcement. With regard to the regional context, in particular, it has been said how the same is widely considered as the optimum scale to address marine pollution of onshore origin. Nevertheless, regional systems do not appear empowered with the appropriate instruments to effectively tackle this environmental issue.

The *leitmotiv* of the present article, therefore, has been to reconduct all this vast number of rules to a single general international law principle, the Principle of Prevention, and fill it with the relevant content, identifying the standard of "due diligence" which States are held to in preventing marine contamination of onshore origin.

The result is a framework customary rule, which obliges all States and whose substantial and procedural content can be retrieved from the rules and

measures they are subject to in connection with the specific geographical context. Declining the Principle of Prevention to this latter frame, the same comes to incorporate the rules and measures enacted at regional level, with regard to which the compliance to the "due diligence" standard must be scrutinised. According to this approach, a violation of the regional (as well as, of course, global) rules, otherwise very difficult to enforce, especially under the Regional Seas Conventions, would allow to claim a violation of the sectorial regional obligations which constitute "due diligence" and, consequently, convert into a violation of the general Principle of Prevention.

In terms of effectivity of a rule, in fact, it is essential to have an obligation, in the case at stake the duty to prevent marine pollution from land-based sources of contamination, with a precise and coherent content, whose reconstruction is the objective of the investigation this article stems from.

Once the relevant duties have been identified, appropriate obligations could be efficiently enforced. Besides litigation opportunities, in this regard, the importance of monitoring must be emphasised, as already underlined in international case law.[46] Appropriate monitoring, indeed, as a subsidiary obligation of the Principle of Prevention, is essential to identify violations of the obligation to prevent marine pollution from onshore activities and to make them enforceable in front of the appropriate jurisdictions. In this regard, reconducting the rules constituting the legal framework applicable to land-based marine pollution to a single international law rule, the Principle of Prevention, opens to enforcement opportunities connected to a direct violation of a customary law of international law, which could have greater potential in comparison with the violation of specific and isolated treaty-based rules. As the international order, however, both at global and regional level, still presents deficiencies in terms of centralised and effective jurisdictional control mechanisms, such enforcement opportunities would, at the *status quo*, rather be represented by national remedies. In this respect, it must in fact be reminded that a violation of the Principle of Prevention could not only trigger international responsibility of the State which did not comply with its "due diligence" duties,[47] but also that such a violation could be enforced before national jurisdictions, where the

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[46] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, Judgement of 20 April 2010, ICJ Rep. 14, para 197; *MOX Plant case* (*Ireland v. United Kingdom*), International Tribunal for the Law of the Sea, Order of 3 December 2001, No. 10, para. 89(1)(b); *Case concerning Land Reclamation by Singapore in and around the Straits of Johor (Malaysia v. Singapore), Provisional Measures*, Order of 8 October 2003, No. 12, para. 106(1)(a)(i).

[47] Issues connected to the States with legitimacy to enforce the violation, also in connection with possible arguments regarding an alleged *erga omnes* nature of the duty to prevent marine pollution from land-based sources, will not be addressed in the present article, but will be broadly explored in the context of a wider research project.

customary rule would be applicable, in accordance with the relevant adaptation to international law mechanisms in the respective legal order.

Such a level of enforcement, indeed, could play a more relevant role than that of inter-State litigation, which, as seen in case law, is, at the moment, quite limited and, in any case, subject to the willingness of a State to take legal action against another State. This would also allow a wider range of subjects to trigger the violation of the Principle of Prevention, also thanks to the UNECE Aarhus Convention, which, in the European regional context, remains an irreplaceable instrument for granting access to justice in environmental matters.

List of abbreviations/acronyms

Best Available Technique(s): *BAT(s)*
Best Environmental Practice(s): *BEP(s)*
Environmental Impact Assessment: *EIA*
Global Programme of Action for the Protection of the Marine Environment from Land-based Activities: *GPOA*
International Tribunal for the Law of the Sea: *ITLOS*
Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection: *GESAMP*
Marine Protected Area(s): *MPA(s)*
United Nations Convention on the Law of the Sea: *UNCLOS*
United Nations Environment Programme: *UNEP*

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