

The Law of Transboundary Aquifers in the Draft Articles of the International Law Commission and in the UN Convention on the Law of the Non-Navigational Uses of International watercourses

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CONTENTS: 1. The goals proposed by editors of the Draft Articles - 2. The principle of the sovereignty of "aquifer States" - 3. Comparison between the New York Convention and the draft articles, with particular reference to environmental law - 4. Conclusions

1. The goals proposed by editors of the Draft Articles

The Draft Articles or "Draft" on the law on transboundary aquifers has been prepared by the International Law Commission (ILC), and annexed to the Resolution A/RES/63/124, adopted by UN General Assembly at the 63rd session, on December 11, 2008 (the original draft is available in www.internationalwaterlaw.org/documents/intldocs/), recommending it to the attention of States.

In essence, the International Law Commission has recommended that the General Assembly should consider the draft articles in a resolution, to annex to same and this was necessary, because the New York Convention regulated the use of groundwater aquifers, that is to say those connected to a surface water system, leaving a gap on the regulation of fossil aquifers; subsequently, an attempt was made to fill in this gap, with a resolution on an ad hoc "confined aquifer" 1994, exhortation of nature, therefore non-binding, and hence did not solve the problem.

The reason is that the terminology used by the ILC, in this context, is technically correct and confuses "confined" with "aquifer uncorrelated". Some lawyers have demonstrated that there is still a substantial lack of clarity; in terms hydrological "confined aquifer" is "an aquifer and surmounted at the base of a training or almost impenetrable waterproof, in which the water is stored under pressure. So confinement is a matter of hydraulics and was not a matter of being related to or connected with surface water bodies".

The approach adopted by the ILC to make the decision to include or exclude sections of groundwater from the scope of the United Nations Convention on Watercourse if the base of groundwater is "meaning limited ... what is unrelated to any surface water", has met widespread criticism (Eckstein G., 2005).

There are "international aquifer", aquifers that are part of a system where groundwater interacts with surface water, fall within the scope of the United Nations Convention Watercourse (McCaffrey S., 2007). But there are also aquifers that are not connected to an international (sometimes wrongly called the confined aquifer), are not covered by the UN Convention Watercourse and "not because there is a connection to surface water and have been intentionally omitted from the ILC (Mechlem K., 2004). The lack of a comprehensive and blackberries hydrologically sound formulation suggests that the United Nations Convention was formulated without a solid understanding of the hydrological reality (Resolution on Confined transboundary groundwater, in Yearbook of the International Law Commission, Vol. II, Part 2, New York, 1994, at 135).

The Commission then decided to fill this gap, by regulating all groundwater system in an integrated framework; at the same time, another goal was ensure the survival of these resources, in fact, the emphasis on the protection and preservation of aquifers, is more pronounced in the Draft than in New York Convention.

The Draft articles on the law on transboundary aquifers, are the result of a strong collaboration between legal experts and scientists which took place in a period of time ranging from 2003 to 2008.

The Draft was prepared by the International Law Commission, with the technical support of UNESCO – IHP. The latter has inventoried 273 transboundary aquifers; 68 on the American continent, 38 in Africa, 65 in Eastern Europe, 90 in Western Europe and 12 in Asia (article on http://www.unesco.org/water/news/aquiferes_transfrontaliers.shtml - *L'Assemblée Générale de l'ONU adopte une résolution sur la loi des aquifères transfrontaliers*, UNESCO - IHP, Paris, 2014).

Aquifers, as rivers and lakes extend across borders, but aquifers differ from them, because they are "invisible", since they flow beneath the soil.

In them is contained almost 96% of the world's freshwater; 65% is for irrigation, 25% is for the supply of drinking water and the remaining 10% is for industry.

Aquifers represent more than 70% of the water used in the European Union, and often one of the only resources, if not the only, in arid and semi-arid; 100% in Saudi Arabia and Malta, 95% in Tunisia, and 75% in Morocco.

In addition, the irrigation systems of many countries depend largely on groundwater resources; 90% in Libya, 89% in India, 84% in South Africa and 80% in Spain.

The largest transboundary aquifers are found in North Africa and in South America; the aquifer of the "Nubian Sandstone", or Nubian Aquifer System in Sandston North Africa, is divided between Chad, Egypt, Libya and Sudan, and is the largest fossil aquifer on Earth, while the aquifer of the "Guarani ", in South America, is shared by Argentina, Brazil, Uruguay and Paraguay.

Moving to the Middle East, "the Aquifer of the Mountain", feeds the territories of Israel, Palestine and the occupied territories, and is the leading source of water for irrigation in the West Bank.

The draft consists of 19 articles, divided into four parts (Part I - Introduction, Part II - General principles, Part Three - Protection, conservation and management, part four Miscellaneous provisions).

The purpose of the law on transboundary aquifers is contained in Article 1, which can be seen with obvious clarity to the specific nature of the draft; the law does not speak of groundwater in general, but rather of the aquifers or aquifer systems between them connected.

Often an aquifer is to be connected to one or more aquifers (aquifer system) and, therefore, these should be treated as a single system for the purpose of better management.

But, what's an aquifer?

Article 2 states: "*aquifer is a permeable water-bearing geological formation underlain by a less permeable layer and the water contained in the saturated zones of the formation*".

Aquifer consists of two elements that are the underground geological formation which functions as a container for water and the water stored therein which is extractable and is water for life.

The term water-bearing has been employed to distinguish coverage of the draft from oil and natural gas. It should be emphasized that the purpose of the Draft, is not limited to the use of transboundary aquifers, but also extends to activities that may have an impact on them and, consequently, the measures for the protection, preservation and management (Art. 1).

For uses of the aquifers, there are certain activities that affect not only the extraction of freshwater, which is the main use of the aquifers, but also the extraction of heat for thermal energy, mining, storage and waste disposal, as well as new techniques for using the aquifer, for the "capture" of the carbon dioxide.

The activities that may have a negative effect on aquifers, refers not only to pollution by pesticides, fertilizers, etc., but also to the construction of senseless works that can have a negative impact and affect not only the geological formation aquifer itself, but also the process of recharge or discharge, resulting in deterioration of water quality and reduction of the same.

Therefore, we can argue the great importance of adequate protection of aquifers and strong cooperation in this regard, as well as the signing of agreements among the various states concerned by the same aquifer, to prevent pollution or over-exploitation.

In fact, the problems related to measurement, make it difficult to monitor the "effective" aquifers, withdrawals which, even in the presence of a co-operation, can be exploited through the use of private pumps.

The overexploitation (not regulated), set up by individual users of a transboundary aquifer, obviously has an impact on the populations located beyond national borders, and can cause a "*tragedy of the commons*", that is the over-exploitation of a shared resource, beyond the limits of sustainability (such as the depletion of groundwater in South Asia).

In addition, the lowering of aquifers caused by over-exploitation in one part, can determine an intrusion of sea water, nitrates, phosphates in the other, which can make the aquifer unusable in neighboring countries; and this is what has happened to the aquifer located in the Gaza Strip, already exacerbated by water shortage (UNDP Report 2006, Chapter 6, Managing transboundary waters, at 215-217).

Therefore, the adoption, by the UN General Assembly resolution in question, denoting the awareness on the importance for humankind, to safeguard the protection of groundwater resources, for the purpose of ensuring the development, conservation, utilization and protection of *groundwater resources*, within the context of sustainable development of these resources in question, for present and future generations.

States law is "*evolving*", and agreements relating to groundwater have risen only in recent years, compared to 445 transboundary aquifers and underground reservoirs, which only five are governed by agreements (Mechlem K., 2013). Example of Aquifers Agreements: 1977/2007 Genève (Switzerland and France local authority), 1992/2000 - I and II Nubian Sandstone AS (Egypt, Libya, Sudan, Chad), 2002 Northwestern Sahara AS (Algeria, Libya, Tunisia), 2009 Iullemeden AS (Niger, Nigeria, Mali), 2010 Guarani AS (Argentina, Brazil, Paraguay, Uruguay).

Therefore, this resolution encourages the States to take appropriate bilateral or regional arrangements for the proper management of their transboundary aquifers.

These provisions include cooperation among States to prevent, reduce and control pollution of aquifers and the threat from unsustainable exploitation and, given the importance of these resources, states are invited to consider the draft articles as a basis any future instrument.

The law on transboundary aquifers is a step forward for matters relating to the protection of groundwater.

In the past, there has been no international legal instrument which has provided the necessary guidelines and recommendations for management "*durable et paisible*" aquifers themselves (Raya M.S., 2009).

In this paper the author analyzes the issue of the sovereignty of States in the matter, which is the subject of seemingly different treatment in the two instruments, that's to say the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses and the 2008 Draft articles on the law on transboundary aquifers.

The analysis sheds light in particular on the similarities, but also on some discrepancies between the two instruments; in particular, attention will also be paid to the decidedly "environmental" slant of the Draft articles above mentioned, compared to the more "utilitarian" approach of the 1997 Convention.

2. The principle of the sovereignty of "aquifer States"

The principle of "sovereignty" of the aquifer States (to clarify the meaning of the use of various technical terms, see: <http://www.groundwater.org/gi/gwglossary.html>), governed by Art. 3 of the Draft Articles of the International Law Commission on the law of transboundary aquifers in 2008, located in the second part dedicated to general principles. As first sight, it seems to dust off the concept of absolute sovereignty, but in reality, from reading of Art. 3, becomes clear that, as the Convention on the Law of the Non- navigational Uses of International Watercourses of 1997 (*New York Convention*), is not absolute sovereignty, but rather, limited sovereignty, because : "*Each State has sovereignty over the portion of a transboundary aquifer or aquifer system located within its territory. It shall exercise its sovereignty in accordance with international law and the present articles*" (for a different opinion, McCaffrey S., 2009).

The first part of the article refers to the Principle 2 of the Rio Declaration on Environment and Development in 1992 (Marchisio S., 1993), which recognizes to the States, "The sovereign right to exploit their own resources pursuant to their own environmental policies and development (Marchisio S., 2008) in accordance with the United Nations Charter and the principles of international law and the duty 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".

From this statement it appears, the "right" and, therefore, the sovereignty of States over their own natural resources, reiterated in various General Assembly resolution and in many treaties and legal instruments; on the other hand, their "duty" is to watch the activities carried out under their jurisdiction that do not cause damage to the environment of other States.

In summary, the obligation of States to prevent transboundary damage is the result of a balance between the principle of state sovereignty and that of maintaining the integrity of other states.

So far, *nothing questio*.

The second part of the same article, follows the concept of limited sovereignty, because it must be "*exercised*" in accordance with international law and the present Draft articles.

The aquifer States have sovereignty over the portion of the transboundary aquifer located within their territories, but that sovereignty is not absolute as it is asserted (McCaffrey S., 2009), but it has clearly diminished by the "concretization" of the principle of the equitable and reasonable utilization according to Art. 4, and obligation not to cause significant harm, regulated by Art. 6, as well as the entire Draft.

In essence, the fundamental principle of the general obligation to cooperate is embraced by the aquifer States themselves in Art. 7, which involves several *steps*, contained in the subsequent articles, as the regular exchange of information, monitoring, asset management, prevention, reduction and control of pollution, which testifies in favor of a sovereignty that is not absolute, but bounded by 'mutual interest of the States in the use of the common good.

The "community of interest" that is thus created, is not simply the result of the "confluence" of state interests, or rather of interests which unite them, and that draws its roots from the sharing of resources.

Such principle has been enhanced by the development of international law and own deeds, as noted by the New York Convention, which confirms the principle of community of interest on international watercourses (Tanzi A., 1997) and forms the basis on which the draft is modeled.

The inclusion of Art. 3 in the Draft of the term "sovereignty" *over shared groundwater* aquifer and then *on the aquifers*, should not be misleading, bringing back "to light" the ancient ghosts of absolute sovereignty, according to which the State could exercise full authority, exclusive and unlimited, on "part" of an international watercourse lying within its territory, regardless of the consequences that could be passed on to the others who benefiting from the same water resource.

This rigid design draws its origins from the famous "Harmon doctrine", named after the American jurist who presented it on December 12, 1895.

It is related to a dispute between the United States and Mexico, in connection with the use of the waters of the Rio Grande river ; in particular, in a Note of 21.10.1895 a Mexican minister named Romero complained that following the work of irrigation put into operation in the upstream riparian river by the United States, significantly decreased the amount of water was significantly decreased in Mexican territory with serious consequences for the population.

Reaffirming the temporal priority of the uses of the Rio Grande river on the part of Mexico and a priority of the legal position, the memo declared how the conduct of the United States constituted a violation of international law.

In advancing this theory, Harmon retraced in a famous decision taken by the U.S. Supreme Court, which ruled an absolute and exclusive jurisdiction of the United States over its territory (case "The Schooner Exchange v. MC Faddon", Justia US, Supreme Court, Pennsylvania, 24.02.1812, in <http://supreme.justia.com>).

Fortunately, this theory has not been followed and neither has the theory of absolute territorial integrity. The theory of absolute territorial integrity is no more than a reflection of the theory of absolute sovereignty, analyzed, however, "on the part" of the country situated downstream.

In essence, the latter may require the upstream state of an international watercourse not influence the natural course of the same with its use.

The waters that enter in the territory of the upstream state belonging to the territory downstream and should therefore arrive in their entirety and integrity, with the consequence that the latter may prohibit any use of the international river upstream to the country.

The theory has its own territorial integrity of the countries located downstream of an international watercourse, such as Egypt, Pakistan, Syria and Iraq.

Today, the practice of the states involved in water disputes, is increasingly oriented towards the community of interest which has led to a complete abandonment of these theories.

The theory of absolute sovereignty appears to be contrary to modern international law and above all unfounded, if reduced to the current reality, which is characterized by an ever increasing international cooperation among States, by the lack of available water resources and by the need to protect the environment.

Referring again to Art. 3, we may make another consideration.

McCaffrey sustains (McCaffrey S., 2009) that the State is sovereign in the exercise of its functions on the geological formations aquifers, up to the point where the boundary intersects these formations, that's to say, within the limits of its territory.

The State has not sovereignty over the waters contained in the aquifers, precisely because this is "*something moves from one State to another*".

Therefore, the rights of a State on the groundwater portion of a transboundary aquifer, located within its territory, are different from those enjoyed on the part of its "land".

But the aquifer States have, a "*right of use*" and, this can be reduced to the notion that States have "*sovereign rights*", precisely for the use of aquifers, however such rights meet some limits, which are related to the equitable and reasonable use and to the obligation not to cause significant harm referred to in Art. 4 and 6.

The agreement stipulated among Argentina, Brazil, Paraguay and Uruguay on the Guaraní aquifer of August 2, 2010, is a clear example of limited sovereignty, which recognizes the sovereign right of States over the portion of the aquifer located in their territory and at the same time affirms the undertaking to apply international water law and to respect the principle of equitable and reasonable use and the obligation not to cause significant harm.

Finally, according to some scholars, the principle of limited sovereignty of states is the exact reflection of customary international law, while for others, with whom I agree, is a principle that is enshrined in the New York Convention, based on the community of interests between States that share an international watercourse, which is a principle that is also fully incorporated in the Draft (papers presented at the international conference on transboundary aquifers held in Paris, 6-8 December 2010).

3. Comparison between the New York Convention and the Draft articles, with particular reference to environmental law

A first observation is that the Draft, as well as the New York Convention, is based on the principle of limited sovereignty.

It is clear that although the legal effect of the New York Convention was modest, however, this finding does not affect that part of the Convention, enacting rules of customary law, like equitable and reasonable utilization and the obligation not to cause significant harm, which is binding for the states.

In essence, the principle of limited sovereignty is not only *conditio sine qua non* for the safeguard of a peaceful governance of shared water resources, but also "*guarantee*" of equity among the States in the sharing of benefits arising from the use of the same resources.

Another consideration concerns the terms used in the New York Convention, in relation to the Draft. The Convention is directed at a watercourse system of both *surface water and groundwater* interacting with the former and which are, as stated in the Art. 2, *a unitary whole and normally flowing into a common terminus*; the unitary complex is made up of rivers, lakes, aquifers, glaciers and so on. Therefore the Convention covers all groundwater that are hydrologically connected with surface water and the only form of groundwater not covered by the Convention is that which does not interact with the surface water, namely the water contained in "confined aquifers", that's to say, those waters which do not receive "recharge" from surface, because they are found at very great depths (it is considered in that sense, as fossil water).

The purpose of the Draft is to cover the waters contained in all the transboundary aquifers, including those are *recharged* from surface water and *discharged*, such as groundwater and "fossil".

Therefore there is an overlap between the two instruments, with regard to non-fossil waters, which come under the scope of both instruments.

I agree with those who affirm that this "*overlap*" (overlap with regard to non-fossil water, the New York Convention is silent over fossil water) is problematic, both with regard to how the two instruments can be applicable to the same situation and, especially, which of the two to apply (McCaffrey S., 2009).

Reconciling these conflicting objectives is not an undertaking, as pointed out by the International Law Commission in its recommendation, that, on this point, to a unique suggestion, which does not exist, but further recommends to the General Assembly take note of the Draft articles on the law of the aquifers in a resolution and annex it to the same, in order to invite States to put in place appropriate bilateral or regional agreements for the management of transboundary aquifers and, finally, to consider the elaboration of a Convention on the basis of the Draft.

In essence, the author of the Draft is aware of the "shadow zone" created by the overlap, but he refuses to solve it, postponing the resolution to a later date.

McCaffrey argues that it is necessary to consider the Draft as a manual for use by users (McCaffrey S., 2009); in my opinion, such an instrument is not binding on the states, although it may be easier to use for the same reason.

Personally I am inclined, to a more binding instrument, such as a convention, or protocol subject to the New York Convention, because it is the guarantee of "respect" by the States, although these should all ratify it.

With regard to the various articles of the Draft, we note that they are generally based on those of the Convention, with appropriate adjustments.

In fact, a careful examination shows that the two basic principles of the international law of the water, of "*equitable and reasonable utilization*" and "*obligation not to cause significant harm*", referred to in Art. 4 and 6 of the Draft, are modeled on Art. 5 and 7 of the Convention.

The former, however, differs from the latter, because they reflect the uniqueness and the nature of groundwater and, therefore, of the aquifers.

First of all, reading the first lines of Art. 4 shows very clearly the basic principle applicable to shared natural resources, their equitable and reasonable utilization, a principle that permeates the successive paragraphs.

In particular, the Art. 4 (*a*) clarifies that equitable and reasonable utilization of aquifers by States which share them aims at equitable sharing of benefits among them.

The successive points, from *b* to *d* of the same article, regarding the reasonable utilization, and in legal regimes relating to renewable natural resources is often referred to as sustainable utilization, that's to say, it implies the adoption of measures to conserve and "to endure", the natural resources as long as possible.

The concept of sustainable utilization is proper in the New York Convention and covers precisely renewable waters that receive a substantial recharge, but does not appear adequate in the case of aquifers; the *non-recharging aquifers* are not renewable, so any exploitation inevitably leads to their depletion.

Moreover, the points *b* and *c* of Art. 4 apply to both renewable resources and to those non-renewable aquifers, or *recharging* and *non-recharging*; therefore, this article aims "*to maximize long-term benefits*," that's to say, "to prolong" certain benefits for longer periods of time, being aware that the use cannot be maintained in perpetuity. Such maximization could be realized through the establishment of a comprehensive utilization plan by aquifer states concerned taking into account present and future needs; they should also prohibit any use that may damage the aquifer, so that the benefits can be shared among future generations.

However, analysis of Art. 4 shows that there is not an obligation to respect and maintain the volume of water, or certain minimum levels in the aquifer. Moreover, it is recognized, that the power to decide on what constitutes a benefit and what are the expected benefits that should be derived from the use of the aquifer in a given period of time, is in the hands of the aquifer States.

Point *c* then provides the obligation for aquifer States to establish aquifer utilization projects, preferably jointly, on the basis of an agreement for the lifespan of the aquifer.

Finally, point *d* provides that any use of the aquifer must not compromise its ability to stably operate, especially, if they are aquifers receiving artificial recharge, for the simple reason that it is essential that they maintain their own peculiarities and physical qualities (Report of the International Law Commission, Fifty-eighth session, 1 May - 9 June and 3 July - 11 August 2006, General Assembly, 61st Session, Supplement No.10 - A/61/10, New York, 2006).

As in the Convention, the Draft provides in Art. 5 a series of factors relevant to equitable and rational utilization of the shared resource; in particular, adds two factors "*d*" and "*i*" as the contribution to the formation and recharge of the aquifer or aquifer system and the role of the aquifer or aquifer system in the related ecosystem; *d*) means the comparative size of the aquifer in each aquifer State and the comparative importance of the recharge process in each State where the recharge zone is located, *i*) the role signifies the variety of purposive functions that an aquifer has in a related ecosystem. Such ecosystem may exist within aquifers (karst aquifer), or outside aquifers (an ecosystem in some lakes is dependent on aquifers).

The aquifer States should essentially take into account all relevant factors and circumstances related to the aquifers as well as their present and future needs, which, forged together, determine the use as equitable and reasonable.

It is interesting to note that the Draft, like the Convention states that within the weight to be given to different factors, special attention must be guaranteed to "vital human needs" ("vital human needs" means water used for human survival, including drinking, cooking and health needs, such as water and the need for the support of the immediate family. Article 3 (20) of the Law Association Berlin International standards on water resources, 2004), such as water for survival.

As Art. 7 of the Convention, and also Art. 6 of the Draft contemplate an obligation not to cause significant harm, namely the basic principle of international responsibility.

If we look closely, at Art. 6 paragraph 1 of the Draft appears to be broader, because it "extends" this obligation to the *discharge zones of aquifers* (rivers, lakes, oases, oceans) that are located in the territory of other States, as well as in the aquifer States. This is because even the State whose in a territory a discharge zone of the transboundary aquifer can be affected by damages.

The damage in question derives from the utilization of transboundary aquifers, whose activities may have an impact on them and measures for the protection, preservation and management, as cited in points 1 and 2 of Art. 6, which recall the points *a* and *b* of Art. 1 of the Draft.

The issue of compensation is not considered in this article as the mitigation and elimination of the damage, and due diligence to prevent it, rather contemplated by Art. 7 of the Convention (in the New York Convention is contemplated the obligation not to cause significant damage, and there is the possibility of compensation; such a possibility, however, is not provided in the Draft articles and, therefore, the obligation is absolute); the elimination and mitigation of damages, are however, applicable, despite its compliance with the obligation of prevention.

I would also like to dwell on the question of extending the "threshold", or protective boundary, in relation to the harm triggered by an aquifer State against another.

In the work of Commission's political considerations dictated by the need to balance the interests of the parties involved have led, to the definition of the limit of the damage, or the application of the term "*significant*", as stated in Art. 6 of the Draft.

Significant means something which is more than "detectable", but need not be at the level of "serious" or "substantial".

However, in the course of that work, some members suggested to "lower" the threshold to a simple damage, or "minimal damage" (eliminating therefore the word significant, see Report of the International Law Commission, Fifty-seventh session, 2 May - 3 June and 11 July - 5 August 2005, General Assembly Official Records, 60th Session, Supplement No.10 - A/60/10, New York, 2005), thus expanding the range of prevention, given the particular nature of the aquifers and their vulnerability.

The Commission considered this issue already in the work of the New York Convention (The "question" on the threshold of *significant harm* is also contemplated in the prevention of transboundary harm from hazardous activities within the International liability for injurious consequences arising out of acts not prohibited by international law, against. Report of the International Law Commission, Fifty-eighth session, 2006), and established its position on the threshold of "significant harm", stressing that the term significant is not intended to be in a substantial sense, but it should be referred to those agreements covering certain projects that have *a significant adverse effect upon third watercourse States*.

The limit of significant harm applied also to the aquifers is in effect an elastic and a relative concept, because what can be assessed as "significant" harm for an aquifer, could not be the same for a watercourse.

The examination of the principles relating to environmental protection that are contained in Part IV of the New York Convention, in relation to those covered in Part Three of the draft articles on the law of transboundary aquifers deserves further attention.

In particular, the Art. 20 of the Convention provides that the watercourse States, either individually or jointly, shall protect and preserve the ecosystems that exist in a shared water resource in proportion to their responsibility in causing harm or danger.

In essence, the obligation to protect the ecosystems of international watercourses is nothing more than the application of the provisions contained in Art. 5 of the Convention. Such an obligation imposed on States ensure that ecosystems are "protected" from harm or damage arising from pollution; this being understood as an alteration of the composition of the water quality of an international watercourse directly or indirectly from human activity.

States that share the same watercourse, individually or jointly, are therefore obliged to reduce and control pollution that can cause harm to other co-riparian, or to their environment, health, or safety of man as well as the biological resources of the shared watercourse (Art. 21, paragraph 2).

To achieve the best prevention, reduction and control of pollution, the States concerned undertake consultations, at the request of one of them, in order to engage in mutually acceptable methods and measures relating to the definition of objectives and common criteria requirements for water quality, detection techniques and instruments to combat pollution of point or diffused sources, and to establish the lists of substances whose introduction into the waters of an international watercourse should be prohibited, limited, investigated and monitored (Art. 21, para. 3).

The obligation to adopt measures to prevent the damage, is found in Art. 3 of the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 1992, which binds the Parties to take appropriate legislative, administrative, and technical measures for the control and containment of hazardous substances in transboundary waters, based on the standard of the best available technologies, which is found in the Principle 17 of Rio Declaration (The Protection of the Quality and Supply of freshwater resources, Application of Integrated Approaches to the Development, Management and Use of Water Resources, and Action Program on the Environment for the XXI century (Chapter 18), Agenda 21), 1992, which provides as a national instrument, environmental impact assessment, the precautionary principle 15, and so on.

The obligation of prevention extends to cases of any release of new species (GM) or alien (non-native species of flora and fauna) into an international watercourse that may affect the ecological balance and cause problems such as eutrophication, species extinction etc., which are capable of causing adverse effects to the ecosystem of a watercourse and, therefore, significant harm to other states that share the watercourse (Art. 22).

Therefore it is necessary to protect these ecosystems in order to keep their physical characteristics intact and thus their status as natural; this important provision is also adopted by the Draft in Art. 10. The obligation of States to protect the marine environment, also falls under the extended coverage of "protection", including estuaries, taking into account the generally accepted rules and standards and adopting the necessary measures to this end.

In addition, the riparian States at the request of a State concerned, shall promote consultations for the management of international watercourse, or to establish joint management mechanisms, in order to plan the exploitation of the resource through action plans, as well as encouraging the protection and control of the use of watercourse in the rational and optimal conditions (Art. 24).

The cooperation principle is manifested also in the control or regulation of water flow (To "control", means the use of hydraulic or other parameter, used on a continuous basis, to change, correct or control the flow of an international watercourse. In practice, the adjustment means are dams, canals, reservoirs that regulate the volume of water to inhibit the flooding, prevent erosions along the banks of the river, as well as ensuring an adequate supply of water), which has been established by the riparian States, who collaborate on the construction, maintenance or defrayal of the costs arising from the works necessary for the interventions that they have agreed to undertake (Art. 25). However, if there is a risk evidence of adverse effects resulting from these works, as provided in Art. 26, at the request of a State, consultations begin, involving the proper operation and maintenance of facilities and equipment related to the watercourse, as well as the protection of workers from intentional or negligent actions, or by the forces of nature.

The prevention and mitigation of harmful conditions still requires cooperation among riparian States in adopting, measures to prevent or reduce the harmful conditions of an international watercourse, either individually or jointly, that result from natural causes or human activities, likely to be harmful to other states, such as floods, ice, droughts, desertification, water-borne diseases (Art. 27).

In the face of natural causes or human activities that falls under the emergency situations as referred in Art. 28, the affected State shall promptly inform the others that are likely to be damaged and will take all necessary measures to prevent, reduce, eliminate adverse effects of the emergency, through the adoption of joint plans.

From the foregoing, it is clear that the set of principles set is nothing more than the concrete application of the principle of limited sovereignty, precisely because it is an expression of community of interests and, therefore, cooperation among riparian States, in the use of the common good.

Like the Convention, the Draft also contains articles (Part Three) of reference to the protection, preservation and management of ecosystems, which are, however, more pronounced than those contained in the Convention.

Also in the Draft, as in the Convention, the reference to the concept of sustainable development stands out.

To confirm this principle further intervenes Art. 10 which emphasizes the obligation for States to take all appropriate measures *to protect and preserve ecosystem within, or dependent upon their transboundary aquifer ...*, and measures to ensure adequate amounts of recharge and discharge of water in aquifers, so that the water released and retained is sufficient to protect and preserve the ecosystem.

This means that the aquifer States have a duty to protect the ecosystems from harm or danger, while the duty to preserve applies to freshwater ecosystems and, therefore, requires that they be treated in a manner that preserves their natural state as much as possible without altering it.

This is because, outside interference, such as human activities, can break the perfect balance of the constituent components of freshwater ecosystem, making it unsuitable to perform its function of *life-support system*.

If we look closely, the obligation to preserve ecosystems is found in section 18.2 of Agenda 21, which states “... *the general purpose is to preserve the ideological functions, biological and chemical properties of the ecosystems, adapting human activities to capacity limits of nature*”, but also, in the practice of States and in various documents of international organizations; for example, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 1992, the Agreement on the Conservation of Nature and Natural Resources, Kuala Lumpur, 1985, the Protocol on Water and Health to the 1992, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, London, 1999.

The obligation to preserve and protect not only extends to freshwater ecosystems, but also to recharge and discharge zones of aquifers, in order to guarantee their correct functioning.

The aquifer States are obliged to take appropriate measures to prevent and minimize *detrimental impacts on the recharge and discharge processes*, once recharge and discharge zones of transboundary aquifers are identified (Art. 11 point 1).

These measures are crucial, especially if they relate to recharging zones, in order to prevent forms of pollution within the aquifers, pollution that is contemplated by the following Art. 12.

Point 2 of Art. 11, which extends cooperation to the States in whose territory recharge and discharge zones are situated, either in whole or in part, which, although not aquifer States, undertake to cooperate with States in whose territory a transboundary aquifer is located, to protect the same and related ecosystems.

This provision corresponds to the content of paragraph 18.3 of Agenda 21, which recognizes that *the aggravated pollution of freshwater resources in many regions of the world, together with the progressive influence of incompatible activities, requiring an integrated approach to water resources, and this ... must cover all water bodies, including surface and groundwater, as well as aspects of quality and quantity of water* (this concept is also contained in the EU Directive 2000/60/EC, Luxemburg, 2000).

However, sustainability is to be found even in the principle contained in Art. 4, in points *c* and *d*, which the aquifer States shall establish, *individually or jointly, comprehensive utilization plan, taking into account present and future need ... they will not use a recharging transboundary aquifer at a level ... that would prevent continuance of effective its functioning*.

This means that any use of the aquifer should be implemented so as not to damage its ability to operate, keeping intact, its physical properties as much as possible.

Also this point, is traced to article 10, ... *Aquifer States shall take all appropriate measures ... to ensure that quality and quantity of water retained in an aquifer...as well as that released.. are sufficient to protect and preserve ecosystems*.

With regard to pollution control, it is already mentioned by Art. 12, which is similar to Art. 21 of the New York Convention, which imposes aquifer States the obligation of *due diligence* to prevent "new" forms of pollution, and to abate and control existing pollution that may cause significant harm to other States. This is necessary, because, once aquifers are polluted, it is then difficult, if not irreversible, to eliminate the causes that led to such contamination.

In addition, noting the fragility and uncertainty of transboundary aquifers (as regards the nature and extent), Art. 12 calls for a precautionary approach (Caponera D.A., Nanni M., 2007).

The decision to include the word "precautionary approach", instead of the precautionary principle, was at the instant of the majority of the members of the Commission (Report of the International Law Commission Fifty-eighth session, 2006), to avoid substantive and procedural arguments; the term less "accredited" approach, could better match the actual characteristics of the aquifers.

Personally, I prefer the "principle", for the simple reason that it is expressly contemplated in Principle 15 of the Rio Declaration of 1992, which states that *"in case of a risk of serious or irreversible damage, lack of full scientific certainty should not be a pretext for delaying the adoption of appropriate measures and effective ..."*.

Another very important obligation imposed on the aquifer States, is to monitor (there are various international instruments for joint monitoring of aquifers, such as the EU Directive 2000/60/EC, the

Program for the Development of a Regional Strategy for the Utilization of the Nubian Sandstone Aquifer System, CEDARE, Cairo, 2000/2001) their transboundary aquifers. This activity should be carried out with the other States involved, in cooperation with competent international organizations. These activities cannot be carried out jointly, and mutual exchange of data among the States concerned is envisaged.

Finally, for the purpose of monitoring, it takes into account the fact that States must make use of standard and methods agreed upon, governed by Art. 8, which provides for exchange of data and information (geological, hydrological, hydrogeological, meteorological, and ecological) on the conditions of the aquifers. In the case of uncertainty about the extent and scope of the aquifer, the aquifer States should employ their best efforts, using the "due diligence" to collect the necessary information, taking into account practices and standards (Art. 13).

In summary, the above mentioned articles fully relate to the concept of "sustainability" in the sense that the "purpose" of the aquifers, just as regulated, ensure compliance with the entire ecosystem, acting, as some experts (Burchi S., 2009) claim, to "support" for the same, or *"ecosystem support function of transboundary aquifers"*.

The protection of aquatic ecosystem, together with preservation helps to ensure their viability as *"life support system"*.

To conclude, I would recall the cooperation principle (Giuffrida R., 2004), provided, in Art. 7 of the Draft and 8 of the New York Convention, as well as in various other international instruments: example The Convention for the Protection of the Rhine (Berne, 1999), the African Convention on the Conservation of Nature and Natural Resources (Maputo, 2003), the Convention on Cooperation for the Sustainable Use of the Danube (Sofia, 1994), the Convention for the Protection of the courses transboundary water and International Lakes (Helsinki, 1992), the Convention on Sustainable Development of Lake Tanganyika (Dar es Salaam, 2003), the Protection of the Quality and Supply of freshwater resources, Application of Integrated Approaches to the Development, Management and Use of Water Resources, and Action Program on the Environment for the XXI century (Chapter 18), Agenda 21 (Rio de Janeiro, 1992).

The sovereign equality and territorial integrity of the aquifer States, mirrored by the articles mentioned above, is an essential condition to be able to "collaborate" and therefore, is the prerequisite and starting point of the cooperation, and hence "essential prerogative" for shared natural resources.

The cooperation principle is the common thread that binds together all articles relating on the various forms of cooperation; in particular, the Art. 7 which carries with it Art. 8, (which is the first "step" of cooperation among aquifer States) on the regular exchange of data and information, as well as Art. 9, which deals with bilateral and regional agreements that are put in place by the aquifer States for their management, as well as articles on the protection, preservation and management of transboundary aquifers (Arts. 10-15).

The general obligation to cooperate for the aquifer States also involves an obligation to establish joint cooperation mechanisms which relate to agreements made by them to achieve the set purposes (exchange of information and databases, research, management, monitoring of aquifers, Articles 7, paragraph 2, and 14), as well as to collaborate with countries in the developing world for the protection and management of transboundary aquifers (Art. 16).

4. Conclusions

The following conclusions emerge from the analysis:

1. The principle of sovereignty in the Draft Articles is not absolute as argued by Prof. McCaffrey, but relative and attenuated. Absolute sovereignty and absolute territorial integrity have nowadays been superseded by the development of customary international water law as reflected in the UN Watercourses Convention, which has served as a model for the Draft Articles, particularly, in the doctrine and principle of equitable utilization which permeates both instruments;

2. The UN Convention and the Draft Articles are equally predicated on the limited sovereignty principle. Due to groundwater's vulnerability to pollution and depletion, however in the Draft Articles the protection and conservation of aquifers attract greater attention relative to the utilitarian functions of aquifers, compared to the UN Convention;
3. Some overlap between the two instruments is detectable regarding renewable groundwater resources, as these come within the purview of both instruments. This issue has been raised but not tackled by the ILC Special Rapporteur Yamada, and it remains pending notwithstanding consideration by UNGA: Resolution adopted by the General Assembly, Sixty-sixth session, New York, 9 December 2011, N.66/104, *The Law of transboundary aquifers*, and Resolution adopted by the General Assembly, Sixty-eighth session, New York, 16 December 2013, N.68/118, *The law of transboundary aquifers*;
4. The author favors developing the Draft Articles into a binding instrument, like a peer Convention to the UN Watercourses Convention, or a Protocol under the latter, over the non-binding kind of instrument advocated by Prof. McCaffrey.

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