

*Javier Del Valle Melendo*

*University Centre for Defence, Zaragoza. (Environmental Engineering and International Relations)*

*E-mail: [delvalle@unizar.es](mailto:delvalle@unizar.es)*

## WATER AS A STRATEGIC RESOURCE: INTERNATIONAL COOPERATION IN SHARED BASINS AND GEOWATER

### **Abstract**

*Most major rivers basins are shared between two or more countries, given that the administrative boundaries often do not coincide with the natural ones. In many cases, water is not managed at basin scale, which is the natural unit of water on the surface of the Earth. Several neighbouring countries that share river or lake basins are immersed in conflicts over water. However, shared water management constitutes a powerful mechanism for international cooperation if it is aimed at satisfying human and environmental needs, what has been coined “geowater”.*

### **KeyWords**

*Water, shared basins, conflicts, cooperation, geohydric, geowater.*

## WATER AS A STRATEGIC RESOURCE: INTERNATIONAL COOPERATION IN SHARED BASINS AND GEOWATER

### INTRODUCTION

Water is an abundant resource on a global scale, and it is also a renewable one on account of the water cycle. However, the distribution of water is uneven and subject to time and space constraints. The fact that it is an essential and irreplaceable resource that is on constant demand for different uses (irrigation, domestic supply, industry, etc.) has led to growing uncertainty as to future supply, which is further exacerbated by climate change, which affects the water in all regions differently. The integrated management of water resources is therefore a pressing issue.<sup>1</sup>

The ever closer link between security and the environment has prompted concerns about the non-military aspects of security.<sup>2</sup> Guaranteed access to water is one of the primary concerns, in addition to the fact that it is an essential and irreplaceable resource.

Water has become a strategic resource and different strategies have been devised in an attempt to control it. Water security is defined as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.<sup>3</sup>

Sustainable management and international cooperation in shared water bodies has therefore become indispensable. Indeed, an emerging human right in international civil society is the right to drinking water and sanitation, and the idea of not having access to safe drinking water is a relatively new realisation. Subsequently, it has become *essential to tackle* the problem from different angles, including the human rights angle.<sup>4</sup>

---

1 WORLD BANK. *Sustaining Water for All in a Changing Climate*. World Bank Group Implementation Progress Report. The World Bank ed. Washington DC, 2010, p 10.

2 GRASA R. Los conflictos “verdes”, su dimensión interna e internacional. *Ecología política* No. 8, Ed Fuhem/Icaria. 1994, p 27.

3 UN WATER: *Water Security and the Global Water Agenda*. A UN Water analytical brief. United Nations University, 2013.

4 SAURA ESTAPÁ, J. El Derecho humano al agua potable y al saneamiento en perspectiva jurídica internacional. *Derechos y Libertades: Revista del Instituto Bartolomé de las Casas* No. 26, 2012, p. 150.

## MANAGEMENT BY BASIN. SHARED BASINS

### The river basin concept

This is comprised of the land in which the surface water flows into a main river, and where drainage water exits through a single point, towards a sea or lake. This main river has a number of tributaries, each with its sub-basin. There are no basins without rivers, or rivers without basins. In all areas, there is a drainage network, although this sometimes ends up getting lost in arid, inland areas (endorheic basins).

Each river basin is a natural dynamic water unit where there is precipitation, infiltration, recharge of groundwater, surface runoff and drainage networks that ultimately flow into the sea or lake. The boundaries of these basins are natural, not man-made; therefore the natural and administrative boundaries do not always coincide. Indeed, river basins and administrative boundaries rarely coincide.

A river's circumstances are determined by nature and how the territory and the waters in the basin are managed. Consequently, the volume of water, the water regime and the quality of the water not only depend on the climate or geological and lithological conditions of the basin, but also on how the land around the river and the water are used (extraction, uses, treatment, etc.).

We live in a basin through which the water of a river flows to cater for our needs; water that has come from areas where other people live, perform activities and use the water. The course of the river unites us in a common interest: proper management of the territory, especially surface and groundwater, from the moment it rains until the water flows into the sea or lake, and causing as little harm as possible to the associated ecosystems. The ideal approach to integrated water management encompasses the top-down water cycle process.

The main elements of a river basin are:

- *The main river.* This rises in the upper basin and has its mouth in the lower basin. It receives water from rainfall that is then carried by a network of ravines and tributaries, although some of this water is used for percolation and some is retained by the vegetation.
- Small rivers, forming *minor drainage basins*: sub- or micro-basins spatially delimited by their respective boundaries.
- Depending on the geological substrate and the weather conditions, rivers exchange water with aquifers (bodies of permeable rock that store groundwater).

The relationship between a river's surface water and its aquifers is very close, with rivers supplying the aquifers during certain periods of the year and vice versa. During periods of low rainfall, their importance is paramount.

All of these comprise the geographical unit bounded by the main river basin. Aquifers do not usually respect the boundaries of the river basin on the surface, and are formed by nature. They may supply water to several rivers and basins at a time. Therefore, if the groundwater of one of the basins becomes polluted, it can spread.

- *Transitional waters.* These are bodies of surface water close to the mouth, which are especially salty because of their proximity to the coast, and which receive flows of freshwater.<sup>5</sup> This is a transition area between the river and the sea, with ecosystems that are very sensitive to fresh and saltwater, and with possible alterations depending on the quality of the water.

### Shared river basins

The concept of a basin was adopted for the first time in the Resolution of New York in 1958 and was included in the Helsinki Rules on the Uses of the Waters of International Rivers at the Helsinki Conference. The concept of an international watercourse, on the other hand, was adopted at the Convention on the Law of the Non-navigational Uses of International Watercourses in 1997.<sup>6</sup>

However, it is important to draw a distinction between the two concepts:

- An international river basin is a geographical area, all of whose waters flow into one main river, with just one point of entry into the sea or lake, and which may belong to one or more states. The term “basin” is sometimes used – erroneously – in place of the word “river”.<sup>7</sup>
- A watercourse is a system of surface and groundwater, a unitary system that flows into the same river mouth. It could well be described as a river system or network, and may belong to several states, in which case it is an international watercourse.

---

<sup>5</sup> Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of Water Policy. DOUE 6.II.2007.

<sup>6</sup> UNITED NATIONS GENERAL ASSEMBLY RESOLUTION. Convention on the Law of the Non-navigational Uses of International Watercourses. 1997. A.RES /51/229/ 8 July 1997.

<sup>7</sup> AURA Y LARIOS DE MEDRANO A.M. La Regulación Internacional del Agua Dulce, Práctica Española. Aranzadi Derecho Administrativo 2008, p 120.

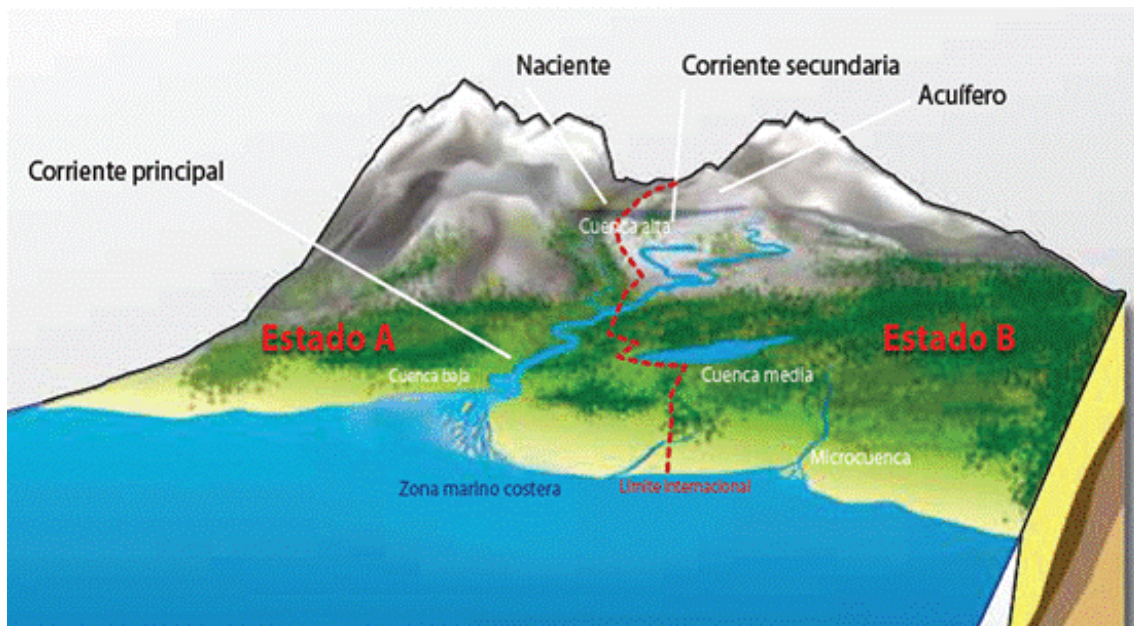


Figure 1: Diagram of an international watercourse. Adapted from Aguilar G, Iza A.<sup>8</sup>

Given that the law governing shared basins is part of International Law, the main stakeholders are states.<sup>9</sup>

According to the international law governing rivers, states located in river basins are known as *riparian states*. However, this is only the case with surface waters; when we include groundwater, it becomes more complex.

With regards terminology, we are not sure that the term “shared basin” is the most accurate. From a legal perspective, it is a shared resource in the same way that an international forest area or migratory species may be. The concept is broad enough to allow different interpretations: major river, river network, surface water or groundwater, and includes a geographical area, river network and surface and groundwater resources that are connected with a maritime or coastal transition zone.

Water is an indivisible resource. At the national level, a state controls all of its inland waters; however, states that share a river exercise a kind of condominium based on the natural indivisibility of the water, which results in a shared sovereignty of the water. This is not the case, however, with other parts of the basin, such as the riverbed which can be divided physically. Each state in the basin holds partial sovereignty to the portion of the riverbed that crosses its territory. The principles of good neighbourliness and cooperation may limit national sovereignty over the states’ own river beds.

8 Aguilar G, Iza A. Gobernanza de aguas compartidas. Aspectos jurídicos e institucionales. UICN, serie de política y Derecho ambiental No. 58, Bonn. 2009, p 11.

9 Aguilar G, Iza A (2009). Op cit. p. 16.

The definition of a shared basin depends on the existence of political borders or boundaries, which will not be affected if a basin is considered to be transboundary, shared or international.

Some authors speak of “**shared basins**”. However, we consider this term less accurate because it applies more to waterways, i.e., to rivers, not basins. Therefore, rivers can be classified as follows.

- a) National: rivers that flow through only one state;
- b) International: rivers under the sovereignty of many states, either because they separate two states or because they flow through two or more of them.
- c) Internationalised: governed and administered by an international commission.
- d) Navigable Waterways of International Concern: created between states. This was set up following the Barcelona Convention and Statute (20 April 1921) to ensure freedom of navigation in international rivers and waterways (artificial canals, lakes and lagoons) which, being naturally navigable to and from the sea, are located within the territory of only one state and link naturally navigable international rivers.

The term “transboundary basin” is also used. The terms “boundary” and “transboundary” only apply to rivers and lakes, not to basins, strictly speaking. The aforementioned terms are used in connection with political borders. Only rivers, as a component of a basin, can constitute a boundary; not the basin, because this is a territory, not a linear element like a river.<sup>10</sup>

The concept of basin has a marked holistic character, as it is an expanse of area created by nature. Quantitatively, all natural resources (land, water, animals and plants) can be clearly demarcated. Because of the physical interconnection between waters, any changes made by nature or man to the waters in any part of the basin will only affect the borders of that basin:<sup>11</sup>

It suffices to recall the Helsinki Rules<sup>12</sup>

- Major watercourses, their tributaries, and connected lakes
- The bed and subsoil.
- The bed, flora, wild fauna and other natural resources.

---

<sup>10</sup> Aguilar G, Iza A (2009). Op cit. p. 19.

<sup>11</sup> Caponera D. El régimen Jurídico de los recursos hídricos internacionales. Estudio Legislativo No. 23 de la Organización de las Naciones Unidas para la Agricultura y la Alimentación. 1982, p 6.

<sup>12</sup> Aguilar G, Iza A (2009). Op cit. p. 20.

- Groundwater, the regulation of which is supplemented with the Seoul Rules on International Groundwaters (1986).<sup>13</sup>
- The adjacent maritime coastal area.

This holistic approach was confirmed in the Convention on the Protection and Use of Transboundary Watercourses and International Lakes<sup>14</sup>. Signed in Helsinki in 1992 and entered into force in 1996, the Convention provides a legal framework for cooperation in shared water resources.

For environmental protection purposes, the holistic approach to the management of water resources is considered to be the most appropriate because it takes all processes and activities into consideration, not just those in the main watercourse, but also those in the tributaries, aquifers, coastal areas and surrounding territory.

This assumption meant that the concept of a river basin was not very well received, especially by the main states in shared basins.

When analysing the regulations governing shared basins, we consider approaches such as the regulation of the entire basin. While this may be more ambitious, it places a restriction on the use of the waters by the state and imposes the obligation to protect its environment and that of the neighbouring riparian state.

There is an international tendency to integrate basins and watercourses to establish boundaries. We can find many examples on all continents: Africa (Niger, Lake Chad, Revised Protocol on Shared Watercourses in the SADC);<sup>15</sup> America (The Amazon,<sup>16</sup> Rio de la Plata Basin);<sup>17</sup> Asia (Mekong)<sup>18</sup> and Europe (Danube,<sup>19</sup> Elbe, Scheldt, Meuse, Oder, Convention on the Protection and Use of Transboundary Watercourses and International Lakes).<sup>20</sup>

The management and regulation of water resources in each basin requires that water be integrated with other resources (groundwater). Because the link between surface

---

13 INTERNATIONAL LAW ASSOCIATION. "Seoul Rules on International Groundwater", 1986.

14 United Nations Economic Commission for Europe (UNECE). The UNECE Convention of 1992 Protection and Use of Transboundary Watercourses and International Lakes. Ed: UN, 2004, p 6.

15 Water, a Shared Responsibility. Second UN World Water Development report. (2006). Zaragoza, p 504 (consulted in Spanish).

16 Ibid. p 380.

17 Ibid. pp 498-501.

18 Ibid. p 344 and <http://www.mrcmekong.org>, consulted in January 2015.

19 Ibid. pp 474-477.

20 Directive 2000/60/EC of 23 October 2000 establishing a framework for Community action: op cit.

and groundwater is so close,<sup>21</sup> it should be managed as a single resource. Aquifers are sources of water that store, distribute and treat water other than surface water.<sup>22</sup>

However, these resources are rarely managed or regulated appropriately, thus restricting the integrated management of water in shared basins. According to Sahuquillo,<sup>23</sup> “despite its huge potential and the fact that we have technology to analyse it, groundwater is not usually taken into consideration by water authorities.

This is very serious in the case of transboundary waters. The UN has pointed out that the integrated management of water is especially complex and calls for the subordination of private interests. Very often, international agreements allocate and distribute waters and establish infrastructures, however very few of these provide for integrated management models”.<sup>24</sup>

---

21 Winter et al. Ground Water and Surface Water, a single resource. US Geological Survey Circular 1139.1998, p 9.

22 Sahuquillo A. La importancia de las aguas subterráneas Rev. R. Acad. Cienc. Exact. Fís. Nat. (Esp) Vol. 103, No. 1. 2009, p 103.

23 Sahuquillo A. La importancia de las aguas subterráneas Rev. R. Acad. Cienc. Exact. Fís. Nat. (Esp) Vol. 103, No. 1. 2009, p 97.

24 SALINAS S. La Cuenca Hidrográfica en el Derecho Internacional de los recursos hídricos. In GUTIÉRREZ ESPADA et al. (Coords). El Agua como factor de cooperación y de conflicto en las relaciones internacionales contemporáneas. Murcia, Fundación Instituto Euromediterráneo del Agua, 2009, p 226.

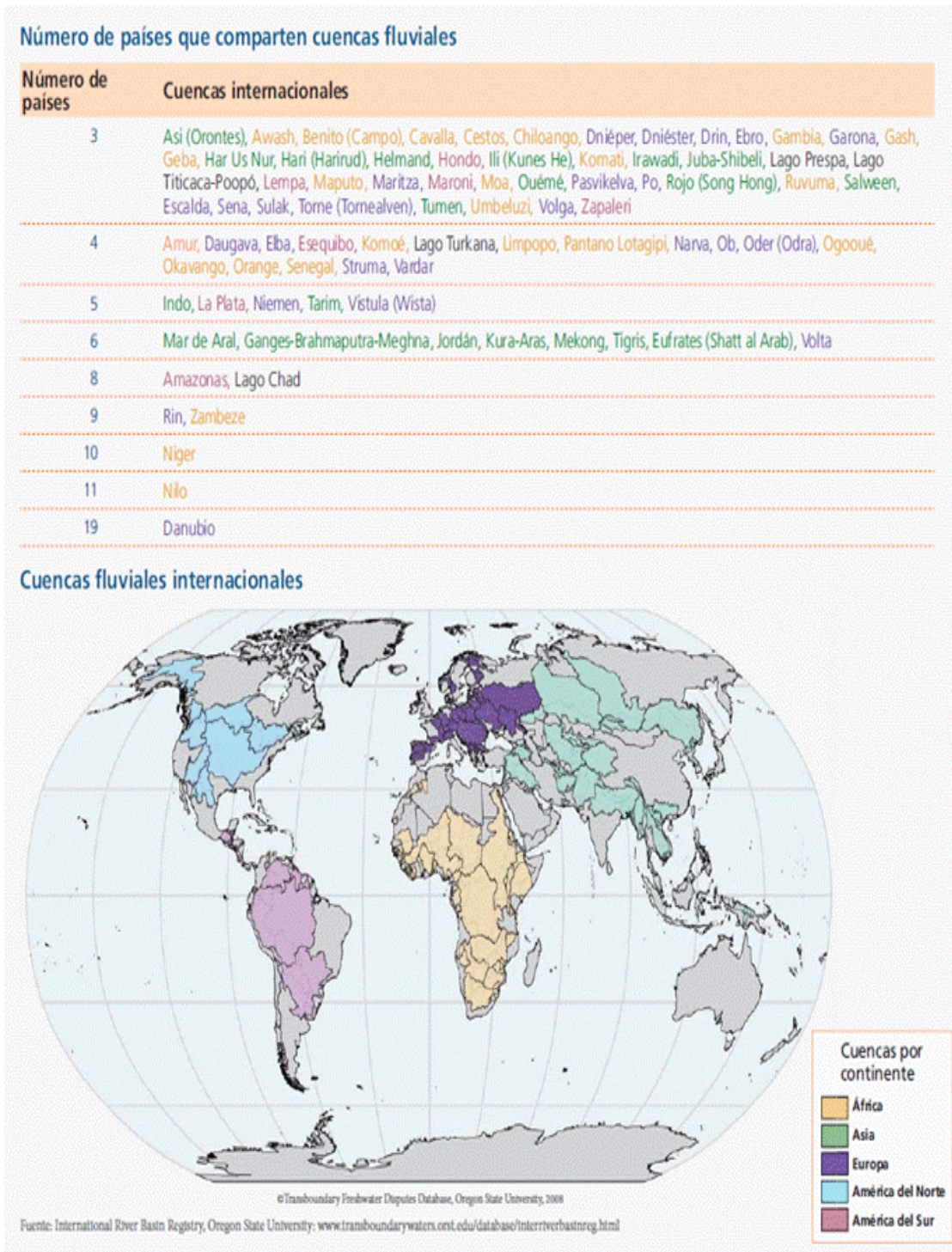


Figure 2: Shared river basins by continent and number of countries sharing a river basin.<sup>25</sup>

25 Kramer A. Wolf A. Carius A. Dabelko G. A Year for Cooperation, Not Conflict, Over Water. The keys to managing this. A world of science (special issue) Vol 11, no. 1 (January– March), UNESCO. 2013, p 5 (consulted in Spanish).

## Principles of International Law for shared basins

International Law is based on the assumption that a state belongs to the international community and therefore waives the unlimited right to territorial sovereignty and the invocation of the absolute integrity of its territory.<sup>26</sup> The state's territorial sovereignty is therefore subject to a restriction, as it must refrain from taking action that is detrimental to neighbouring countries. And because it cannot assert the absolute integrity of its territory, it has to tolerate the consequences of third countries' actions, assuming these constitute lawful use of the property and do not affect essential interests.

As a result, a number of duties and powers have been defined for states using a shared basin:<sup>27</sup>

- **Cooperation:** The obligation to cooperate flows from the requirement of unity in the river basin and the subsequent community of interests. Only mutual cooperation will lead to sustainable development and ecological integrity. This is a general obligation that does not specify institutions or the extent to which states should cooperate.
- **Integrated management:** States shall achieve unified management of surface and groundwater, among other things. Accordingly, states should integrate water management with that of other natural resources.
- **Sustainability:** Considering the increased pressure on water resources, it is essential to achieve a balance between the development and conservation of natural resources. This is closely linked to the precautionary principle, which the Rio Declaration defines as follows: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".<sup>28</sup> This means that states shall adopt all necessary measures to prevent, reduce and control damage to the water environment when there is a risk, or even a suspected risk of damage.
- **Damage prevention:** Each state in a shared basin may use the part of the basin that is under its jurisdiction, provided it does not significantly affect the rights

---

<sup>26</sup> Aguilar G, Iza A (2009). *Op cit.*, p. 26.

<sup>27</sup> *Ibid.*

<sup>28</sup> Rio Declaration on Environment and Development, consulted in Spanish in February 2015 at <http://www.un.org/spanish/esa/sustdev/agenda21/riodeclaration.htm>. Report of COMEST'S Expert Report on the Precautionary Principle, UNESCO, Paris, 2005, p. 12; COM (2000) 1 final, COMMUNICATION FROM THE COMMISSION on use of the precautionary principle, p. 10.

of the others. Hence, there is the obligation to anticipate and minimise damage to the environment in accordance with the principle of sustainability: it is only possible to ensure the continuity of the ecosystems and life on the planet when the utilisation of water respects the integrity of the sources.

Participation, with two fundamental aspects:

- **Equitable participation:** In shared basins, there is the right to participate in the equitable, reasonable and sustainable management of the waters. Agreements between states define the use of water according to the will of the signatories. The principle of equitable participation provides that no agreement shall condition the rights of a signatory state without its consent.
- **Public participation:** Indicates that the necessary measures shall be taken to ensure that the people concerned can participate in decisions concerning the management of the waters. Although this is not well defined, it is essential, given that it unites stakeholders with opposing interests, whose participation is necessary in a democratic system.

## Powers and obligations of states

The Convention on the Law of the Non-navigational Uses of International Watercourses (1997) lays down powers and duties for states that share basins:

- **Navigation.** The Barcelona Convention and Statute on the Regime of Navigable Waterways of International Concern (the Barcelona Convention of 1921) recognises the freedom of navigation without discrimination, but does allow riparian states to give priority to national or naturalised passengers or goods in local transportation.<sup>29</sup>

With regard to non-riparian states' navigation of international rivers, the automatic right of access is not guaranteed. Cooperation has given rise to the establishment of a Commission responsible for managing navigation of the river, such as in the case of the Rhine and Danube.

- **Equitable use.** According to the Convention, "Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and

29 Barcelona Convention and Statute on Freedom of Transit. Barcelona, 20 April 1921. <http://www.ehu.es/ceinik/tratados%5C22TRATADOSSOBREELAGUA%5C22Aguadulce%5CTA22II.ESP.pdf>. Consulted in Spanish in January 2015.

sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned”.<sup>30</sup>

This does not imply a division of waters, but rather the determination of equal rights in a shared sovereignty and the equating of interests according to the different needs and uses of the waters. Hence, all stakeholders reasonably share the benefits, while satisfying their needs.<sup>31</sup>

The Convention has introduced several points to clarify this concept:

- Geographic, hydrographical, hydrological, climatic, ecological and other natural factors.
- The economical and social needs of riparian states.
- The population dependent on the watercourse in each riparian state.
- The consequences of using the watercourse in one riparian state for another.
- Current and potential uses of the watercourse.
- Conservation, protection, harvesting and economy in the utilisation of water resources.
- The existence of alternatives of a comparable value where private use of a watercourse is concerned.

To define equitable and reasonable use, all relevant factors should be examined together. Conflicts in international watercourses should be resolved taking the fulfilment of vital human needs into consideration.

- The duty to not cause damage. In International Law, there is no absolute prohibition against contamination. “Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States”.<sup>32</sup> This obligation stems from the “principle of good neighbourliness”. The states concerned shall avoid, within their jurisdictions, changes that hinder the use of the basin by other riparian states.
- Procedural obligations. States shall exchange readily available data and information on the condition of the watercourse, in particular that of a

---

<sup>30</sup> Article 5, Part II. General principles of Resolution 51/229 adopted by the UN General Assembly. Convention on the Law of the Non-navigational Uses of International Watercourses. 1997.

<sup>31</sup> AURA Y LARIOS M.A., *op. cit.*

<sup>32</sup> Article 7. General principles of Resolution 51/229 adopted by the UN General Assembly. Convention on the Law of the Non-navigational Uses of International Watercourses. 1997.

hydrological, meteorological, hydrogeological and ecological nature and related to the water quality. Before adopting a measure that might cause harm, the state concerned shall promptly report it, and provide technical data and the results of environmental assessments within six months for the assessment being carried out.

No measures shall be carried out without the express consent of the notified states, bearing in mind the provisions on equitable utilisation and the obligation not to cause significant harm. However, the foregoing measures may be implemented without delay when they are required to protect vital interests and public health and safety.

- Protection of ecosystems. States shall protect, individually and, where appropriate, jointly, the ecosystems of international watercourses. The convention provides for the obligation to take measures to control the introduction of exotic species that may have detrimental effects on an ecosystem of an international watercourse.

However, it does not clarify whether the concept of ecosystem refers to the section of river in each country or the ecosystem of the entire basin. While it may consist of individual river ecosystems in each country, when viewed from the perspective of the interests of the international community, it can be seen as a global public good and world heritage asset which may, therefore, restrict state sovereignty. Based on the importance that the Convention attaches to the protection of the ecosystem, it can be deduced that it is referring to the ecosystem of the entire watercourse.

An important aspect in the protection of ecosystems is the preservation of *environmental flows*; these are commonly accepted as an essential component of integrated water management, particularly for resolving issues concerning the health of freshwater ecosystems, their sustainable development and the equitable sharing of the benefits they provide.

The concept environmental or ecological flow has evolved considerably, and is open to multiple interpretations. It generally refers to the obligation to respect a minimum flow in a natural water body so as to maintain its values and the goods and services it provides (drinking water, aquifer recharge, recreational uses, fisheries, etc.). Nevertheless, it is important to point out that merely recognising that the environment is a “water user” is not enough; there have to be organisational, preventive, dissuasive and participatory measures in place to ensure its protection.

The Convention has sufficient support; after being ratified by Vietnam in May 2014,<sup>33</sup> it officially entered into force on 17 August that same year. Spain had signed the Convention in September 2009.

---

33 [https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII12&chapter=27&lang=e](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII12&chapter=27&lang=e). Consulted in January 2015.

In 2004, the International Law Association (ILA) adopted the “Rules on Water Resources” document<sup>34</sup> in Berlin. The document sets out regulations for nations to follow with respect to water within their boundaries and water they may share; it regulates behaviour in wartime, when nations are not permitted to take action that may result in a shortage of life-sustaining water for civilians, unless a nation being invaded is compelled by military emergency to disable its own water supply, or that may cause undue ecological damage. Poisoning water necessary for survival is in all cases forbidden.

The main objective of the document is to ensure the right of every individual to equal access to water to sustain life without discrimination, even in times of war. It requires states to enable their citizens to participate in decisions affecting water access, and also mandates the compensation of those who are displaced in the interests of securing water preservation.

In conclusion, we can say that there are numerous shared river basins (figure 3), and that in many cases no agreements or partial agreements have been signed between the countries concerned. Four of the world’s largest river basins (the Amazon, Ganges, Congo and Orinoco) are shared.<sup>35</sup>



Figure 3: International water conventions and treaties.<sup>36</sup>

34 INTERNATIONAL LAW ASSOCIATION (ILA). Law on Water Resources. Project presented at the Berlin Conference, 4–21 August 2004.

35 Conclusiones 3er foro 2008 Agua para el Desarrollo, Cooperación en cuencas Internacionales. Ed. Fundación Canal, Madrid 2008, p. 17.

36 Fernández Jáuregui C, Crespo Milliet A (2009). Las aguas transfronterizas en el marco de la crisis mundial del agua. Fundación Agbar, Barcelona, p 9.

## EXAMPLES OF TENSIONS OVER WATER

Water is an abundant resource, but its distribution over space and time is uneven. And because it is essential for life and numerous socio-economic activities, it is often a source of tension in some areas of the globe, particularly when it is in short supply, under constant exploitation or when states develop water management and utilisation policies that harm other states (or when the latter perceive this to be the case).

The principle of state sovereignty and autonomy governs international relations, i.e., a nation state's right to decide how to manage and preserve its natural resources. However, the environmental crisis and the new paradigm of a global ecosystem have raised international awareness of the limits of natural resources and the need to cooperate in their management. Alongside this, a growing population puts increased pressure on resources, including water, which is sometimes exacerbated by poor management that overlooks the need for water savings and quality. We are now faced with the necessity to create international rules for the administration of shared, limited and scarce resources, whose conservation concerns all of us.

Sometimes, national sovereignty has given way to cooperation in a bid to address the transboundary impact of environmental degradation. Considering the confrontational nature of international relations, it is necessary to move towards an international regime based on cooperation, not conflict.

Up until now, the main obstacles to this have been:

- The North/South divide in terms of development levels, with the South having very different consumption patterns in relation to natural resources.
- Sovereignty over resources, which some states are unwilling to give up, because they consider it vital for the consolidation of their situation and security.
- A lack of incentives for negotiations between states.

Water is not necessarily a source of conflict or cooperation, but it can give rise to tensions between countries that share basins over the many uses they make of water. Water scarcity undoubtedly leads to tension, as do other factors such as how water is shared, the relative power of each state in the basin and ease of access to the resource. We believe it is important to mention some of the conflicts between countries that share abundant water resources and where the International Court of Justice was required to intervene, before looking at other scenarios in which water scarcity is an issue:

- The construction of the Gabčíkovo-Nagymaros dam project on the Danube, signed between Czechoslovakia and Hungary and abandoned by the latter country. The Court ruled that Hungary did not have sufficient grounds for abandoning the project,<sup>37</sup> but it also called on the parties to agree on a satisfactory solution for the volume of water to be released into the old bed of the Danube.
- The installation of a pulp mill on the River Uruguay, between the Eastern Republic of Uruguay and Argentina. The International Court of Justice found that Uruguay had breached a number of its procedural obligations under the Statute of the River Uruguay, but that it had not breached its substantive obligations for the protection of the environment.<sup>38</sup>

A look at the map showing the areas suffering from water stress or scarcity (figure 4) may provide us with an insight into the current and future situation.

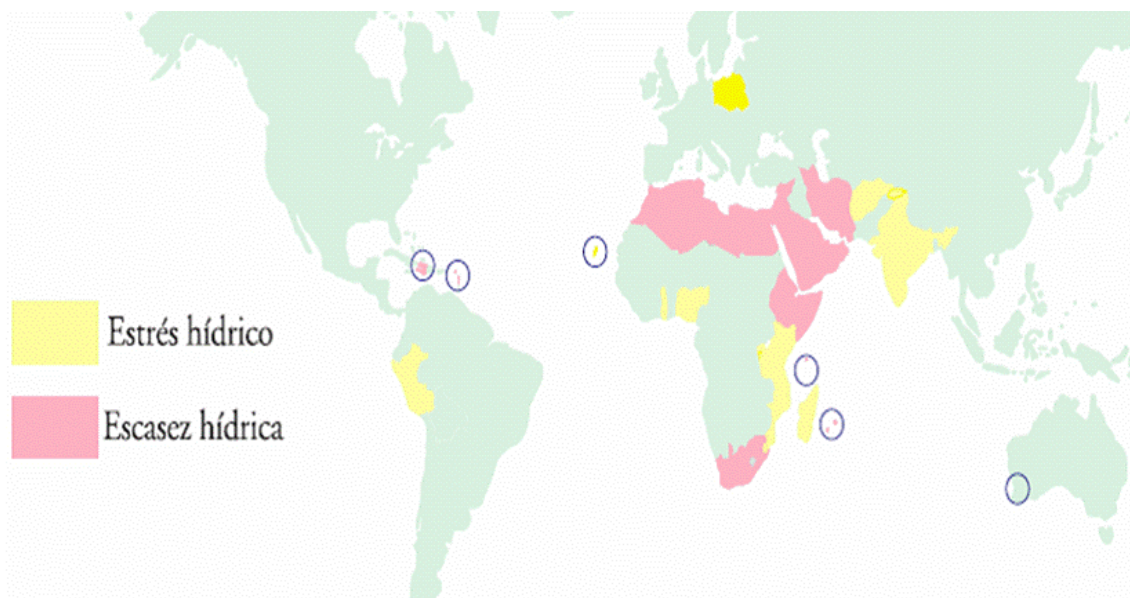


Figure 4. Countries subject to water stress or scarcity.<sup>39</sup>

As can be seen, there is a significant threat of conflict on account of water scarcity in the Middle East, in addition to the current instability in the region. Here, Syria,

<sup>37</sup> See the Ruling of the International Court of Justice in relation to the Gabčíkovo-Nagymaros project (Hungary Vs Slovakia) of 25 September 1997.

<sup>38</sup> Ruling of the International Court of Justice in relation to the Pulp Mill on the River Uruguay (Argentina Vs Uruguay) of 20 April 2010.

<sup>39</sup> Fernández Jáuregui C (2000). El agua como fuente de conflictos. Repaso de los focos de conflictos en el mundo. Programa Hidrológico Internacional. Unesco, p 3.

Jordan, Israel, Egypt and Yemen are in open conflict, and there is a latent conflict in Saudi Arabia, Iraq, Kuwait and Libya. The UNESCO has described the tension in the Middle East as the ticking time-bomb of the 21st century.<sup>40</sup>

This situation can only be understood when we analyse the definition of a shared basin, where more than 50% of the water resources are shared with and dependent on neighbouring countries.<sup>41</sup>

It is only then that we can truly understand the words of Anwar el-Sadat when he said that water was “the only matter that could take Egypt to war again”.

Indeed, if anything, the current scenario is becoming more complicated. As can be seen from figure 5, the number of countries expected to experience water stress is increasing, and new sources of tension are emerging.

---

40 Seguridad y medio ambiente, especial medio ambiente 2011. [http://www.mapfre.com/fundacion/html/revistas/seguridad/nEspecial2011/cap7\\_5.html](http://www.mapfre.com/fundacion/html/revistas/seguridad/nEspecial2011/cap7_5.html). Consulted in January 2014.

41 Fernández Jáuregui C (2000). El agua como fuente de conflictos. Repaso de los focos de conflictos en el mundo, op. cit, p 7.

Región	1997	Escenario 2025
América del Norte	-	-
Europa Occidental	Bélgica	Bélgica
Pacífico	-	-
Ex URSS	Azerbaizhán	Azerbaizhán
	-	Turkmenistán
	Uzbekistán	Uzbekistán
Europa Oriental	-	-
África	-	Argelia
	Egipto	Egipto
	Libia	Libia
	-	Marruecos
	-	Sudáfrica
	-	Túnez
América Latina	Perú	Perú
Oriente Medio	Afganistán	Afganistán
	Arabia Saudí	Arabia Saudí
	Bahrein	Bahrein
	Irán	Irán
	Irak	Irak
	Israel	Israel
	Jordania	Jordania
	Kuwait	Kuwait
	Qatar	Qatar
	Unión de Emiratos Árabes	Unión de Emiratos Árabes
	Yemen	Yemen
China	-	-
Sudeste asiático	Corea	Corea
	Pakistán	Pakistán
	-	Singapur

Figure 5. Countries suffering from water stress, 1997 and 2025 scenarios.<sup>42</sup>

Many analysts work on the assumption that the scarcity of such a vital resource as water leads to conflict. This certainly seems plausible: the less water we have, the more valuable it becomes and the more likely people (and states) are to fight over it. Nevertheless, systematic research into conflict indicators on transboundary waters has failed to find any statistically significant physical parameter.<sup>43</sup>

42 Fernández Jáuregui C (2000). El agua como fuente de conflictos. Repaso de los focos de conflictos en el mundo, op. cit, p 7.

43 Kramer A., Wolf A., Carius A., Dabelko G. Managing Water Conflict and Cooperation. Op cit., p. 9.

Hence, countries with arid climates are no more inclined towards conflict than humid ones and it was even found that international cooperation increased during droughts. Indeed, no causal link was found between any of the variables: democracies were as prone to conflict as autocracies; rich countries as much as poor ones, densely populated countries as much as sparsely populated ones and large nations as much as small ones.

Carius et al <sup>44</sup> argue that conflict is not the inevitable outcome of scarcity.

When Oregon State University researchers looked closely at water management practices in arid countries, they found institutional capacity was the key to success. Naturally arid countries cooperate on water: to live in a water-scarce environment, people adapt to it by developing institutional strategies: formal treaties, informal working groups or generally warm relations<sup>45</sup>.

They found that the likelihood of conflict increased significantly if two factors came into play:

- First, conflict is more likely if the basin's physical or political setting undergoes a large or rapid change, such as the construction of a dam, an irrigation scheme or territorial realignment.
- Second, conflict is more likely if existing institutions are unable to absorb and effectively manage that change.

Seeing as it is impossible to even briefly analyse all the current hotbeds of tension, let us take a look at the more significant ones.

## The Middle East

The region has a semi-arid climate, with arid and desert zones in some areas. Political instability has been a constant in the region since the mid-20th century, mainly on account of the Arab-Israeli conflict following the creation of the State of Israel after World War II and the absence of a Palestinian state.

---

44 CARIUS, A., Dabelko, G. D. AND Wolf, A. T. Water, Conflict, and Cooperation. ECSP Report, No. 10, pp. 60–66. 2004.

45 Kramer A., Wolf A., Carius A., Dabelko G. Managing Water Conflict and Cooperation. Op cit, p 9.

Israel's control of the territory also extends to water resources. Indeed, the map of settlements in the West Bank was designed to protect the territory's water resources, not just to ensure the security of the Israeli border.<sup>46</sup>

Water resources are scarce and concentrated in the River Jordan which rises in the Golan Heights in the north and flows southwards through the Sea of Galilee before emptying into the Dead Sea. The main water artery starts in the Golan Heights, Syrian territory occupied by Israel in 1967 and in 1973, and regarded by Israel as a strategic region from the perspective of territory and water supply. Israel zealously guards the water resources it secured following confrontations with Syria, Jordan and Lebanon in the conviction that the Jewish People "will make the desert bloom". One example is Israel's threat to bomb the "dam of unity", a joint project of Lebanon and Syria in order to be able to utilise the waters of the Yarmouk River, a tributary of the Jordan River, if it ever materialises.

Water scarcity is particularly acute in the West Bank, where Israeli, Palestinian and Jordanian interests and demands for water converge. Here and in Gaza the amount of water available per person per year is way below 100 cubic metres (with almost total dependence on groundwater), while in Israel the figure is somewhat below 300 m<sup>3</sup> and in Jordan it is around 100<sup>47</sup> (a country is considered to have a water shortage if availability is below 1,000 m<sup>3</sup> per person per year). This contrasts with the situation of the Israeli settlers in the West Bank, who have significantly more water than the Palestinians.<sup>48</sup> The Israelis are allowed to drill for wells to a depth of 800 metres, while the Palestinians are not allowed to go below 120 metres, therefore the salinity levels of the water are much higher.

The situation is worse in Gaza, where the economy is based on intensive farming, there is no surface water, an already dense population continues to grow and there is a structural shortage of water, all in addition to varying water prices: higher prices for Palestinians than Israeli settlers (who receive subsidies). The pressure on scarce water resources has led to increased contamination of the aquifers, which further exacerbates water shortages and conflict.

Having said that, Israel, Palestine and Jordan have maintained a basic level of cooperation in this field.<sup>49</sup>

---

46 FAJARDO T. El Agua de Palestina bajo el régimen de ocupación de Israel. In GUTIÉRREZ ESPADA et al., op. cit.

47 JAGERSKORG A. Reparto del agua entre israelíes, jordanos y palestinos. Un Mundo de Ciencia, op.cit.

48 HUMAN DEVELOPMENT REPORT 2006, Beyond scarcity: Power, poverty and the global water crisis. United Nations Development Programme. 2013, p 38 (Spanish version).

49 Kramer A., Wolf A., Carius A., Dabelko G. Managing Water Conflict and Cooperation. Op cit,

Between 1953 and 1955, E. Johnston, the U.S. ambassador to Israel, attempted to secure multilateral agreements in the Middle East and set up a quota system for the shared waters of Lake Tiberias. The plan was to be developed by an international committee, which was to allocate the water resources equitably, economically and efficiently. Although an agreement was drawn up and accepted by each country's expert team, Israel and the Arab League refused to sign it for political reasons (they did not recognise the State of Israel).

The peace agreement between Israel and Jordan (Madrid, 1991) provided for the creation of a joint water committee, which has helped to settle disagreements over distribution. The committee has continued to meet and work even during the tensest moments.

In addition, there is a provisional agreement (1995) between Israel and Palestine, although the latter considers it inadequate in terms of water rights and availability. There is also a general agreement on essential cooperation in relation to shared water resources and Israel's recognition of the Palestinians' right to water. In this respect, we should highlight the creation of a joint committee whose resolutions are adopted unanimously, which has therefore led to the deadlocking of projects.

Although water had little to do with the outbreaks of violence between the Arabs and Israelis in 1967, 1973 and 1982, it was an important source of political tension and dispute in the negotiations that ensued<sup>50</sup>.

In addition to resolving the border issue, it will be essential to adopt appropriate and equitable formulas if peace is to be achieved in the region.

## Central Asia

Another region where water is scarce is in the centre of the continent of Asia, miles from any ocean and separated from the coast by large mountain ranges that give the region a sharp continental climate.

---

p 7.

<sup>50</sup> Kramer A., Wolf A., Carius A., Dabelko G. *Managing Water Conflict and Cooperation*. Op cit, p 4-5.



Figure 6: Political map of Central Asia.

There are several points of conflict, including:

*Management and utilisation of the Amu Darya and Syr Darya rivers*



Figure 7: Amu Darya and Syr Darya river basins, the main rivers that flow into the Aral Sea.<sup>51</sup>

Kyrgyzstan and Tajikistan are the region’s two major “water producers”, given that it is here that the region’s largest rivers either rise or are supplied with water: the endorheic rivers of Amu Darya and Syr Darya (much smaller than the former), both tributaries of the Aral Sea. And further downstream, we have Uzbekistan, Turkmenistan and Kazakhstan, which rely heavily on the water resources of the aforementioned rivers.

During the Soviet era, large irrigation systems were built for the large-scale production of cotton taking water from the Syr Darya, most of which is now in the territory of Turkmenistan and Uzbekistan. Water consumption in connection with these irrigations has had a huge impact on another conflict, which we will discuss later on - the reduction of the Aral Sea.

<sup>51</sup> <http://www.karakalpak.com/stanaral.html> (consulted on 16 January 2014).

Disagreement between the five countries in Central Asia is not over the scarcity or availability of shared water resources, but the equilibrium required to ensure sustainable harvesting of water between the easternmost region (Kyrgyzstan, Tajikistan, upstream), which produces 75% of the resource, and the floodplains (Uzbekistan, Turkmenistan and Kazakhstan, downstream), which consume close to the same percentage.<sup>52</sup>

Turkmenistan, Kyrgyzstan and Tajikistan have no significant oil or natural gas reserves to supply their population with electricity and heating.

Most of the electricity is supplied by hydroelectric plants, and the countries' water reserves are needed to produce electricity in the cold winter and irrigate the cotton fields downstream in the summer. Kyrgyzstan is developing the Kambaratinsk Dam project, which involves the construction of a number of dams on the Naryn River, a tributary of the Syr Darya River, while Tajikistan is building the great Rogun dam, primarily for hydroelectric purposes.

Hence, the geopolitical landscape is a highly complex one<sup>53</sup>, in which we are likely to see confrontations or, at the very least, conflicting interests between the countries that control the headwaters of the two rivers (Kyrgyzstan and Tajikistan) and the other countries in the region (Uzbekistan, Turkmenistan and Kazakhstan).

### *Reduction in the volume of water and surface of the Aral Sea*

The volume of water and surface of one of Central Asia's largest inland lakes has been falling drastically since the late 20th century. This phenomenon has largely been attributed to the drastic expansion of irrigation in the cotton fields in the mid and lower sections of the Syr Darya and Amu Darya rivers.

The irrigated area was increased to seven million hectares (figures 8), for which purpose over 90 dams and around 24,000 kilometres of irrigation canals had to be built. These huge projects were developed when the region belonged to the Soviet Union, when planning was centralised.

---

52 Campíns M. Los retos de la cooperación regional en Asia Central: más sombras que luces en la gestión de los recursos hídricos compartidos. Revista electrónica de Estudios Internacionales No. 19 (2010), p. 6.

53 Campíns M. Op.cit.

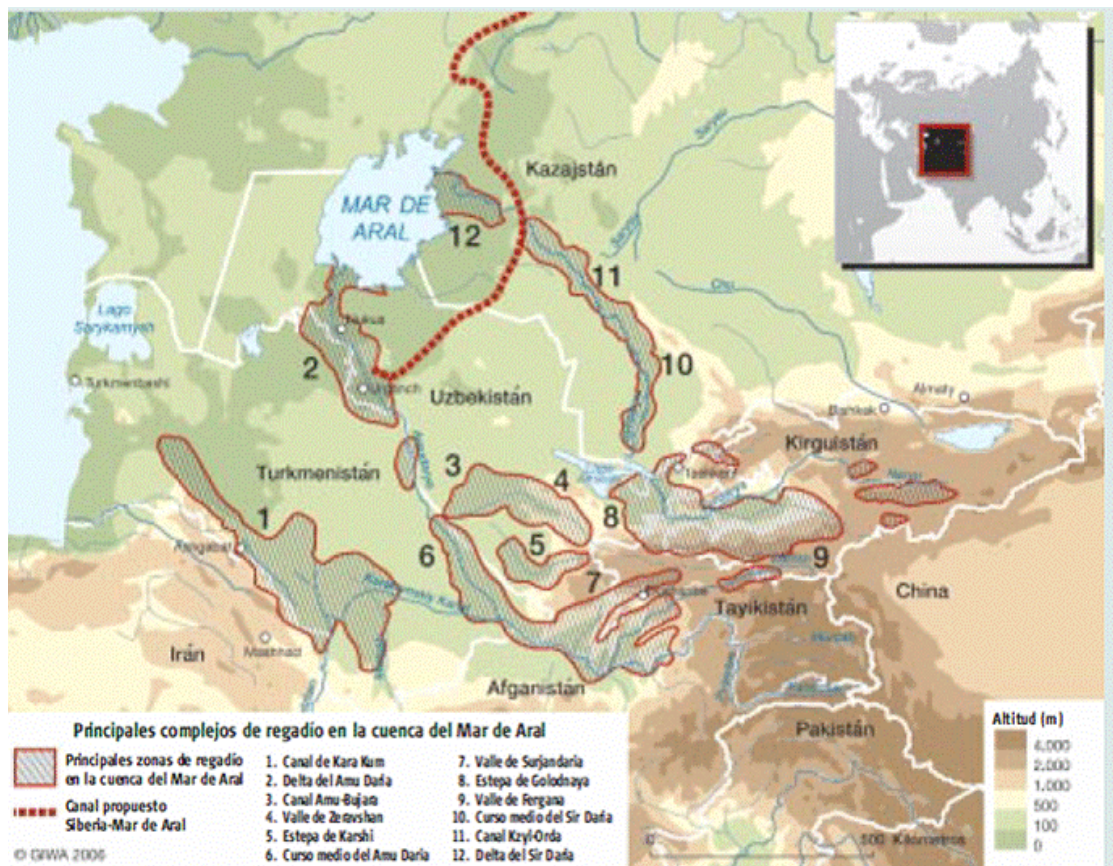


Figure 8: Main irrigation areas in the Aral Sea basin.<sup>54</sup>

The heavy exploitation of the main tributaries of the Aral have caused a drastic drop in water supply, and have reduced the volume of the basin by approximately 75% since 1960, when it was Central Asia’s second largest water mass. The original lake bed has been reduced to a series of disconnected lake basins (figure 9), and because it is a salt lake, its dry bed is covered with a crust of salt containing chemicals from irrigation runoff.

This crust is dragged by the wind, causing the so-called “salt depositions”, either dry or in the form of rainfall, within a radius of thousands of square kilometres, causing soil salinity and, therefore, loss of fertility. In addition, the health of the people living in surrounding area has also been affected, and the number of respiratory diseases and cancer has risen exponentially.

54 Water, a Shared Responsibility. Second UN World Water Development report. (2006). Zaragoza, p 183 (consulted in Spanish).

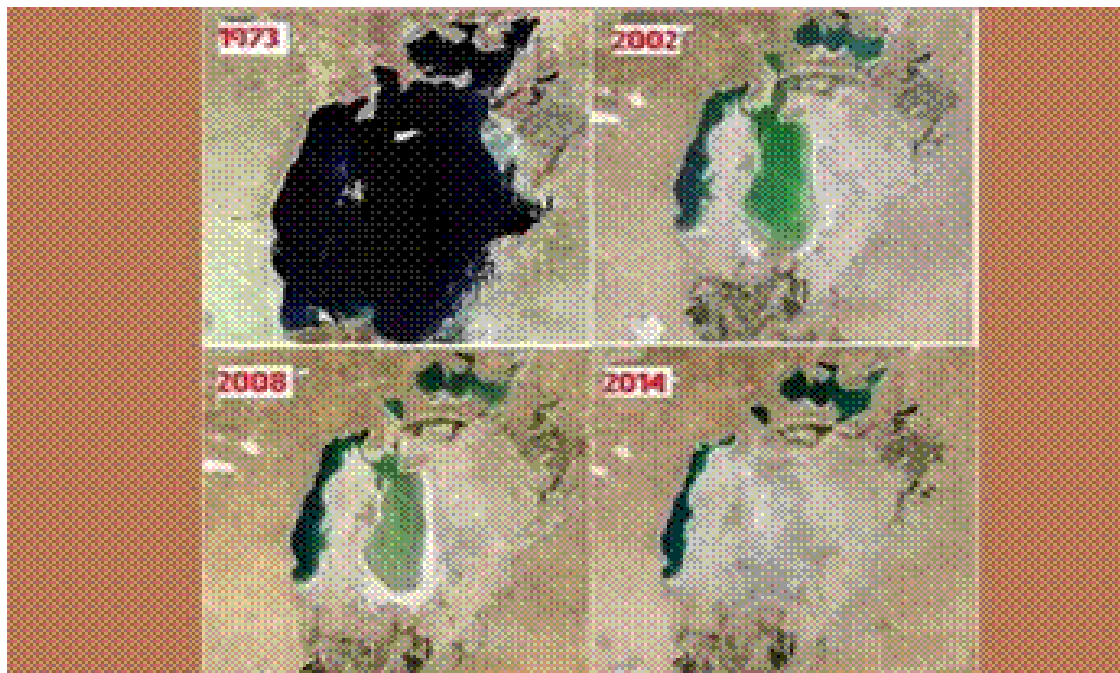


Figure 9: Satellite images of the Aral Sea area.<sup>55</sup>

The situation has also caused a reduction in fish catches. The raw material for an important processing industry and exports, catches fell from 50,000 tons in 1959 to 5,000 tons in 1994.<sup>56</sup> In addition, there has been a dramatic drop in the biodiversity of the waters and seashores, which have become virtual fossil coasts, kilometres from where the water is today.

The Aral Sea is between Kazakhstan and Uzbekistan, countries particularly affected by the previously described problems, although the salts and chemicals are carried by the wind within a radius of several kilometres of the lake.

### *The division of the Nile*

The Nile is the longest river in the world (6,700 kms from the source, the Kagera tributary). The Nile basin is characterised for great geopolitical complexity and growing instability, and marked by natural variety and diversity, poverty (four of the poorest countries in the world share its waters), strong population growth and environmental instability and degradation.

<sup>55</sup> <http://www.lavanguardia.com/natural/20141001/54416512573/el-mar-de-aral-marca-un-nuevo-record-de-tragica-sequia.html>. Consulted in January 2015.

<sup>56</sup> Water, a Shared Responsibility. *op cit*, 183.

The basin is shared between eleven countries, including South Sudan. The key to the volume of flow of the Nile, which crosses the Sahara lengthwise, lies in its two main sources of water: lakes Victoria and Albert, the primary feeder rivers (known as the White Nile) and the mountains of Ethiopia, which experience abundant rainfall during the rain season, where the Blue Nile forms, which is further fed by Lake Tana (figure 10). Without a doubt, the countries that most benefit from the Nile's waters are Sudan and, most especially, Egypt, where there is hardly any rainfall (very little in Sudan) and where evaporation is even higher than precipitation.

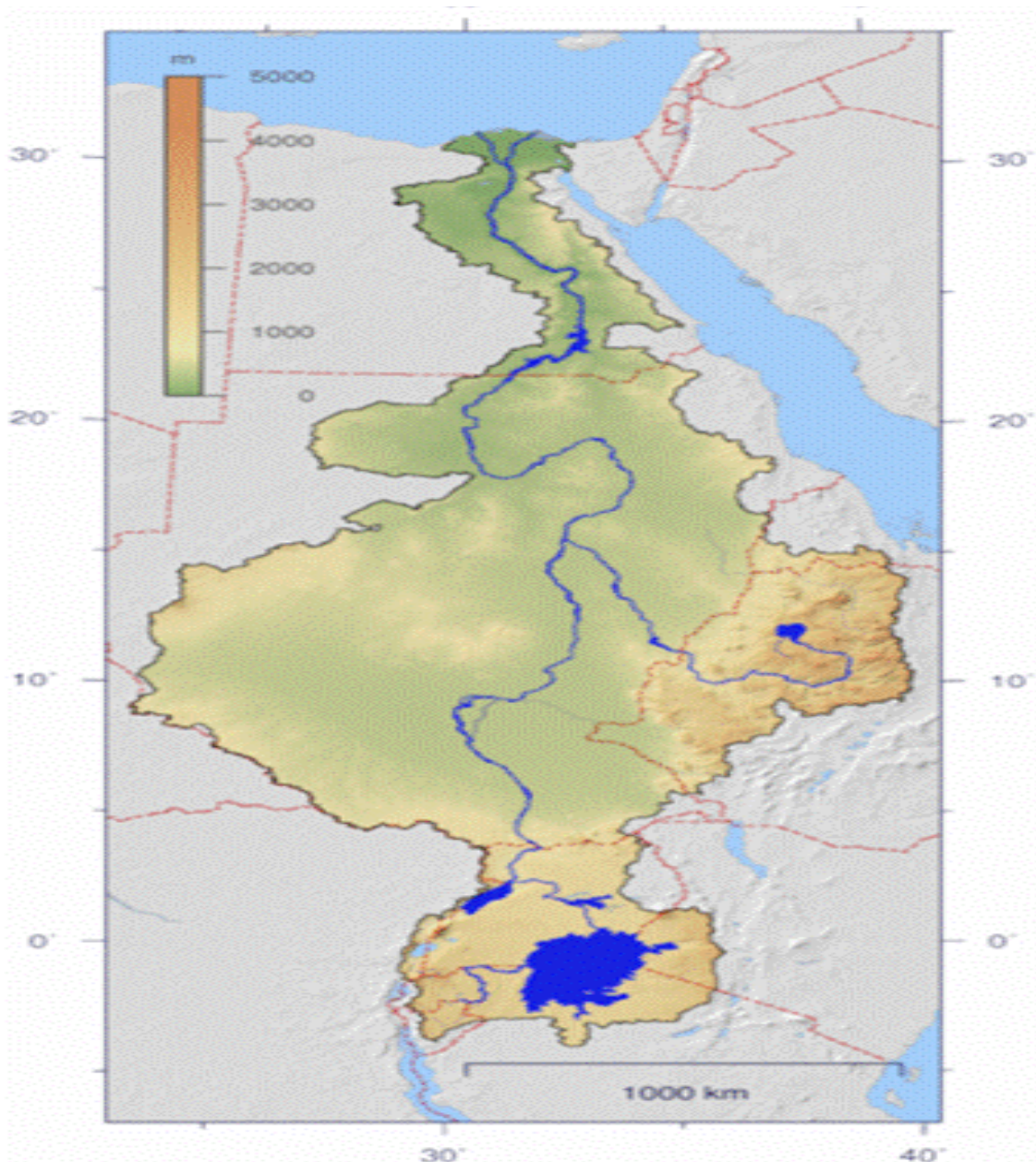


Figure 10: The Nile River Basin.

The sharing of the Nile has been a constant source of dispute. In 1929, when the region was under British rule, an international treaty for the sharing of the Nile's water was signed. Minor amendments were made to the treaty in 1959 (by which time Egypt and Sudan gained independence), and Egypt was given a privileged position: more than 50 billion cubic metres (out of a total of 84 billion); a considerable amount for a country that contributes very little to its volume, in addition to the right to veto the construction of any dams outside its borders.<sup>57</sup> It was therefore granted a huge amount of control over the river, including the use of its waters by the countries upstream. The treaty did not include Ethiopia, a country with a large section of the river on account of the Blue Nile.

Egypt and Sudan together control more than 90% of the River Nile, which the other countries in the basin consider unfair. Egypt argues that the water should be shared according to the needs of each country, not the contribution of each one. Indeed, tributaries from the main river fulfil approximately 95% of Egypt's water needs (the country that uses the least water in relation to the total population of the river basin).

Spurred on by their discontent, seven non-Arab countries signed the Entebbe agreement in 2010, which amended the sharing of the basin to the benefit of the signatory states and thus put Egypt on the alert. The latter, like Sudan, refused to sign the agreement, thus exacerbating the tension. A year later, Ethiopia announced a major extension to its "Renaissance" hydroelectric power plant (in the initial stage) so that it could increase its irrigation area. Egypt's discontent is evident. Documents leaked by WikiLeaks indicate the country's desire to halt the Ethiopian project, even by force, if necessary. According to Cairo, Addis Ababa and Khartoum (united by common interests) were planning to set up an air base in Darfur. Another move Egypt considered was to cut off external financing, seeing as Ethiopia does not have the funds needed on its own.

The aforementioned tensions come within the context of traditionally poor relations between Egypt and the countries in the middle and upper sections of the basin, as well as ignorance of the African nature of the country. Following the revolution of 2011, we are seeing indications that Egypt would like to settle the water conflict diplomatically. The amount of contact and visits by Egyptian delegations to other countries in the basin has increased and a joint committee has been set up with Ethiopia to study the impact of the "Renaissance Dam". Without a doubt, closer cooperation between Egypt and the other countries in the basin will help ease the tension, and policies aimed at saving water, creating public awareness and better flood irrigation techniques should help Egypt to reduce its dependency on the Nile.

---

<sup>57</sup> Espinosa A "La Guerra del Agua" Egipto vs Etiopía. <http://www.ort.edu.uy/facs/boletininternacionales/contenidos/168/enfoquesunoi66.html>. Consulted on 12 January 2014.

*The Chad Basin*

This lake is situated between Niger, Nigeria and Chad. The surface runoff of a large endorheic basin shared between eight countries in the heart of the Sahel, some of which are the poorest in the world, run into this lake. The climate is tropical with very marked dry and wet seasons. From time to time, it shows arid characteristics, when the precipitation associated with the Inter Tropical Convergence Zone, and typical of the rainy season, is not intense. Rainfall is generally heaviest in the south and very sparse in the north, where the Sahara Desert is located (figure 11)

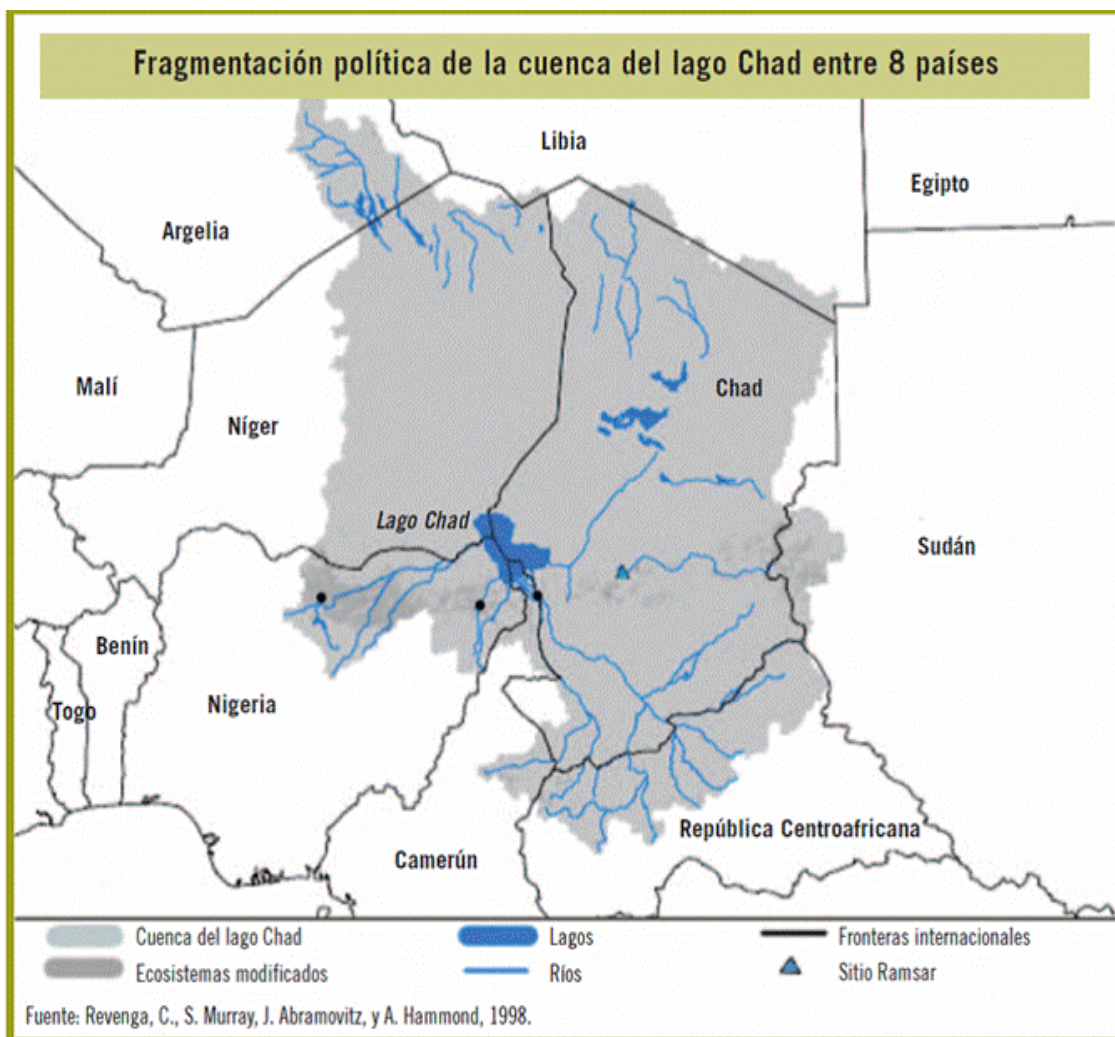


Figure 11. Lake Chad endorheic basin.<sup>58</sup>

58 Fernández Jáuregui C, Crespo Milliet A (2009). Las aguas transfronterizas en el marco de la crisis mundial del agua. Fundación Agbar, Barcelona, p 11.

With saline features, it is Africa's largest wetland area (not counting the lakes in East Africa). It is home to a wealth of biodiversity comprised of mammals, birds and fish, which have resulted in a thriving fish export business, particularly to Nigeria.

In 1963, the lake occupied an area of 23,000 km<sup>2</sup>, but this had fallen to under 2,000 km<sup>2</sup> by the mid-1980s due to a number of factors, but particularly:

- The major droughts that affected the Sahel during the 1970s and '80s, significantly reducing rainfall during the wet season and causing severe famines.
- Overgrazing and the elimination of the plant cover for different reasons affected precipitation by reducing average relative humidity levels. This also facilitates erosion and hinders soil regeneration, which in turn impedes natural revegetation, especially species that require good quality soils.
- Irrigation projects with water from tributaries of the lake (in Nigeria, Cameroon, Chad and Niger), which prevent natural replenishment by breaking the balance between evaporation and compensation.

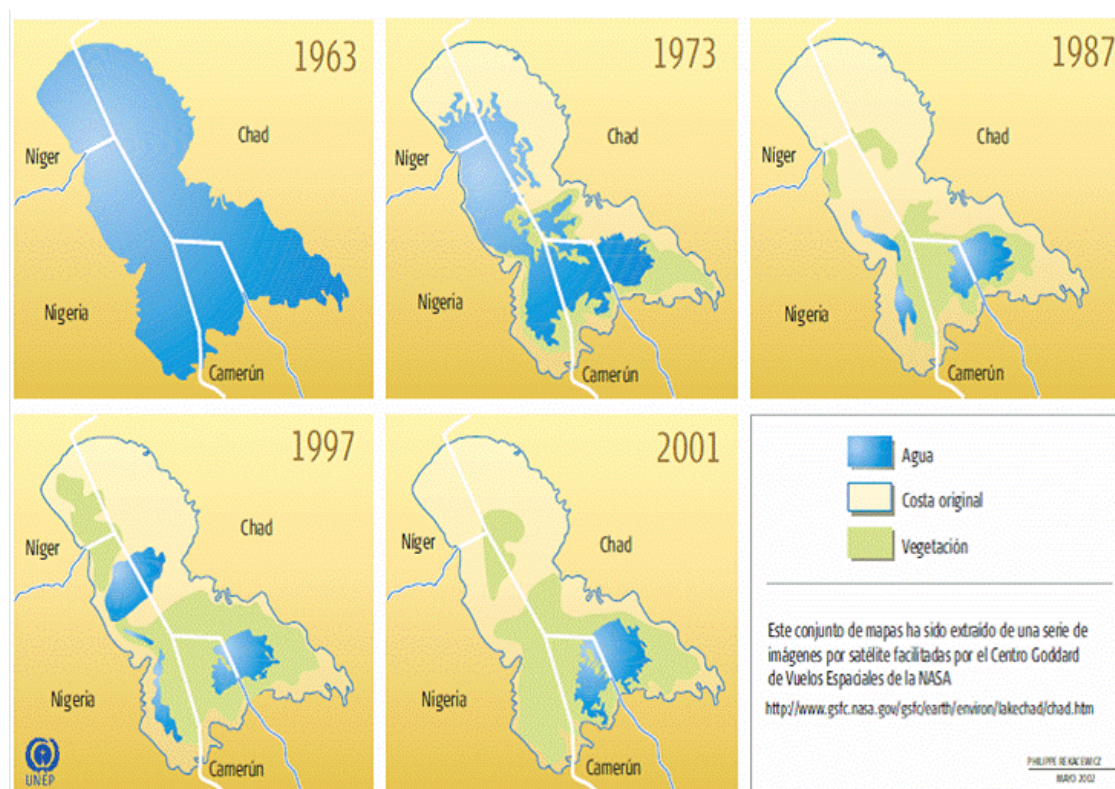


Figure 12: Evolution of Lake Chad.<sup>59</sup>

In the late 1990s, the level of the lake began to rise, although rainfall had been decreasing between 1900 and 2005, according to the Fourth Assessment Report by

.....

<sup>59</sup> Water, a Shared Responsibility, op cit, p 182.

the Intergovernmental Panel on Climate Change (IPCC).<sup>60</sup> This caused the area covered by water to rise, especially in the south, although the aforementioned report foresees an increased risk of drought and a likely drop in rainfall in tropical latitudes with semiarid climates. This could result in water shortages, increased salinity of the soil and the area around the lake as a result of dehydrated salts from the substrate being carried by the wind and a drop in fish numbers, in addition to other adverse effects for the biodiversity and natural assets of the area, such as a reduction in or the extinction of certain fish species and birds that migrate to Europe in the summer. The environmental degradation of the Lake and its surroundings would lead to poorer living conditions, and particularly food insecurity, with the consequent risk of mass migration and new conflicts.

### *Dams in the Mekong River Basin*

The Mekong River is Asia's seventh longest river, and the main waterway in the southeast region. It runs from the eastern Tibetan Plateau to southern Indochina and forms the borders of seven countries (China, Burma, Thailand, Laos, Cambodia and Vietnam). It is home to a wealth of fish species, with some 26 million tons of fish being caught in its waters every year<sup>61</sup>. It is the habitat of an estimated 1,200 fish species, some of which are endemic, and a population of approximately 70 million people, many of whom live off the river.

In 1995, the latter four countries set up the Mekong River Commission (MRC)<sup>62</sup> as part of an agreement to coordinate the sustainable use of the river's resources, with China and Burma later becoming "dialogue partners".

There are currently three dams in operation in the basin (figure 13), and two under construction (upper basin). Furthermore, the riparian countries have plans to build an additional fourteen dams in the middle and lower courses.

---

60 Fourth ASSESSMENT REPORT OF THE IPCC (Summary Report). 2007.

61 FAYANÁS E. <http://www.nuevatribuna.es/articulo/medio-ambiente/el-mekong-la-muerte-de-un-ro/20110412124605053267.html>. Consulted on 15 January 2014.

62 <http://www.mrcmekong.org/> Consulted in February 2014.



Figure 13: Dams built, under construction and planned for the Mekong River.<sup>63</sup>

In a strategic environmental assessment from 2010,<sup>64</sup> MRC concluded that the dams would cause serious damage to the river's ecological functioning, driving the migratory fish species to extinction (Mekong giant catfish, one of the largest fish in the river) and, hence, causing significant damage to the local economies.

The sediment carried by the river would also disappear, thus seriously affecting the recharge of the Delta, which would end up becoming stagnant or begin to recede. In addition, the salinity of the groundwater and soil would increase as a result of the advancement of the seawater, adversely affecting Vietnam's most fertile lands and, therefore, its economy.

63 Kramer A., Wolf A., Carius A., Dabelko G. *Managing Water Conflict and Cooperation*. Op cit, p 12.

64 Kramer A., Wolf A., Carius A., Dabelko G. *Managing Water Conflict and Cooperation*. Op cit, p 12.

In 2011, the Commission announced that there was dissent among the countries in the basin over Laos's announcement to build a hydroelectric dam. This was the Nam Theun dam (420 kilometres long<sup>29</sup>) which will directly affect the lives of 7,000 people. It will have a generation capacity of 1,070 MW, 1.5 times the country's current capacity, of which 95% will be exported to Thailand.

The Laotian government had initially awarded the project to a Thai company; however, in 2012, the project was temporarily suspended so that changes could be made to reduce the dam's impact on the environment. By last November the changes had been made and construction had resumed.

In the past, this region has suffered dramatic situations and wars. Recent decades, however, have brought stability and the region is experiencing steady economic growth, especially in the coastal districts. Economic exploitation of this great river causes tensions and disagreements because of the environmental and socio-economic impact of hydroelectric projects whose economic benefits have had adverse implications for certain people and the natural environment.

## The Tigris and Euphrates rivers

As far as we know, it was in this area that the first war over water took place around 3,000 years ago, and it was resolved with the first agreement over shared water.<sup>65</sup>

The two rivers, which define Mesopotamia, rise in Turkey (figure 14), which enjoys a privileged position over the other countries in the Tigris-Euphrates basin (Syria and Iraq). As a result, Ankara is at an advantage when it comes to controlling the two rivers, given that the two upper sections are in Turkish territory. The case is similar to that of the Blue Nile in Ethiopia, except that Turkey has much more political and economic power and is much more stable, also compared with its neighbours, Syria and Iraq.

There is no treaty to regulate the shared use of these two great rivers, which run through a very unstable but extremely valuable area and supply energy to distant countries, given that they both empty into a single estuary (Shatt al-Arab) in the Persian Gulf. There is, however, a large-scale hydroelectric power plant project underway, known as the South-eastern Anatolia Project (the only Turkish region with a shortage of water), also called the Güneydoğu Anadolu Projesi (GAP).

---

65 VAN DER VALK, M. and KEENAN, P. (Edits). *The right to water and water rights in a changing world*. Colloquium Paper. Delft, The Netherlands, 2011, p 6.



Figure 14: Map of the Mesopotamia region and the Tigris and Euphrates river channels.

The GAP is comprised of 13 subprojects (6 on the Tigris and seven on the Euphrates), and includes the construction of 21 dams and 19 hydroelectric plants. One large dam is worth a special mention – the Atatürk. The project will enable the irrigation of approximately 1.7 million ha of the 3.5 million hectares suitable for crop-growing in southeast Turkey (figure 15).

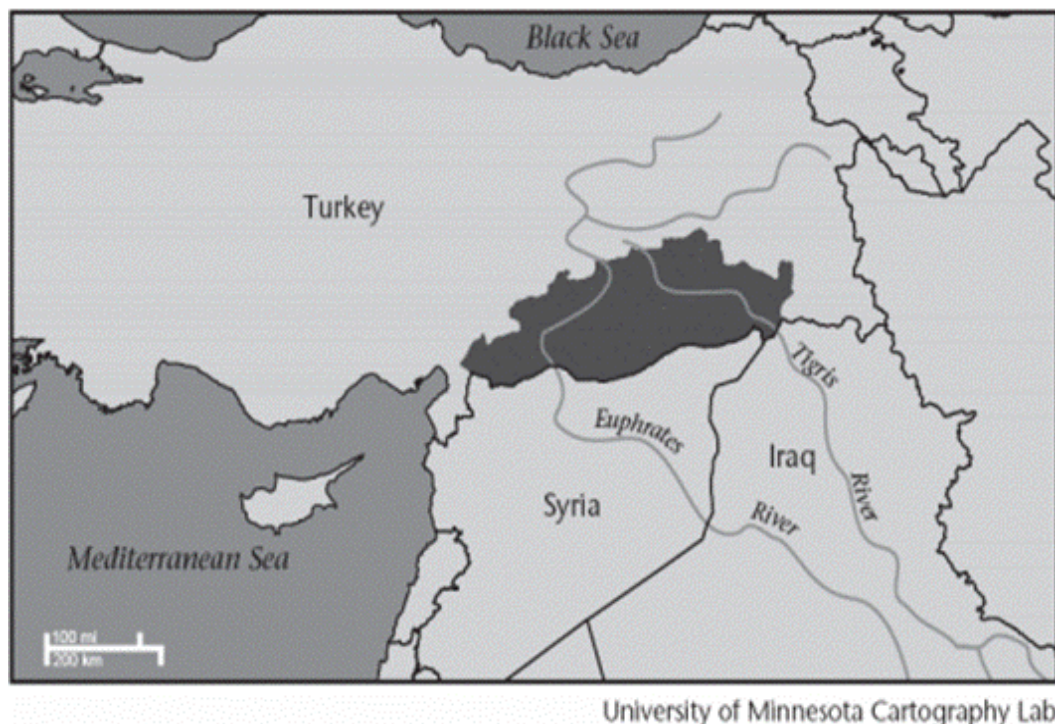


Figure 15: The area affected by the changes contemplated in the GAP project.<sup>66</sup>

This is a major project funded by Turkey and rejected by the neighbouring Arab countries, particularly Syria and Iraq, who can see how they are becoming increasingly dependent on Turkey which controls the use and management of water in the upper basins.

Although Turkey proposed the construction of a large aqueduct (“a peace aqueduct”) to carry water from the Seyhan River (which flows into the Mediterranean Sea) to Syria, Jordan and Saudi Arabia, the latter countries rejected it in a bid to avoid becoming over-dependent on Turkey.

Turkey is currently using the power it has over water to pressurise its neighbour Iraq in exchange for oil and Syria in exchange for withdrawing its support for the Kurdish separatists, seeing as approximately 40% of the Kurdish population is living in Turkey, and is the majority population group in many eastern parts of the country.

.....

<sup>66</sup> <http://ejts.revues.org/docannexe/ima...1-small480.png> (consulted on 17 January 2014).

## CONFLICT RESOLUTION AND COLLABORATION IN THE MANAGEMENT OF WATER RESOURCES - “GEOWATER”

Water is a finite, irreplaceable and essential resource which, in most parts of the world, is most commonly found in the form of surface freshwater that is distributed via lake and river basins shared by several countries. Accordingly, it is likely to be a source of dispute and conflict, although it can also constitute a meeting point between states looking for fair, equitable and sustainable water exploitation formulae.

Sources of potential water conflicts include the following:

- Scarcity (permanent and temporary)
- Differences in goals and objectives
- Complex social and historical factors (including pre-existing antagonisms)
- Lack of social engagement, i.e., when policies are developed by governments who have different interests or fail to involve those directly affected by water policy decisions
- Misunderstandings or ignorance of circumstances and data
- Asymmetric power between localities, regions or nations
- Significant data gaps or questions of validity and reliability
- Specific hydro-political issues at stake (dam construction or diversion of water, water abstractions for different purposes)
- Non-cooperative settings and value conflicts, especially in terms of water mythology, culture and water symbolism.

<b>2002</b>	<ul style="list-style-type: none"> <li>● A principios de 2002, la organización Amigos de la Tierra de Oriente Medio inició el proyecto Buenos Vecinos del Agua con el objetivo de sensibilizar a la población sobre los temas relacionados con el agua y el medio ambiente en la región. Se han puesto en marcha varios programas de cooperación en Jordania, Palestina e Israel cuyo objetivo es promover el intercambio de ideas e información entre las distintas comunidades que habitan en la región. Estos programas han promovido también la campaña para proteger el río Jordán, que reúne a las partes concernidas de la región en torno a la labor conjunta de preservar el curso de este importante río.</li> </ul>
<b>2003</b>	<ul style="list-style-type: none"> <li>● En las conversaciones mantenidas entre India y Bangladesh en el marco de la Comisión Fluvial Conjunta, en septiembre de 2003, India aceptó incluir a Bangladesh en las discusiones futuras acerca del controvertido proyecto fluvial, valorado en 200.000 millones de dólares estadounidenses (172.000 millones de euros), que aportaría agua para la irrigación desde las cuencas del Ganges, Brahmaputra y Meghna a Haryana y Gajarat. En febrero de 2004, Bangladesh solicitó al Gobierno de la India que, antes de iniciar el proyecto, llevara a cabo una evaluación del impacto del proyecto sobre el medio ambiente y la biodiversidad.</li> <li>● En octubre de 2003, los Estados Unidos y México llegaron a un acuerdo sobre el agua utilizada para la irrigación. México, en deuda hídrica con Estados Unidos conforme a acuerdos previos, aceptó liberar agua de sus embalses para ayudar a los agricultores de Texas afectados por la sequía.</li> <li>● En noviembre de 2003, el Comité Técnico Permanente de la Cuenca del Limpopo estableció la Comisión del Curso de Agua del Limpopo (LIMCOM) con el objetivo de fortalecer la capacidad de gestionar mejor los recursos hídricos compartidos en la cuenca entre Sudáfrica, Botsuana, Mozambique y Zimbabue.</li> <li>● El 13 de diciembre de 2003, Irán firmó un contrato con Kuwait según el cual aquí se comprometió a suministrar agua potable a Kuwait durante por lo menos treinta años. Un volumen de 300 millones de m<sup>3</sup> anuales será transportado por una tubería de 540 km de largo, cuya construcción exigirá una inversión de alrededor de 2.000 millones de dólares estadounidenses.</li> </ul>
<b>2004</b>	<ul style="list-style-type: none"> <li>● En 2004, Kazajstán advirtió sobre una posible catástrofe ambiental relacionada con los planes de China de desviar el curso de los ríos Irtysh e Ili. Preocupaciones similares se han expresado ante la propuesta de científicos rusos de volver a considerar un viejo plan soviético de desvío del curso de los ríos siberianos Ob e Irtysh con el fin de abastecer al Amu Daria y al Sir Daria. Kazajstán y China firmaron un acuerdo de gestión de los recursos hídricos transfronterizos, pero la comisión conjunta creada no logró que sus intereses fuesen tomados en cuenta.</li> <li>● El proyecto Dniéster-Odra, iniciado en 2004, es un proyecto de Eco-TRAS, en asociación con ONG de Polonia y Ucrania, que fomenta la cooperación entre ONG locales y los Gobiernos estatales y locales en las grandes cuencas europeas. El proyecto tiene por objetivo compartir conocimientos en relación con la gestión integrada de las aguas transfronterizas de los ríos Dniéster y Odra.</li> <li>● En 2004, los países que comparten la cuenca del río Amazonas -Brasil, Bolivia, Colombia, Ecuador, Guayana, Suriname, Perú y Venezuela- renovaron su compromiso de reducir el daño medioambiental y proteger la mayor reserva de agua dulce del Planeta. Representantes de estos países acordaron crear tres grupos de trabajo que considerarían el impacto de la contaminación en el río Amazonas en una reunión de la Organización del Tratado de Cooperación Amazónica (OTCA) que tendría lugar en Río de Janeiro, Brasil.</li> <li>● A pesar de algunas dificultades esporádicas, los Estados ribereños de la cuenca del Nilo continúan su labor en la iniciativa para la Cuenca del Nilo (NBI), presentada oficialmente en 1999 como un proyecto que pretende fomentar el desarrollo conjunto y fortalecer las capacidades institucionales de la región del África oriental y de todos los Estados ribereños: Burundi, Congo, Egipto, Eritrea, Kenia, Ruanda, Sudán, Tanzania y Uganda. A finales de mayo de 2004, se implementó el Programa Transfronterizo de Acción Ambiental para la cuenca del Nilo, el primero de los ocho proyectos iniciados por el Programa de Visión Conjunta enmarcado por la NBI.</li> <li>● El 13 de julio de 2004, siete de las ocho naciones ribereñas del río Zambeze firmaron la Convención del Curso de Agua del Zambeze (ZAMCOM). Los Estados firmantes iniciaron el proceso de ratificación y su entrada en vigor, tras haberla ratificado dos tercios de los firmantes, se prevé para finales del año 2005.</li> <li>● El proyecto de Mejoramiento de la Gobernabilidad del Agua en la Cuenca del Volta, puesto en marcha en septiembre de 2004 por la Unión Internacional para la Conservación de la Naturaleza (IUCN) y la Agencia Sueca de Cooperación para el Desarrollo Internacional (SIDA), tiene por objeto ayudar a Burkina Faso y Ghana en su tarea para definir principios comunes y construir un marco de cooperación internacional para la gestión de la cuenca del Volta.</li> </ul>
<b>2005</b>	<ul style="list-style-type: none"> <li>● A comienzos de 2005, la Unión Europea lanzó el proyecto de investigación denominado El Agua y los Recursos Ambientales en el Desarrollo Regional (WERRD), cuyo objetivo consiste en analizar las políticas y mejorar los medios de vida en las cuencas fluviales internacionales. En la actualidad, el proyecto se centra en el río Oluwangi y cuenta con la participación de Botsuana, Inglaterra, Namibia, Sudáfrica y Suecia.</li> <li>● En 2005, Bolivia y Chile llegaron a un acuerdo para compartir las aguas subterráneas del Acuífero del Salta, que ha sido motivo de conflicto durante años. No obstante, aún debe decidirse acerca del estatus del Río Salta, una masa de agua que se disputan los dos países mencionados. Las conversaciones bilaterales se interrumpieron durante el mandato del Gobierno interino formado en Bolivia tras la renuncia del presidente Carlos Mesa.</li> <li>● En 2005, los Gobiernos de Honduras y Nicaragua solicitaron apoyo técnico y financiero a la Organización de los Estados Americanos (OEA) para mejorar sus relaciones fronterizas tras el desvío de las aguas del Río Negro a causa del huracán Mitch.</li> <li>● En abril de 2005, Amigos de la Tierra Canadá y Amigos de la Tierra Estados Unidos solicitaron al Gobierno de Canadá que presentara una denuncia ante la Corte Internacional de Justicia, con sede en La Haya, para que Estados Unidos detuviera la construcción del proyecto de desvío de las aguas del Lago Devil, en el estado de Dakota del Norte. Según Amigos de la Tierra, el proyecto trasladaría aguas contaminadas e introduciría especies acuáticas invasivas desde Estados Unidos a un río canadiense que fluye hacia la Bahía de Hudson.</li> <li>● Tras varios años de intentar que India interrumpa la construcción de la presa Baglihar en el río Chenab por considerar que ésta viola el Tratado de las Aguas del Indo, firmado en 1960, Pakistán ha solicitado la aplicación del mecanismo de resolución de disputas que consta en el Tratado. Ésta es la primera vez que una de las partes involucradas solicita la aplicación de dicho mecanismo. El Tratado establece que el Banco Mundial, que auspició su firma en 1960, debe designar un árbitro neutral para solucionar el conflicto.</li> <li>● En mayo de 2005, La Cruz Verde Internacional inició el diálogo sobre la cuenca del Plata, "Agua para la Vida", a través de su programa Agua para la Paz, en colaboración con Itaipu Binacional y el Comité Intergubernamental Coordinador de los Países de la Cuenca del Plata (CIC). En esas conversaciones de alto nivel han participado miembros de todos los sectores de la sociedad con el fin de identificar proyectos que contribuyan a mejorar la gestión de la Cuenca del Río de la Plata.</li> <li>● En junio de 2005, Guinea se incorporó a la Organisation pour la mise en valeur du fleuve Sénégal (OMVS), la Organización para el desarrollo del río Senegal, lo que ha reunido a los cuatro países ribereños (Guinea, Mali, Mauritania y Senegal) por primera vez en más de treinta años.</li> <li>● En julio de 2005, Israel, Jordania y la Autoridad Palestina firmaron un Memorando de Entendimiento según el cual se llevaría a cabo un estudio de dos años de duración para analizar los efectos sociales y medioambientales del transporte de grandes cantidades de agua a través de una tubería de 200 km de largo desde un pequeño canal en el Mar Rojo al Mar Muerto. El Banco Mundial aportó los 15 millones de dólares estadounidenses requeridos por el acuerdo.</li> <li>● En 2002, UNESCO y la OEA pusieron en marcha el proyecto sobre la Gestión de Recursos de Acuíferos Transnacionales (ISARM) de las Américas. El proyecto organizó tres jornadas, en 2003, 2004 y 2005, durante las cuales se presentaron los datos sobre aguas subterráneas transfronterizas recopilados en América del Norte, América Central y América del Sur y se hizo hincapié en la necesidad de hacer un seguimiento del proyecto.</li> <li>● En octubre de 2004, la UNESCO y la Universidad Aristóteles de Salónica, en Grecia, presentaron durante un taller conjunto un inventario preliminar de los acuíferos compartidos en el sudeste europeo. Éstos fueron los primeros resultados del proyecto ISARM-MED, que se publicaron en 2005 y pueden verse en este capítulo.</li> <li>● En 2005, la UNESCO y la FAO publicaron una recopilación de todos los tratados e instrumentos legales existentes en el campo del uso de los recursos de aguas subterráneas, compilación que se publicó bajo el título: <i>Groundwater in International Law: Compilation of Treaties and Other Legal Instruments</i>.</li> <li>● En 2005, la Comisión de Derecho Internacional de la ONU seguía trabajando en la elaboración de un instrumento legal sobre recursos hídricos subterráneos transfronterizos, proyecto iniciado en 2002.</li> </ul>

Figure 16: Timeline of geopolitical developments (international cooperation and conflicts) concerning water since 2002.<sup>67</sup>

67 Water, a Shared Responsibility, op cit, p 380.

Recent literature on the prevention and resolution of conflict over water has highlighted the need to move from descriptive studies towards the creation of measurable indicators that measure the performance of shared water systems, monitor the process of equitable sharing and provide the mechanisms for monitoring both the current state and changes in interdependent water systems.<sup>68</sup>

They must also provide more realistic insights through field studies<sup>69</sup> and include non-assessable variables on water resources (symbols, emotional or mythological charges and cultural values).

Theoretical approaches must be counterbalanced by practical examples of water sharing at every level.<sup>70</sup> Although there is great difficulty in measuring the performance, process and product of water sharing through quantitative and qualitative indicators, they can help us to develop the critical thresholds; articulate the interesting differences, as well as significant trends and developments; and put forward the data necessary for balanced decision-making. Useful indicators for the conflict prevention and resolution phases are the following:

— Operational/administrative interdependencies for sharing water:—Number of international basins and transboundary aquifers regulated by Resolution A/RES/63/124 on the law of transboundary aquifers<sup>71</sup> and applying to all types of transboundary aquifers.

- Dependency on inflow from other river basins.
- Impact on upstream water diversions and impoundments.
- Upstream and downstream integrative mechanisms.
- Systematic considerations of water users and uses interdependencies.
- High water stress, scarcity and poverty conditions.
- Basin-wide operational water planning and management.
- Surface and groundwater conjunctive use.
- Number of treaties and cooperative events.

---

68 Carius, A., Dabelko, G. D. and Wolf, A. T. *op cit*, p 61.

69 Gleick, P., Cain, N., Haasz, D., Henges-Jeck, C., Hunt, CKiparsky, M., Moench, M., Palaniappan, M., Srinivasan, V., Wolff, G. 2005. *The World's Water 2004–2005: The Biennial Report on Freshwater*.

70 *Water, a Shared Responsibility*, *op cit*, p 386.

71 RESOLUTION A/RES/63/124 ADOPTED BY THE UN GENERAL ASSEMBLY. The law of transboundary aquifers. 15 January 2009.

— On cooperation and conflict:

- Existing conflict accommodation and resolution mechanisms.
- Significant number of water treaties or conventions.
- Economic, scientific or industrial agreements.
- Cooperative events involving transboundary rivers.
- Unilateral projects, highly centralised water megaprojects.
- Existence of laws and regulations for fair water allocation.
- Stakeholders' involvement and participation mechanisms.
- Publication of joint inventories of transboundary resources.
- Effectiveness of community-based management.
- Newly internationalised river basins due to changes in borders and the emergence of new states.

— On vulnerability and fragility:

- High degree of rivalries, disputes and contestation within and between countries or areas.
- Ratio of water demand to supply.
- Environmental and social fragility, non-robust social system.
- Diminishing water quality and degraded groundwater dependent ecosystems.
- Poverty, lack of good sanitary conditions.
- Extreme hydrological events and periodic water disasters (flood and droughts) and protection mechanisms.
- Demand changes (sectoral) and distribution.
- Dependence on hydroelectricity.

— On sustainability and development:

- Expressed and implementable water conservation measures.
- Competence for dealing with and managing water related conflicts.
- Desire for and implementation of balanced environmental policies.
- Capacity to recover the true costs of water projects.
- Importance of virtual water in food trade.

According to the International Law Commission of the UN, what some authors have coined “hydrodiplomacy”, i.e., the general principles that help to prevent conflict over water resources and even resolve them,<sup>72</sup> are the following:

- ·Equitable utilisation. States are entitled to a reasonable share in the beneficial use of shared water.
- ·Prevention of significant harm to other states: the obligation not to cause significant harm to other states through action that affects international watercourses.
- ·Obligation to notify and report actions and activities that may affect neighbouring countries.
- ·Obligation to exchange data, which has progressed considerably thanks to the ease of access to and sharing of information; nevertheless, information on water resources is still considered classified in some regions.
- ·Cooperative management of international rivers. The right of states in a shared basin to take part in the development, use and protection of shared water resources. Eckstein proposes collaboration based on the scale of the basin, with institutional mechanisms and approachable and adaptable management<sup>73</sup>.
- ·Obligation to resolve disputes peacefully.

In 1978, the United Nations reported that there were 214 international basins. Today there are 276, due to the internationalisation of national basins through political changes, such as the break-up of the Soviet Union and the Balkan states, as well as access to better mapping sources and technology.<sup>74</sup> Approximately 40% of the world’s population lives in these basins.<sup>75</sup> Around two billion people rely on an as-yet poor cooperation to ensure the supply of water.

If the management of international basins is subordinate to national interests or those of power groups, the likelihood of shortages, disputes and conflicts over water is huge.

It is also clear that large-scale, human-induced environmental pressure can affect national and international security, and some of this pressure has to do with water. In

---

72 Carrillo L. *La Geohídrica. Nuevo paradigma de las relaciones internacionales para alcanzar el desarrollo sostenible*. Ed. Ministerio de relaciones exteriores de Perú. Lima, 2008.

73 ECKSTEIN G. *Water Scarcity, Conflict, and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy*; in: *Wisconsin International Law Journal*, Vol. 27, No. 3, p 436 et seq.

74 Kramer A., Wolf A., Carius A., Dabelko G. *Managing Water Conflict and Cooperation*. Op cit.

75 WORLD BANK. Op cit, p 39

1992, the UN Security Council expressed its concern over the link between security and the environment, stating that the non-military sources of instability in the economic, social, humanitarian and ecological fields have become threats to peace and security.<sup>76</sup>

Environmental security is crucial in the field of international relations. The links between the environment, conflict and cooperation are manifest, particularly in aspects relating to water. It has even been suggested that “Geowater” is the new paradigm in international relations, based on the following elements:

- Water as a source of power. The shortage of freshwater (real or imagined) has become a strategic issue. As UN hydrologist, Fernández Jáuregui, has pointed out, “since ancient times, access to water has become a source of power and/or the origin of great conflicts”.<sup>77</sup>
- Water as a strategic resource. Nowadays, many areas suffer from “water stress” as result of scarcity in their regions (caused in turn by multiple factors: increases water uses, economic development, population growth, diversion of rivers, pollution, etc.). Although the situation is not widespread, the countries affected concentrate two-thirds of the world’s population, with 385 million of these living in the Middle East. Therefore, controlling regions with abundant water resources (the Amazon, Paraná Basin, Guaraní Aquifer, the Congo Basin, etc.) has become a geostrategic goal.
- Geopolitical appreciation of water. Distribution by continent and population is very uneven (figure 36).

---

76 Document S/23500, Meeting of the Security Council of 31 January 1992.

77 Fernández Jáuregui C (2000). *Water as a Source of Conflicts: A Review of the Focal Points for Conflicts in the World*. op. cit., p 1.

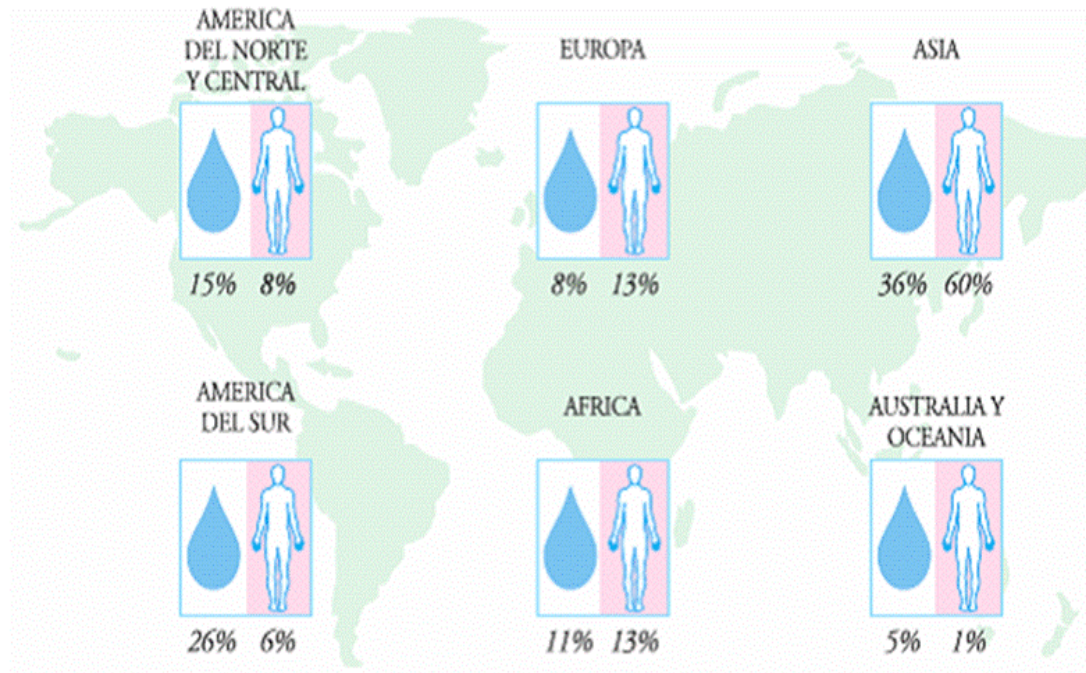


Figure 17: distribution of water and population as a percentage of total world population by continent.<sup>78</sup>

Fourteen percent of the world's population and 41% of its water can be found in the Americas, compared to 60% and 36%, respectively, in Asia. This causes geopolitical appreciation in the more advantaged areas.

- The appreciation of water reserves for the future, such as the Antarctic, Guaraní Aquifer, the Amazon and the Congo River Basin. These are all large freshwater reserves (in solid state in the case of the Antarctic) comprised both of surface and groundwater and shared by several countries.

In the current context of growing vulnerability, interdependence and complexity, one of the main ideas underlying the new management paradigm should be interdependence based on:

- Water interdependencies in terms of the different water uses (irrigation, supply, industry, etc.).
- Political interdependencies in terms of horizontal and vertical coordination.
- Cross-boarder interdependencies, given that most surface and groundwater reserves are shared between several states. This means that shared basins play an increasingly important role as management units and there is the belief that

<sup>78</sup> Source: <http://www.unesco.org/uy/phi/recursos/recursos.html> (in Fernández Jáuregui C.2000 Op cit., p. 2).

water unites the territories through which it flows and should therefore be given priority over a state's desire to exploit the resource to the full.

This approach sees water as a catalyst for cooperation. While regions with shared water resources are likely to dispute over water, when used reasonably and equitably, cooperation allows water to be allocated more efficiently.

Cooperation is not an abstract term used to refer to peaceful coexistence, but an important mechanism for managing natural resources, considering the historical, political, economic and cultural tensions underlying water. Cooperation must combine technological capability with political will, and become an essential component of international agreements.

There are several noteworthy examples of international cooperation in water management, although the models will vary depending on the political or natural circumstances. Some examples of cooperation include:

- The Danube River Basin. Shared between 19 countries, the Danube is the world's most international river basin; some countries are located entirely within the basin, while others are only in part of it. It occupies an area more over 800,000 km<sup>2</sup> and has numerous regional and transboundary aquifers. The International Commission for the Protection of the Danube River (ICPDR) was created in 1998 to promote and coordinate equitable and sustainable water practices and the conservation, improvement and rational use of the water.<sup>79</sup> It encompasses 13 countries in the basin and the European Union. It coordinates the Management Plan which was agreed by all partners in 2009<sup>80</sup> based on the national and basin reports of each Member, and supports the implementation of the EU's Water Framework Directive.
- Lake Peipsi. This is the fourth largest and the biggest transboundary lake in Europe. It is shared between Russia and Estonia, although Lithuania is part of the water basin that feeds it. It is managed by the Estonian-Russian Transboundary Water Commission, which was established in 1997 after the two countries (but not Lithuania) signed a bilateral agreement for the sustainable use of transboundary water bodies.<sup>81</sup> Both countries have made efforts to improve water supply systems and waste treatment plants and developed several national

---

79 <http://www.icpdr.org/main>, consulted on 15 February 2015.

80 EUROPEAN UNION. Regional policy. Panorama Inforegio No. 37. The EU Strategy for the Danube Region. A united response to common challenges. 2011.

81 MINISTRY OF THE ENVIRONMENT OF THE REPUBLIC OF ESTONIA AND THE RUSSIAN MINISTRY OF NATURAL RESOURCES. Lake Peipsi Chudskoe/Pskovskoe between Estonia and the Russian Federation. [http://webworld.unesco.org/water/wwap/wwdr/wwdri/pdf/chap17\\_es.pdf](http://webworld.unesco.org/water/wwap/wwdr/wwdri/pdf/chap17_es.pdf). Consulted on 15 February 2015.

and international programmes to protect biodiversity. As a member of the EU, Estonia is implementing the Water Framework Agreement in its territory, while Russia is trying to meet the Millennium Development Goals concerning water. Together they have developed a joint lake monitoring programme.

- Rio de la Plata Basin and Guaraní Aquifer. The five countries comprising this area have joint principles for the sustainable development and management of the basin's abundant water resources (surface and groundwater). Although there is no legal framework for the joint management of groundwater resources,<sup>82</sup> the Guaraní Aquifer was a milestone. In addition, a number of actions have promoted integrated water management throughout Latin America.<sup>83</sup>

Of the European examples cited, special mention should be given to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.<sup>84</sup>

- The Nile Basin Initiative. The Technical Cooperation Committee for the Promotion of Development and Environmental Protection of the Nile Basin (TECCONILE) was created in 1993 with the intention of drawing up a development agenda. Shortly after, a series of talks were held under the auspices of the Canadian International Development Agency in order to create an informal mechanism for dialogue and the exchange of views between the Nile riparian countries. Within the TECNONILE framework, an action plan for the Nile Basin was prepared in 1995. However, it was not until 1999 that cooperation was given a significant boost with the creation of the Nile Basin Initiative (NBI) as an institutional mechanism that includes all the countries in the basin with the goal of fighting poverty and promoting economic development in the region. The NBI is guided by a shared vision, which is the achievement of sustainable development through equitable utilisation of the Basin's water resources.

The Initiative's main objectives are:<sup>85</sup>

- To develop the Nile Basin water resources in a sustainable and equitable way in order to ensure prosperity, security, and peace for all its peoples.
- To ensure efficient water management and optimal use of the resources.
- To ensure cooperation and joint action between the riparian countries.

---

82 Water, a Shared Responsibility, *op. cit.*, P 501.

83 RUBIO E.M. La gestión integrada de los recursos hídricos: breve referencia al acuífero guaraní. In GUTIÉRREZ ESPADA et al., *op. cit.*

84 United Nations Economic Commission for Europe (*op. cit.*), p 5.

85 GORVACHOV M. Water for peace: Peace for water. Ed. ExpoZaragoza 2008, p 19.

- To target poverty eradication and promote economic integration.
- Members of the Initiative have agreed to the following points:
- They recognise that the Nile River, its natural resources and environment are assets of immense value to all the riparian countries.
- They therefore commit to the creation of a Framework Agreement to promote integrated management, sustainable development, and harmonious utilisation of the water resources of the Basin, as well as their conservation and protection.

Cooperation mechanisms reduce the possibility of conflict in a basin where tensions arise on account of states' intention to exploit their waters to the full, something which goes against the interests of Egypt, the great beneficiary of the situation up until now. The following objectives should be mentioned:

- Constitute a forum for joint negotiations, taking all current and potentially conflicting interests into account in decision-making.
- Examine different perspectives and interests, facilitating new management options and advantageous solutions.
- Promote trust through joint collaboration and research.
- Institutional strengthening in the management of water resources, particularly in less developed countries lacking in economic, human, technical and even legal resources.
- Promotion of initiatives in relation to integrated water management, development and governance of transboundary basins, thus strengthening international cooperation.

*The way to avoid violent conflict and create the conditions for long-term peace is to combat poverty, hunger and disease. Water is the key to achieving this.*

*M. Gorbachev.*

## CONCLUSIONS

- There is enough water to cater for the needs of the world's population; even when you consider what is freshwater and easily accessible (surface water in rivers and lakes and groundwater), there is still enough water left over for use in socio-economic activities (irrigation, energy and industry). Furthermore, the availability of water is assured as it is a renewable resource, thanks to the water cycle.
- Nevertheless, it is a finite resource that is experiencing growing pressure as countries develop and progress. The distribution of water by inhabitant and country is very uneven; "per capita" availability is very high in some countries and very low in others.
- Part of the water scarcity problem is caused by pollution; after it has been used in certain activities, it is unsuitable for other uses.
- It is indispensable for life, health and food safety. If the water used for sanitation and hygiene is scarce or of poor quality it can cause many diseases.
- Water is irreplaceable for many socio-economic activities, such as irrigation, industrial use and power generation. And because electrical power is needed to treat and desalinate water to make it drinkable, there is a close relationship between water and energy. Therefore, water is also a strategic resource for other important sectors.
- In recent years, growing concern over the uncertainty of water availability is further strengthening its perception as a strategic resource. Consequently, strategies have been developed to control the process for surface and groundwater.
- Many aquifers and basins are shared by two or more countries whose political boundaries do not always coincide with those of the river. Ever more detailed knowledge of aquifers shows that this is indeed the case.
- Furthermore, there is a risk of – open or latent - tension and conflict arising between states when one of them develops water policies that affect the interests of the neighbouring states. Some conflicts are explicit; others are mixed with a variety of international issues, further complicating the situation.
- However, there is also room for cooperation, and a shift in international water relations towards what has been coined "GEOWATER" - a new paradigm based on cooperation in the use and management of a resource that knows no borders and which unites people and lands in the water cycle.
- International law provides legal instruments for the regulation of waters. It proposes management that is based on natural water units (basins and aquifers),

that is sustainable, equitable and does not restrict the rights of third parties. It also recommends that international agreements be adopted in this respect.

**BIBLIOGRAPHY**

- Aguilar G, Iza A. Gobernanza de aguas compartidas. Aspectos jurídicos e institucionales. UICN, serie de política y Derecho ambiental No. 58, Bonn. 2009.
- INTERNATIONAL LAW ASSOCIATION. Law on Water Resources. Project presented at the Berlin Conference, 4–21 August 2004.
- INTERNATIONAL LAW ASSOCIATION. Seoul Rules on International Groundwater, 1986.
- AURA Y LARIOS DE MEDRANO A.M. La Regulación Internacional del Agua Dulce, Práctica Española. Aranzadi Derecho Administrativo, Pamplona, 2008.
- Campíns M. Los retos de la cooperación regional en Asia Central: más sombras que luces en la gestión de los recursos hídricos compartidos. Revista electrónica de Estudios Internacionales No. 19 (2010).
- Caponera D. El régimen Jurídico de los recursos hídricos internacionales. Estudio Legislativo No. 23 de la Organización de las Naciones Unidas para la Agricultura y la Alimentación. 1982.
- CARIUS, A., Dabelko, G. D. AND Wolf, A. T. Water, Conflict, and Cooperation. ECSP Report, No. 10, pp. 60–66. 2004
- Carrillo L. La Geohídrica. Nuevo paradigma de las relaciones internacionales para alcanzar el desarrollo sostenible. Ed. Ministerio de relaciones exteriores de Perú. Lima. 2008.
- COM (2000) 1 final, COMMUNICATION FROM THE COMMISSION on use of the precautionary principle. Brussels 2.2. 2000.
- COMEST. COMEST'S Expert Report on the Precautionary Principle, UNESCO, Paris, 2005.
- United Nations Economic Commission for Europe. The UNECE Convention of 1992 Protection and Use of Transboundary Watercourses and International Lakes. Ed: UN, New York and Geneva, 2004.
- Conclusiones 3er foro 2008 Agua para el Desarrollo, Cooperación en cuencas Internacionales. Ed. Fundación Canal, Madrid 2008.
- Barcelona Convention and Statute on Freedom of Transit. Barcelona, 20 April 1921.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of Water Policy.
- Document S/23500, Meeting of the Security Council of 31 January 1992.

- ECKSTEIN G. Water Scarcity, Conflict, and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy; in: Wisconsin International Law Journal, Vol. 27, No. 3.
- Water, a Shared Responsibility. Second UN World Water Development report. Zaragoza. 2006
- ESPINOSA A. “La Guerra del Agua” Egipto vs Etiopía. <http://www.ort.edu.uy/facs/boletininternacionales/contenidos/168/enfoquesuno166.html>. Consulted on 12 January 2014.
- FAJARDO T. El Agua de Palestina bajo el régimen de ocupación de Israel. In GUTIÉRREZ ESPADA et al. (Coords). El Agua como factor de cooperación y de conflicto en las relaciones internacionales contemporáneas. Murcia, Fundación Instituto Euromediterráneo del Agua, 2009.
- FAYANÁS E. <http://www.nuevatribuna.es/articulo/medio-ambiente/el-mekong-la-muerte-de-un-ro/20110412124605053267.html>. Consulted on 15 January 2014.
- Fernández Jáuregui C. Water as a Source of Conflicts: A Review of the Focal Points for Conflicts in the World. International Hydrological Programme. UNESCO. 2000.
- Fernández Jáuregui C, Crespo Milliet A. Las aguas transfronterizas en el marco de la crisis mundial del agua. Fundación Agbar, Barcelona. 2009.
- Gleick, P., Cain, N., Haasz, D., Henges-Jeck, C., Hunt, CKiparsky, M., Moench, M., Palaniappan, M.Srinivasan, V., Wolff, G. The World's Water 2004–2005: The Biennial Report on Freshwater. 2005.
- GORVACHOV M. Water for peace: Peace for water. Ed. Expo Zaragoza 2008.
- GRASA R. Los conflictos “verdes”, su dimensión interna e internacional. Ecología política No. 8, Ed Fuhem/Icaria. 1994.
- HUMAN DEVELOPMENT REPORT 2006, Beyond scarcity: Power, poverty and the global water crisis. United Nations Development Programme. Madrid.
- INTERNATIONAL COURT OF JUSTICE. Reports of Judgments, Advisory Opinions and Orders Case Concerning The Gabcikovo-Nagymaros Project (Hungary / Slovakia). Judgment of 25 September 1997.
- INTERNATIONAL COURT OF JUSTICE. Reports of Judgments, Advisory Opinions and Orders Case Concerning pulp mills on the River Uruguay (Argentina v. Uruguay). Judgment of 20 April 2010.
- IPCC. Fourth Report on Climate Change (Synthesis report).

- Kramer A. Wolf A. Carius A. Dabelko G. Managing Water Conflict and Cooperation. The keys to managing this. A world of science (special issue) Vol II, no. 1 (January–March), UNESCO. 2013.
- A/RES/51/229 RESOLUTION ADOPTED BY THE UN GENERAL ASSEMBLY. Convention on the Law of the Non-navigational Uses of International Watercourses.
- RESOLUTION A/RES/63/124 ADOPTED BY THE UN GENERAL ASSEMBLY. The law of transboundary aquifers.
- RUBIO E.M. La gestión integrada de los recursos hídricos: breve referencia al acuífero guaraní. In GUTIÉRREZ ESPADA et al. (Coords). El Agua como factor de cooperación y de conflicto en las relaciones internacionales contemporáneas. Murcia, Fundación Instituto Euromediterráneo del Agua, 2009.
- SAHUQUILLO A. (Chapter Conjunctive use of Groundwater and Surface Water). (Theme Groundwater), Edited by Luis Silveira and Eduardo Usunoff, in Encyclopaedia of Life Support System. Eolss Publishers, Oxford UK. 2002.
- SAHUQUILLO A. La importancia de las aguas subterráneas. Revista Real Academia Ciencias Exactas Físicas y Naturales (Spain). Vol. 103, No. 1. 2009.
- SALINAS S. La Cuenca Hidrográfica en el Derecho Internacional de los recursos hídricos. In GUTIÉRREZ ESPADA et al. (Coords). El Agua como factor de cooperación y de conflicto en las relaciones internacionales contemporáneas. Murcia, Fundación Instituto Euromediterráneo del Agua, 2009.
- SAURA ESTAPÁ, J. El Derecho humano al agua potable y al saneamiento en perspectiva jurídica internacional. Derechos y Libertades: Revista del Instituto Bartolomé de las Casas No. 26, 2012.
- Seguridad y medio ambiente, especial medio ambiente 2011. [http://www.mapfre.com/fundacion/html/revistas/seguridad/nEspecial2011/cap7\\_5.html](http://www.mapfre.com/fundacion/html/revistas/seguridad/nEspecial2011/cap7_5.html). Consulted in January 2014.
- EUROPEAN UNION. Regional policy. Panorama Inforegio No. 37. The EU Strategy for the Danube Region. A united response to common challenges. 2011.
- VAN DER VALK, M. and KEENAN, P. (Edits). The right to water and water rights in a changing world. Colloquium Paper. Delft, The Netherlands, 2011.
- WINTER TC, HARVEY J.W., FRANKE O.L. ALLEY W.M. Ground Water and Surface Water, a single resource. US Geological Survey Circular 1139.1998.
- WORLD BANK. Sustaining Water for All in a Changing Climate. World Bank Group Implementation Progress Report. The World Bank ed. Washington DC, 2010.

## Websites consulted

<http://ejts.revues.org/docannexe/ima...1-small480.png> (consulted on 17 January 2014).

[http://webworld.unesco.org/water/wwap/wwdr/wwdr1/pdf/chap17\\_es.pdf](http://webworld.unesco.org/water/wwap/wwdr/wwdr1/pdf/chap17_es.pdf).  
(Consulted on 15 February 2015).

<http://www.icpdr.org/main>. (Consulted on 15 February 2015).

<http://www.karakalpak.com/stanaral.html>. (Consulted on 16 January 2014).

<http://www.lavanguardia.com/natural/20141001/54416512573/el-mar-de-aral-marca-un-nuevo-record-de-tragica-sequia.html>. (Consulted on 12 January 2015).

[http://www.mapfre.com/fundacion/html/revistas/seguridad/nEspecial2011/cap7\\_5.html](http://www.mapfre.com/fundacion/html/revistas/seguridad/nEspecial2011/cap7_5.html). (Consulted on 20 January 2014).

<http://www.mrcmekong.org>. (Consulted on 27 January 2015).

<http://www.nuevatribuna.es/articulo/medio-ambiente/el-mekong-la-muerte-de-un-ro/20110412124605053267.html>. (Consulted on 15 January 2014).

<http://www.ort.edu.uy/facs/boletininternacionales/contenidos/168/enfoquesuno166.html>. (Consulted on 12 January 2014).

<http://www.un.org/spanish/esa/sustdev/agenda21/riodeclaration.htm> (consulted 16 February 2015).

[https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII12&chapter=27&lang=e](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII12&chapter=27&lang=e). (Consulted on 18 January 2015).

---

- Submitted: 8 July 2014.

- Accepted: 19 January 2015.

---

