A Global Water Ethic

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The W4W Group's Members

Annie Balet is a doctor of ecophysiology at the Orsay Faculty of Sciences (Paris-Sud). She worked on environmental problems, then taught biology at the secondary-school level. She has collaborated in writing a pharmacopoeia to facilitate dialogue between traditional African medicine and scientific medicine, with the goal of promoting improved access to health care.

Benoît Girardin is currently the president of PIASS, a private university in Rwanda, and a professor of political ethics at the Geneva School of Diplomacy and International Relations, a university institute. He has extensive international experience, having in fact been responsible for Swiss cooperative development efforts in Cameroon, Pakistan, and Romania, then later for evaluation, finally serving as the ambassador to Madagascar. Initially, he had earned a doctorate in theology at the University of Geneva in 1977.

Evelyne Fiechter-Widemann is a member of the Geneva bar and holds a master's degree (MCJ) from New York University. She is currently a doctoral candidate at the Geneva Faculty of Theology. Her research focuses on the global ethics of water. She served as a deputy judge on a judicial commission of CRUNI (Geneva's administrative court) and taught Swiss and international public law at the Collège de Genève. She was on the Swiss Church Aid (EPER) foundation's board and also that of the International Museum of the Reformation.

After studying at the University of Geneva, **Laurence-Isaline Stahl Gretsch** spent fifteen years as an archeologist specializing in prehistory, both in Jura Canton (for construction related to the Trans-Jura freeway) and at the University of Geneva. Following the defense of her dissertation in sciences, she was hired by Geneva's History of Science Museum, which she has headed for seven years. In 2009 the museum created an exhibit on hydropower in Geneva.

After earning a master's degree in civil engineering at the Swiss Federal Institute of Technology in Zurich, **Christoph Stucki** initially specialized in analyzing the behavior of materials at the Swiss Federal Laboratories for Materials Science and Technology (EMPA) before joining an engineering firm in Lausanne. He then developed a railway network planning model at the Swiss Federal Institute of Technology in Lausanne. In 1980 he became the general manager of Geneva's public transport system. Currently, he is the president of Unireso, the cross-border transport fare network for a basin encompassing parts of France, Vaud, and Geneva.

Gary Vachicouras, a doctor of theology, studied at the Holy Cross Greek Orthodox School of Theology (Brookline, Mass.), the University of Paris IV-Sorbonne, and the University of Athens. He was a teaching fellow at the Ecumenical Patriarchate's Orthodox Center in Chambésy-Geneva and the executive director of the Foundation for Interfaith and Intercultural Research and Dialogue. His involvement in higher education has touched on human security, especially through his teaching, innovative research, and intergovernmental dialogue.

After being trained as a professional IFR pilot, **Renaud de Watteville** traveled and created Swissmate, an event company. For over 20 years he managed projects for various companies in Switzerland and abroad. In 2008 he started Swiss Fresh Water, which developed a low-cost decentralized desalination system intended for use by low-income populations. This was an opportunity for him to make a real human difference by making his experience available for a high-impact industrial project.

W4W (Workshop for Water Ethics)

W4W is an apolitical civic-minded interdisciplinary platform that brings together notable figures from the theological, ethical, political, scientific, economic, and legal spheres who share a common concern for water challenges in a globalized world.

Water is a natural resource that was long considered a free good. Its status is changing as awareness of its increased scarcity grows, and especially as it is used abusively (polluted and wasted, especially in agriculture).

Indeed, this resource is increasingly threatened not only by increasing demand from the public, agriculture, and industry, but also by climate change.

To meet the demand and avoid "water wars" by defusing water-related conflict, the public sector—in partnership with the private and community sectors—must create appropriate conditions for managing this resource fairly and sustainably.

It has set the following goals for itself.

1. Conceptualize and explain the ethical dimension—essential for identifying and implementing solutions—of fair and sustainable water management in a globalized world.
2. Contribute original thoughts that could influence the creation of a favorable environment for implementing development goals 3 and 7 of the Millennium Declaration.
3. Take these solutions' interdisciplinarity into account.
4. Using a pluralist and ecumenical approach, establish contacts with existing ethical focus groups, for example IRSE, Gloethics.net, the Institute of Business Ethics, and similar entities abroad.
5. Involve influential private-sector players, university researchers and students, and civic-minded associations.
6. Organize colloquia on the topic of water's ethical challenges in a globalized world, provide targeted information to decision-makers and influential stakeholders, and exchange thoughts in networks and on blogs.

Speakers

Mark Zeitoun is a Reader in the School of International Development at the University of East Anglia, and Director of the UEA Water Security Research Centre. He is interested in the ways that power asymmetry and social justice interact to influence water policy and relations over water. The interest stems from his work as a humanitarian-aid water engineer in conflict and post-conflict zones in Africa and the Middle East. He also consults regularly on water security policy, hydro-diplomacy and international transboundary water negotiations.

Mara Tignino is an associate professor and the coordinator of the Platform for International Water Law at the University of Geneva's Faculty of Law. She is a visiting professor at the Catholic University of Lille's Autonomous Faculty of Law. She regularly works for governments, international organizations, and NGOs.

After studying at the Ecole Nationale Supérieure des Mines in Paris, **Evelyne Lyons** worked as an engineer responsible for monitoring at the Seine Normandie water agency, then at Lyonnaise. She is a professor on the Faculty of Social and Economic Sciences at the Catholic Institute of Paris for masters degree programs in International Solidarity and Action, Interdependent Economy and Market Logic, and Environmental and Sustainable Development Policies. She is a member of the Water Academy.

Following studies at HEC Paris and an advisor position at Arthur Andersen, **François Dermange** took up theology, first in Paris, then in Geneva. He earned a doctorate in commercial ethics before becoming a professor of ethics at Geneva's Faculty of Theology, of which he was the dean from 2005 to 2009.

Victor Ruffy was trained as a geographer and is the former assistant manager of the Canton of Vaud's regional planning department. He has served in political offices at the municipal, cantonal, national, and European levels. He was the vice-president of the Council of Europe's Committee on the Environment, Regional Planning, and Local Authorities. He is currently a member of Solidarité Eau Europe, an NGO headquartered in Strasbourg.

Evelyne Fiechter-Widemann, **Benoît Girardin**, **Christoph Stucki et Renaud de Watteville**
See "The W4W Group's Members."

Foreword

"Thinking" a Global Water Ethic

Evelyne Fiechter-Widemann

Helping to encourage a clearer and more lucid perception, from an ethical perspective, of the difficult and complex issue of potable water (which is unavailable to nearly a billion people around the world) is what motivated W4W's members to organize three colloquia between 2011 and 2013.

The University of Geneva and its Faculty of Theology, IRSE, and CUSO encouraged this process.

The first colloquium set the scene by asking the question "too much water or not enough: how can we wisely use this unpredictable resource?" The second and third got to the heart of the matter by taking up, in turn, the values of justice and responsibility. For example, the second meeting discussed global justice, and the third tried to feature the sensitive issue of responsibility for protecting water.

The speakers at all three colloquia, who hailed from Switzerland, France, Great Britain, Jordan, and the United States, were all well-versed in water issues thanks to decades of experience in the field, scientific circles, or the academic or political arenas. W4W was very honored that they devoted so much time to this conference series.

The final colloquium in March 2013 focused on the delicate issues of political hegemony in water use and the often controversial questions related to dams. These were addressed by, respectively, Mark Zeitoun of the University of East Anglia and Evelyne Lyons of the Water Academy. To explore the connections between humanitarian law and international public law with respect to potable water needs during armed conflict, we turned to Mara Tignino.

At the March 19, 2013 meeting, former Ambassador Benoît Girardin wore two hats, being both the moderator and a speaker. He met the challenge perfectly and made us acquainted with the complex issues of transboundary aquifers (such as the one that lies between France and Switzerland) and the role that UNESCO plays in protecting them. The Council of Europe's commitment to promoting transnational and international water education, which often goes unrecognized, was championed with conviction by Victor Ruffy.

Fresh Water and its president, Renaud de Watteville, gave us a surprise by transforming brackish water into potable water right before our astounded eyes. Christoph Stucki presented this project and its real-world implications in great detail, and will be developing the main aspects of it further in the coming months, together with the Rotary Club.

The keystone of the event was the very pointed remarks by François Dermange, a professor of theology and ethics, who showed us the relevance of an ethical approach to the issue of responsibility for protecting potable water, which is that of a moral requirement in the face of a power imbalance. With a nod to Calvin and Gandhi, he invited politicians to use their power "for others' good and not for [their] own."[1]

I offer my deepest appreciation to everyone.

My thanks would be incomplete, however, if I neglected to add a heartfelt and grateful acknowledgement of the chatelaine of this wonderful venue, Geneva's History of Science Museum, who saw to it that the three colloquia went smoothly. Laurence-Isaline Stahl Gretsch was our hostess. The tricky and demanding task of putting these proceedings into their present form also fell to her, with some much-appreciated assistance from Dora Nicolopoulos, who conscientiously reviewed the text. Panagiotis Adamantiadis recorded the talks and debates, with remote support from Gary Vachicouras. With a camera in one hand and a plate of goodies in the other, Annie Balet enlisted Ana-Maria Pavalache and two museum caretakers to help take photographs, which were much appreciated by the participants. We should note that some attendees were present for the third time, including former ICRC President Cornelio Sommaruga, who honored us with his presence.

Did we truly, during these three meetings, "dare to think" a global water ethic, as German philosopher Immanuel Kant's famous adage *sapere aude*[2] seems to invite us to do?

Those who heard the March 25, 2013 RTS radio broadcast on the colloquium topic, arranged by journalist Sarah Dirren,[3] might be able to tell us. If the answer is "yes," then W4W will have accomplished what it set out to do.

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[1] Weissbrodt, Bernard, Aquaresponsabilité, www.aqueduc.info/ aquaresponsabilité, p. 2.

[2] Kant, Immanuel, *Qu'est-ce que les Lumières?* (trans. Jean-François Poirier and Françoise Proust) [An answer to the question: what is enlightenment?], Flammarion, Paris, 2006, p. 43. Theology students were reminded of this adage by Faculty of Theology Dean Andreas Dettwiller in his sermon at the beginning of the 2012 university academic year.

[3] Broadcast entitled "Babylone" [Babylon] by Nancy Ypsilantis, http://www.rts.ch/espace-2/programmes/babylone/4725208-babylone-du-25-03-2013.html or http://download-audio.rts.ch /espace-2/programmes/babylone/2013/

A Global Water Ethic: Interdisciplinary Perspective

The Duty to Protect As a Condition of Possibility for a Global Water Ethic

Evelyne Fiechter-Widemann, attorney and founder of W4W

Introduction

Responsibility is an ethical fact that cannot be pigeonholed in a discipline such as law, sociology, philosophy, or theology. From the standpoint of Kant's transcendental philosophy, this ambiguous concept can at the very least be considered as the "condition of possibility" for implementing basic rights and freedoms.

When the United Nations General Assembly gave water human-right status in July 2010, it elevated this natural resource to an axiological level that gave it a value to be defended, and placed it alongside the other human rights in the ranks of inalienable rights (see the preamble to the 1948 Universal Declaration of Human Rights).

In so doing, the international community acknowledged—at least implicitly—that the human right to water borders on natural law. Let us recall that the ancient philosophy of Stoicism saw natural law as a principle of divine origin, the *logos* governing the *cosmos.* Christendom restructured these concepts such that the *cosmos* became the creation and the principles of divine origin became the Ten Commandments and the Law of Christ.

So, given the kernel of natural law that lies at the heart of human rights, it is valid to use interdisciplinary tools to examine the concept of the responsibility to protect water, through the lenses of theology, ethics. and law.

Theological Lens

With support from the teachings of reformer John Calvin, who saw creation as the "theater of God's glory," and theologian Bonhoeffer's extremely humane way of viewing marginalized and suffering people, the principles upon which a global water ethic can and should be based can be named in an authentic and credible way. It is a matter of humankind accepting God's assignment to manage nature responsibly without overusing it, while at the same time taking into account the present and future needs of the poorest. These clearly stated principles destroy medievalist Lynn White's position, which holds that Christianity is at the root of today's ecological crisis.

Ethical Lens

United Nations experts created three concepts for use by governments tasked with implementing the human right to water. They are expressed in the three responsibilities summarized as the "duties to respect, to protect, to fulfill." For the moment these duties or responsibilities, which have no binding legal force, can be clarified from an ethical standpoint. From this perspective, they form a whole, in my opinion, in the sense that respect is the ethical motive for a responsibility to protect, and when the responsibility is fully accepted, the right to water is implemented *ipso facto*.

So it is the motive for responsible action that will interest us here. What is covered by this concept of respect? In the context of water as a vital need, it cannot assume its currently accepted meaning of fear, deference or the distance to be maintained from eminent persons. On the contrary, it is in fact a matter of the consideration due to those in need.

While Immanuel Kant considered the respect due to a person as also primarily the respect due to the law, Paul Ricœur finds that the issue is one of crossing the dialogical divide, the contrast between the agent and the patient, that respect creates. Where water is concerned, a dissymmetry between two entities can be illustrated by, for example, a government that shuts off the water supply of a consumer who can no longer pay the bill. Ricœur feels that by referring to the Golden Rule we can bring the two pans of the scale back into balance. This maxim makes it possible to see an ethical, even theological rule in the duty to "respect" suggested by the UN experts for implementing the right to water.

Legal Lens

South Africa is making an exceptional contribution to the issue of the human right to water and its attendant responsibilities. Its 1996 constitution established the right to water, and in a government order issued in

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2000, it set rules for supplying free water to poor blacks in rural areas. The national "Free Basic Water Policy" aims to provide a minimum of 25 liters per day to about 7 million of the country's 23 million residents, to cover their vital needs for drinking, cooking, personal hygiene, and household cleaning. Do not such rules provide a foundation on which to base the goal of the human right to water, namely respect for human dignity? Since the subsidies needed to provide this free water are a burden on the national budget, it will eventually be in the government's interest to see the number of recipients of free basic water decrease, with each user being called upon to contribute to the water service according to his or her means. Indeed, and the UN experts are quite definite on this point, the human right to water does not mean a right to free water. So the challenge for the government is to pass laws that make water affordable.

Obviously there is no form of international oversight capable of ensuring that laws to prevent excessive water prices are passed in "failing" States. Furthermore, abuses have very often been seen when water service is entrusted to private companies. It is precisely with the goal of blocking such abuses that the UN experts' directives and the example of South Africa should come into play.

Conclusion

The theological, ethical, and legal perspectives on the duty to protect that I have just outlined relate to a particular type of responsibility, an ethical responsibility, along the lines of a mission to protect water.

So this is not a case of responsibility as attribution of an action that is to be evaluated from a moral or legal point of view.

It seems to me that the example of South Africa's water legislation clearly results from a mission to protect, and therefore leans more toward the ethical than the legal.

After all, are not the human right to water itself, and its implementation, related to God's command to protect the weakest of the weak?

International Hydro-politics: Lessons for Water Diplomacy from the Jordan and the Nile

Mark Zeitoun, Director— UEA Water Security Research Centre, School of International Development, University of East Anglia

Water diplomacy requires improvement

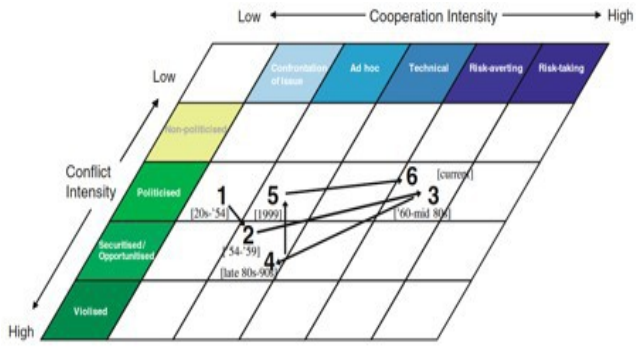
Water diplomacy will be assisted by solid analysis and objective water-sharing standards. Because international transboundary water conflicts are by nature distributional, they are perfectly suited to Lasswell's definition of politics paraphrased as "who decides who gets what, when, and how." This document draws lessons for water diplomacy from two rivers that are often considered cooperative, but where the asymmetry in water-sharing is extreme: the Nile and Jordan. The mischaracterization is due in part to the use of inadequate analytical tools, and the lack of objective standards, amongst others. It is asserted that the shortcomings of analytical techniques can be improved through tools that allow for interpretation of power asymmetries, and the co-existence of conflict and cooperation. The potential and limits of international water law as diplomatic tool are also discussed.

Power, and co-existing conflict and cooperation on the Jordan and Nile rivers

The vast majority of transboundary water conflict analysis relies upon the Basins at Risk (BAR) Event intensity Scale[4] (Wolf, Yoffe and Giordano 2003). The tool posits water conflict and cooperation at opposing ends of a spectrum—and is often used with data from the Transboundary Freshwater Dispute Database (TFDD 2008). Recent criticism related to the quality of the dataset aside (Kalbhenn and Bernaeur forthcoming), the BAR scale has served to highlight that the overwhelming majority of international water events are "cooperative"—thus also helping to dispel media hype about the existence of water wars.

The combined use of the BAR scale and quantitative approach has a number of shortcomings that prevent the utility of the analysis, however: a tendency to downplay the importance of non-violent water conflicts, neglect of political and historic context, and—perhaps most importantly— naïve assumptions about cooperation (Zeitoun and Mirumachi 2008). For instance, the BAR scale counts transboundary water treaties as proof of a pinnacle of cooperation, though numerous other authors have noted either their ineffectiveness (Bernauer and Kalbhenn 2008) or the coercive ends they serve (Conca 2006; Zeitoun, Mirumachi and Warner 2011). Sometimes, as in the Nile and Jordan, the water treaty is the problem, and analysts of transboundary water conflicts are advised to pay particular attention to the destructive side of such "cooperation."

Fortunately, another tool— Mirumachi's (2007) Transboundary Water Interaction Nexus (TWINS)—provides a way to interpret relations between states in a more realistic manner. Recognizing that conflict and cooperation between states can co-exist (e.g. technicians collecting data jointly, while politicians engage in rhetoric), the TWINS turns the



BAR scale into a matrix. Figure 1 shows both the TWINS matrix and its application to relations between Sudan and Egypt over the Nile.

Figure 1: Mirumachi's TWINS matrix of water conflict and cooperation, applied to bilateral relations over time between Sudan and Egypt (up to 2008) (from Zeitoun and Mirumachi 2008: Fig 3).

[4] The BAR scale has inspired a number of econometric studies from North America (Yoffe and Larson 2001; Dinar, et al. 2012) and Europe (e.g. Brochmann 2012) to further the analysis of water conflicts.

With conflict and cooperation plotted against each other, the analyst can begin to see how some actors might choose to emphasize cooperative events over conflictual events, or vice-versa—normally with the chosen perspective reflecting their political interests. The interaction between Egypt and Ethiopia during the period of the Nile Basin Initiative (1990s-2010) was presented as conflictual by Ethiopian (Mekonnen 2010) perspectives, for example, but as cooperative from the perspective of Egypt (Metawie 2004), or intermediaries such as the World Bank (Grey 2006). The latter perspective typically makes no mention of the 1959 Nile Treaty that provides the lion's share of the flows to Egypt (and none at all to Ethiopia, which was not included in the negotiations), while the former is always quick to point out the effects of that heavily skewed agreement. The fact that ministers from each country were jointly discussing data-collection and development projects masked the tensions at the root of the Nile conflict—at least for the more powerful sides. The uncritical observer may thus be lured into thinking the technical cooperation matters more than the political conflict, and thus miss the strategic, manipulative and coercive sides of "cooperation."

Such asymmetry in power between transboundary water actors is the other piece of the puzzle that water diplomats must take into consideration. The particularly strong influence of "soft" power is emphasized via the analytical framework of hydro-hegemony (Zeitoun and Warner 2006), for instance, to demonstrate the who decides and how of Lasswell's phrase. The authors reveal how military threats (a soft expression of hard power) can back-up expressions of soft power like the construction of knowledge, the "sanctioning" of discourse— and the signing of skewed treaties. The effect is not only to maintain an asymmetric distribution of water, but to get the consent of the weaker side and international mediators to the arrangement. The 1995 Oslo II Agreement between Israel and Palestinians, for instance, anchored a 90%-10% distribution in flows for basin hegemon Israel. The PLO consent to the agreement commits the Palestinian side to self-enforcement of the unfair terms of the agreement, and has proven a considerable obstacle to the sustainable development of the water sector in the West Bank and Gaza (World Bank 2009). The once-heralded and still enduring Israel Palestinian Joint Water Committee is now discredited as an Israeli tool to legitimize the colonial Israeli settlement project via water negotiations (Selby 2013)—an instance of "domination dressed up as cooperation" (Selby 2003). Palestinian consent to both the Agreement and the wranglings of the Committee may be explained by the coercion applied by the Israeli side, but as with the asymmetric distribution of the flows that are at the head of the conflict, this is rarely even mentioned by the international diplomatic community (Zeitoun 2008) in any of the several ongoing transboundary water initiatives (Waslekar 2011; e.g., FOEME 2012b; FOEME 2012a).

Effective water diplomacy continues to evade us.

International Water Law as guide to fair water sharing

It follows that diplomacy efforts aimed at resolving or transforming transboundary water conflicts must consider both the co-existing conflict and cooperation, and the influence of soft power. Even with a sound analytical basis, however, diplomatic efforts would be assisted if they were working towards a common objective or measure of fair water-sharing. International Water Law presents some opportunities in this regard.

State claims to water shares have been anchored in territorial sovereignty (the "Harmon doctrine") or "first in time, first in right" (i.e., a state can do what it wants with the water, regardless of downstream impact or whoever else might need water later). A more multi-lateral approach has developed, however, through customary state practice—and has been codified in the 1997 UN Watercourses Convention[5] (UNWC). The predominant article of the UNWC related to water sharing is "equitable and reasonable use,"[6] which provides a middle ground between attempts to establish sovereignty over a resource that mocks political borders, and perfect equality—which does not take into consideration social and physical realities about dependence upon the flows (millions of Egyptian farmers have no option but to rely on the surface water flows, given the lack of rainfall in the country, for instance).

As with all international law, IWL has detractors—but by setting "equitable and reasonable use" as the goal, it is as close to an objective standard as any mediator may find. The recent Clingendael report on water diplomacy (van Genderen and Rood 2011) makes the point emphatically, and calls for "neutral brokers" and entrepreneurs of fair water-sharing norms. IWL furthermore provides a legal framework that serves to de-securitize the discussion to allow public empowerment towards environmental justice, at least in theory. The result of a collective effort of dozens of years of deliberation amongst scientists and lawyers, the principles of the UNWC are a distinct conceptual step towards a "community of interests" (PCIJ 1929; ICJ 1997) and "shared sovereignty," and away from unilateralism.

[5] IWL also includes the UNECE Water Convention (UNECE 1992), and the Draft Aquifer Articles (UN ILC 2008)

[6] The UNWC also lists a number of factors that may be used to determine "equitable and reasonable" entitlements, including size of population, economic needs, historic use, availability of alternative water sources, etc.

The widespread reluctance of or resistance to ratification of the UNWC has come from a number of influential states (see McCaffrey 2007; Rieu-Clarke and Loures 2009), typically by those who favor the asymmetric status quo—like basin hegemons (Woodhouse and Zeitoun 2008). IWL thus faces the same challenges faced by all forms of international law, in terms of implementation and the "soft law" approach of guidance and development of norms. It is certainly not realistic to expect that the UNWC will rectify the unfair sharing on the Nile or Jordan, for instance, but it is worth noting how the principles may be employed by intermediaries or weaker states towards conflict resolution. With law as guide, furthermore, other water conflict resolution approaches used in tandem (e.g. Sadoff and Grey 2005; Phillips and Woodhouse 2010) may prove more effective.

Conclusions—Water diplomacy can be improved

(1) While power asymmetry and co-existing conflicts and cooperation may be "facts of life" in most basins around the world, their destructive impacts and escalation of tensions need not be. Diplomatic efforts can be based on critical analysis that incorporates this reality, and are assisted in the task by such tools as the analytical framework of hydro-hegemony and the Transboundary Water Interaction Nexus. These have served in the Nile and Jordan cases to explain how power asymmetries serve to project images of transboundary water interaction (as either positive or negative) to suit political ends. With the distribution of the flows wholly inequitable and unreasonable, tensions continue to mount on these rivers—and affect the broader political conflict in ways that are difficult to ascertain, but very real (see e.g. DNI 2012).

(2) The potential for International Water Law to serve conflict resolution or transformation efforts lies in its call for "equitable and reasonable" sharing, but is compromised by resistance to such intervention by powerful actors. With the only other option being un-guided politically pragmatic initiatives that are blind to power plays, the principled approach remains the preference.

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Water and War: A Legal Perspective

Mara Tignino, Associate Professor and Coordinator of the Platform for International Water Law, University of Geneva Faculty of Law

One of the main concerns about the possibility of water-related clashes is that they can lead to armed conflict between nations. Hostilities can take various forms: international armed conflict, violence within a country, or occupation of a territory. If we observe the ties between water, peace, and international security, we can consider water not only as one of the triggering natural environment factors for war, but also as a weapon and a military objective—an aspect that is often overlooked in studies of the relationship between water resources and armed conflict. Finally, when a dispute limits access to water and causes environmental damage to water resources, the safety of the entire population is threatened, which makes the process of reestablishing peace in the affected country longer and more difficult.

International humanitarian law contains important rules for protecting water resources during periods of armed conflict. The 1977 Protocols I and II additional to the four Geneva Conventions of 1949 provide for an obligation not to attack goods indispensable to the survival of civilians, including potable water reservoirs; prohibit bombing of installations containing dangerous forces, such as dams and dikes; and forbid the causing of "widespread, long-term and severe damage to the natural environment."[7] It is appropriate to emphasize, however, that the protection established by these standards is weak where international watercourses are concerned. In particular, articles 35.3 and 55 of Protocol I, which concern environmental protection in times of armed conflict, set conditions that are difficult to meet.[8]

International law governing international watercourses can protect water resources during an armed conflict. Instruments that pertain to transboundary water resources and provide rules for armed conflict are rare, however. At the regional level, only the Revised Protocol on Shared Watercourses in the Southern African Development Community, written in 2000, contains a standard in this area.

At the global level, the 1997 United Nations Convention on the Law of the Non-navigational Uses of International Watercourses and Lakes and the Draft Articles on the Law of Transboundary Aquifers adopted by the International Law Commission in 2008 contain provisions covering armed conflict. The provisions' terms are ambiguous when it comes to implementing these instruments in times of armed conflict. However, analysis of actual practice shows that countries involved in armed conflict do take the instruments covering protection and management of watercourses into consideration. This was the case with respect to the river regime in effect on the Danube.

During the conflict in the former Yugoslavia, the UN Security Council, acting under chapter VII of the United Nations Charter, imposed sanctions on the Federal Republic of Yugoslavia (Serbia and Montenegro). In Resolution 820 of 1993, the Security Council confirmed "that no vessels registered in the Federal Republic of Yugoslavia" or "in which a majority or controlling interest is held by a person or undertaking in or operating from the Federal Republic of Yugoslavia […] shall be permitted to pass through installations, including river locks or canals within the territory of Member States […]."[9]

The Danube Commission was created on August 18, 1948 by the Convention regarding the Regime of Navigation on the Danube. During the period from 1993 to 1995, aware of the risks to free navigation on the Danube posed by the Security Council sanctions, it stressed the importance of having Yugoslavian ships participate in maintenance work on the Iron Gates locks. In light of information received by the Danube Commission, the Security Council decided in 1995 to make exceptions to the river navigation sanctions and allow Yugoslavian ships to repair the Iron Gates locks.[10] During the work, the Danube Commission was to ensure that the authorized exceptions worked toward the Security Council's objective.[11] Despite the armed conflict in the former Yugoslavia in the early 1990s, the navigation regime established by the 1948 Convention

[7] Articles 35.3, 54, 55 and 56 of the Protocol Additional to the Geneva Conventions of August 12, 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I); and articles 14 and 15 of the Protocol Additional to the Geneva Conventions of August 12, 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II).

[8] See M. Tignino, *L'eau et la guerre: éléments pour un régime juridique* [Water and War: Elements of a Legal Regime], Brussels, Bruylant, 2011.

[9] Resolution S/RES/820, par. 16.

[10] Resolution S/RES/992, par. 1.

[11] *Ibid.,* par. 2.

remained in effect. So the Danube Commission contributed to compliance with this regime during a period of armed conflict. Enforcement of international humanitarian law and the law on international watercourses could strengthen the protection accorded to such waterways. Compliance with the instruments that cover transboundary water resources helps avert the risk of significant damage to other riparian nations. As the International Court of Justice noted, the States must "ensure that activities within their jurisdiction and control respect the environment of other States […]."[12] Enforcement of the legal instruments for international watercourses plays an important role in implementing this general obligation of international law.

[12] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996, p. 226, par. 29.

The Social Consequences of Building Dams: What Are the Responsibilities, What Are the Tools?

Evelyne Lyons, Water Academy

Today's dams, with their enormous size made possible by technical advancements and their cross-border ecological and social consequences, are particularly controversial.

The issue of dams brings up questions about development models and perhaps even the very notion of development itself. On the one hand, these constructs increase human control over river flows, making populations less reliant on changes in natural runoff (which is increasingly variable as the climate changes). On the other, their benefits are often less than hoped, while consequences for the directly affected populations and the environment can be terrible. The power relationships they create between upstream and downstream countries, and between central and local authorities within the same country, challenge institutional capacity for fairly and peacefully managing the change.

Following a significant wave of construction in southern countries during the 1960-70s, scientists and many civil society groups (in India, the United States, France, and elsewhere) offered increased resistance. Near the end of the 1990s, the World Commission on Dams (WCD) undertook a major review based on retrospective analyses, culminating in 2000 with the new recommendations included in the "Dams and Development" report. Without denying the usefulness of dams and the need to build more such facilities in the future, the report listed seven strategic priorities broken down into 26 recommendations for consideration when planning new projects.

Reactions to these recommendations have varied. The principle that public acceptance of such projects is necessary has been contested by many governments on the grounds of acting in the country's best interests. However, some of the points are gradually being applied and incorporated into financial institutions' new normative or regulatory texts. For example, in the World Bank group, the Bank's safeguard policies have been improved to include better informing the affected populations, and in particular better protecting indigenous populations in dealings with their governments. OECD export credit agencies have adopted protective "common approaches," though these have largely been inspired by the safeguard policies. As far as financing for private companies is concerned, the International Finance Corporation has issued performance standards that have been included in the Equator Principles adopted by a large number of banks. These principles provide, in particular, for the presence of international ombudsmen to whom victims can turn. In addition, most national agencies that provide international aid have their own standards, more stringent than those of the southern countries themselves, governing impact studies for projects they might be likely to finance. This is less often true of financing from emerging countries, however. Finally, the International Hydropower Association's new standard for hydroelectric dams,[13] which was developed together with the Chinese, incorporates some of the WCD's recommendations.

In principle, it is a government's responsibility to protect its citizens, including their right to just compensation for any unavoidable damage. Yet civil society organizations, including those at the international level, rely largely on the various tools outlined above to slow or stop the building of new dams. This is certainly an opportunity to negotiate better support for the affected populations. Current demonstrations associated with the gradual development of India's Narmada River are serving mainly this purpose. The approach favored by the WCD, equality of rights for affected communities, has little chance of being adopted as a general principle for action. In contrast, promising new approaches include a systematic analysis of social risks so that they can be proactively addressed.

The example of resistance to the Ilisu dam on the Tigris River in Turkey shows the succession of European opposition movements that affected its financing, first by the British, then by the Swiss, Austrians, and Germans. Today, the Turkish government is continuing the project with Chinese financing. This is despite two successive decisions by the Turkish Council of State, which ruled against construction; and the possible listing of the city of Hasankeyf, which is several thousand years old, as a UNESCO World Heritage Site.

So the issue of dams is heavily tied to that of democracy. Transition to democracy is often accompanied by abandonment of government dam-building projects (in Burma, for example). Yet civil society's systematic resistance to all projects often merely slows the work. In the context of climate change, more dams and reservoirs will be needed to adapt. Where is the line between development aid and adaptive strategy drawn? The terms of the debate are often muddled.

[13] "Hydropower Sustainability Assessment Protocol" of the International Hydropower Association (IHA).

Photos

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Front: M. Tharin, E. Fiechter-Widemann and N. Ghoula

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Guaranteeing Access to Water Is One of The Rotary Foundation's Six Strategic Focuses

Christoph Stucki and Renaud de Watteville

Rotary International, a network of men and women from the business world, the liberal professions, and civil society, has over 34,000 Rotary clubs around the world. For 1.25 million Rotarians, it represents a commitment to "service above self," which is our motto.

Since 1928, a distinct entity within Rotary called The Rotary Foundation has been unceasingly working toward its goal of supporting the Rotarians in their efforts to promote world understanding, peace, and good will through humanitarian and educational activities. It is a nonprofit organization supported exclusively by voluntary contributions from Rotarians and friends of the Foundation who share its vision of a better world.

A central focus in developing The Rotary Foundation's new strategic plan was identifying six key strategic focuses:

- promoting peace and working toward conflict prevention and resolution,
- disease prevention and treatment,
- water and sanitation: water, a source of life, is a vector of death and disease in most developing countries; through their actions in the area of water and sanitation, Rotarians help those in the world who do not have access to potable water,
- maternal and child health,
- literacy and basic education,
- economic and local development.

The Rotary Water Booster

A Sustainable Water Kiosk for Small Villages

- High quality drinking water
- Provided at an affordable price
- From any dirty and salty raw water
- On site production creating local jobs and strong impact

The "Rotary Water Booster" is a tool developed by Rotarians and Swiss Fresh Water that brings safe drinking water to low-income villages.

Enabling Local Water Treatment

Swiss Fresh Water (SFW) is a company that developed a low-cost, decentralized system that turns any brackish water into drinking water.

This system is offered to local operators through "water packages" that include the full equipment and enable local operators to develop a water kiosk.

Since June 2011, SFW's offering has been tested in Senegal in a successful pilot project, providing access to safe drinking water for 20,000 people.

The Situation of Small Villages

The pilot project demonstrated the specific needs of small villages:

- Small villages require a small water package; the purchase includes the cost of the maintenance of the equipment; the equipment itself needs to be sponsored.
- Small villages need sponsoring to finance their first year's water package since they often don't have the means and can't access bank credit.

To address the situation of these small villages, the founders of SFW initiated the Access to Water Foundation and its "Water Booster."

Swiss Fresh Water's Solution

SFW's water treatment solution is tailored to the requirements of local operators in emerging countries, allowing them to develop a small water enterprise.

It includes a small-scale, low cost desalination machine, a decentralized maintenance concept and a local business model based on "water packages."

Small-scale & low cost machine:

- SFW's desalination machine produces up to 4,000 liters of WHO-compliant drinking water per day from any water source.
- It uses reverse osmosis membranes that remove residuals of any size: salt, arsenic, fluoride, heavy metals, viruses, and bacteria.
- The machine is low-cost, robust, easy-to-use, and can be powered with solar panels or with electricity from the grid.

Decentralized maintenance:

- Every machine constantly communicates via GSM and Internet with SFW in Switzerland, transmitting all necessary production data.
- Regional Service Centers proactively maintain a cluster of machines, supported by the telemetric follow-up of SFW.
- The local operators do not need in-depth technical training or skills to operate the machine and sell the produced drinking water.

"Water packages" for local operators:

- SFW offers prepaid "water packages" with a maximum duration of one year that include the rent of the machine, its full maintenance, and the possibility to produce and sell a certain amount of drinking water per year.
- To make sure its water is affordable, SFW sets the water sales price with local authorities, in Senegal at 1.5 euro cents per liter. This sales price still enables the operator to make a profit while paying salaries and operating expenses.

If the operator can't pay the water package upfront, local banks serve as financing partners, providing him with credit to be able to pay SFW.

How Does it Work?

Water Boosters financed by Rotary allow small and low-income villages to establish a water kiosk that becomes self-sustaining. It consists of:

- The technical equipment for a small water package. A small water package allows producing and selling from 50,000 to 200,000 liters of drinking water per year. Its cost covers the full maintenance of the machine.
- The sponsorship of the first year of maintenance. The village in return transfers the majority of its water sales revenues to a bank account that will cover the second year's water package.

By selling 200,000 liters at 1.5 euro cents per liter, the village will generate a turnover of 3,000 euros, and thus gross a margin of 1,170 euros for salaries and the community.

Financing & Budget

Each Water Booster financed with one-time donations from Rotary clubs covers:

- a complete water treatment equipment;
- the first year's water package.

Rotary's Impact

Financed with one-time donations, every Rotary Water Booster creates a sustainable annual impact in two "Rotary Areas of Focus":

- Water and sanitation,
- Economic and community development measures.

Budget (to be refined after technical site check)

"Rotary Water Booster"	Euros
SFW machine BW50	6,950[1]
Auxiliary equipment (tanks, tubes)	1,750
Transport Switzerland—Senegal village	800
Furnishing of facility & installation on site	500
Solar power unit (panels, batteries)	4,000
Water package year one	1,830
Total per "Water Booster"	**15,830**

[1] Access to water is not exclusively from SFW but instead chooses the most cost effective, technically viable solution.

Annual Impact	Per Year
Number of "Water Boosters"	1
Safe drinking water produced[2]	~ 550 l/day
Population with new access to safe water[3] access to safe drinking water	~ 550
Number of jobs created and maintained[4]	2
Number of professionals trained[4]	2
Number of consumers educated (hygiene)[3]	~ 550

[2] Based on a water package of 200,000 liters/year Impact according to Rotary Area of Focus.

[3] Water and sanitation.

[4] Economic and community development measures.

"Rotary Water Booster" in a Nutshell

- Provides small villages with access to affordable and safe drinking water.
- Helps start up a local water kiosk that becomes self-sustaining.
- Is based on one-time donations that have a lasting and sustainable impact.

What's in it for Rotary?

- Its one-time donation creates a sustainable impact in two "Rotary Areas of Focus".
- Visibility of Rotary's logo in the village supported by the "Water Boosters."
- An annual report on the safe drinking water produced by its "Water Boosters" and on the impact created in the region.

To learn more about the Rotary Water Booster and the Access to Water Foundation, please contact us at: +41 21 711 22 77, info@accesstowaterfoundation.org

Fair Management of Transboundary Aquifers

Benoît Girardin

Background

Unlike watercourses, which flow in plain sight of all nearby residents and create a physical asymmetry between those upstream and those downstream, the water in aquifers is accessible via springs or pumping. Its flows, and also its reserves and quality, are much less easily observable. Strictly speaking, it has no natural outlet as rivers do: springs and wells act as points of contact where discharge and intake occur.

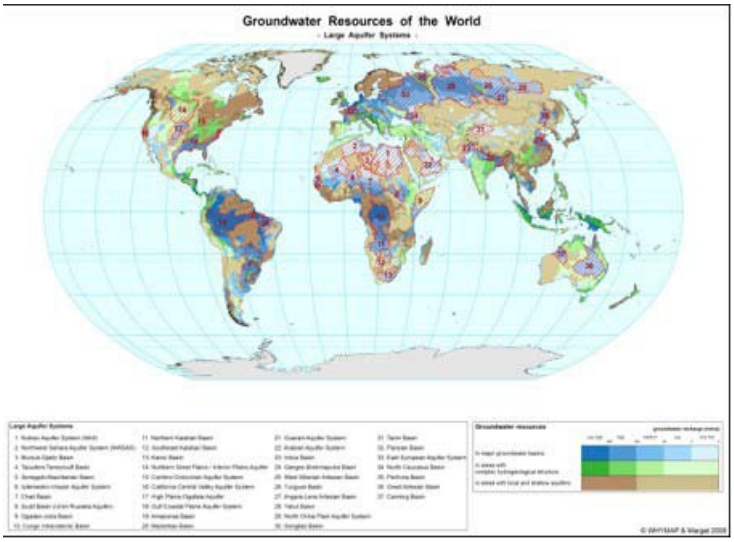
Over half of the potable water swallowed by Earth's inhabitants comes from aquifers; in Europe, this proportion increases to as much as three-quarters.

Many aquifers extend beneath multiple countries, for example, the 40,000 km³ Guarani aquifer between Brazil, Argentina, Uruguay, and Paraguay, which is easily rechargeable; the Nubian sandstone aquifer between Egypt, Libya, Sudan, and Chad; and the Iullemeden aquifer between Mali, Niger, and Nigeria, which recharges less easily.

Just a stone's throw from Geneva lies an aquifer that completely disregards the French-Swiss border and is therefore a transboundary aquifer.

According to some estimates, 47% of the earth's surface overlies transboundary aquifers (Charrier 1997), which therefore are of great importance.

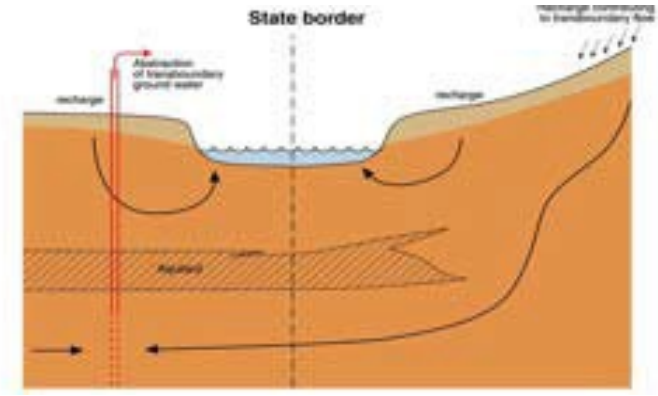
Overuse of these aquifers becomes a tragedy, especially in areas with irrigated crops such as northern China, the southern United States, and the Punjab of Pakistan and India, where the aquifer level has fallen by 10 meters since 1973 with an attendant considerable increase in soil salinity. Use of the Iullemeden aquifer has exceeded recharging since 1995, which poses a threat to the Niger River during the dry season. The Nubian aquifer is also being heavily pressured by Libya and Egypt. In the Geneva aquifer's case, the threat of depletion prompted an attempt to reach an agreement to preserve it.[14]



One characteristic of transboundary aquifers is that water removal may occur on one side of the border while recharge occurs on the other; the volume of water being removed can be hidden for a long time, and it is possible to be unaware that the aquifer is being polluted—or the polluter may know it but pretend not to. The effects of steps taken may not be known for a relatively long time, and a point of no return may be reached before anyone realizes it. Emptied aquifers

[14] http://www.agu.org/journals/wr/wr1201/2011WR010562/.

may take decades to refill, and decontamination of polluted groundwater can be a very difficult and expensive process, and therefore simply be abandoned. This is a less likely possibility in the case of surface watercourses.



See the additional graphic at the end of this paper.

So these reserves can be considered as both strategic advantages and potential crises. Considering that demand is increasing, that—as is common knowledge—pressure on the aquifers has intensified due to the proliferation of boreholes and technology, and finally that cross-border management is a sensitive issue, confrontation seems a likely outcome.

In 2008 UNESCO inventoried and mapped the 273 transboundary aquifers, and it is now engaged in developing internationally recognized rules for managing them. This task is being approached holistically, with identification of the legal, institutional, socioeconomic, environmental, scientific, and hydrological aspects.

Very few international agreements have been signed to regulate the use of transboundary aquifers, in stark contrast to the case of transboundary watercourses. The scarcity of legal instruments and agreements indicates that the level of awareness of this reality does not yet match its seriousness, and also that the parameters for use are more difficult to define.

Traditionally, legal frameworks have taken as their point of reference either (1) springs or wells, treating water as a "commodity";[15] or (2) the development of transboundary mining lodes or petroleum deposits—thus demonstrating an inability to envision the reality of transboundary aquifers and take into account the fluid, moving, and fungible nature of water.

Of course, not all geographical configurations are identical, which has implications for defining how to manage them across borders. Various typologies have been suggested based on the respective geographic positions of aquifers and watercourses—whether or not they are connected—and especially based on whether or not the aquifer is confined, since if it is not then recharge and decontamination may be possible. However, it is not my intent here to go into such sophisticated details.[16]

It was not until 1997 that the UN Convention on the Law of the Non-navigational Uses of International Watercourses and Lakes explicitly recognized the systemic connection between surface water and groundwater. In December 2008, the UN General Assembly approved the 19 articles developed by UNESCO's International Hydrological Programme and the UN International Law Commission to provide a framework for managing transboundary aquifers. We should note that an agreement concerning Guarani was signed in the summer of 2010. The reworking of the Geneva region agreement in 2007 is along the same lines.

Challenges and Dilemmas

The first challenge is political: transboundary aquifers are managed by sovereign States that are "naturally" tempted by a unilateral approach centered on their territory and immediate interests, whereas effective management requires

[15] Such is the case in British public law, the French civil code, and Spanish law—which, however, introduces the idea of a public aquifer. Islamic traditions are the most open-ended, speaking of a right to drink, water animals, and irrigate the land, but limiting itself to wells and springs with no mention of aquifers. The first time transboundary aquifers were taken into consideration, other than for joint management of transboundary springs or wells, was during a 1950 discussion between Luxembourg and Germany with regard to the consequences that building a dam in Luxembourg might have for the aquifer. The 1978 agreement between France and Geneva was the first to focus on the aquifer itself: extraction and recharge (Wohlwend 2002; Eckstein 2005).

[16] Although Barberis suggested four types of transboundary aquifers in a 1986 FAO study, in 2005 Ecktstein contested two of these and suggested four others, for a total of six, to illustrate the diversity of hydrologic situations and their legal implications, especially in terms of confinement or non-confinement (connection to a hydrologic system), and capacity for and location of recharge based on pumping sites.

getting beyond sovereignty, or accepting sovereignty that is limited and shared with both neighboring countries and future generations. To see this clearly, all we have to do is ask questions about aquifer ownership, withdrawal rights, access capacity, and states parties' obligations and responsibilities with regard to contamination. We find dilemmas between management for today and sustainable management, a national or international approach, a single-factor or holistic approach, national or regional or even municipal responsibility, and the State as owner versus the State as a steward that cares for its resources with sustainability in mind. The commitment to inform the other party in a timely manner is another aspect of this limitation of absolute sovereignty.

In fact, national responsibility still too often focuses on national territory. This being the case, transboundary aquifers mark the limits of traditional sovereignty, the limits of the sovereign approach to a resource that transcends sovereignty.

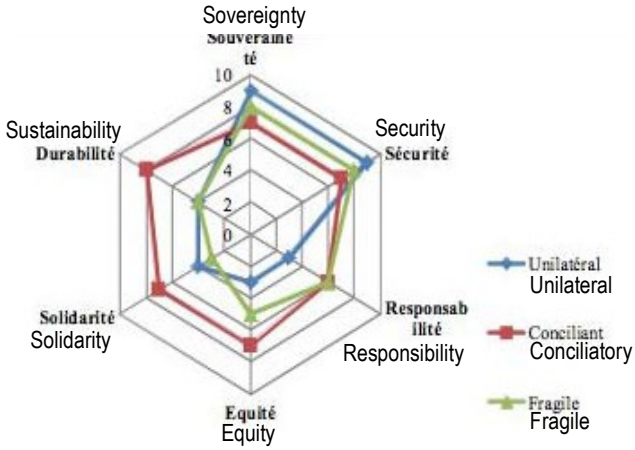
The second challenge has to do with an equitable and reasonable allocation of the water and the determination of user rights. Of course every country has the right to fair and reasonable use of the aquifer resource: the criteria for what is "equitable and reasonable" remain to be defined, and the authority that will set and monitor the rights must be identified. Should "fairness" reflect the needs of the public, of industry? Should it be relative to surface area or the amount of water located under each nation's territory? Here, the dilemma has to do with solidarity's role—in view of allowing, for example, use by less well-off farmers or nomads—all while stressing responsibility in case of sanctions or compensation. What is most reasonable? One could also argue that, with due consideration of the future and sustainability, what is "reasonable" demands a certain level of frugality such that the volumes used do not exceed the recharge volumes. Could such self-limitation be implemented within one country only?

The third challenge involves the resource itself, its use, its quality (because contamination could occur), and recharging (which can be by percolation or pumping but may also be affected by dam construction in the percolation zone). In cases of overuse or unilateral contamination, how and especially when can liability be determined and compensation or reparations set? In this case, the dilemma relates to management that is effective, sustainable, and fair in the context of "polluter and monitor quantity and quality? Experience shows that the practice of zero-cost water has led to devastating overuse and monopolizing by players who are capable of learning to use expensive technologies and then implementing them.

The fourth challenge is an economic one: what price is to be paid to extract and use the water, recharge the aquifer, and monitor quantity and quality? Experience shows that the practice of zero-cost water has led to devastating overuse and monopolizing by players who are capable of learning to use expensive technologies and then implementing them.

The fifth challenge belongs to the scientific realm: the expertise necessary to describe the water table's condition must be available. Is the aquifer rechargeable or not, confined or not, vertically accessible, prone to salinization? Also needed is the ability to measure existing amounts of water; flows; amounts withdrawn, lost, or wasted; and the quality of the water with sufficient accuracy and within a short enough time frame to avoid a point of no return; and finally to identify areas at risk of pollution. We must further be able to accurately and impartially establish responsibility for use and contamination.

Such scientific professionalism also implies a quickness or "high gear" commensurate with the scope of the challenges.



The sixth challenge is institutional in nature and concerns the status, capabilities, and authority of the monitoring entity. First, the need for rapid analysis and action demands that management be accomplished from as close to the aquifer as possible, which means that municipalities, not national governments alone, will have to be committed. This was the breakthrough achieved at the Karlsruhe summit in 1996.[17] Next, the monitoring authority or institution must be professional, impartial, objective, and efficient. Its independence must be beyond question since it must suggest or even impose sanctions. The dilemma related to the monitoring agency's composition has to do with the appropriate mix of professionalism versus loyalty—loyalty both to one country and to several countries.

As we can see, there are dilemmas between sustainability and effectiveness, shared responsibility and equity, solidarity and conciliation, against a backdrop of possible tensions and a threat to peace and security.

Ethics matters: like the Devil, it is in the details

Fair and appropriate management of transboundary aquifers depends on an ethical system of reference that, under the term justice, focuses on responsibility, equity, sustainability, and solidarity. Such a system of reference makes appropriate, pays" logic.

In seeking joint management, the terms of which are not imposed unilaterally by one of the parties, a dynamic of peace is created. Conversely, one party's intentional or tolerated contamination can be considered a declared hostility. So accepting a kind of national sovereignty that is both plural and limited is of the utmost importance and turns out to be an essential condition for effective aquifer management.

This ethical system of reference is certainly evident in agreements and international conventions, where it is fairly well accepted judging by the growing number of conventions that have been or are being signed. Signing costs something, of course, but it is implementation of the agreement or convention—and therefore the system of reference—that will really cost and therefore requires a trenchant ethic.

The experience of cross-border management of the Franco-Genevan aquifer,[18] which was laid out in an initial agreement in 1978 and reworked thirty years later in 2007, clearly demonstrates the importance of ethics to effective implementation, measurement, and instruments. The following features stand out.

- Originally, in the name of sovereignty, the approach taken was unilateral management, that is, two juxtaposed or parallel management systems, with each party judging that it should handle the issue itself in order to better serve "its own" taxpayers. The initial approach quickly turned out to be too short-lived and

inadequate. A gradual transition to joint management of a shared resource required that each party agree that its sovereignty was limited by an overriding interest, sustainability, to make the resource last.

[17] The 1996 Karlsuhe agreement was preceded by two important steps, the 1980 Madrid Convention on Transfrontier Cooperation between Territorial Communities or Authorities, followed by the 1992 Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

[18] The need to use a transboundary approach in managing the Geneva aquifer arose when the resource was seen to have declined dramatically in the 1960s due to excessive pumping that exceeded the natural recharge rate. The aquifer's level had dropped by 7 meters, and one-third of the entire layer of water had disappeared in 20 years.

- The need for efficiency and close management of the operation, especially in high alert situations, led to a change in the level of institutional counterparts from the 1978 signing of an agreement between the Republic and Canton of Geneva and the French Republic—represented by the Upper Savoy Prefecture—to the 2007 signing of an agreement between local government entities. Specifically, the Republic and Canton of Geneva delegated authority to SIG, and France to the Communauté d'Agglomération de la Région d'Annemasse [Annemasse Regional Metropolitan Area Community], the Communauté de Communes du Genevois [Community of Geneva-Area Municipalities], and the Commune de Viry [Municipality of Viry]. Unity and scalable diversity were accepted thanks to patiently built trust!

- Measurement, planning, and monitoring procedures are bilateral and transparent: criteria and risk thresholds are jointly defined—with the French monitoring pollution in the Arve River and the Swiss monitoring pollution of the aquifer—, at-risk areas on either side of the border are identified together, the Swiss measure the amounts pumped on both sides of the border and the amount that is recharged, with billing by SIG. In order for all of this to be accepted, there had to be a mutual exchange of the measurements made and free access by the other party to information, case-by-case review of expenditures and adjustments between pumping and recharging, all done by an operational work group supervised by a joint commission. These mutual accountability measures turned out to be critical to effective management and also to developing mutual trust. For example, technical feasibility facilitated political interaction, and the scientific basis established objectivity and impartiality. It was not necessary to call on a third party for independent and impartial arbitration. The parties were also able to specify and set up mechanisms for joint decision-making to handle emergencies (drought, pollution).

- The solution was chosen based mainly on a scientific criterion of feasibility: artificially recharging the aquifer using a supply of the same type of water siphoned from the Arve River at Vessy, and monitoring the Arve's pollution in French territory, were chosen over pumping from the lake. This procedure turned out to be the most suitable and least expensive answer, and made easy scientific measurement of quantity and quality possible.

- Distribution of the operating and recharge costs is based on equity, though also with an element of solidarity and counterbalance: equity because each party pays in proportion to the amount of water pumped, and solidarity through an exemption for the French side, for which the first 2 million m³ are free[19] and through the mention of a price ceiling if Swiss consumption should decrease considerably

- These two policies can be summarized as a judicious proportioning of checks and balances.

- The stakeholders' approach used in this example requires responsibility (contamination, maintenance, consumption) but also depends on management of differences, insofar as on the Geneva side, ownership and responsibility were transferred to SIG, that is, an entity operating under the rules of the private sector; its economic logic could worry the French municipalities, which are more comfortable under the public umbrella.

From an ethical point of view, I will close by stressing that:

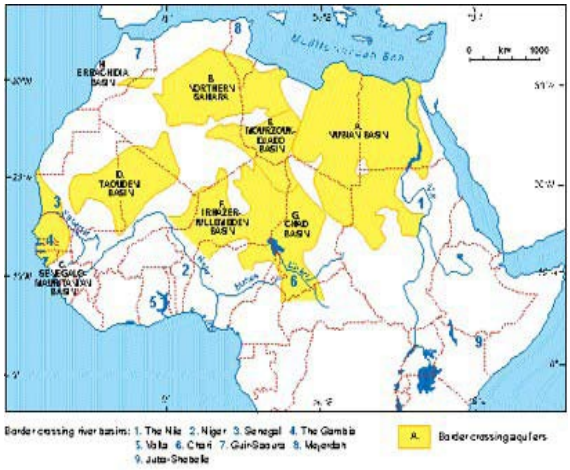
- efficient, effective, appropriate management is, at the same time, fair management that is rooted in the values of responsibility, equity, sustainability, and limitation, and implemented using detailed and transparent operating procedures, especially mutual accountability.

- this is a stepwise process of building mutual international trust that gets stronger with time; not one where fulfillment of some essential condition is demanded as a prerequisite for any cooperation.

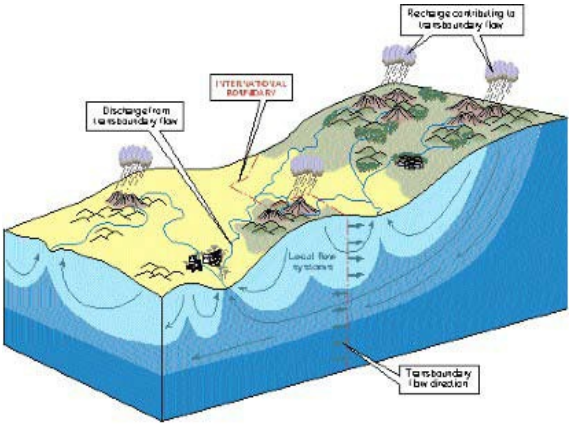
- the key players must be represented at the table to express their interests and risks, so as to be able to understand the other party's interests and fears.

The fact remains that in many places in the world, countries that share an aquifer do not have equal institutional capabilities and technical expertise. So the risk that the stronger country will push its advantage is far from negligible. It may prove wise to turn to an independent multilateral or regional third party that is involved beginning with the joint evaluation of the steps taken and risks. Implementing policies and sustainable strategies, awareness campaigns to prevent escalation of disputes, and multisector technical partnerships would be highly advantageous. Here, again, equity, responsibility, and sustainability are affirmed, complemented by a kind of solidarity that is able to avoid the trap of dependency. This does not replace political will, but can certainly help it to be more fitting and fair.

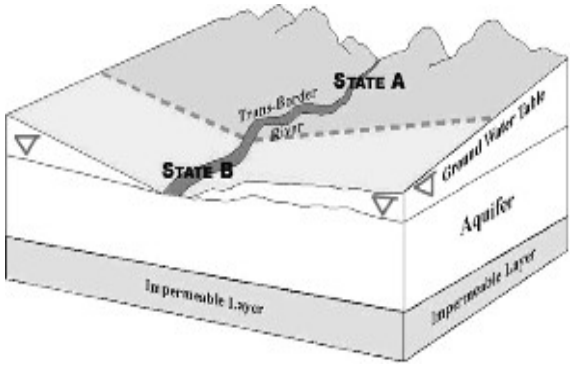
[19] These 2 million m³ reflect French consumption estimated during the previous shared management era, an amount that was compensated by the natural recharging of the water table.



Aquifers of northern Africa



Schematic representation of a transboundary aquifer



Transboundary aquifer in the Geneva region

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Youth Parliaments for Water, a Solidarité Eau Europe Program

Victor Ruffy, a National Councilor and Swiss representative to the Council of Europe

The NGO Solidarité Eau Europe ("Solidarity Water Europe"), or SEE, was created in Strasbourg in 1998, on the initiative of the International Secretariat for Water in Montreal and the Council of Europe.

Its founding document, the Strasbourg Declaration, lists five major challenges it attempts to meet:

- recognizing water's democratic nature,
- better protecting aquatic environments,
- designing water services for a fair economy,
- considering water as a factor in land-use planning,
- making water a subject of instruction.

Youth Parliaments for Water, a specific program of SEE, seeks through its form to address three of these challenges in particular.

Tap water may come from a spring, but it still requires an infrastructure, and even a whole distribution system.

What kind of service is this? Who provides it and how?

What logic guides the creation of the entities responsible for distributing water and for sanitation? What principles govern the development, allocation, and pricing of water?

Such inquiries help us learn how users are involved in managing this shared legacy of water, and whether each person has sufficient access to it to meet his or her primary needs.

On a European scale, what is needed is a preliminary general overview of the resource's distribution and development throughout the continent as a function of climatic regions; the focus can then zero in to cover the country or region where the parliament is being held.

Each country has its own issues; accordingly, each parliament has its own theme and seeks appropriate partners from among public authorities, water agencies, cooperative agencies, and private companies that specialize in water management.

For Switzerland, known as Europe's water tower, this was upstream and downstream solidarity in Morges, Bellinzona, Samedan, and Chur; for Moldova, it was access to potable water and sanitation in rural areas in Chisinau, Vadul lui Voda, and Vorniceni; for Russia, the treasures of the rivers in Nizhny Novgorod; and for The Netherlands, water and climate change along the Rhine in Gelderland.

When we focus on youth, we are banking on energy, the power of imagination, and a willingness to get involved.

To motivate young people, the heads of SEE require each registered delegation to prepare a presentation on the selected theme, which they then give and defend at the plenary session. Once sworn in, the members of the parliament attend presentations by specialists, participate in workshops with visits in the field and discussions with users, initiate debate with local and regional political authorities, and write a final statement which the President of the Parliament submits to the local, regional, and sometimes national authorities.

The parliaments are accompanied by photo and video contests and always include intercultural evening functions.

It is difficult to draw conclusions about the effects of these events, but in Moldova the gradual addition of water supply and sanitation facilities to high schools, the public awareness program, and the Ministry of the Environment's "urban-rural solidarity" campaign should be considered positive results.

The parliament held in Russia made it possible to capitalize on civil society's courage and the commitment of some authorities who were working hard to be heard as they defended an environmental policy that had fallen into disgrace in a hyper-centralized national system.

General Discussion

Summarized by W4W member L.-I. Stahl Gretsch

F. Dermange to M. Tignino: How can we quantify the water used for food crops?

M. Tignino: The amount needed to avoid famine. This is subsistence farming.

E. Lyons: In arid countries, 90% of the water goes to agriculture. Can that still be described as subsistence farming?

M. Tignino: The issue is human survival.

J.-J. Fornay to R. de Watteville: How long do the machines last?

R. de Watteville: The parts are changed regularly, for a complete overhaul once every 12 years.

J.-J. Fornay: Have you already approached the UNEP?

R. de Watteville: Our project is still too small for that, but it will be relevant soon.

Question to E. Lyons: The World Bank's "reservations" about equality (or not) of interests, with an obligation for consultation.

E. Lyons: The problem is the role played by China, which does not feel bound by international agreements.

E. Fiechter-Widemann finds the idea of youth parliaments very convincing. They play an incredible role for peace. It is good to have a spokesperson on the Council of Europe to support them.

V. Ruffy: Water is not a subject that members of parliament explore spontaneously, except when there is a disaster (and when there are high points). The same difficulty has arisen in summarizing the existing state of affairs for Marseilles, and it's a shame. For example, settling aquifer-related conflicts is a matter only for governments, not parliaments.

M. Tignino to V. Ruffy: Why so much interest for Central European countries such as Moldova?

V. Ruffy: They lie within the former Soviet Union and applied its standards (no consultation, but free water). The water supply system there is obsolete and about 15% of the revenues allocated to water need to be devoted to it.

Residents of these countries are now especially concerned about this subject.

J. Rochat (originally from the Balkans): Civic instruction is needed in these areas, because everything used to be free. So the people must be educated.

E. Fiechter-Widemann: These comments reveal the global public forum and the fundamental importance of water's democratic nature.

V. Ruffy: In the context of European Union draft directives, the issue of privatization came up. The Austrians and Germans showed a clear desire to keep water public and control prices.

J.-J. Fornay: One aspect not often addressed today is the monopolizing of water for industrial needs, which creates conflicts—especially with the dominant ideology of economic growth.

E. Fiechter-Widemann: This question of industrial water is taken into account in the new "virtual water" concept, an indicator that could help avoid water wasting.

M. Zeitoun: Virtual water (that is, the water that is consumed to produce something) is very important in the food business (use of water resources, transport, etc.). For example, asparagus grown in a Peruvian desert or Egypt importing food from Argentina.

V. Ruffy: In the case of the Peruvian asparagus, is it to the detriment of local residents?

M. Zeitoun: Yes, very much so, especially in desert areas.

B. Girardin: If we can't impose quotas, we can influence this element through the price of water. A study of the impact and ecological footprint (which must be reflected in taxes or a compensatory element) would help balance things out.

M. Zeitoun: Water cannot be limited to a strictly economic value, because that would contradict its status as a human right.

B. Girardin: One could imagine something similar to the carbon tax, which provides an incentive to offset consumption.

M. Zeitoun: Standards need to be created.

E. Fiechter-Widemann: Water is a development issue.

B. Girardin: Not solely, look at the Unites States.

E. Fiechter-Widemann: For example Singapore, which has seen its population grow by 1/3, has an impeccable (but expensive) water supply system, after making enormous investments. So it's not a question of standards, but of technological developments.

B. Girardin: These are still standards, in addition to financial incentives.

E. Fiechter-Widemann: Our state of mind has to change. Water cannot be free, and now people need to be taught that that's how it is.

V. Ruffy: This is a case of historic inertia (compare the examples of Istanbul and its new residents or the phenomenon of migration from rural areas to cities).

E. Lyons: We need to make a distinction between the free resource (aquifers, lakes, rivers) and the services and access to water (pumping, treatment and distribution), which have a cost.

The issue is knowing what "price signal" we are sending. There are two different models: South Africa, where the basic amount is free and the rest must be paid for (but there has to be wealth for this model to work); or per-volume pricing, which encourages water conservation (with public assistance for the poorest people).

Ch. Häberli: Switzerland did not ratify the right to food and water agreement, but it did ratify the one on social and cultural rights (along with 160 other countries). So the equalization is social, especially where the three main monotheistic philosophies are concerned, with corruption of the word "love" by the word "charity." We are not anywhere near an automatic worldwide system! Example: the issue of "do no harm," which is violated by the WTO when it hinders exportation.

We need to remember Switzerland's humanist vocation while at the same time noting the impoverishment of developing countries.

M. Zeitoun: The very direct link between money and food, especially within the CAP (Europe's Common Agricultural Policy), violates the right to water.

A participant: Can we even imagine a world without dams?

E. Lyons: We cannot and we should not! We must include all of the parameters, including costs, when we build them.

Ethical Summary

Professor François Dermange, University of Geneva Faculty of Theology
Notes taken by L.-I. Stahl Gretsch

Days like today are an opportunity to expand our horizons.

I am going to attempt to communicate to you what I, as an academic, have understood from these discussions with regard to the concepts used, such as fairness, solvency, etc.

The heart of the question revolves around the concept of responsibility. For what and for whom are we responsible, and to whom?

There is a kind of tension, or complementarity, among three kinds of responsibilities, two of which come down to us from ancient Rome:

- The Latin *sponsio,* which is an exchange of consent between two people, with an outside person—the *responsor*—acting as the guarantor of the exchange and who therefore should not be seen as being in the wrong, but as the person who is responsible. This is the role of the government or supranational authorities, which implies some legal work to envision the entities that will guarantee harmony, especially in relation to the outside.
- In the tradition of the Roman Republic, what really counts is freedom and the refusal to submit. So it is essential for people to be able to participate in decisions that concern them. Equality and the refusal to submit must be restored.
- There is a thought common to both Gandhi and Calvin. Both saw that there is a dissymmetry between the strongest people and the weakest, between those with more resources and the others. What counts is that the one with power uses it for the good of the others and not for himself. So we are dealing with a moral requirement and not an economic or legal one.

Today's presentations all spoke of responsibilities, in complementary and different senses, which is why we have raised some perplexing points.

Similarly, there are so many different uses for water that we cannot manage to be clear as far as essential needs are concerned (drinking, sanitation, agriculture—how far do we go).

From left to right: M. Zeitoun: L.-I. Stahl Gretsch, B. Girardin, E. Lyons, B. Ruffy, E. Fiechter-Widemann, M. Tignino and F. Dermange