Water Resources in Subsaharan Africa

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Note

The following working document is a short summary of the report of the IERPE on water resources in Sub-Saharan Africa written for the conference "Peace With Water". Complements to the information below, bibliographical resources, additional maps, tables and graphs are available right now in the original version of the report (French) The complete translation in English will be distributed as soon as possible. We sincerely apologise for this.

Introduction

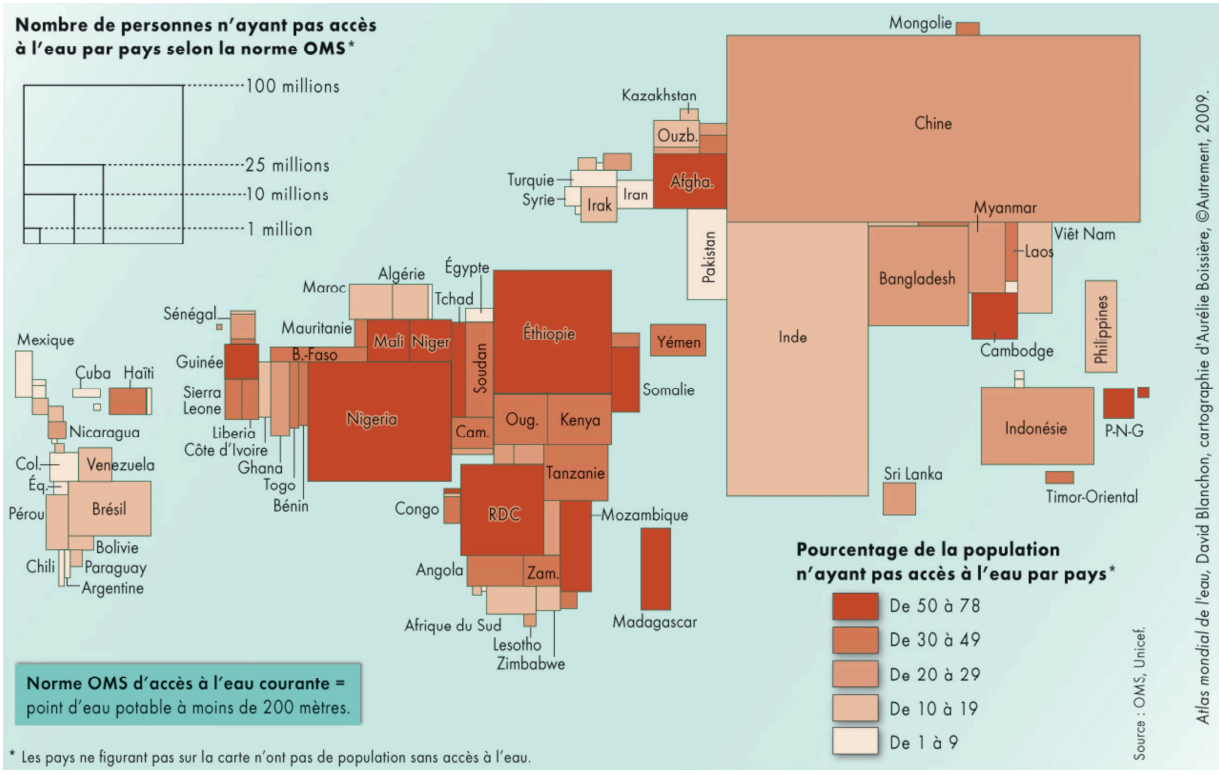
In sub-Saharan Africa, water resources are the victims of aggressions and predations, and conflicts surrounding the propriety of and the access to water are more and more likely to happen. The study is based on the assumption that this area of the world is characterised by three major political constraints that impinge its development and its capacity to supply water to all its population. First, sub-Saharan Africa is an extremely poor region. Its populations have always been maintained in this state of affairs and are still the victims of a long-lasting impoverishment process. Africans are more and more thirsty, not because they live in a water-poor continent, but because they are poor themselves. Second, the region is economically very dependent on former colonial powers. Natural resources in Africa have been exploited for the benefit of external powers and their elites, whereas local people never had the opportunity to enjoy any associated advantages or benefits. They have witnessed external companies overexploiting and destroying those resources with no return to the population, which has to live with what is left. Several examples are discussed in the complete report, especially the well-known example of the overexploitation of the Lake Victoria for the exportation of the Nile Perch to Europe. Finally, the third constraint consists in the weakness or even the absence of states capable of governing water resources in an effective way for all. The failure to develop a stable post-colonial state is not only the responsibility of Africans. External interests have often been involved in wars and other conflicts that affected the region and its stability. As a consequence, there have never been any efficient frameworks developed for the government of water resources at the local, national and basin-wide levels. The power of decision has constantly been in the hands of public and private organisations in charge of the management of the tight-aid as well as of international financial institutions such as the World Bank, the International Monetary Fund, the European Union, the NEPAD and the African Development Bank especially.

The report presents a state of the art of the African situation with regard to water resources. It begins with a short statistical reminder of the socioeconomic conditions of the region and the situation of access to water and sanitation for the population. Then, it focuses on the major natural and human-induced issues at heart of these catastrophic situations and their impact on the probability of conflicts over water resources. Finally, the main solutions proposed by the international community in general are shortly discussed.

Sub-Saharan Africa: General Presentation and water resources:

The region under study includes all African states except Morocco, Algeria, Tunisia and Libya. In sub-Saharan Africa, the living conditions of the population are part of the worst in the world in terms of health, education, and economy. 800 million people live in sub-Saharan Africa, with a population growth rate of more than 2.5%, as much as twice the world's rate. Three quarters of the people living with HIV on Earth live in this region, which is also the most affected by water-related diseases that lead to numerous casualties each year. There, life expectancy is less than 50 years, whereas the whole world rate reaches 68 years. Children and infant mortality are particularly high. Education is also a key problem since a lot of girls do not have the opportunity go to school yet because they need to deal with other domestic matters such as getting water, sometimes far from home. With regards to economy, it is the poorest region in the world; attaining 1.5% the world's GDP for 12% of its population. Furthermore, wealth distribution is even more unequal there than anywhere else in the world (the 20% richest populations possess 60% of the local wealth, against 43% in the whole world, and the 40% poorest only obtain 12%, against 20%). The socioeconomic situation of the region is catastrophic and helps better understand the water issues at stake.

Number of inhabitants with no access to water sources (in % of the national population)



Source: *Atlas mondial de l'eau*, David Blanchon, Cartographie Aurélie Boissière, Editions Autrement, 2009

In a more specific way, sub-Saharan Africa is the area where the lowest rate of the population has access to improved drinking water sources (58%) in the world. The situation is however better in urban areas (where 82% have this access compared to 95% worldwide) than in

rural ones (only 44%, against 72%). The map above is based on the WHO standard, which affirms that water resources must be situated at less than 200m far from the inhabitant's home to consider that the latter has access to water. However, the conditions are even worse in what relates to sanitation, with only 28% of the rural and 50% of the urban populations having access to satisfactory hygiene systems. With a rate of 36%, sub-Saharan Africa is far behind the world average of 58%. However, one has to keep in mind that the scarcity of water for the population is an "economic scarcity", not a "physical" one, meaning that it exists not because there is not enough water in the region, but because people do not have access to it. Economic water scarcity occurs when the human, institutional and financial capital limit access to water even though it is available locally to meet human demands, with abundant resources relative to water use but also the existence of malnutrition. Therefore, sub-Saharan local populations do not have water because they are poor. Finally, water resources are also victims of human aggressions, especially because of non-African interests. External companies often exploit resources in the region, without any worries for the environment or any return for the local population, who only are witnesses of the destruction of their source of life.

Major natural and human-induces issues

Many issues affect this alarming situation. Most of them are human-induced, although several natural causes also have some impact. They are presented as follows: natural and geographical, socioeconomic, political and institutional, and technical issues. All of them tend to worsen the situation and even be the source of potential water conflicts in the near future.

Natural issues

Water is distributed very unevenly in sub-Saharan Africa, which extends from very dry countries such as Mauritania and Niger (Western Africa), Somalia (Eastern) and Botswana, Namibia (Southern) to very humid ones in Central and Western Africa (Democratic Republic of Congo DRC, Gabon, Nigeria). Therefore, water needs are not the same depending on the climatic conditions. A good example is the Nile River basin, shared by ten states such as Egypt, Sudan, Uganda, and the DRC. Egypt is located in the Sahara, and definitely needs more water from the Nile than the DRC or Uganda, who have plenty of other sources of water on their territory. 97% of the water used by Egypt comes from the Nile. In addition, climate variations particularly affect this part of the world. In Western Africa, only 1% of total annual rains fall during the dry season and 80% during the humid one. This variability is also expressed by the regular occurrence of natural disasters such as severe and prolonged drought or floods. Empirically, climate change seems to reinforce the strength and the unpredictability of these phenomena. In 2025, at least 20 countries of sub-saharan Africa will be facing severe water stresses (1000-1700 $m^3/cap/year$) or water scarcity (less than 1000 $m^3/cap/year$), especially in Eastern and Southern Africa. It also has an impact on desertification. Long and severe droughts are, along with human-induced activities, responsible for the deterioration of soils, which affect the needs for water.

Socioeconomic issues

Poverty is the major issue here. It is one of the key tools for discrimination with regard to access to clean water and sanitation. Water distribution and prices often exclude the poorest populations. The distribution of water goes in priority to the richest parts of cities, whereas rural areas tend to be forgotten by the institutions. Only one third of the population is connected, and the poorest need to pay in average four times the price paid by people connected to public distribution. In Benin, for example, 91% of the richest quintile of the population has access to tap water, against only 13% of the poorest one. It is the same in Mali (73% against 6%). As a consequence, in cities, the most deprived populations buy water to private sellers, which is expensive. In rural areas, they tend to migrate to cities where they think they will get access to a better life and water everyday. However, migration leads to wild urbanisation and to the exponential development of gigantic slums, where access to water and sanitation is even poorer. Nowadays, 25% of the population of sub-Saharan Africa lives in slums. The region holds an urbanisation and a slums' growth rate of respectively 4.58%, and 4.53%. There, access to water is usually more of a battle than anything else. This situation shall worsen during the next years, with soon 40% of the regional population living in slums in 2020.

Another matter is the very high population growth rate. During the twentieth century, the African population has tripled and the demand for water is six times higher. With the actual rate of 2.5%, the population of the region will double to exceed 1.5 billion people in 2040. The pressure on the resource will therefore be higher. And even though a large majority of this growing population is deprived from access to water, a certain segment of it is as voracious as the richest populations in developed countries in terms of water consumption.

About health, water-related diseases such as malaria kill more than 5 million people each year in the world, most of them in sub-Saharan African. They have a clear impact on children, especially the youngest. The sanitarian situation is catastrophic and the growth of slums tends to support the idea that it will not be safer in the near future. The case of "flying toilets" in the slum of Kibera, in Nairobi (Kenya), illustrates perfectly these worries.

The powerful economic, industrial and commercial groups also tend to overexploit and pollute the richest water ecosystems of Africa, often through the use of totally unsustainable methods, until their complete annihilation. Two main causes of the overexploitation of the resource are discussed. First, the prevalence of agriculture is an issue because it is the largest water-consuming sector of these poor economies, attaining an average of 86% of national water uses. Deforestation (for the creation of agricultural land), the exploitation of barren arable land, the overuse of pesticides and fertilisers and intensive cattle breeding are all related to agriculture and tend to have irrevocable impacts on water resources. Second, the dependence of local economies to the international market worsens the situation. Structural Adjustment Programmes (SAPs) imposed to Africa by the international financial institutions during decades forced those countries to concentrate on one or a few agricultural goods called monocultures, in order to

ensure them revenues through exportation. Those policies were shown to be ineffective and even sometimes contradictory. Global agricultural prices are dictated by occidental economies who subsidise their own agricultural sector, therefore African economies depend on those very low prices and they do not even benefit enough to reimburse their own debt. Furthermore, in some cases the choices of the World Bank, amongst others, have been very surprising. Mali, for example, which is one of the driest countries on Earth, mainly exports cotton, rice and red onions, which are very water-demanding products… The introduction of the Nile Perch in the lake Victoria in the 50s in order to expand local opportunities for economic growth through the exportation of fishes is nowadays very criticised. Indeed, the ecosystem of the lake is continuously harmed because of over-fishing, the extinction of many endemic species, the proliferation of plants and the pollution from industrial complexes built specifically for the transformation of the fishes for exportation. Therefore, the lake Victoria is slowly but surely disappearing like the Lake Chad, for instance. Pollution of water resources is another key issue. It finds most of its roots in: agricultural practices (fertilisers, pesticides), industrial discharges (untreated or solid products, refineries), urban areas (discharge of soiled water) and other infrastructures (salination, sedimentation, invasion of aquatic plants). Pollution and overexploitation involve the decline of water quality, water quantity and of the size of arable land, but also the degradation of humid areas, ecosystems and forests, the loss of biodiversity and the development of new water-related diseases.

Political and institutional issues

Sub-Saharan Africa is politically a very unstable region. Violent conflicts are frequent at all levels. Recently, the political crises in Zimbabwe, the violence in DRC and South Africa or the establishment of a military regime in Guinea illustrate this chronic political instability. Those last 15 years, the genocides in Rwanda (1994) and Darfur (continuing) are other extreme examples of this situation, between other humanitarian catastrophes. Most countries experienced at least one conflict that disturbed the national order of things because of migration or hunger during the last twenty years.

Furthermore, the colonial legacy has some consequences on the distribution of water resources. Indeed, each state now shares at least one of the 63 transboundary river basins of sub-Saharan Africa, amongst which the 15 largest transboundary basins cover more than 70% of the surface of the region. For example, Guinea is at the crossroads of 12 international rivers and Mozambique is downstream of 9 of them. Two main criteria to determine the probability of international conflicts over water resources are the presence of numerous transboundary resources and the fact that several states share the same resources. These criteria applies very well to the region under study, with several basins shared by more than five riparian states such as the Congo (13), the Niger (11), the Nile (10), the Zambezi (9) the Lake Chad (8) or the Volta (6). Most of the basins are not managed jointly by all states concerned.

Another issue is the strong competition over water resources between states and at the local level. Interstate violent conflicts never occurred yet, but many hydropolitical analyses of this region show that the probability there is higher than in most regions of the world, except the Middle East. But the absence of violence does not mean the absence of conflict. In this region, the risk comes from several key factors: diverging national interests (especially upstream vs. downstream), unilateral infrastructure developments (dams, canals), interstate power relations (unilateralism, exclusive bilateral agreements), unsustainable use (overexploitation, pollution) and climate variations (droughts, floods). The Lake Chad, for example, is disappearing because of an accumulation of those factors. It lost 95% of its size since the 60s. Instead of cooperating, states continue to overexploit unilaterally the resources of the lake in an unsustainable way. Nevertheless, most existing conflicts over water resources happen at the local level. There is a clear lack of political and institutional cohesion between economic sectors, which are more and more water demanding. All sectors must learn working hand-in-hand towards the development of a common national water policy in favour of all protagonists. Else, tensions occur between representatives of different sectors or of local communities. For instance, violent conflicts between upstream and downstream agriculture workers are very common. This is the case in Tanzania, where rice producers attack each other in order to get access to a maximum quantity of water. In this aim, downstream producers sometimes diverge upstream irrigation pipes in violent circumstances.

Technical issues

The last group of issues refers to technical ones. First, the lack of information and data relative to existing and future water resources makes local populations very vulnerable to climate variations. There is a clear need for the development of hydrological information systems, data and databases in order to ensure that previsions can be efficient in what related to daily water withdrawals. Even when they – rarely – exist, they need to be publicly available and transparent for all. Data on groundwater resources, water quality and environmental needs is very rare and should be more developed. At the regional level, states would gain at sharing and coordinating their data, notably through a standardisation and a harmonisation of the methods used by all states. Regions exposed to regular droughts and floods should be assisted in priority. There is also an urgent need for the education of specialists in this crucial domain with good incentives to avoid the massive "brain drain". Second, the lack of infrastructure and alert systems reinforces the vulnerability of all states to water shortages. Alert systems are indeed crucial to avoid the worst consequences of droughts or floods, thanks to better previsions of those events. Therefore, states need to cooperate in order to prevent any of them from being let behind. Alert systems should be accompanied with efficient infrastructures in order to avoid any harm to local populations and to be able to store water or release it at all time. Reservoirs and dams are examples of what those infrastructures could be. However, the point here is not to multiply them but to ensure that they exist and are efficiently distributed between riparians in order to avoid

upstream/downstream conflicts. The environmental impact of those types of structures is indeed commonly underestimated.

As a summary, the following table includes all issues discussed and the sources of conflict over water resources that they bring with.

Type of issue	Issue	Source of conflicts
Natural and geographical	Uneven distribution	• Diverse needs and uses (humid, arid) • Increasing number, strength and frequency of natural disasters • Sanitarian crisis • Reduction of water availability (quantity and quality) • Migrations
	Climatic variability and Climate Change	
	Desertification	
Socioeconomic	• Poverty o Distribution and price o Rural migrations, wild urbanisation and slums	• Exclusion of the poorest • Migrations • Social discrimination (power relations, women children, poor) • Lack of infrastructures • Sanitarian crisis • Higher competition between states, sectors and users • Reduction of water availability (quantity and quality) • Food crisis
	• Population growth.	
	• Health	
	• Bad government of water o Overexploitation o Pollution	
Political and institutional	• Political instability (national and regional)	• Latent political instability • Reduction of water availability (quantity and quality) • Higher competition between states, sectors and users • Upstream vs. downstream tensions • Border tensions / Territorial waters • National sovereignty over common interests (infrastructures, unilateralism…) • Population disappointment
	• Transboundary basins	
	• Strong competition and lack of cooperation o Interstate (power relations) o National, local (between sectors and communities)	
Technical	• Lack of information, data and databases	• No previsions possible • Recurrent risks of scarcity • Natural disasters • Migrations
	• Vulnerability to climatic variability o Lack of infrastructures o Lack of alert systems	

Major solutions proposed by the international community

It is been more than 30 years, starting with the United Nations Conference on water in Mar del Plata (Argentina) in 1977, that the international community has been aware of those issues and has continuously developed solutions of all kind in order to reduce their impact on local populations. During the 1990s, the World Bank, along with the Global Water Partnership and the World Water Council, started bringing together the public and the

private sectors to achieve a supposed "improved efficiency in water management". Thus, the source of all policy promoted up until now by the international community is based on the Integrated Water Resources Management (IWRM) principles (water is as an "economic good", liberalisation of the "water market", development of public-private partnerships (PPP), promotion of transparency and good governance, …). Below you will find a selection of the most promoted solutions by the international community and a short evaluation of each of them. They will be discussed in two distinct sections, one focusing merely on national level solutions, the other one relating to international level ones.

At the national level, and according to the package of institutional changes proposed by the international community, all sectors of economic activities should be integrated in order to ensure that there exists only one unique national water policy in favour of the development of stable institutional frameworks encouraging the inclusion of all users to the improvement of this policy, notably for the protection of the environment to be more taken into account. The international community now also goes for the management of the full cycle of water, where groundwater and surface water are linked with soil management. It considers that the promotion of decentralisation mechanisms and the participation of all is essential as well. In line with the general philosophy of governance, the international community advocates that the state, public and private entities, the civil society and other protagonists of the water sector need to be involved in the formulation and the implementation of decisions relative to water policy at all levels, in order to guarantee that all interests are taken into account and to avoid potential related conflicts. Finally, there is a clear claim for the improvement of political sensitisation mechanisms to make sure that national elites consider water as one of the main catalysers of development. It would reinforce their will to satisfy vital water needs for the most endangered part of their population. The recent Sirte declaration in Libya in 2004 and the creation of the African Ministers' Council On Water (AMCOW), amongst others, are proofs of the growing governmental interests in those issues in sub-Saharan Africa.

The international community also calls for the development, more specifically the importation of numerous technologies and techniques: the improvement of water-related data, databases and standardisation methods, alert systems, modern irrigation systems at a large scale, storage mechanisms (rainwater storage, small local dams), water re-use systems and treatment of soiled water, amongst others. All of them require very large investments from the states of sub-Saharan Africa in order to import them from developed countries. However, one does not have to fall into another type of dependence of African countries to external powers through the importation of costly technologies. The major goal here is to ensure that this region is able to deliver enough water to all its population, not to make from sub-Saharan Africa a new market for occidental countries to sell as much as possible of their technologies without transfer of knowledge and know-how. Some of these solutions need to be taken with precaution, such as the development of modern irrigation systems on a large

scale. The terrible consequences of intensive and extensive irrigation on the environment and on the well-being of the resources are well known.

In terms of economic policy, the international community promotes the commercialisation of the resources, the liberalisation of "water markets", the use of "best price" policies, the development of sustainable financing and the implementation of cost-recovery policies. Those solutions recall the guiding principle that characterised the SAPs during the last decades, which did not achieve their expected goals and were very controversial. Those solutions need the populations to assume that water is an "economic good". However, most of the inhabitants of sub-Saharan Africa traditionally consider water as a social, common good and a human right. It is the source of life, which makes it distinct from any other "good". In several national constitutions and legislations of the region, such as in South Africa, the DRC or Gambia, there are even direct and indirect references to the right to water for all. This dichotomy is problematic and raises doubts about the efficiency of the choice of such a basic principle, especially in terms of conflict prevention. This would also lead to privatisations mainly through PPPs. According to studies on the topic, most of the positive aspects of privatisation are favourable to companies: better accountability of users' expenses, investment returns, bill payments, … On the other hand, the number of connexions is often under the previsions and tariffs tend to raise. The poorest populations, in particular in rural areas, are the first victims of such policies. Finally, the fair use of the concept of virtual water offers some interesting opportunities to states lacking water or which are victims of food crises, like 25 sub-Saharan states (in 2003).

The international community is more efficient and coherent regarding the development of solutions at the international level, based on the obvious need for cooperation between states. The most urgent requirement, which everyone agrees on, is the establishment of strong principles of international water law (IWL) and the strengthening of existing ones. The United Nations Convention on the Law of Non-Navigational Uses of International Watercourses in 1997 provides an excellent contribution to IWL. It needs to be ratified by 35 states to enter into application, but only 16 did it yet. However, the principles at the heart of its conception are tremendous bases to the development of any cooperative scheme at the basin scale, such as basin commissions, for instance. The principles of equitable and reasonable use, the obligation not to cause any significant harm to other riparian states, the creation of a framework of exchange of information and data, the protection and conservation of shared basins, the development of joint management mechanisms and the elaboration of systems of conflict resolution are indeed necessary to ensure peace around water resources.

Also, international cooperation has to be reformed in favour of a more efficient support to the less developed countries, therefore to most sub-Saharan Africa. International aid as it has been put into application up until now could definitely be improved, since it never achieved its objectives. Alternative support mechanisms should be promoted. They

could not only be financial, but also technical or even call for solidarity. For instance, one could support the development or improvement of North-South and South-South cooperation as a means to exchange experiences and expertise in the form of "inter-basins' twinning", or other incentives in favour of cooperation.

Finally, the international community understandably promotes the creation of institutions dedicated to the cooperative government of shared basins. They should be seen as the roots of wider integration mechanisms in favour of regional peace and development. On 52 transboundary basins in sub-Saharan Africa, only 19 are under the rule of treaties that offer the legal foundations of further joint management frameworks, as shown in the table below.

Transboundary basins with and without treaty(ies) in sub-Saharan Africa

Transboundary basins with treaty(ies)	Transboundary basins without treaty(ies)	
1. Congo	20. Akpa Yafi	37. Mana-Morro
2. Corubal	21. Awaso	38. Mbe
3. Cunene	22. Baraka	39. Moa
4. Gambia	23. Bia	40. Mono
5. Gash	24. Benito/Ntem	41. Lac Natron
6. Incomati	25. Buzi	42. Nyanga
7. Jubba	26. Cavally	43. Oueme
8. Lake Chad	27. Cestos	44. Ogooue
9. Limpopo	28. Chiloango	45. Sabi
10. Maputo	29. Cross	46. Sassandra
11. Niger	30. Cuvelai/Etosha	47. St. Jean
12. Nile	31. Geba	48. St. Paul
13. Okavango	32. Great Scarcies	49. Tano
14. Orange	33. Komoe	50. Lac Turkana
15. Ruvuma	34. Little Scarcies	51. Umba
16. Senegal	35. Loffa	52. Utamboni
17. Umbeluzi	36. Lotagipi Swamp	
18. Volta		
19. Zambezi		

Source : *Atlas of International Freshwater Agreements*, UNEP, FAO & Oregon State University, 2002

Their development would be an opportunity for states to establish basin-wide water policies to ensure that all states always have enough water to fulfil their needs, even during rough periods. However, the existence of a ruling institution at the basin scale is not a guarantee for peace, like on the Nile, the Niger, the Volta, the Okavango or the Zambezi river basins where tensions persist despite the existence of institutions for cooperation. In accordance with the concepts raised above about IWL, basin organisations are more likely to be efficient when they are founded on the following principles: regional integration and development, common management and monitoring of the resources in terms of quality and quantity, flexible allocation methods, hydroelectric production, with specific mechanisms for conflict resolution and public participation and the sharing of benefits (fishing, hydropower, agriculture, …).

Conclusion

This study shows that to liberate sub-Saharan Africa from thirst is not an easy task, given the complex situation of this particular region of the world. In order to attain this objective, priority has to be given to the eradication of poverty, the decline of the dependence of African states to occidental powers, and the prevention of conflicts. This is a long-lasting process during which Africans need to control their resources; especially water. From a broader point of view, profound and immediate changes need to be made in the mechanisms of international markets, agricultural subsidies and debts payment that worsen the already difficult situation of those states, else there is no reason for being optimistic on the short-term. An international climate favourable to this region essentially composed of agricultural economies is indeed essential. These solutions are political and do not belong to the framework of this report, however they should not be forgotten. They are the roots of all water policy aiming at giving back their freedom to sub-Saharan populations.