

# *Ethical Issues of water management*

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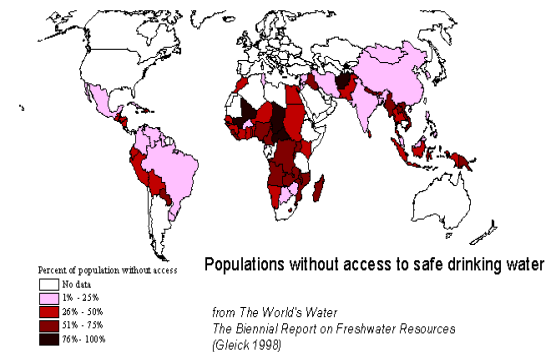
“The art and practice of equitable distribution and access to fresh water for all people in the 21<sup>st</sup> century, as a fundamental human right and international obligation, is the mother of all ethical questions of all transboundary natural resources of a finite nature.”<sup>1</sup>

## INTRODUCTION

Different societies have different moral codes but it seems to be worldwide the importance of water, generally valued and respected in all religions and cultures.

From the whole global resource only 3% is fresh water, and from this amount only 1% is running water, while 2% is immobilized in the Poles, although the main issue with water management is not about scarcity, but about the distribution problem of water around the world. The difficulty of access to water in some places in the beginning of the century is forcing us to think over about our concepts of stability, dependence and responsibility, as well as our notion of sustainability. This issue has been debated often and we are starting to give the first steps toward a global commitment to deal with the problem. It is necessary to find an ethical argument able to unify and sustain this change. More than 5 million people continue dying annually from water related problems, 1,4 billion people live with no access to drinking

water (25% of the world population) , 2,9 billion (around half of the world population) don't have basic sanitary service and 6 thousand children die every day due to this problem.



“...who, if anyone owns the water?...in trying to apply our concept of ownership to a resource who's very

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<sup>1</sup> Mr Thomas R. Odhiambo, Past President, The African Academy of Sciences, and Vice-chairperson of the COMEST (World Commission on the Ethics of Scientific Knowledge and Technology) in his closing address to the First Session of the COMEST, Oslo, April 1999.

nature runs contrary to the idea, we have a recipe for conflict.”<sup>2</sup>

Debates on water resources management mirror broader debates on social ethics and relate to what many consider universal ethical principals, for example, the UN Universal declaration of Human Rights of 1948 and the proclamation of the 1977 UN Water Conference which claimed that “all people. . . have the right to have access to drinking water in quantities and of a quality equal to their basic needs”.

These principals are directly applicable to the issue of water and are the following:

- ***Principle of human dignity and equality.*** If we account that water is a basic need of every human being and wildlife, than we are establishing the ethical basis of solidarity that should be in account in our actions.

- ***Principal of precaution*** in the sense of sustainable development. Should developed countries reduce their needs so that third world countries can develop? Should we rely on technology to save us in the future (ex: desalination of sea water or should we be more active in conservation?

Of course it is very difficult to have a global approach on any matter that concerns different realities, cultures, political structures and economical situation with these principals because the Earth is one but the World is not.

In debating water use and sustainability we must assume that protecting the water environment is an ethical imperative and we must pursue to identify the value of nature beyond anthropocentric utilitarianism. Only

then will it be possible to resolve conflicts that arise in water management between present and future generations, between human and non-human users and between human competing users. We must engage a “water ethic” that will serve as a touchstone for the evaluation of the environmental action and policy. Do we have the right to have access to as much water as we choose? Society must first ensure that appropriate prioritization of water access is put in place which allows humanity’s essential needs to be met as well as those of our ecosystems (Selborn, L.; 2001). Accepting the problem is the first step towards an international pact that will act on sustainability and a social equality. In this way, we will be able to manage the water supply in a sustainable way and adjust this ethical challenge to its political and economical dimension, as an instrument of development and cooperation between nations.

## **WATER ETHICS**

Ethics are moral guidelines for human behaviour, but ethical behaviour needs to answer to the question ‘why should I care?’ to be embraced from people and justify the concept of sustainable use. In the modern debate we can find different arguments in favour.

### **Utilitarian.**

This position identifies value in the environment because it is useful to human being. Water is basic for humans because it is implied by the right to life, food and health, as stated from the United Nations Universal Declaration of Human Rights. In this point of view we have to worry about the interruption of the water cycle caused by modifications of climate; aridity of some areas in the world; pollution and conflicts about access to the springs.

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<sup>2</sup> Philip Ball, *H2O: A Biography of Water*, London, Weidenfeld & Nicolaon, 1999.

Many important themes are included in this theory, but a frequent consequence is the adoption of an economic perspective of utility and the attribution of money value to the environment in front of competing demands.

Moreover we have to consider that 'us' is a not very defined concept: who do we include in 'us'? It could be the family, the city, the country or the continent, but it will always exclude parts of the world, maybe the uninhabited ones, that could be anyway exploited or polluted for our needs.

### **Consequentialist.**

Consequentialism talks about the consequences that we generate with our actions in the present but mostly in the future, for next generations. Here we find the concept of responsibility that's a basis of ethical arguments and finally equity, related to the present society, the future being and all the components of the ecosystem. The consequentialists argue that water is a fundamental part of environment and one of the most important lively resources and we have to protect it from abuse, mismanagement and waste.

Also, it sounds reasonable that there are some problems in defining in detail the object of this responsibility. For example, future generations are not quantifiable, and we cannot predict accurately about their entity or their effective existence. So it's hard to find a balance between our actual needs and their eventual future needs and it is equally difficult to quantify the responsibility to non-human and non-living nature, and to calculate their necessities.

### **Intrinsic.**

On this point of view is articulated the Aldo Leopold 'land ethic', which treats the same topics about land and environment. This theory implies a kind of respect for the whole environment as an entity with its own intrinsic value,

just because it exists and it's not an object made for our exploitation. We don't own it, so we cannot waste it just for our pleasure or use it without limitations. Hurka (1993) proposes one frame of ethical awareness. Hurka's framework considers anthropogenic consequences in terms of present human generation everywhere having ethical standing, future humans everywhere having ethical standing, and the natural environment having ethical standing. If all existing humans have ethical standing, then all humans must be considered for equitable distribution of clean water. This ethical point means that water security must be ensured for all humans as a basic right; basic needs must be met; and this right must not be threatened. If future humans have ethical standing, all future generations must be ensured of an equitable distribution of water. This ethical stance means sustainable use of water through water and habitat conservation. If the natural environment has ethical standing, then the environment must be considered for equitable distribution of water as well as for protection from pollution and environmental degradation. This ethical stance means the natural environment is considered a water user as much as humans are users and is thus allocated its fair share to meet its basic needs or requirements (Beverage, M; 2006).

This is the more difficult argument to explain and to share from the users. That's because it's based on moral issues that are maybe the same that underlie the religious point of view. It seems difficult to attribute to natural elements rights and an intrinsic value and distinguish it from the economic and commercial value. Moreover, it must be define the limit where the human use becomes exploiting.

### **Theistic.**

Here we find the religious vision of the world, which includes human beings, animals, plants and inanimate

elements. As created from God, all of them have its own value and humans have the responsibility on everything the divine being gave them to survive.

Although this argument is very powerful, above all in the Christian community, it has been criticized by this argument that nature is created to be “filled” and “subducted”, as written in the Bible (Genesis 1:28).

The goals of water ethics are equity and sustainability. They are intended not as a final status but as a continuous process to be carried out in the management of this resource in the future. In this direction many organizations have discussed (Working Group on the Use of Fresh Water Resources, UNESCO, 1998; World Commission on the Ethics of scientific knowledge and Technology (COMEST, Oslo, 1999); United Nations Conference on Environment and Development; Dublin Statement on Water and Sustainable Development, ICWE 1992).

Equity, or the perception of equity, is fundamental for a peaceful society. Equity is about just distribution of “goods and services, wealth and income, or opportunity and disadvantage” (Stone, 2002, 39). If the resource in distribution is in abundant supply, the question of equity is not an issue; if, however, supply is scarce, the question of distributive equity is most certainly an issue (Wenz 1988).

Sustainability is defined as human development that meets the needs of present generation without compromising the ability of future generations to meet their own needs (WCED, 1987, 8). Sustainability does not include economic growth, but may merely imply the indefinite continuance of desired characteristics.

Overall, water as a resource to be managed carefully, sustainably, and equitably has only emerged as an international topic in the last two decades; water has moved from becoming a significant topic to

becoming a topic worthy of its own genre of ethics. (Beveridge, M; 2006).

Water is limited in its amount on Earth. While this fact is not ethical, its implications are ethical as this understanding is absolutely fundamental to how we manage our use of water and is thus a principle deserving of specific discussion. Factors of population growth, lifestyle affluence, habitat destruction, land use, pollution, and the implications of climate change mean water can no longer be treated as an inexhaustible resource. Due to these factors, together with spatial and temporal variations in water availability, water is becoming relatively scarcer. (Beveridge, M; 2006). The limited but renewable nature of water, its geographic distribution, and its variability in annual and seasonal availability condition water use and human activity.

Recognizing water as finite and vulnerable involves a holistic approach, linking social and economic with ecosystem protection, and should be applied across a whole catchments area or groundwater aquifer. This holistic approach is an important implication of the finite nature of water. (Beveridge, M; 2006).

## **ECOLOGY**

Water is fundamental to the biochemistry of all living organisms. Ecosystems are linked, maintained and sustained by water. Water availability is often a key controlling factor in maintaining biodiversity. Due to the increasing domestic, industrial and agricultural human demands, it seems great task just managing water just for drinking and basic sanitation, let alone agriculture and industry. This situation gives a very pessimistic view on a conflict of competing demand between wildlife and humans. Such a view ignores the indirect benefits to humanity of functioning ecosystems and that

people and the environment are profoundly linked. In Rio 1992, Agenda 21 it was said that “since water sustains all life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems.” This means that ensuring water for the environment means using water indirectly for people. For example in South Africa the law states that “the quantity, quality and reliability of water required to maintain the ecological functions on which humans depend shall be preserved so that the human use of water does not individually or cumulatively compromise the long term sustainability of aquatic and associated ecosystems”, and we are talking about a country where the availability of water is tied directly to human dignity and development. The concept of sustainability suggests that the answer is to give the greatest benefit to present generations, while maintaining the potential to meet the needs and aspirations of future generations. It is essential, therefore, that the costs and benefits to society of allocating water to maintain ecosystems and those involved to support direct use be quantified. So in this sense we can talk about a water ethics dichotomy where we have on one hand the need to share water amongst our selves, and on the other hand we should recognise that other species have a utilitarian importance for us by maintaining biodiversity, if not the right to water and life. It is an ethical security that can be seen as a luxury for some, and maybe, can only be approached by those who already have achieved economic and social security.

## **WATER MANAGEMENT**

In respect to water management in a political point of view there are two main chains of thought on the question: should water be privatised? One

believes and recognizes the “right to water” of all citizens of a given country and their collective responsibility, so there should be a public management of the quality of sanitary service. The other called Neoliberal view does not recognize the so called “right to water” to citizens and see water as a commercial good and can accept terms like the “water market”, the “water industry” or the “water business”. This view defends that the water from rivers, lakes, and other resources are property of the State in name of the Nation but since human intervention transforms a natural resource into a service that requires costs and investment, it is transformed in something with economical value, which can be traded and appropriated. This concept has been accepted in the International Conference on Water and Development organized by the United Nation in Dublin 1992. It is based on a principal that private investment is the motor of economical and social development and that public investment should create a favourable environment for private investment. In an ethical approach it may seem far from the principal of equity and justice but in an economical point of view there are no individual or collective rights inherent to human beings, just civil rights, so each person is merely a consumer or a client. There is a difference between ownership and management of a resource and the private sector should benefit from their public service even though it doesn't have the political power of decision over the natural resource. According to this point of view liberalization can assure the equal repartition of goods and services by total and equal access to the market, and it is more a question of efficiency of the market that determines social equality. The problem with this mercantilist view is that it is very profitable for the private sector and stockholders but in fact it does not provide an actual solution for populations with no sanitary systems

especially from poor and developing countries. There is a dis-equal disperse of private investment geographically and this situation reinforces dis-equality which can prove the failure of this kind of neoliberal model, as the private sector has failed to success in developing countries. Private enterprises have serious problems with financial risks and contractual risks and restrictions in developing countries which make it non-profitable to invest in the poorest areas. Also in Europe there are problems of equity. For example in France the prices practised by private companies are 15 to 20% higher than the public sector.

The government has to guarantee user rights monitoring the prices and evaluating them in connection with transport costs to irrigation and water supply, purification costs. Data must be shared with decision makers so they give have the tools to choose the best solutions and increase efficiency of systems of utilization of water. They need to be technically and morally informed (user rights, transaction costs, conflicts between users – i.e. transboundary and common waters). In order with this assumption we have to consider different situations in the world. In many regions women are the principal managers of water resources in the society. Especially in small villages and communities where they use it for domestic works, they are employed in irrigation more than men. But they rarely participate in the debate about water management and this leads back to problem of involvement and sharing information. In that sense, safeguarding women rights, in some cases means also optimizing the utilization of goods.

International co-operation plays a fundamental role in the management of transboundary and common waters. To evaluate the value of this argument we have to consider that 40% of the world population lives downstream and

depends from the water flow to survive; moreover the most part of major river systems are shared by five or more countries because of their lengthiness, and all countries depend on the one where the flow originates. In this case dams, withdrawals to irrigate, industrial pollution, salinization, deforestation and soil erosion can decrease the amount of water for the depending countries. It could be a great motive of international conflicts, especially if the involved nations have military potential.

The international community tried to solve also this problem by creating a plan for regulation of shared water. The Food and Agriculture Organization (FAO) has identified many treaties about non-navigational waters related in the years and based on rights, needs and efficiency. The United Nation Convention on the Non-Navigational Uses of International Watercourses, approved in 1997, gives a leading law to share fresh waters taking in consideration geographic, ecological, economic and ethical notions.

Unquestionably the “water framework Directive 2000 / 60/ CE”, settled on 23 October 2000 by European Parliament, is the most representative document about water resource management.

It establishes a framework to protect and improve the quality of aquatic ecosystem and to promote sustainable water use. It also encloses every kind of water except the sea one:

- Surface water (i.e. watercourses, lakes, etc.)
- Underground water
- Coastal water (i.e. water estuary, etc.)

The water framework Directive arranges four important objectives:

- protecting the aquatic ecosystem: acting a dilution of toxic polluting substances, as mercury, atrezin, plumb, nickel; recycling and using flowing back purified waters (art.

6); prevention and restoring of natural condition in case of disasters;

- promoting cooperation between different countries about international water ports

- management: fixing common methods to preserve water healthiness;

- ensure drinking water supplies: ensuring the right quantity of water when and where it's necessary according to solidarity's common sense;

- optimize water as a consumer good;

- recognition of hydrographical areas, which are defined as the whole of terrestrial and sea areas, including just one or more than one bordering basin within respective underground and sea water of a limit zone;

- monitoring a correct pricing of services related with water.

The principle goal of the Directive would be the restore of "good water condition" for any European Union State within 2015. In a second term it aims to obtain an equal distribution and destination of the resource between all involved countries and their citizens and to ensure a correct charge of the costs on the users and managers. Moreover, it aspires to establish a correct way to manage the different realities of hydrographical areas.

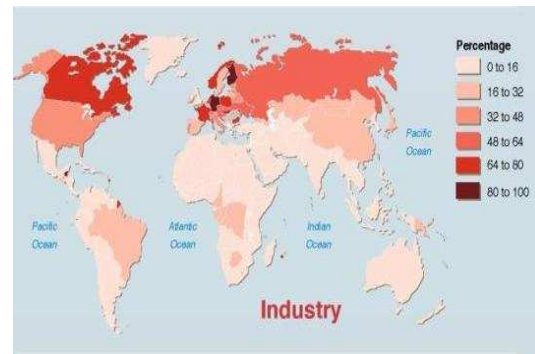
## INDUSTRY

The industry of science and technology is developing in a way that doesn't allow us to predict its consequences.

Water is the main component of industrial production, for it features in all industrial stages and functions. The main users of water are the principal industrial sectors such as food, paper and oil refineries.

Industrial development doesn't mean pollution increase. Data from the last three decades show us that developed countries decreased the use

of water and pollution in industry.



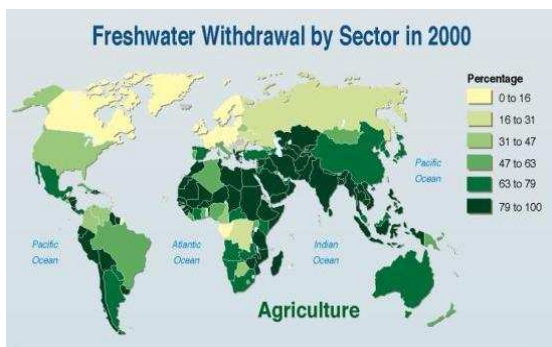
Industry may then evolve without causing big impacts, improve techniques and ways to use water. It can also develop new procedures, such as "clean" industries, and develop new services such as cheaper desalinization. These procedures can make use of recycling, which can reduce the consumption of water by 50%.

Nevertheless, for the industry to gain global conscience, we need to consider the economical advantages and disadvantages. The alternative must be lucrative so that the industry adopts new ideas. The ethical use of water will have to pass not only by the profitability of the industry itself, but also by the implementation of laws and economical benefits. In the near future, it's probable that, initially, the products tend to be more expensive, for a better environment. It's also probable that some countries will deny this environmental discipline, achieving more competitive prices. The international market has the obligation to deny the access to these products.

It's important to mention the importance of industry in energy production, in particular de hydraulic energy. In the 19<sup>th</sup> century, the construction of dams was considered a great achievement due to its positive economical impact. We will develop this question further with a practical example.

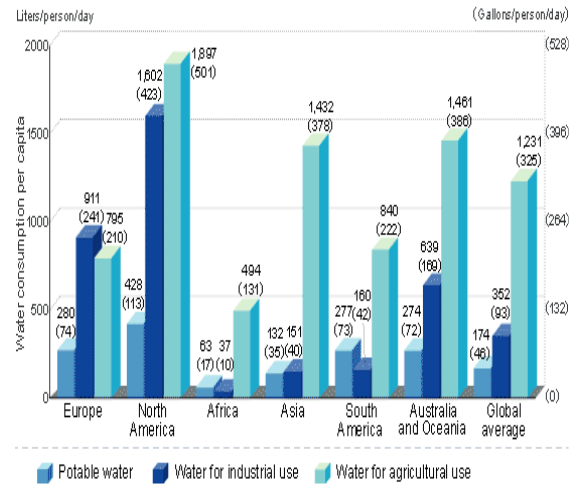
## AGRICULTURE AND FOOD PRODUCTION

Agriculture defines a fundamental and basic life standard to the world population, because it produces the bigger part of aliments consumed by the humanity.



Exactly because it is a basic need of human being, there is no alternative but to continue cultivating the planet. This conclusion brings some problems. The biggest problem is alarming: agriculture is the main water consumer.

According to these facts and to the world demographic growth, this will not be a sustainable situation. Besides that, in economic terms, agriculture is less profitable, comparing to industries that have 200 times higher return of investment.



It's necessary to find a more productive way to use water and distribute the available water trough the different sectors.

Scarcity and the improper management of water may mean imposing boundaries to the food production. In consequence, it will affect seriously countries with big population density and those who already lack water. Looking in a different perspective, maybe imposing boundaries can imply positive changes in the society and economic structures.

At this point we must pay more attention to the importance of water: in the lack of a valuable good, there will be a lot of social tension and it could bring us to world wide conflicts. So it's important to establish the politics of change gradually before the problem.

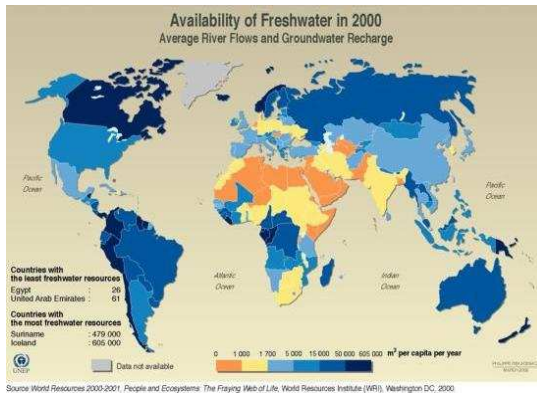
## GROUNDWATER

“Out of sight, out of mind”

The use of groundwater increased considerably, mostly in areas of water scarcity (arid countries), many times due to the lack of control of small public and private operators. On the other hand, the superficial exploration is in a bigger scale. This happens because it's projected by governmental entities and there is a lack of knowledge about subterranean water and its value.



- For tourist use.
- For agriculture use.



Should we use subterranean water to keep an intrinsic value so we can create a conservationist sensibility about the water? Or should we give it a potential value to our next generations? When exploring this issue, we need to consider some important points. The depletion of the subterranean water reserve can have consequences:

- Water founts and courses may disappear or be contaminated by agro-industrial chemicals or even salt water.
- Soil humidity decreases which influence the disappearance of some kinds of vegetation and animals that depend of that vegetation.
- Microclimates change because of the decrease in evapotranspiration.
- Diminution of irrigation for agriculture that is dependent of these reserves, and the food production and the local demographic growth falls.

## STUDY CASE

Alqueva is the biggest European artificial lake located in Baixo Alentejo, Portugal, in the rivers Guadiana e Degebe. The goals of the construction were:

- To form a water reserve that supplies the districts of Évora and Beja.
- To produce electric energy (for the National electric network)

Until 2025, about 1800 million euros will have been invested in Alqueva. The energy produced serves 300 thousand people, and in agriculture it supplies 110 thousands hectares of area for irrigation.

The lake occupies an area of 250 km<sup>2</sup>. In this large area, there are submerged historical patrimonies like the Mourão's Castle and rock engravings in Alandroal. There were also several animal species displaced for other areas in Portugal and Spain. The issue that caused more social impact was the relocation of a whole village called Aldeia da Luz that included 350 people. A new village was created with the same name. Since this change, people are deserting the village. The youngest people don't have space to construct new houses. People are complaining about the local economy is stagnated. The local agriculture suffered adjustment and demands a type of intensive agriculture and different types of agricultural products so that it is profitable. Taking in account that Spain, our upstream neighbours introduce 40.000 tons of nitrites, phosphates and minerals in the river and this water will be used for agriculture there is the possibility of sterilization of the soil and contamination of underground water.



There are two ethical problems to consider in the construction of the Alqueva:

- On one hand, the construction benefits of the advantage of producing clean energy and give access to a more efficient system of agricultural irrigation,

- But, it creates a huge impact on local population in social terms and destroys (partially) the flora and fauna environment and the landscape.

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