

Mining for the blue gold....

Why do we need water?

Water is a basic component and prerequisite for all life on Earth. Humans, animals and plants all need it for their survival. Providing drinkable water to people in emergency situations is the second most important action to be done in order to safeguard their lives, after keeping them warm. Not consuming drinkable water can provoke death to a human being in only a few days, while consuming contaminated water may lead to serious health problems. But water is also vital to us in

many more indirect ways. We need it to wash ourselves, our clothes or the things our food gets in contact with in order to avoid diseases and infections, and we use it for cooking. But human beings also depend on ecosystems for their survival, and there would be no such thing as an ecosystem without water!

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Important topics:

- The impacts of climate change on water behaviour and food security
- Industrial agriculture
- Water and emancipation in Palestine
- Privatization of water treatment and delivery.
- *The Ben Smim Affaire*

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Then why does not everybody have access to this life-necessary water?

Access to healthy drinking water and sanitation: a global overview.

Our planet consists for about 1.4 billion km³ of water, of which 2.5% is freshwater¹. Of those 2.5%, human beings use some 54% for their subsistence. The World Health Organization (WHO) recommends a daily consumption per capita in liter (c/c/l) of 100 for basic health insurance, including direct water intake as well as water needed for cooking and hygienic practices². Unfortunately, the proportions of water used for basic daily sustenance show huge disparities all over the world: The most staggering numbers come from the USA and Australia, with a respective c/c/l of 575 and 495 (which is about 5 times more than the recommended quantity!). The lowest in ranking is Mozambique with a deplorable c/c/l of 5³. Although the Millennium Development Goal (MDG) for drinking water⁴ was met already in 2010, in the same year 783 million people still didn't have ac-

cess to safe drinking water sources. Moreover, the progress which had been made by 2010 was not at all equally spread: almost half of it occurred in India and China, while most of the countries which are still lacking access to healthy drinking water are located in Africa (the lowest rate being 52% of the urban population in Mauritania). Apart from these regional differences, there is also a huge gap between urban and rural areas: while 96% of the world's urban population had access to safe drinking water facilities in 2010, this need was only covered for 81% of the rural population.

At the same time, available data on access to sanitation are even more worrying. About 2.5 billion people still didn't have access to improved sanitation in 2010, which makes it very unlikely that this MDG target will be met by 2015⁵. If Asia and So-

uth-America are currently providing most of their population with healthy drinking water, they do not reach the same standards regarding sanitation. Although the lowest percentages in these two continents can be found in Nepal (48%) and Bolivia (35%), we don't have to go too far away from home to find less astonishing but equally worrying numbers. While in 2010 99% of the Russian population had access to safe drinking water, only 75% of it was connected to an improved sanitation system⁶.

Again, there are huge disparities between urban and rural areas, with respective rates of 79% and 47%. Thus the gap between rural and urban zones is twice as big concerning sanitation compared to the access to healthy drinking water.



¹Freshwater is the opposite of salty seawater and it is often referred to as 'sweet' water. It includes natural sources of water like rivers, lakes and groundwater, all of these containing low salinity levels.

²This recommendation only includes direct water consumption. It does not take virtual water consumption into account, such as the amount of water which is necessary to produce the food we are eating (e.g. 1000 - 3000 l to produce 1kg of rice, and 13 000 - 15 000 l to produce 1kg of grain-fed beef).

³Numbers date from 2006.

⁴The MDG drinking water target was to halve the amount of people who did not have access to improved drinking water sources from 1990 to 2015. According to WHO standards, improved drinking water sources are those who are able to protect the source from outside contamination such as for example fecal substances. They include rainwater collection, protected springs, protected dug wells, tube wells or boreholes, public taps/stand pipes and piped water into a house or yard. Unimproved drinking water sources are unprotected dug wells, unprotected springs, carts with small tanks or drums, tanker trucks, any kind of surface water (e.g. river, dam, lake, pond, stream, canal, irrigation channel, etc.) and bottled water (if it is not accompanied by any other improved source).

⁵The MDG for sanitation is to provide at least 75% of the world's population with improved sanitation (in 2010 this target was only met for 63% of the world's population). According to WHO standards improved sanitation facilities make it possible to separate human excreta from human contact. They include composting toilets, pit latrines covered with a slab, ventilated improved pit latrines and flushes or pour-flushes connected to piped sewer systems or to septic tanks or pit latrines.

⁶Percentages for urban population.

=Water and emancipation in Niger.

The average woman in Niger has 7.1 children and earns less than 1\$ a day. This makes the price of water for them literally and figuratively very high. Only 46% of the population in Niger has access to water. Most of the people who don't have access to it, live in rural areas. Moreover, the price of water in the countryside is five times higher than in the city, while it takes rural women much longer to reach the source of their water. But even for villagers who do have access to water, problems aren't solved. 80% of the children die because of waterborne diseases. Animals and humans use to drink from the same sources, and where

there are wells, they aren't covered. This exposes the water to all kinds of bacteria and contamination - e.g. fluor contamination - which can lead to child deformations and ultimately to death. Generally, women go to take water 7 to 8 times a day. The wells are usually located a few kilometers from the villages, which makes the way to the source very heavy and dangerous for the women. They carry the water in buckets on their head, which weighs a lot and much of it falls out of the jar on their clothes, causing not only annoyance while walking but also injuries over time. In some regions, women also die on their way to the well because of attacks by wild animals, and too many of them have been raped

on the way. Still, searching for water continues to be a job for girls and women in Niger. "Our husbands don't help with the agricultural work, they sit in the shadow under a tree. They say it's a question of honour and religion", says Mariama Saidou of Jeunesse Environnement Démocratie Développement (JEDD). She complains that the UN recommendations on the right to water are not being put into practice and asks for their implementation. According to her, not any real change will be possible, until women - who are the most affected by the lack of water - are being taken into account and allowed to participate in the decision making.

Reduction of the available amount of freshwater on the planet

The impacts of climate change on water behaviour and food security

The general rise in temperature due to climate change is already having a noticeable effect on our planet's water resources. Among others, it causes more evaporation, which leads to a direct decline in available freshwater. This rise in evaporation at its turn makes for higher salinity levels

and brings about serious alterations in biodiversity and food security. Farmers along Egypt's Nile Delta find their lands more and more unfertile after increasingly occurring floods with saline sea- and groundwater, while changes in wave directions leave Egypt's fishermen almost empty-

handed in their regular fishing spots, with some species disappearing completely and other foreign fish types turning up due to the rise in temperature of the



But trees and bushes also prevent the soil from eroding: their roots make the ground more permeable. Like this, the ground is able to absorb more rainwater, and surface runoff is less likely to happen. And of course their presence also makes it less likely that the wind will blow away the upper surface layer,

Trees are not only beautiful to look at...

Plants need to transpire and do photosynthesis. In order to do so, a plant opens up its "stomata" (comparable to the pores through which human beings transpire). But, when the plant goes through a period of drought or reduced water availability, it closes those stomata, to avoid dehydration. This ensures the plant's survival, but it reduces the agricultural yield. Due to their deep roots, trees are able to store a lot more water in their system

than smaller plants or shrubs. They can reach deep layers of groundwater and transport the acquired water up to the surface of the earth, keeping the upper ground layers humid. Combining trees and crops with complementary needs, can therefore significantly reduce the amount of irrigation needed for agriculture. Moreover, the shadow provided by the trees may reduce surface evaporation, which will be beneficial in areas with frequent but not intensive rainfalls.

as they can form a natural "wall" which breaks the wind. Deforestation practices for industrial or intensive agricultural purposes break this general natural balance and require high amounts of external water input. In short:

more trees = more solid and humid soil = less erosion and less water input from external sources needed.



Industrial agriculture

Modern agricultural practices involving extended mono-plantations, unnaturally high levels of water extraction from the surroundings of the cultivated land and great amounts of chemical inputs, have very negative impacts on the quantity and quality of water on Earth. Irrigation for agriculture is said to lie at the origin of up to 70% of all blue¹ water consumption on our planet nowadays. Half of this blue water withdrawal stems from nonlocal (e.g. diverted rivers) and/or nonrenewable water resources such as fossil groundwater, desalinization plants etc. This is quite an astonishing figure, but still blue water is not the only water resource on which our food production relies. 60-70% of the world's food (crops, meat etc.) has been grown on rainfed land (i.e. coming from green water resources), which makes the total amount of water used for agricultural purposes even higher than the generally mentioned 70% of blue water withdrawal. An example of such big mono-plantations and its disastrous impact on the surrounding water resources can be found in Andalucía, Spain, where the main type of cultivated crops is olives. In the natural park of Cazorla, Segura y Las Villas, an annual total of 450 millions of water is withdrawn from the park's aquifer to irrigate the 654 hectares of olive yards, lying outside the park's boundaries. This immense water uptake is already leaving its marks on springs and rivers in the region, and ecologists warn for a complete and irreversible depletion of the aquifer if the current practices don't change.

But also the production of palm oil, sugarcane, soy and corn for agrofuels, human consumption and/or animal feeds require huge amounts of water. Not only the irrigation, but also the washing of the harvest and - in the case of agrofuels - the cooling down of boilers during processing are terrible water consumers.

Further, also tree mono-plantations are detrimental to the environment. Although it was said earlier that trees are beneficial to the water balance in our ecosystems, this is obviously not the case with tree mono-plantations. The occurrence of one single specie only (be it trees, shrubs or plants) in a certain area, destroys the biodiversity in that zone and leads to exhaustion of the local soil and water resources. Moreover, it eliminates a great diversity of animals and insects which form a crucial part of our ecosystem, and without which life on our planet would not be possible (let's think for example of the natural fertilization of our plants)². Proposals which aim at the reforestation of vast areas with single species of wood yielding trees for commercial purposes are therefore no solution for the environmental problems caused by deforestation.

¹With 'blue' water we mean freshwater stemming from rivers, lakes and aquifers, in contrast to 'green' water which is water obtained from rainfall. The latter can either refer to rain in its actual form, or to groundwater originating in precipitation.

²More info on how we depend on natural ecosystems for our survival will be provided in part II.

Mining and fracking

It goes without saying that agriculture is not the only bogey when it comes to the destruction of biodiversity and the exhaustion of water resources. Although industry in general only accounts for about 10% of all human water withdrawal, its environmental footprint is far from neglectable. Water is - directly and indirectly - an indispensable element for the processing of any industrial product, from the abstraction of primary resources to the actual functioning and maintenance of machinery. Mining for ores and chemical elements like uranium, employ a great deal of water to separate the desired metal or mineral from the sand or rocks they were found in. But also other primary resources such as gas and oil, demand enormous amounts of water for their extraction. In 2005, some 15 217 million liters of saline and freshwater were used daily in the US alone for the purpose of mining. This number includes all operations connected to the mining process, from the actual extraction of the ore, oil or gas, to the processing and re-injection of some parts of the recuperated water for second use.

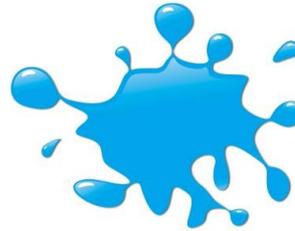
But as conventional sources of oil and gas are declining in number, the industry is looking for - mostly more water consuming - alternatives. One of these, is the conversion of bituminous

sands¹ into petrol. The transformation of one m³ of petrol, requires between three and five m³ of water, beside a lot of natural gas, the abstraction of which at its turn exacts considerable amounts of water. There are various ways and sources to extract gas from. One way is to capture the gas that is released during the extraction of oil, although the amount of gas freed during such a process is considerably low. Conventionally, natural gas is obtained by perforating into the surface of the earth until reaching a so-called 'gas ble': These bubbles arise when the gas, originated in porous rocks, starts to move until reaching an impermeable layer of rock. There it gets stuck and forms a gas bubble. However, as the number of easily reachable gas bubbles is going down, the industry has started to look for alternatives. One of these is to search for gas in impermeable rocks. In this case, the gas stays in the pores of the rock and doesn't move



towards upper layers. This type of gas is called "shale gas" - because of the porous kind of rock it was generated in - and its extraction process is also being referred to as "hydraulic fracturing" or just "fracking". To get the shale gas from these pores, it is not enough to perforate the rock (because you would have to perforate to-

wards every single pore), but the rock has to be broken so that the gas can escape by itself from the pores. In order to do so, a mix of water and sand (98%) and a wide variety of toxic chemical products (2%) is introduced into the rock under high pressure. This makes the gas leave the pores, and after releasing the pressure, the gas and some of the injected liquid (usually between 15% and 85% of it) come to the surface. The rest of the inserted liquids stays in the underground. The amount of water needed for fracking is about 17 million liters of water per well... Of the recuperated - toxic - liquids, only a certain amount can be reused for further fracturing, the rest is usually stored in big open air reservoirs, waiting to be treated, or just re-injected into deep underground pits.



¹Bituminous sands are a natural mix of sand or argil, water and bitume (also known as asphalt).

Influence of conflicts on access to water.

As cruel as it may sound, water is also used as a tool for political purposes. Although it is absolutely not the only one, the conflict between Israel and Palestine is a very good example of water being used as a weapon in political conflicts: In Hebron (West Bank), destruction of water and sanitation equipment is a very common practice of the Israeli army. But beside the demolition of existing infrastructure, the unbalanced water supply in the West Bank also finds its roots in legislation. The Oslo Agreements in

1995, left Israel with the right to 80% of the water outcome of the region's natural aquifer, while Palestinians had to be satisfied with the remaining 20%. In certain places for example, the daily water consumption rate of Palestinians is about 30 l per person (which is far below the WHO recommended 100 c/c/l), while only a few km further in an illegal Israeli settlement there's a daily c/c/l of not less than 400l. But also Arab Bedouins in the so-called 'unrecognised villages'¹ in the Negev Desert, are victims of

this kind of water crimes. Not only have they never been provided with good water provision since their establishment in the region in 1948, they are now also being pushed into big settlement camps, which makes it even easier to cut them off completely and control the supply of basic services such as water and sanitation. The same counts for Gaza, where Israel controls all in and outgoing traffic, which leads to huge sanitation and sewage treatment problems in the occupied zone.

¹Before the creation of the State of Israel in 1948, some of its regions were inhabited by Arabic Bedouins and half nomadic peoples. After the creation of the State, most of the Bedouins left to Arab countries, but some of them stayed and their villages were incorporated into the territory of Israel.

Water and emancipation in Palestine

According to Faty Koumba of the Association des Libertés, Droits de l'Homme et non-Violence, the water problem in Palestine is not a matter of scarcity, but of distribution. It isn't a natural problem, it's a military problem. Since the Oslo agreements, the situation for Palestinians has only got worse. On average, Palestinians use only 1% of the available water (which is even less than the 20% the agreements speak of), while Israeli citizens a few kilometers further have enough water to maintain their gardens and to hold thalassotherapies. Moreover, every night at 18h-19h there's a curfew in the cities and all water is cut for the Sabbath hour. Strangely enough, the Israeli authorities "don't always remember" to switch it back on. Beside that, all wells are also

controlled by the Israeli army. As children or men are regarded as terrorists when they go for water, and imprisoned, it are the women who get this stressful task.

To get access to the water sources, they have to pass through barriers with X-rays, and as the wells are surrounded by the army, on top of that they often even get raped or shot at.

To reduce the water scarcity and the mental and physical torture which they have to suffer in order to get water from "recognised" wells, Palestinians have dug "illegal" wells. But, if people are discovered around one of those wells, they are imprisoned, their house is destroyed and the water of the well is poisoned. Meanwhile, other regio-

nal conflicts between Israel, Palestine, Jordan, Syria and Lebanon (all somehow bordering the Jordan River) also have a severe indirect impact on natural water resources in the area. Together, Israel, Jordan and Syria are diverting more than 98% of the river's water, which has lowered the river's volume from 1 300 million m³ before the beginning of the conflicts around the 1950's to only 50 million m³ per year nowadays. In addition, this remaining water is highly contaminated: it is estimated that each year, some 30 million m³ of untreated sewage are discharged into the Jordan River. But also the Dead Sea is reaching its limits. As the Jordan River has its outfall into the Dead Sea, the decline in capacity of the first obviously has a major impact on

the total volume of the latter: every year, the level of the Dead Sea is decreasing 1m. To solve water stress in the region, Jordan is planning to build a canal connecting the Red Sea with the Dead Sea. From there, and after desalination, another pipeline would carry the water until Am-

man. But this unnatural sudden addition of a huge amount of water into the Dead Sea is very likely to provoke i.a. the creation of more sink holes in the affected area, which constitutes a great danger for the local population (right now there already exist about 1000 sink holes along

the banks of the sea).

These are problems which can only be overcome by a cooperation of all countries involved. However, until today it has appeared to be impossible to gather all five protagonists of these problems in order to collaborate towards a solution.

Water grabbing

Privatization of water treatment and delivery.

Competition or monopoly?

When trying to sell the idea of privatisation to the larger public, private companies often refer to increased competition and therefore better services as one of the main advantages. However, throughout the short history of water privatisation, it has already become clear that privatisation does not necessarily lead to increased competition.

One of the earliest countries to introduce privatisation in the water sector, was France, the homeland of Veolia, Suez and Saur, the world's three largest private water companies nowadays. Since then, only 5% of all private water contracts in the country have ever been submitted to competition. Even since competition has been legally imposed by the French court in 1996, only 4% of all contracts has yearly been subjected to it, as the already existing contracts remain valid until the end of their established term. And even though the three kings of water privatization are

rivals, they are well aware of their monopoly and don't shrink back from collaborating in order to maintain their dominant positions.

The second to follow was England with the implementation of the 1989 Water Act, which gave licenses to recently privatized water and sewage authorities and other already existing water companies, without any submission to competition. Consequently, in 2002, all these licenses became legally valid for an indefinite period of time, unless the Secretary of State announces their annulment with a 25 year notice of termination. Seen the fact that governments do not tend to stay that long in power, the possibility that these contracts will ever be revised or subjected to competition, is close to zero.

In the 1990s, privatisation sought to spread further especially towards Eastern Europe and South America. However, due to unfavourable circumstances¹, public unpopularity² and quite some local resistance, the tide has turned, and since the 2000s private companies are searching their luck rather in Western Europe and North America. At the same

time, they are looking for financial risk buffers, which they find in International Institutions such as the World Bank (WB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB) and local public-private partnerships (PPPs).

Another myth which privatisation's proponents like to put forward to persuade people, is that most companies nowadays are privately run. This, however, is far from true. Only 10% of the world's population gets its water from private companies. In Africa and Asia, the public sector accounts for respectively 80% and 88% of investments in water infrastructure. But also in high income countries, the largest part of investments has been realised by the municipalities (through direct or indirect taxes), or by private companies using public loans or charging the customer directly for its services. Even in France, until the 1970s, most of the infrastructural expansion was carried out by municipalities, although private companies were already dominating the market.

¹Private companies only prosper in big cities, but regardless of what private sector proponents want us to believe, most of the water provision facilities in the world are still in hands of the public sector. Further, the private companies have not been able to fulfill their expectations and those of their shareholders, due to various negative economic circumstances and a lack of public subsidies which could buffer these losses in poor regions.

²Water privatisation has encountered a lot of resistance both because of the fact that it is globally seen as a basic natural resource which shouldn't be converted into a commodity, and because it were especially foreign companies intruding domestic markets, a phenomenon which was generally perceived of as 'laying hands on something which should be managed on a national level'.

Better services?

It is also extremely doubtful whether privatisation automatically implies more qualitative services. In fact, in many cases, the opposite has already been shown.

First of all, history has proved that privatisation does not serve all of us. It is financially not profitable for private companies to expand their infrastructure to villages on the countryside, which makes that only cities and medium class families are attended and the

most needed among us are again left out. Even worse, privatisation deprives indigenous people who never registered the land they lived on or the natural resources they used, of their access to water by simply expropriating it and registering it as an economic good. Moreover, in places where water is already managed privately, it doesn't necessarily entail a higher quality or better services neither. In some cases it even caused serious

health problems. In Jakarta for example, a 6 months long breakdown of the infrastructure, led to an outburst of diarrhea which killed 12 babies and sent hundreds of people to the hospital. But also in Brussels, Veolia Water - through Aquiris, a daughter company of them - let untreated wastewater flow into the Zenne river during a whole day because of an argument with the local authorities.

Bottled water

A maybe somewhat more obvious way of privatising water, is to sell it in bottles. One of the main arguments in favour of selling bottled water, is that most natural wells don't have healthy drinking water anymore. However, this aggressive robbing of water does not only deprive many people of the access to drinkable water due to its high prices, but it also brings about he-

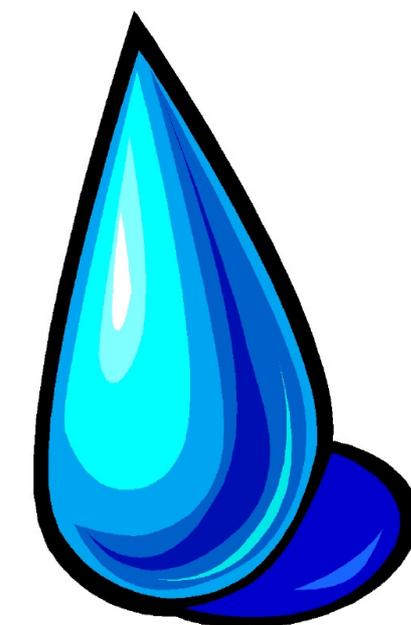
avy environmental pollution, corruption and criminalisation of local inhabitants. Thus, the industry of bottled water aggravates the problem of contaminated drinking water, rather than solving it, while it also creates another source for multinational companies like Coca Cola, Nestlé, Danone, Evian, and others to enrich themselves and conquer the world. Especially in

countries with rapidly growing economies like China, cities are expanding faster than their water infrastructure, which makes the tap water in many places unsafe to drink, and obliges the local population to buy bottled water.

Some case studies on the social and environmental impacts of the bottled water industry:

Rocchetta, "the ultimate beauty water"

With this slogan, the Italian company which in the early 1990s took control of a well near the Rio Fergia in Umbria and which nowadays is the national leading bottled water company, convinces its customers of the healing characteristics of its products. In the first ten years of the company's establishment its profit increased by 280%, and in 2006 it got permission to extract almost double as much water from the river as it already did. Their well, however, is not rain fed but draws from an exhaustive aquifer. The 36 000 bottles of water which it now produces every



hour, have already led to the

drought of a neighbouring river, the Rio Feo. As local inhabitants see the danger of the commercialisation of their water and are directly affected by it, in 1993 they organised themselves in a committee in defense of the river (Comitato Boschetta). This committee now guards the wells along the river continuously, and carries out researches and blockades when they deem it necessary.

Danone in Java

In 2002, the World Bank bribed the Indonesian government with not less than 300 million \$, to change its Constitution. Against the former Constitution, the new law now allows a company to buy some land and to convert it into "a protected zone", which gives it the right to exploit the land as desired. This makes it very easy for private water companies like Danone, to withdraw huge amounts of water without having to face the music. Having already established

15 branches in Indonesia and planning to start up another one, Danone is literally sucking out the region. With 800 perforations already carried out and an aim of extracting 63 liters of water per second, the area around Java is now almost completely dried up and not apt for agriculture anymore (at least not without adding millions of tons of water for artificial irrigation), leaving the local population with no means at all for self-sufficiency.

Despite resistance in the form of physical attacks on the exploitation sites and manifestations under the direction of local religious leaders, the French food and water company is still allowed to rob the regional natural resources without



The Ben Smim Affaire

Ben Smim, a settlement in the Moroccan Atlas mountains somewhere south between Rabat and Fez, counts about 3000 inhabitants who are entirely dependent on agriculture and cattle breeding for their survival. The center of all life in the area, and unfortunately also the focus of the "Société Euro-africaine des eaux", is the spring of Ben Smim. In 1999 the Société chooses Ben Smim as the object of their business, and two years later they sign a contract with the State, which gives them the right to use 60% of the available water from the spring, during a period of not less than 30 years. Despite

many protests of the local inhabitants, the construction works start off in 2007, under police protection.

Since then, the village is completely enclosed, all incoming and outgoing traffic is controlled, there is no electricity and villagers can't leave the territory without being arrested. However, the resistance withstands and it even achieves a temporary cessation of the works. Nevertheless, after a while the construction goes on, and in 2010 the first bottles of "Ain Ifrane" water are sold, implying an extraction of 120 000 liters of water per day. Water in the Atlas is a rare

resource, and many persons have been injured in the struggle for its protection in the area of Ben Smim. 6 locals have even been condemned to three months of prison and a fine of 7 000€, which obviously is an impossible amount of money for people who have lived their whole life of small farming and cattle breeding for their own subsistence.

As the villagers feel that their complaints are not being heard, many of them sell their land and cattle, and try to find a new job in the city - a very difficult task for somebody who has never learnt another profession than farming.

Hydroelectric power dams: another way of grabbing water.

Hydropower plants do not only destroy large areas of nature and have heavy social consequences for the people who get evicted from their houses where the dam will be built, but they also use a lot of water, which had better be left for maintaining the natural equilibrium of ecosystems or for basic

human needs like growing food, drinking, cooking and hygiene. It is said that these dams are necessary and useful to provide all people on our planet with electricity, a basic human right. However, most of the electricity they generate does not at all reach the rural population, who are generally the

ones who don't have access to it. The construction and maintenance of such dams is so expensive, that their functioning only becomes profitable with the construction of high voltage lines, in order to export the energy for industrial purposes. Investing in a network of many low voltage lines to rural

areas costs more effort, and doesn't pay off for the electricity companies, as most villagers are not able to afford the prices they ask (for up to now unclear reasons, big industrial and commercial conglomerates pay ten times less for their energy than

ordinary persons). In addition, the impact of these dams on the environment is equally worrying. Apart from damaging ecosystems as was mentioned before, they also alter the climatological stability of our planet. The natural areas which they cover, used to

create a lot of organic material before they were submerged, which now will be decomposing in the water of the reservoir, thus producing considerable amounts of greenhouse gases.

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This booklet has been prepared by Judith Vervisch, an EVS volunteer in the Foundation for Education and Development of Civil Society

