The New Global Agri-Food Order and Water Disputes in Northern Mexico

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Abstract

The purpose of this article is to show how commercial agricultural processes and climate change are depleting groundwater aquifers in the northern Mexican state of Chihuahua as well as to describe the movements, demands, and achievements of farmers struggling against the private and exclusionary appropriation of water resources. All of this is linked to the new, capital-dominated global agri-food order, the drive to speculate on food and biofuel, the planet-wide effects of climate change as well as the way that these forces run counter to the ongoing pursuit of formal recognition of the right to water by national and international institutions.

Keywords: Chihuahua, climate change, global agri-food order, Mexico, right to water, social movements, water, water resources.

Acronyms:

CFE	Federal Electricity Commission (Comisión Federal de Electricidad)
Conagua	National Water Commission (Comisión Nacional del Agua)
Inegi	National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía)
Mm^3	Millions of cubic meters
Profepa	Federal Environmental Protection Agency (Procuraduría Federal del Medio Ambiente)

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RHA	Hydrological administrative regions
Sagarpa	Department of Agriculture, Livestock, Rural Development, Fishing and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación)
Semarnat	Department of the Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales)
SIAP	Agriculture and Fisheries Information Service (Servicio de Información Agraria y Pesquera)

INTRODUCTION

There appear to be two different dynamics and two processes related to water that are currently in confrontation on the international level. On the one hand, the General Assembly of the United Nations, in its 108th plenary session on July 28, 2010, adopted resolution A/RES/64/292, that: «[...] recognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights». This right was enshrined by an amendment of Article 4 of the Political Constitution of the United Mexican States, February 8, 2012, which states that: «All persons have the right of access, provision and drainage of sufficient, healthy and affordable water for personal and domestic consumption. The central government will guarantee this right and the conditions, support systems, and modalities for equitable and sustainable access and use of freshwater resources will be defined by law».

On the other hand, and running counter to this dynamic of enshrinement of rights, climate change has made water not only an increasingly scarce resource but also a source of disputes among diverse communities. In this regard, citing the French Council of State, the prominent globalization jurist Mireille Delmas-Marty points out that:

> In 2010, the General Assembly of the United Nations recognized the right to clean and high-quality drinking water as an «indispensable right for the full enjoyment of the right to life». And the French Council of State raised the alarm: «Now, at the start of the 21st century, our new concerns are about climate change and its consequences in terms of both the availability of water in volume and quality and the risks associated with the phenomena of floods or increasingly severe droughts».[2] (Delmas-Marty 2013: 51-52)

This dual process of threats to water resources resulting from climate change and disputes between different social actors, each clamoring for its rights, have been increasing sharply in northern Mexico.

This is especially true along Mexico´s almost three thousand kilometer border with the United States which is located at the latitude of the great deserts of the world, north of the Tropic of Cancer. Most of the surface area of the six Mexican federal states that make up this region includes the two largest deserts in North America: the Chihuahuan and Sonoran deserts. The former is an altiplano desert, located between the two ranges of the Sierra Madre, the Occidental and the Oriental, in Mexico and stretching to the foothills of the Rockies in the United States. The latter is a low desert adjacent to the Gulf of California and extends to the states of Arizona and Utah.

2. Translation by *Apuntes*.

In recent years, the world as a whole has been afflicted by droughts of much greater severity than those that occur cyclically. As water shortages intensify, social conflicts for control and access to water for both domestic and agricultural use escalate. It is certainly paradoxical that this kind of ecosystem is home to much of Mexico's most productive and technically sophisticated agriculture.

Thus, there are a number of processes that are on a collision course: on the one hand, the expansion of commercial agricultural production, which is increasingly depleting surface and groundwater resources; on the other, the demands of peasant communities for the water that is rightfully theirs and which is necessary for their barest subsistence; and finally, there are processes of depletion of aquifers and clearing of land and plant cover in a region that is said already to be subject to climate change with temperatures that are increasingly high and humidity that is decreasing.

What kind of social processes are generated in this context? What are the positions of different social actors? What role has the state played and what role will it be asked to play in the future? What transformations in public policies regarding water are contained in the demands of various actors? These are some of the questions that we will try to answer.

The purpose of this paper is to describe the situation in the state of Chihuahua, where social tensions have increased significantly as a result of worsening droughts. We analyze the export-import processes related to hydrological flows that operate to and from the territory and then we describe the development of irrigated agricultural areas in connection to the evolution of crops and the value they generate as well as the economic and social impacts of this type of water use. Later, we provide a brief summary of the protest movements and struggles for access to water for irrigation in a specific part of the territory; we end with conclusions and public policy proposals.

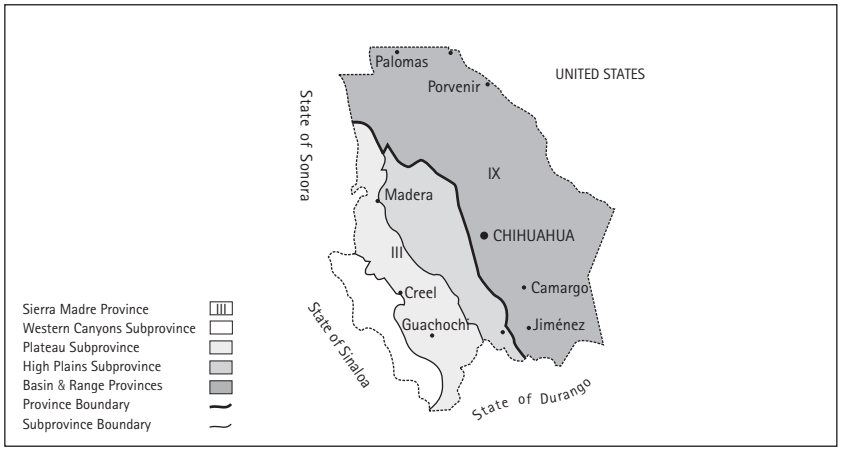
1. CHIHUAHUA: A DESERT STATE THAT EXPORTS WATER

Chihuahua is the largest state in the Mexican Republic and is located in the north-central part of that country (Map 1). It has a surface area of 244,000 km^2, equivalent to 24.4 million hectares. Its vast geography is divided into two large physiographic provinces: the Province of Basins and Ranges, primarily desert, in the north and east of the state; and the Western Sierra Madre Province in the south and west, which is subdivided into three regions: High Plains, Plateau and Canyons (Map 2).

Map 1
State of Chihuahua, United Mexican States

Source: Inegi (2013).

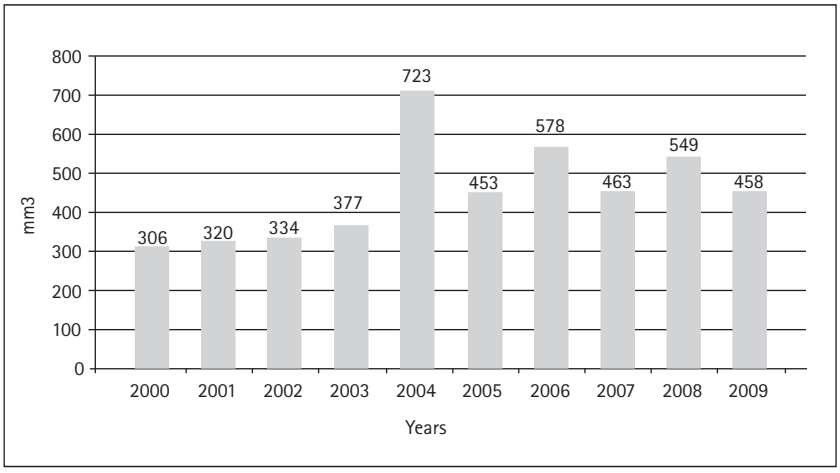
Map 2
Natural provinces and sub-provinces of Chihuahua



Source: SEGOB (n.d.)

Chihuahua's location at the same latitude as the planet's great deserts is the cause of its sparse rainfall year round. In the decade between 2000 and 2009, the average rainfall for the state between January and November was 456.4 mm (Graph 1).

Graph 1
Rainfall in Chihuahua, January–November, 2000–2009 (in cubic millimeters).



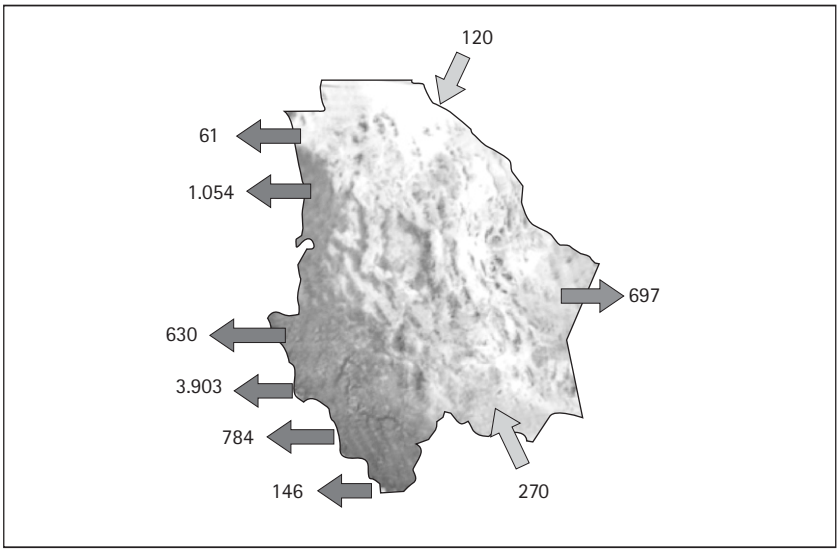
Source: SIAP-Sagarpa (2009).

The effects of climate change are causing rainfall to become still sparser. Thus, starting in the winter of 2010-2011 and throughout the entire year that followed, rainfall was 38% below the average for the previous decade, reaching a minimum of around 270 mm.

Even so, the «water balance», understood as the difference between surface waters that enter Chihuahua from the neighboring states of Mexico and the United States and those that flow out of the state through various rivers, is disadvantageous to Chihuahua (Map 3): while 120 and 270 million cubic meters (Mm^3) of water entered via rivers flowing from the United States and from the state of Durango, respectively, 7,275 Mm^3 left the state for Sonora and Sinaloa and for the Rio Grande that flows towards the United States (Secretaría de Desarrollo Rural del Gobierno del Estado de Chihuahua 2011a). Part of this flow is regulated by the 1944 International Boundary and Water Commission Treaty between the governments of Mexico and the United States. The treaty commits Mexico to supplying the Rio Bravo with a third of the total flows from the Rio Conchos, Rio San Diego, Rio San Rodrigo, Rio Escondido, Rio Salado and the Arroyo de las Vacas, amounting to an average of 2,158.6 Mm^3 during a cycle of five consecutive years; in exchange, the United States

allows the passage of water from the Rio Bravo to Ciudad Juárez and water from the Colorado River to the Mexicali Valley in Baja California.

Map 3
Surface water inflows and outflows, Chihuahua (in millions of cubic meters)

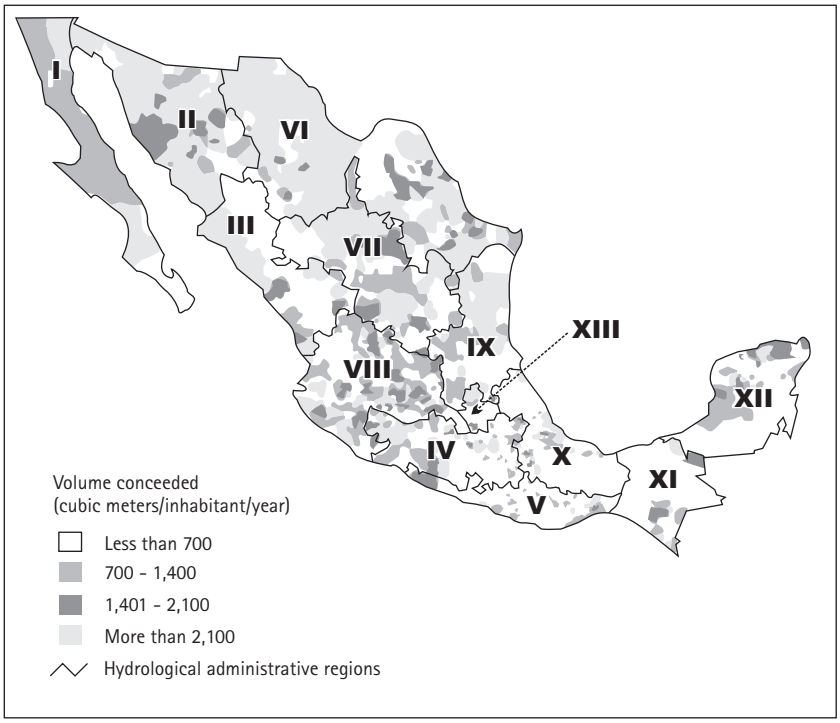


Source: Secretaría de Desarrollo Rural del Gobierno del Estado de Chihuahua (2011b).

2. USES AND ABUSES OF WATER IN CHIHUAHUA

Given the location of Chihuahua as well as its status as a net exporter of water to other Mexican states and the U.S., the maximization of water resources is vital to the state's productive activities. In 2009, out of a total annual consumption of 5,151 cubic hectometers, 4,590 (89.1%, one of the largest percentages in the country) was used for agriculture, 476 went for public use, 58 for self-supplied industry, and 28 for thermoelectricity. As shown on Map 4, this puts Chihuahua in third place among all Mexican states - both in absolute and per capita terms - in volume of water consumption, only behind the states of Sinaloa and Sonora (Conagua 2011: 64).

Map 4
Water concession volume per capita, Mexico, 2010 (in cubic meters)

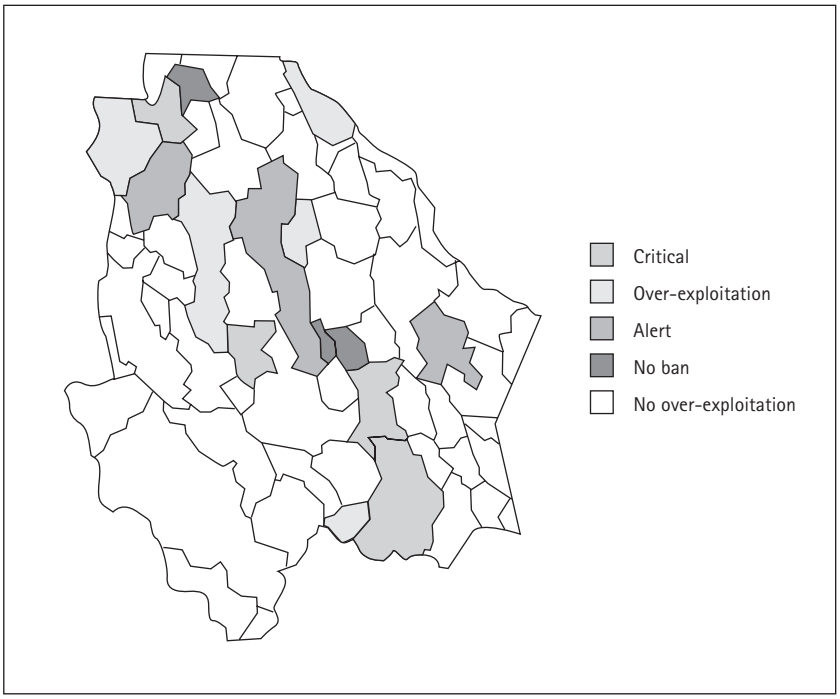


Source: Conagua (2010).

However, 41.48% is of the total water used for agriculture in the state of Chihuahua is surface water - obtained from rivers, dams, lakes, streams, etc. – and 58.51% is extracted from the subsoil. These figures reflect the tremendous importance of pumped groundwater to irrigation and therein lies the problem, because there is a considerable disparity between extractions from aquifers and their recharge capacity. Natural groundwater recharge is only 656.32 Mm^3 while annual extraction stands at 2,406.5 Mm^3 via 20,943 electric-powered wells, of which at least 13,500 are for agricultural use.[3] This has exerted immense pressure on the 61 aquifers in the state, of which five are in a critical situation and nineteen are subject to some degree of over-exploitation or a state of alert, as shown in Map 5.

3. Without considering illegal or «cloned» wells (those drilled using the license for another well already in operation).

Map 5
Status of aquifers in Chihuahua, 2011



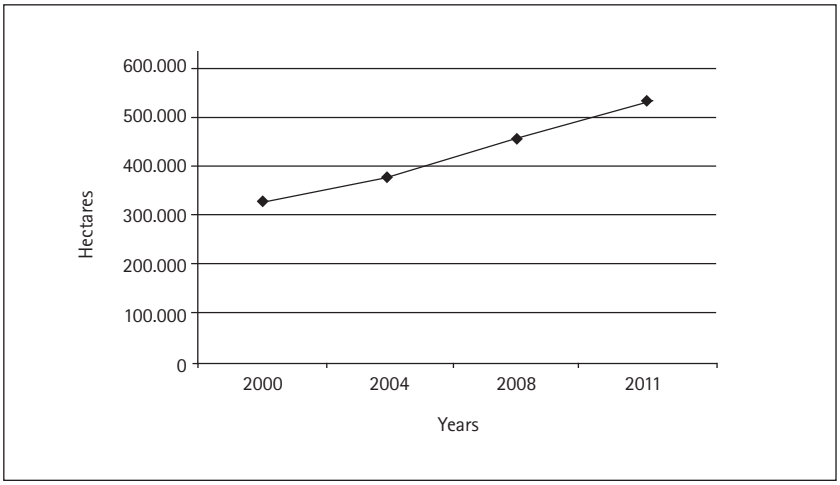
Source: Secretaría de Desarrollo Rural del Gobierno del Estado de Chihuahua (2011a).

It is important to note that data regarding the amount of agricultural land are not precise. According to the state's Department of Rural Government (Secretaría de Desarrollo Rural de Gobierno del Estado), the amount of agricultural land in Chihuahua consists of 1,279,743 hectares, of which 479,125 are cultivated through irrigation and 800,616 are rainfed.

Nonetheless, other data suggests that official estimates are either higher or lower than the real figures. This requires careful examination. First, federal government figures from the SIAP-Sagarpa, calculated at the end of each annual planting season from 2000 to 2011, demonstrate that the area under cultivation has increased constantly, from 337,643.16 hectares in the first year to 524,819.03 in 2011. This represents an increase of 64%, meaning that the land area irrigated for planting expanded by two thirds in just eleven years. Practically the entire area was irrigated through wells since Chihuahua reached its surface water irrigation limit some time ago.

The Department of Rural Development of the state of Chihuahua provides very similar data: in 2011, the number of hectares irrigated for both districts and irrigation units was 526,354, of which 138,390 were irrigated with surface water and 387,964 with groundwater (Graph 2).

Graph 2
Evolution of irrigated land area, Chihuahua, 2000–2011 (in hectares)



Source: Secretaría de Desarrollo Rural de Gobierno del Estado (2011a); compiled by author.

Second, this data, alarming in and of itself, seems conservative when compared with the information provided by the staff of Chihuahua's Department of Rural Development. This information is based not on Inegi's or Sagarpa's statistics but on the combined analysis of SPOT satellite images and statistics on changes in land use supplied by Semarnat. According to this information, the land area under irrigatiion in Chihuahua increased between 2000 and 2009 from 725,827 to 912,764 hectares while over the same period, the rainfed land area increased from 1,187,543 to 1,350,973 hectares.[4]

3. THE EXPANSION OF THE IRRIGATED FRONTIER IN CHIHUAHUA

Now, how and why has the land under irrigation expanded so much? It is very important to find an accurate answer to this question because the answer will have significant consequences. First, let us look at those rural development districts (distritos de desarrollo

4. Data provided unofficially by staff from the Department of Rural Development of the state of Chihuahua.

rural) in Chihuahua where the most significant increase in land under irrigation has taken place (Table 1).

Table 1
Increase in irrigated land area in Chihuahua, by districts, 2001 and 2010

District	2001	2010	Increase (%)
Bajo Río Conchos	8,892	30,899	344
Balleza	1,588	1,719	8
Buenaventura	16,814	47,030	264
Casas Grandes	71,875	74,645	3
Chihuahua	18,564	34,136	183
Cuauhtémoc	52,815	60,813	15
Delicias	72,393	81,216	12
El Carmen	23,175	60,824	262
Madera	16,695	26,439	58
Papigochi	12,051	13,085	8
Parral	9,099	15,895	74
Valle Juárez	17,540	12,841	- 27
Total	321,501	459,542	43

Source: Secretaría de Desarrollo Rural de Gobierno del Estado de Chihuahua (2011a); compiled by author.

As can be readily appreciated, those districts that have witnessed a dramatic growth in irrigated land area are Bajo Río Conchos (344%), Buenaventura (264%), El Carmen (262%) and Chihuahua (183%) (Map 6). In each case, the expansion was made possible by the drilling of additional wells. Moreover, two of these districts - El Carmen and Buenaventura - are located in the basin of the Rio del Carmen, where a conflict broke out in response to illegal drilling and water usage. In general, these are «free supply zones»[5] with the exception of those in the Rio del Carmen basin, situated in the most arid part of the Chihuahuan Desert in the north and west of the state.

5. «Free-supply zones» (zonas de libre alumbramiento) are areas where groundwater can be extracted and taken to the surface without the need for prior government authorization.

Map 6
Districts with the largest expansion of irrigated land area, Chihuahua, 2001–2010[6]

Source: Secretaria de Desarrollo Rural de Gobierno del Estado (2011a); compiled by author.

What is the explanation for this process of clearing and converting thousands of hectares of land, previously reserved for livestock farming, for crop production and the acquisition of the necessary water via well drilling?

There are several factors at play. First, the prolonged and/or recurrent drought brought on by climate change has drastically affected the entire state, and especially those areas that were more arid in the first place. In the vast plains in the north and east of the state, large ranches had been established for extensive livestock farming; these have good pastureland, but very low stocking rates. By merely tending to the pastureland and watering places and without significant investment, livestock farming was good business until the climate started to change and, with the droughts, pastureland stopped recovering, while the few

6. Rural Development Districts (distritos de desarrollo rural) are areas, each encompassing several municipalities, designated by the federal government for the administration of water resources.

water mirrors and springs ran dry and watering places were gradually depleted. This has reduced herd sizes and forced farmers to invest increasingly large sums to sustain dwindling livestock numbers. At present, therefore, increasing numbers of farmers in these regions are putting their ranches up for sale.

No other local farmers are willing to buy such vast expanses. But now, Mennonite settlers have started to arrive. They come seeking new lands for farming because of the needs of the expanding population of their colonies in the regions of Cuauhtémoc-Namiquipa and Riva Palacio. They have the resources necessary to invest in land clearing, well drilling, equipment and installation of sophisticated irrigation systems and even for the construction of new and highly modern neighborhoods. They have been gradually acquiring properties in the towns of Ojinaga, Julimes and Manuel Benavides in the Rural Development District of Bajo Río Conchos and establishing colonies such as El Oasis and Los Juncos. In the municipality of Buenaventura, in the Rural Development District of the same name, the Mennonite population has opened up several thousand hectares to farming in the El Valle colony and in the municipality of Ahumada, in the Valle de la Esperanza colony, and land clearing is currently underway to found the colony of La Peralta. Meanwhile, in the municipality of Aldama, in the Rural Development District of Chihuahua, arrangements have been made to start clearing the Laguna del Cuervo. These are but a few of many such cases.

In addition, Mennonite groups, generally made up of small numbers of wealthy individuals, have another advantage: most of the properties that they acquire are located in the «free supply zones» and thus they are not even required to pay for drilling permits. However, they could encounter another problem if Semarnat refuses to grant them permits for land-use change. But this tends not to deter Mennonites because they usually do not wait for a permit to be granted, preferring instead to pay the corresponding fine once the land-use change has already taken place.

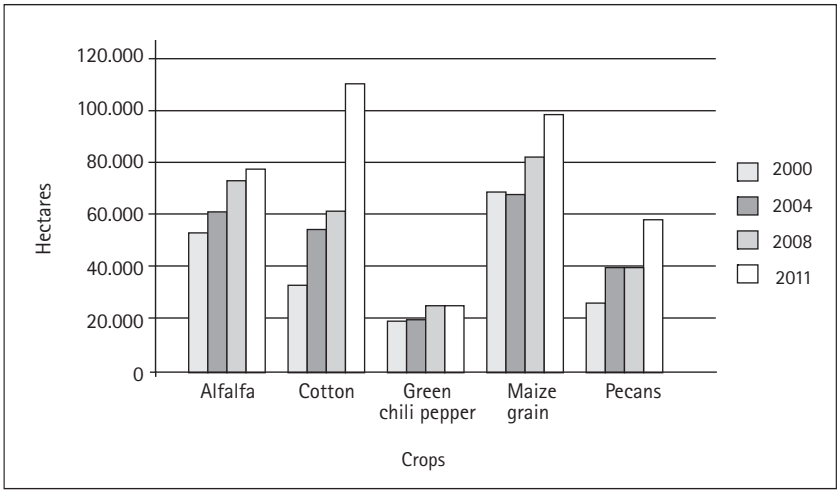
But the question is why do such groups decide to make such large investments in the middle of the desert to open up new lands for crop farming? Let us take a look at that now.

4. THE «POLITICAL ECONOMY» OF THE NEW IRRIGATION IN CHIHUAHUA

If a group of agriculturists, almost always from the Mennonite faith, buys a 20 thousand hectare property in the desert, clears it, levels it, drills a set of two or four hundred deep wells, installs costly irrigation pivots and constructs stores, dwellings and service centers, it is because there are very good possibilities of recouping their investment, and indeed, of recouping it before the aquifer that is to be exploited is exhausted.

Moreover, not only wealthy Mennonite farmers, but also *mestizo* investors have opted to invest heavily in irrigation since they know they can get a quick return on their investment. Graph 3 shows the principal crops in Chihuahua's irrigation zones.

Graph 3
Fastest-expanding irrigated crops, Chihuahua, 2000–2011 (in hectares)



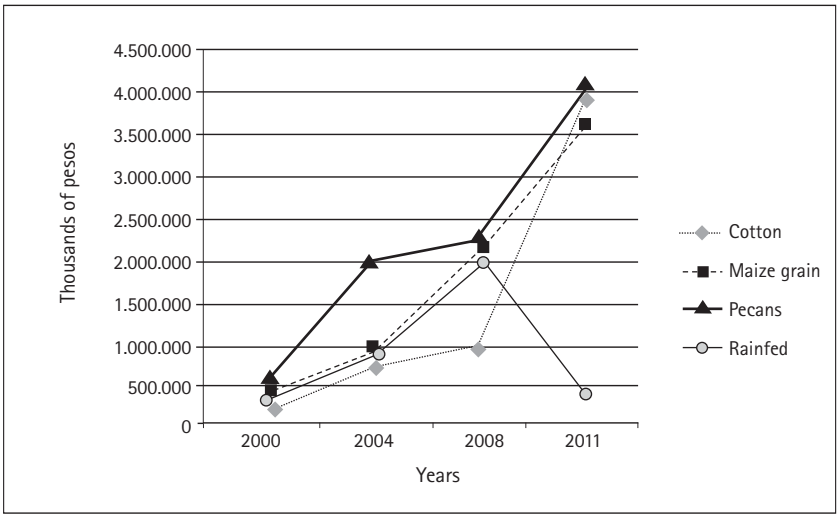
Source: SIAP-Sagarpa (2011); compiled by author.

It is quite evident that cotton, maize grain (predominantly yellow corn), alfalfa and pecans are the crops that have expanded the most in the state. As a brief aside, it should be noted that alfalfa is a crop that requires a massive amount of water and that, paradoxically, Chihuahua has become one of its main producers and exporters. One of the driest states in the country, it nonetheless exports large quantities of water contained in the alfalfa.

One economic motive lies behind the spectacular expansion of the above-mentioned crops: they are all highly profitable for the producer (Graph 4).

Graph 4 clearly shows how sharply the value of maize grain, pecans and cotton has increased in eleven years. In 2000, the value of each of these crops was broadly equivalent to the total for rainfed crops in Chihuahua. But rainfed production has been seriously affected by drought and no longer makes up even as much as a quarter of the value of any one of the irrigated crops in question.

Graph 4
Production value of the main irrigated and rainfed crops, Chihuahua, 2000–2011 (in thousands of pesos)



Source: SIAP-Sagarpa (2011); compiled by author.

Without question, the dramatic expansion of crops such as maize and cotton is due to the worldwide agri-food situation: the new global agri-food order, as defined by Blanca Rubio; that is, a new restructuring of food and agriculture policies worldwide. This trend was brought about by the combined impact of the energy crisis, which has increased fuel prices, and the financial crisis in the real estate sector, which diverted an enormous amount of capital to the agro-food sector for speculative purposes, triggering a widespread rise in food prices starting in 2003, and especially in 2007 and 2008 in the aftermath of the hedge fund crisis. Thus, agriculture has undergone a process of «financialization» which is described by Blanca Rubio in the following terms: «[...] the process by which food prices are determined by speculative investment in food commodities, such as future prices, a process in which basic foodstuffs are bought up in advance, banking on price increases, which completely distorts the economic basis of prices».[7] (Rubio 2008: 40).

7. Translation by *Apuntes*.

The new «energy-financial» order that has encompassed the agri-food sector means basic foodstuffs are used for speculation and agrofuel production rather than for feeding the population. The price increases have led to a reactivation of agricultural production, though this is uneven and centered on large-scale producers. In Mexico, President Calderón's government implemented a series of policies that fit perfectly with this new order, including: the full opening of markets to maize, sorghum, rice and soymeal imports, tax reductions on the import of certain commodities such as powdered milk and beans, financing for producers for the purchase of materials and equipment, and provision of fertilizer at affordable prices. (Rubio 2008: 45).

As a result of these policies, producers have access to subsidies and government aid, especially the Productive Assets (Activos Productivos) program for the modernization of irrigation and pumping. This program allows farmers to acquire new equipment by putting up just 40% of the cost, with the government making up the rest. That said, even with this subsidy, the high costs of modern irrigation and pumping equipment inevitably still mean that only wealthy producers like the most affluent Mennonites farmers can afford the outlay.

This new equipment results in considerable crop productivity increases, to the point where Chihuahua's maize yield of between twelve and fourteen tons per hectare is the highest in Mexico, alongside that of Sinaloa.

It therefore follows that producers who can afford subsidized irrigation and mining equipment can afford to buy new land for crop production; and they do buy tracts that were not previously used for cultivation, above all in northern and eastern Chihuahua, where they offer livestock farmers tempting sums for their ranches.

Thus, new irrigated areas are opened up to crop farming because, despite the sizable investment required, it turns out to be very good business in the short run. Moreover, as we have seen, federal government policies are decisive: first, because they provide support for minimum pricing for agricultural produce, thus pushing up prices; and second, by providing assistance through programs such as Productive Assets and Modernization of Irrigation (Tecnificación del Riego). From our point of view, this is a policy of «promotion that excludes», since it benefits only a small number of producers. We will return to this below.

5. THE HEART OF THE MATTER: THE HIGH COSTS OF NEW FORMS OF IRRIGATION

The success story for a few means high costs and serious problems for the many, as evidenced in the demands of groups such as *El Barzón* and those of other farmers who feel that an entire, permissive support system exists for wealthy agriculturists to the detriment of medium and small-scale producers. Their main complaints are as follows:

- **Wells that operate over and above the concessions granted**. Because of the failure to apply the law in some cases but also because of legal loopholes and pernicious practices by the Mexican government, too many concessions have been granted for the extraction of water from the subsoil in aquifers around the country. In the state of Chihuahua alone, deeds exist for 19,499 wells of all kinds but 20,123 wells are in operation. It remains to be seen whether the aquifers can support this rate of extraction through wells with and without deeds.

- **Overexploited and depleted aquifers**. The proliferation of wells coupled with the lack of pertinent technical studies has resulted in the overexploitation and depletion of aquifers. According to the Conagua, the number of overexploited aquifers throughout the country has been on the rise since the 1970s: 32 in 1975, 80 in 1985, 97 in 2001 and 104 in 2004. Almost 60% of the groundwater contained in these aquifers is extracted for all types of usage. In the state of Chihuahua, as indicated above, there are nineteen aquifers that are overexploited to some degree and five whose situation is critical, if not irreversible. One of the reasons for the overexploitation of aquifers is the need of producers to increase productivity by utilizing more water in order to be able to compete with the artificially low prices of imported agricultural produce. This is clear in the case of maize, which is irrigated with pumped water. Water from wells is used intensively to increase yield per hectare in order to compete with maize imported from the United States, where agroclimatic conditions are clearly more favorable than in Mexico.

- **Free supply zones**. Current legislation continues to apply a concept that owes more to the liberal tradition than to the idea of water as a public good: the free supply zones. In these areas anyone can drill or extract water without the need for prior authorization or concessions from government officials; mere notification is sufficient. It should be noted that, at least in the state of Chihuahua, these areas were previously considered apt only for pasture and extensive livestock farming. Attempts are now being made to turn them into crop producing zones without hydrological or environmental impact studies and without even knowing whether the aquifers in these areas are connected with others or the effect that exploitation in one area could have on other areas.

- **Limited, inadequate, and concentrated investment to improve the efficiency of extraction and irrigation.** The decapitalization of producers, aggravated by a lack of public investment from all three levels of government, has impeded the modernization of more than 250 thousand hectares of irrigated land in the state of Chihuahua. This has led to increased production costs and the inefficient use of water and electricity, among other negative consequences. Most producers are being negatively affected at the same time as a small group monopolizes subsidies from the official programs, Productive Assets and Modernization of Irrigation. In 2008, a series of serious accusations were made by Conagua employees regarding collusion between Conagua officials and the state government to benefit a select few producers via these programs, with equipment to be purchased from only two or three providers. One of the key questions that requires further investigation is how and who these programs and subsidies are benefiting.

- **Monopolization of wells**. It is seldom taken into account that, under current conditions, the concentration of land is no longer as significant as the concentration of water. The redistributive social criteria outlined in Article 27 of the Constitution regarding land and forests foundered on the issue of concessions for groundwater, that is, for wells. Little by little, the most powerful producers are hoarding concessions and acquiring new ones, even drilling illicitly on occasion. This gives rise to the phenomenon that we call «latihydrismo». In Chihuahua, there are large-scale apple and walnut producers who alone possess more wells than those that supply drinking water to medium-sized cities such as Cuauhtémoc or Jiménez. Concessions are still granted on an individual basis, without using criteria to prioritize social usage or mechanisms to prevent concentration or the use of «straw-men» who lend the use of their names. Moreover, government support programs for the drilling of wells for organized peasant groups are almost non-existent.

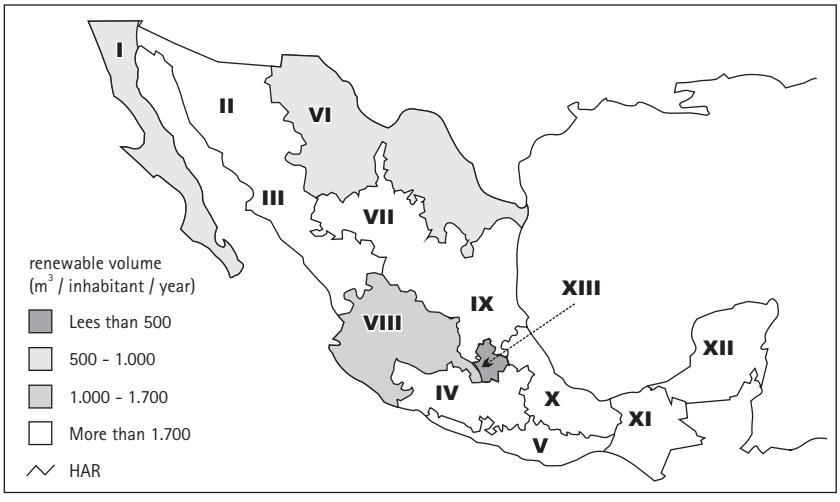
- **Water table and groundwater depletion**. As the recent summer clash between *ejido* land owners and settlers in the basin of the Rio del Carmen has shown, when new wells are drilled or reservoirs constructed in areas where wells and exploitation already exist, the water table falls and surface water flow levels decline, seriously affecting long established producers. Thus, when new farmers arrive and drill below the depth of existing wells, the water table drops, with the result that the longer established producers are compelled to drill to greater depths so as not to lose water, consuming more electricity in the process.

- **Depletion of fossil water and environmental devastation**. Little is said about the latter problem since it is thought that the conversion of the desert into an agricultural

emporium is an indisputable boon. However, the systematic and indiscriminate clearing of vast tracts of desert and the intensive use of aquifers contributes to induced, perverse **desertification**. Plant life native to the Chihuahuan desert - the largest in North America - is being wiped out, the entire ecosystem is being altered, and plant and animal species are disappearing completely. The natural desert, teeming with diverse life forms, becomes an **anthropogenically induced desert**, where life perishes. The aquifers, where water has been stored for 500 thousand years, are drained in little more than a few years, as is the case of the Los Juncos and El Oasis estates in the eastern part of the state. It should be kept in mind that a single drop of water that falls to the ground in this region takes fifty years to reach the aquifer.

- **Unsustainability of water and all forms of life**. This way of exploiting water is totally unsustainable; it holds out no future - and here we do not mean just productive life but life itself - for vast regions of the state. It is noteworthy that the regions we have just described are those where, on the one hand, there is the most water use, and, on the other, there is lowest availability of cubic meters per capita in the entire country. Thus, by 2030 the VI water region, the Rio Bravo, which comprises most of the state of Chihuahua, will occupy the third from last place in terms of renewable water availability per capita in Mexico, with just 918 m^3 per inhabitant per year, ahead only of the Valley of México and Baja California regions (Conagua 2011: 110). This is illustrated in Map 7.

Map 7
Renewable water in river basins, per capita, Mexico, projection to 2030 (in cubic meters)



Source: Conagua (2010).

6. THE PROTEST MOVEMENT IN THE STATE OF CHIHUAHUA

Although the summer of 2012 was not as dry as 2011 in Chihuahua, it was much hotter, and not only because the mercury hit the highest temperatures on record; for almost the entire summer, a vigorous movement of agricultural producers from several municipalities in the north of the state rose up in protest against illegal drilling and water usage in the Rio del Carmen basin.

The producers who took part in the movement were *ejido* land owners, settlers, and small landowners grouped together into local organizations and in the organization of farmers and bank debtors known as *El Barzón*. They came from the municipalities of Riva Palacio, Namiquipa, Buenaventura, and Ahumada, in the basin of the Rio Santa Clara-Del Carmen.

A water emergency was declared in this basin by the federal government in 1995, when the El Carmen irrigation district was created. But subsequently, a small group of Mennonite settlers proceeded to drill wells on the outskirts and built more than 150 dams on the river and its tributaries. This meant that of the 20,000 hectares that had been irrigated in this irrigation district, no more than 7,500 could be irrigated afterwards, decreasing to barely 3,000 in 2012. The volume of the wells belonging to *ejido* land owners and settlers has declined massively as a consequence of deep drilling and reservoirs built by the powerful group of Mennonites, protected by false or falsified permits and Conagua's acquiescence. Many wells dried up while the flow rates of others plummeted from fifty to twenty-five liters per second.

The basic demands of the Defenders of Chichuahuan Desert Water (Defensores del agua del desierto chihuahuense), as they call themselves, are for an end to illegal drilling and exploitation, the destruction of reservoirs, and the enforcement of the relevant laws by Conagua. They also ask that the Federal Attorney's Office for Environmental Protection (Profepa) refrain from granting licenses for land use changes for crop production, that Sagarpa deny support or subsidies of any kind to producers who drill or exploit water illegally, and that the Federal Electricity Commission (Comisión Federal de Electricidad, CFE) refuse to connect producers to the electric grid. Finally, they call upon the state government to monitor the fulfillment of these demands, even providing help from the state police or with heavy machinery.

From June to August 2012, a part of the movement consisting of 1,315 producers from six communities in the municipality of Buenaventura and 1,854 producers from twenty-two communities in the municipality of Ahumada took a very different approach: they

took over public offices, blocked roads and railroads, and also accompanying public officials to dam demolitions and well closures. At times, they reached the brink of physical violence when the traditionally pacifistic Mennonite community said no to demands to cease their exploitation of water. The confrontation was given a great deal of publicity by local, national and even international media. Coverage went far beyond the mere productive and economic aspects of the conflict, with the dispute occasionally portrayed as an ethnic clash between mestizos and Mennonites. Some local media launched a witch hunt against members of El Barzón and other producers, accusing them of baseless attacks on the industrious Mennonite community and of envying their productivity and prosperity.

Nonetheless, the *barzonistas*, as they are known locally, and other farmers refused to yield, voicing strong criticisms of government institutions, especially Conagua, for their negligence, their collusion with corrupt agriculturists, their permissiveness and their ineptitude in terms of properly managing water. In turn, Conagua became embroiled in a dispute with the state government which spilled into the media, with each blaming the other for having caused this explosive situation.

The pressure yielded early fruit and in July 2012, Conagua and the state government committed to closing down illegal exploitation activities and to setting up a working group to look into the problem. Nonetheless, when the producers observed that the authorities had not taken any effective actions, they submitted a complaint to the National Human Rights Commission (Comisión Nacional de Derechos Humanos) on September 2012 against the following federal agencies: Conagua, the Department of the Environment and Natural Resources, and Profepa, declaring that the negligence and oversights of this entire institutional framework meant that the producers were not effectively enjoying the right to water; in other words, this right was being denied them. The president of the National Human Rights Commission, Raúl Plasencia Villanueva, received the complaint personally. This was the first denunciation from northern Mexico concerning the violation of the right to water, which had been recently enshrined in the Federal Constitution.

During the same month, peasants from the municipality of Buenaventura kept up their actions. In the community of Constitución, they knocked down a number of electric poles supplying a new, illegally drilled well. Meanwhile, in the community of Benito Juárez, they stepped up their efforts to stop the Canadian mining firm Mag Silver and its Mexican subsidiary El Cascabel from exploiting a mine on their land because of the negative effects that this exploitation would have on aquifers and the environment.

The first two victims of this movement in defense of water and natural resources came from the latter community. On Monday October 22, 2012, the leader of *El Barzón* in the community of Benito Juárez, Ismael Solorio and his wife, Manuela Solís, were murdered while they were driving in their car. The death of these two young activists, far from intimidating the members of the movement, spurred them on all the more. They held several demonstrations over the weeks that followed and, in mid-November, the community of Benito Juárez held an assembly that unanimously decided to deny consent for Mag Silver to continue operating in their community, demanding the immediate removal of their machinery and equipment.

To increase the pressure, farmers from the municipalities in the basin of the Rio Santa Clara-del Carmen, along with other social organizations from the state of Chihuahua, held what they called Days for Justice (Jornadas por la Justicia) with marches and processions starting in different locations converging on the state capital. On arrival, they reasserted their demands for an end to illegal drilling and exploitation in the river basin and for the law breakers and complicit government agencies to be held to account.

The struggle achieved a significant triumph little more than a month later: as part of the World Water Day celebrations, Mexican President Enrique Peña Nieto signed a decree which, by means of a declaration of a provisional water emergency, suspended and prohibited the drilling of wells in the «free supply areas». From now on, precise, legal, substantiated and documentary authorization from Conagua is required for drilling. The decree, the product of the struggle of the *El Barzón* farmers and other organizations from the Santa Clara-Del Carmen basin, is in effect nationwide but it is obviously of primordial importance for the state of Chihuahua and will also benefit peasant agriculturalists in all of Mexico.

In addition to this struggle, there was a very interesting political development: after the amendment to the Mexican Constitution which enshrined the right to water, the Chamber of Deputies set a term of 360 days for the presentation of an initiative for a new general water law. In response, civil society organizations created the Thematic Water Network (Red Temática del Agua), which brought together academics, researchers, social activists, and community representatives. This network organized the 1st Congress for Citizens and Water Sustainability in Mexico (Ciudadanos y sustentabilidad del agua en México), held on December 7 and 8, 2012. Its ten working groups received several very solid proposals that were conceived from the bottom up and scientifically based for the preparation of a new law that ensures that the right to water is always enjoyed by everyone and forever, as well as for the preparation of a national water plan and the

establishment citizens' and social institutions for the management of this most vital of resources. Representatives from the struggle for water in Chihuahua were in attendance and the following motto was proposed: «Water for all, forever» (Agua para todos siempre), with the aim of implementing the human right to water, sanitation and to sustainable water resources.

Subsequently, on February 6, 2012, this broad coalition of social organizations, academics, producers, communities, and villages presented its proposal for the general water law to the Chamber of Deputies. The most important guiding principles of this proposal include: first, the priority of this human right and it's application for food security and sovereignty; second, comprehensive and sustainable management of basins, groundwater, surface water, and local drinking water and sanitation systems (Consejo Ciudadano de Cuencas 2013); third, respect for the profound interrelationship between communities, their lands, and their water as well as for citizen participation and optimum access to all relevant information. In order to achieve this, the instrument prioritizes planned joint management of the basins, which entails shared responsibility between the authorities and citizens (Consejo Ciudadano de Cuencas 2013).

CONCLUSIONS AND FUTURE PERSPECTIVES

The analysis of the process of appropriation – and depletion – of water resources in the state of Chihuahua and northern Mexico clearly illustrates the diverse processes – and social projects – relating to water, food, and human rights that are currently colliding around the world.

The expansion of the agricultural frontier in Chihuahua by way of pump irrigation or groundwater is motivated above all by economic considerations: opening up land for the most profitable crops. This has nothing to do with producing more basic foodstuffs – if this were the case, pecans and cotton would not figure so prominently – nor is there emphasis on crops that produce the largest profit margins.

The expansion is driven by domestic and international factors and forms part of a global trend. Among the international factors, the most important is the new global agri-food order, characterized by the penetration of financial capital into agriculture and the prevailing speculation in food and biofuel markets (Rubio 2008: 42). One of the domestic factors that stands out and is closely related to the aforementioned international developments is the federal government's policy of «exclusive promotion» or «selective and concentrated subsidies» whereby subsidies are directed toward the capitalization, equipping

and commercialization of commercial producers who are already capitalized, to the detriment of small and medium scale commodity producers.

Another factor of considerable importance is climate change. On the one hand, it is leading many livestock farmers to sell their land when pasture and watering places are depleted. On the other, as surface water volumes fall due to increasingly severe and recurrent droughts, producers resort to well drilling.

Thus, Chihuahua is undergoing a process of social, water and environmental devastation which, unfortunately, is not unique to this state and can be observed elsewhere in Mexico and abroad. Drought and climate change have prompted livestock and crop farmers to sell or abandon their ranches and plots, giving rise to a dual processes of the disappearance of livestock and peasants in rainfed areas. In addition, an increasingly robust group of producers is establishing itself, accumulating wells, irrigated land, resources, financing, and subsidies. This process has serious implications, causing severe environmental impact through the depletion of aquifers, reduction of surface waters to a minimum, clearing of pasture and shrubbery, and destruction of ecosystems native to the Chihuahuan desert. The result is a vicious circle that leads to more desertification, less rain, less vegetation, less groundwater recharge, etc. All this is the product of an agricultural model that wreaks great havoc on natural resources, the closest parallel to which is mineral extractivism. It is, thus, a model of «agricultural extractivism,» which has been denounced and resisted in many different countries by many different means. At the same time, this model has a very negative bearing on climate change since it contributes to increased greenhouse gas emissions due to the application of agrochemicals and the wholesale use of fossil fuels, while the widespread clearing of bush and pasture precipitates a decline in carbon capture.

The protests by agriculturalists from the state of Chihuahua against these developments are pioneering and are a very significant, cohesive social response to climate change and agricultural extractivism. Their demands, their approach to protest, and their appeals echo other struggles that occur elsewhere and will continue to multiply in the near future in the face of the advance of natural resource extractivism and the globalization of industrial agricultural production. The basic demands of these farmers are entirely in keeping with those of the Thematic Water Network and make clear the priority measures that must be adopted, both by civil society movements, nationally and internationally, and in legislation:

> First, to ensure that all states guarantee an adequate supply of high quality water for human consumption for current and future generations and for the ecosystems, as the overriding, fundamental priority for the operation of all systems and basins. In short, to guarantee water for all, forever.

> Second, to prioritize the water required for cultivating basic commodities for the population; that is, water for food sovereignty and not for gain. Only the remaining water, or treated water, should be employed for non-basic crops, industry, or mineral extraction.

Achieving these goals requires two fundamental transformations in citizen participation and in our way of life. The former is indispensable for the management of scarce community goods and in order to implement this, one possibility is the creation of joint management councils. These joint councils, comprised of representatives of various levels of government and citizens, ought to be at the core of water democracy. Their main functions would be preparing and implementing master plans for basins based on the tenets of availability and impact and taking on the responsibility for comprehensive management of basins, so that only ecologically available water flows are utilized, over-extraction and contamination are avoided, and vulnerability is reduced.

Water democracy thus means divesting the state of its monopoly of planning and allocation of this resource. And if democracy starts with the most basic of basics, nobody will be able to stand in its way when it comes to the management of the other common goods. With the democratization of water, the democratization of society will be unstoppable.

The other transformation has unimaginable repercussions. The democratic assignment of volumes of water to communities and ecosystems, based on impartial scientific estimates, will ensure the prioritization of a minimum set of basic rights for all and what remains will be assigned to non-essential agricultural, industrial or domestic use. This will impact industry and mining and even agricultural producers of non-basic foodstuffs. Ensuring that nobody dies from thirst, lack of food or diseases caused by water shortages impacts our way of life, and above all, our consumption habits. We cannot continue eating, drinking, dressing, travelling, and amusing ourselves as we do at present. The planet will not bear it and water will be first to suffer the effects. Therefore, either we head for a Hobbesian future in which the fittest keep on concentrating - and misappropriating - the natural resources of everyone at the cost of a poor quality of life and the death of the majority; or we set off on a path to a new civilization based on sharing, and the responsibility of everyone to the planetary community. A civilization that is acutely aware of what Iván Illich once said: «the frontiers of the good and the strictly necessary are practically the same».[9]

9. Translation by *Apuntes*.

To start heading in this direction, it is necessary to carry out the set of three complex actions proposed by the French jurist Mireille Delmas-Marty to tackle dehumanizing globalization through the use of the law: resist, hold accountable, and anticipate. Resist the exclusive, brutal, contaminating, and for-profit use of water that results in the exclusion of large sections of society and future generations from access to this resource; this means resisting mining extractivism and the agro-export model via social mobilizations that employ all the tools provided by national and international law. Hold to account the numerous actors, such as government officials and citizens themselves, for the effective fulfillment of the right to sufficient, high quality water, also employing the legal instruments that have come into existence as a result of the struggles of peoples. Finally, when mechanisms are established to guarantee water resources' public character, sustainability, and susceptibility to social control, it will be possible to anticipate future depredation, privatization or exclusive appropriation of the water that belongs to everyone.

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