Water as Private Property. Notes on the Case of Chile

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Prologue

This chapter brings together information and appraisals regarding the theme of water policy and regulation, obtained by the author during his two and a half years' contact with northern Chile's reality. It is important to mention that it is an empirical contribution, not based on explicit research. In spite of the importance water has in several economic sectors and for life itself, this text has been written from the perspective of its agricultural use, specifically in irrigation systems.

Any analysis of the theme of water tends to involve a great diversity of physical, economic, social, cultural and, therefore, ideological factors. The ensuing debate has delicate hues that, in the last few years, have centered on legislature trends toward privatising water rights, following the Chilean example.¹

The Chilean context

The territory of Chile spreads over 757,000 square kilometres, from parallel 17°30' southern latitude, in the warm desert, to parallel 56°30' in the Chilean Antarctic. This latitudinal distance translates into more than 4,000 kilometres between north and south, and a mean width of barely 190 kilometres. When crossing this width in the north, one ascends from sea level to the highland plateaux above 4,300 meters altitude.

While half of this territory is classified as arid, with 0 mm of rainfall per year in some parts of the Atacama desert, there are other regions with a rainfall of around 2000 mm/year. It is not surprising that, out of the total area under cultivation, approximately 5,000,000 hectares, around 1,800,000 are irrigated.

Over this varied geography, human cultures have settled for more than 12,000 years. In certain parts of the country some indigenous cultures are still present: Mapuches in the south, and Atacameños and Ayamaras in the north. However, most of the territory is occupied by descendants of immigrants who came during colonial times and more recently.
The use of land and natural resources has evolved markedly in many parts of the country. In the south, the Mapuches originally gathered what nature offered. Afterwards, in a process that was anything but peaceful, farmers settled, whose main activities were related to the cultivation of wheat. Nowadays, this crop has been replaced by large-scale forestry activities. In the more central areas (center and north-center) of the country, high-tech fruit and wine production has acquired great importance for the country's economy.

In the north, mining activities have traditional importance, from exploitation of guano in the past century, passing through saltpetre extraction, to large-scale copper production during the last few decades. In comparison with mining activities, agricultural production in the desert oases of the north can be considered marginal in economic terms. However, from the social point of view and in relation to territorial occupation, this marginal agriculture in small valleys, gulches, plains and oases is basic for the existence of many small desert villages.

This compact summary of Chile's geographical, human and economic diversity leads to the supposition that it has been difficult to harmonise different interests and thoughts with regard to territorial occupation, natural resources use and development of economic activities. In this sense, also in relation to the topic of water, several recurrent alternatives are introduced, as will be seen below.

The Chilean Water Code

Under the previous Chilean water legislation, effective until 1981, water regulations had the following characteristics:
- water use rights, understood as State concessions, were linked to land rights;
- water concessions were not considered as rights that could be 'moved' from one place to another;
- as a concession, water was not an item to be 'negotiated' between natural or juridical persons;
- concessions were granted for actual water use, not accumulable as private reserves.

The previous legislation may reflect a historic period comparatively free of water-related conflicts: a country with incipient industrial development, with extensive agriculture on less irrigated area, with less population density and less per capita water consumption, and a greater State presence in the economy (for example, in the sectors of drinking water, mining and hydro-power). All these were factors that diminished private competition for access to water.

The current Chilean Water Code was enacted in 1981 via Decree with Force of Law No.1122. According to Article 5 of that Code, 'water is a national good for public use, granting private persons the right to use them...'. Following is Article 6: 'Usage right is a real right concerning water resources and consisting in their use and enjoyment...
and... is under the control of its holder, who will be able to use, enjoy and dispose of it...'. The right is expressed in water volume per time unit.

To grant real usage rights, once on record with the Registry of Waters, water could be considered in practice as negotiable private property that can be mortgaged, leased or sold, under market conditions. Usage rights may refer to consumptive use (for example, irrigation) or to non-consumptive use with return to the river bed (for example, in the case of hydropower). Usage rights are usually permanent, but can also be granted as occasional, discontinuous or alternating rights.

The Water Code does not establish priorities for the several uses of water, be it drinking water, or for mining, agriculture, industry, tourism or other uses. If water is freely available at the source, there will be no problem in granting usage rights to a new user. However, if any kind of opposition appears, the Code establishes an auction procedure to give the rights to the highest bidder. When water sources are declared as depleted, no more usage rights can be granted. Then, the only way to get water is to buy it from other users, either the usage rights, with the respective Water Registry transfer, or specific access to water, without transferring rights.

When two or more rightholders share a common intake or natural canal or riverbed, the Water Code provides for the following water user associations: Water Community, Association of Canal Users, or Board of Surveillance. Each holder’s relative weight in decision-making within the organisation depends on the quantity of water-use rights, expressed in water shares, totally comparable to shareholders in a company.

In the last years there have been several legislative attempts to amend the current Water Code. The main topic of debate is that, in its current form, the Law theoretically allows hoarding, monopolisation and speculation with water use rights, without effective, short-term utilisation.

State intervention

The General Water Directorate of the Ministry of Public Works is the organisation in charge of granting usage rights, planning natural water sources, researching and measuring water resources, protecting natural river beds of public use, and supervising the operation of the Boards of Surveillance at the level of individual waterways.

Budgetary and legal restrictions limit certain functions of the General Water Directorate and its regional offices. For example, in the Pica community oasis, supposedly depleted, there are still applications for usage rights, which the GWD is obliged to process: there is no money to carry out the formal study that would declare Pica oasis as a Restriction or Prohibition Zone. With such study the Authority could refuse the applications. Meanwhile, it is estimated that in Pica there are already nearly 600 wells, almost all without water rights entitlement.
Understandably, under the current Water Code's approach of private rights and investments, the Chilean State has not invested much in public water development as has, for example, Peru. There's the Program of Medium-Sized and Small Works, and a program to subsidise up to 75% of investment for private improvement in irrigation and drainage, realised by means of competitive bidding organised by the National Water Commission (Decree Law 18,450).

With regard to the planning function, the same spirit as in the Water Code is reflected in the assumption that the market is the best allocator and, hence, the best planner of scarce resources. However, the subject of natural resource planning is becoming sensitive in Chile, because of the need to confront certain problems more globally (for example, at the watershed level) and not only by playing the 'Russian roulette' of rights, powers and interests among private users. This possible conceptual readjustment could be reinforced by the water supply problems suffered by metropolitan Santiago. Here, the General Water Directorate had to intervene in the allocation of water from the Mapocho and Maipú rivers in order to reassign momentary flow to the different drinking-water companies.

The State does not intervene in user organisations' internal administration, except as indicated by Law. Neither does it apply any development policy for their operation. In practice, the rational or irrational, equitable or inequitable use of water resources in the environment of Water Communities, Canal User Associations, Boards of Surveillance, or other local organisations entrusted de facto with their functions, depends almost exclusively on these organisations' managing capacity.

Water market performance

Since publication of the Water Code in 1981, the long process of regulating existing uses of water - often based on local practices and customs - and granting rights to new applications, has led to a situation in which today much water in Chile is in private hands. There are water owners, but there is no consensus as whether an actual water market has been created in Chile. In any event, the performance of this 'market' is rather strange.

Considering the universe of water shares and the number of users, the quantity of buying-and-selling transactions is quite reduced. It is a static market. This can explained by various reasons. In the first place, water is so vital for a user's economic activity (farmer, mining company, water company, etc.), that none will readily sell his or her rights, except in case of completely abandoning the productive activities of that site. Besides, holding surplus rights unused bears no cost for the user. If there were such costs, these would encourage the sale of the surplus waters. Instead, it is currently advisable to speculate by holding 'surplus usage rights'.

Secondly, water is relatively immobile and difficult to reallocate, it requires infrastructure
to carry it to its place of use. To use a metaphor: 'when you purchase the merchandise, it forces you to acquire not only the truck but even to build the road to be able to transport it'. Only large companies are willing and able to carry out the investment package involved in the effective use of acquired water rights.

In the third place, especially in agriculture, water buying and selling is often related to other transactions, such as land purchase.

In brief, these and other reasons generated a conditioned, static water market because of particular, water-related factors that normally do not form part of other types of transactions.

In the dry north of Chile, water rights applications, grants and transactions entail a high degree of public sensitivity. This is due not only to fear of affecting social or economic sectors, but also because of the spectacular amounts involved. For example, in 1995 a chemical company bought water use rights from two farmers in the Community of Quillagua (Antofagasta Region). Rights to 885,600 m³/year (equivalent to 28 l/s) were sold for approximately US$280,000, and other rights to 238,568 m³/year (equivalent to 8 l/s) were settled at US$235,000. It is easy to understand that, in view of the relative marginality of agriculture compared to the economic power of other productive sectors, and considering the temptations to sell for such figures, these transactions caused a serious stir in the town of Quillagua. Their concern was to be expected: a fragile green habitat in the middle of the desert and the quality of life of the families living there, in danger of disappearing after water rights are reallocated to activities outside agriculture.

Not only water rights transactions involve high amounts of money and high public sensitivity. The water itself has also a high cost (financial, political, etc.) in the north of Chile. Thus, for example, treated waste water sold by a treatment company to horticulture farmers of the La Chimba sector, in the outskirts of the city of Antofagasta, costs approximately US$0.70 per m³, resulting in a cost of water of about US$3,000 per hectare per growing season. This has produced public protests on more than one occasion, pointing out, among other objections, that the selling company holds quite a monopoly in a supposedly free market.

The topic of water rights transactions (and of the water itself) is under the regional authorities' jurisdiction, although the Water Code leaves little room to apply policy to regulate, adapt or guide certain change processes that involve social impacts of water problems. Supported by the Indigenous Law (Law 19,253), the National Corporation for Indigenous Development (CONADI) organises campaigns to convince and provide legal assistance among indigenous people, so that they will convert their individual water rights into communal rights, as an Indigenous Community. In this public institution's defence of cultural heritage, communal water use rights would paralyse water rights transactions, since they would require approval by a majority of the community. In places where this policy is successful
Map 27.1: Region I and II in Chile
(especially in the Region of Antofagasta), communities have greater possibilities of keeping and even developing their habitat, avoiding losses of their 'liquid heritage' due to individual decisions to sell rights to other sectors outside their communities.

When agricultural activities in dry locations are endangered by the threat of selling water use rights to outside economic sectors, this also questions the appropriateness of continuing to invest in improving local irrigation systems when one is not sure that 'tomorrow' the same amount of water will be circulating. These possible doubts about investment policies are part of the vicious circle degrading some local habitats that survive in the desert.

**Individual water rights and collective rationality in irrigation water distribution systems**

Clearly, adequate irrigation application frequency is crucial to maintain perspectives for developing desert agriculture that has traditionally been quite marginal. Timely access to water determines whether the farmer will succeed in sowing some alfalfa, rudimentary but resistant to drought, or if he can try more innovative agricultural technology such as horticulture or other intensive crops. The dry regions of Chile feature an enormous variability of production systems, from subsistence agriculture to high-tech, highly commercial plots, even among producers at the same social level.

Very coincidentally, there is a very close relationship between irrigation frequency and the degree of agricultural development. Irrigation frequency ranges from every 25 days (San Pedro de Atacama) to every 180 days (Tienamar) in the inhabited villages of marginal agricultural development or of agricultural subsistence, respectively. Of course, not all dynamics in agricultural activity depend on irrigation frequency; on the contrary, this frequency mirrors a people's agricultural dynamics, in terms of their insertion into the market, migratory rhythm, etc.

In environments of relative prosperity (Valle Azapa, Chiu-Chiu, Rio Grande, La Chiramba, etc.) farmers can receive irrigation water at 7-day or shorter intervals. It shows that the problems for agriculture are not always related to quantity or (chemical) quality of available water, but especially to timely access to water for crops.

Limited absolute availability is actually relative, as shown in the following example. The Valley of Azapa, in the vicinity of the city of Arica, irrigates with only about 0.30 l/s/ha (both surface and underground water) but has developed very intensive agriculture (the valley is well-known because it supplies large quantities of tomatoes to the city of Santiago). On the other hand, just a few dozen kilometres further, the farmers of Precordillera have almost double the water availability per hectare, but with only every 30 to 90-days' turns they get low yields of alfalfa and oregano and they have little possibility to diversify crops under current scheduling arrangements.
These limitations are due not just to differences in climate when comparing to the Valley of Azapa.

The following observations should be understood within the framework of the above agricultural development considerations and prospects.

Notwithstanding the fact that the Chilean Water Code is a fairly precise and extensive legal text with all of its respective regulations, enforcement and daily control of water flows expose a series of problems. In general, much time, effort and money are spent resolving legal questions, but, once the formal legal part is resolved, there is little verification as to whether the volume and flow are distributed among users accordingly. Only extreme cases are administratively or judicially processed and punished.

Water users' lack of organisation and actual quantified control limits the rationality of their distribution systems; in the North of Chile, extremely scarce water is wasted. It seems that the Water Code favours the hypothesis of market rationality for possible business transactions, however, without paying much attention to the relative (ir)rationality in using water once it has been assigned to a user.

Within a water distribution system, institutionalised via a Water Community, Association of Canal Users or Board of Surveillance, the water use rights are defined as water shares (for example, quantified in hours of individual assignment within a schedule among users). There is often unnecessary confusion between the concepts of 'shares' and 'turns'. However, water shares are fixed, granted by resolution of the General Water Directorate, while any water user association may change their schedule (turns, irrigation frequency), only if such a fractionation or adjustment maintains the proportionality of shares originally granted. This conceptual confusion between 'shares' and 'hours of water turn' hinders the implementation or modification of irrigation frequencies to adjust better to crop water demand. For example, in the Valley of Codpa (Tarapacá Region), in times of mitación a 63-day list is required to cover the shares of all farmers. Within this schedule, each farmer receives his turn according to his quantity of shares. Only recently, through promotional work by external agents, farmers began to understand that they could receive two or more individual turns within the same 63-day period, without affecting the sum of their water share rights.

Another mismatch between individuals and the system involves territorial ordering of individual irrigation turns. In some locations, water is distributed in the order in which the irrigators are listed, perhaps by chronological order, taking the successive location of farms along the distribution canals only partially into account. Likewise, when a farmer receives his 'water share', he often uses the water where there is an immediate need for irrigation, whatever its location within the irrigated area.

In other words, in these cases the distribution canals are soaked several times,
intermittently and with no rational order, by a share list, or by the farmer's choice of using his water shares in certain plots. Of course, excessive, repeated scaling and infiltration in the canals produces considerable conduction losses. Time is also wasted by moving water around within the system, further delaying the irrigation rounds. On the average, as a system, the time intervals between successive irrigations of a given plot are unnecessarily prolonged.

These repeated losses in the canals also happen when, within the system, some farmers try to arrange with each other ('pasar aguía', sharing and exchanging turns) in order to irrigate each holding more often, as an individual and partial system within a system which is highly inflexible. For example, in Saxamar and Lupica, within a traditional agricultural system, several farmers are modernising and need to irrigate more frequently to fill their ponds. Sooner or later, this innovation process will spread, leading to an overall redefinition of water distribution among the users there.

The Chilean Water Code has no relationship between water use rights for agricultural uses and land ownership. They are considered as commercial goods that are totally independent from each other. Within this context, it is not surprising to find quite a disproportional relationship between farmers' water share property and the agricultural area he owns. A recent study in the Valley of Codpa shows that water rights range from 200 to 10,000 m³ per hectare per turn. Farmers at the low end of the range suffer from serious water shortage, while their neighbours enjoy plentiful irrigation water with no need to use it carefully.

This over-entitlement for some holders reflects relative irrationality at the system's level in handling and distributing this scarcity. While these disparities are somewhat ameliorated by water transfers among neighbours, there is no explicit water market ('water rentals') in the zone, except maybe in the valley of Azapa.

When some own abundant water shares within systems that require careful handling of scarce water, this has also repercussions on decision-making within the irrigators' organisations. This is because the relative weight of a user's vote is proportionate to their shares owned. This means that users with abundant water and less need for careful use of available water have more weight in decision-making, which often affects the rationality of the system's operation.

The following example, taken from the community of Pica, illustrates the decision-making problems in an irrigators' organisation, most of whose votes are cast by the farmers with more water. The Miraflores sector's schedule is strictly a 14-day period. By contrast, the Resbaladero sector irrigates each field 'until finished,' which prolongs the period to 28-30 days. A farmer who has land in both sectors states that with the same quantity of irrigation water he grows 4000 m³ of fruit trees in Miraflores and just 2,000 m³ of fruit trees in the sector Resbaladero. Asked why they do not change the regulations in Resbaladero to encourage efficiency and increase the system's coverage, he states that such a decision is prevented by the minority group that possesses the majority of water shares.
Similarly in Belén (Precordillera Comuna de Putre), the administration of an irrigation improvement project called for certain changes in the allocation of irrigation turns. The great majority of farmers there, living by their agriculture, totally agreed with the project, ratifying their decision in several assemblies, but then the following ‘external’ problem appeared. In Belén, a majority of water shares is owned by a group of farmers who keep their plots, but reside in the city of Arica because they work at other economic activities. They go to the precordillera only when there are important (productive, cultural) activities to carry out there, such as, to be present during their water turns. Obviously, this group has no interest in increasing irrigation frequency, for it would mean more time and travel costs to and from the city when, as a matter of fact, this agricultural activity is only a part of their family economy.

Unfortunately, this group’s voting weight of water shares still prevents smaller farmers who are more dependent on agriculture, who spend most of their time in Belén, from changing the schedule in order to intensify their agriculture. This problem of resistance to change, by people who migrate to the city and own a relatively heavy weight of water shares, is recurrent in many remote locations in the north of Chile. This prevents the people who actually live there from developing their productivity.

The general trend in problems involving irrigation water within Chilean systems is highly legalistic, especially in conflict resolution, but does not necessarily reflect logical rationality regarding actual system operation.

The last topic of this chapter deals with a delicate aspect, not easily substantiated objectively: the possible effect of individualisation of water rights on the notion of overall system appropriation. The hypothesis is: ‘the more individual owners of water, the fewer owners of the system’. Here are a couple of impressions.

Currently, the weak operation and even the non-existence of organisations of users is noticeable in many locations, valleys, oases, etc. of the desert, precisely when the scarcity of water could, in principle, be expected to induce a well-organised and quite solid administration. Each farmerbusily receives the water, but there is not much communal activity with regard to the irrigation system shared by all users. It is difficult to achieve a quorum for an assembly, even on very important topics. There is little local contribution to maintenance or improvement of the canal network. Little is sanctioned or corrected in relation to undue water extraction (‘robbery’) of water, because the local agency to complain to is not effective. The social pressure by the other users, when an individual is opposed to certain measures, is ineffective.

Investigating the property of the hydraulic infrastructure in a location, one finds answers that are not very clear. Only in communities with longer cultural tradition and less external intervention, canals are seen as property of the community, as ‘ours’. In other cases, the notion of property varies according to the distributary or...
subcanal, depending especially on who made construction investments or improvements: the State, different support institutions, some group of farmers who bought a couple of cement bags, etc. Thus, one and the same canal or system can have several owners at the same time, via legal definitions and/or via perceptions.

In brief, it is still not very clear if individual owners of water rights also are or feel like co-owners of the irrigation system they share. Evidently, this means that there is not much responsibility shared by users in regard to system operation, maintenance and improvement. It also means that users appeal and complain more to outside agencies (State institutions) to resolve problems, to take responsibility for the maintenance, to invest in improvements, etc. Apparently, the individual water owners are searching to find a system's owner who is disposed to be responsible for the whole system.

Equity

There are multiple definitions and interpretations of the concept of 'equity'. In general, it is not understood as 'the same for all', but as an approximation towards equality in the opportunities to access goods, services, and rights: capital, technology, education and, in this case of course, water use rights and outside support to improve water use.

Since the Water Code was enacted in 1981, it has been expensive to regularise and be granted new water rights, both institutionally and legally. Part of these costs must be paid by the applicant: presentation of technical antecedents (geographical coordinates, flow, etc.), publication in the official gazette, public registration and lawyers' fees, travel, lodging, etc., to arrange this paperwork. For low-income people, these costs could be limiting or prohibitive if they want to legally guarantee their rights. At certain moments and in some territories, the General Water Directorate has supported the regularisation of water use rights by means of specific projects. In 1995, the Chilean State began to subsidise the regularisation of water use rights, and only for native people or organisations. This support is channelled through the National Indigenous Development Corporation.

Apart from the subject of legal access to water use rights, problems of equity have arisen with regard to State subsidies for improvements in irrigation and drainage, under Law 18,450 (operated through the National Irrigation Commission). This Law specifies a 75% refund of private investments in projects that have earned this allowance by competitive selection. To be able to enter the competition, applicants must deliver a thick technical and legal dossier, following precise norms and formats. Evidently, it is quite costly to elaborate the study, affordable for a medium-size agricultural business, but too expensive for small (groups of) farmers. As a reference, one recent example: a small study project to improve an irrigation sector in the community of Pica, to be presented to the National Irrigation Commission, cost US$20,000.
It is not surprising that, with the procedures and costs involved, out of a universe of 951 projects granted between 1986 and 1990, only 61 (6.4% of the total) benefitted the rural sector, receiving 4.6% of the allowances. Obviously, there has been a problem of access to State subsidies for relatively needier groups in society. In the last few years, the National Irrigation Commission has taken measures to remedy this problem.

The previous chapter introduced some examples of the effects of concentrating water shares in a few users of an irrigation system, who do not necessarily make very productive use of the resource. Especially in locations where a strong communal tradition is maintained, the legal procedure calculating the weight of individual votes in relation to the water shares owned, is seen as an inequitable way to make decisions. As with the example in Belén, this creates a conflict between traditional communal democratic procedures and the legally specified system.

Neither does owning water use rights finally resolve a problem that is almost universal in all irrigation systems in the world: less water in the 'tail' than in the head-end canals, due to an inherent loss of water in the system. In other words, the tail-end user receives less water than the head-end user, even if they have exactly the same amount of water use rights (since rights are usually specified at the point of intake from the main canal). Here, inequalities will be corrected only through 'good neighbour' arrangements among users at the local level, without appeal to higher authorities. For example, in the Valley of Codpa, in times of mitación, the lower-part users in the system receive their water allotments with an extra 20% on top of the times legally assigned.

However, the topic of equity regarding investments and water rights in irrigation systems is overshadowed by the national debate about private management of scarce water. The 'big' discussion, driven by a great, nation-wide drought during the last few years, revolves around the concentration of water use rights in the hands of a small universe of companies. Some examples from the hydro-power sector: the three major generating companies accumulate 78% (1,324 m³/s) of the water used for this purpose, they have rights to 73% (8162 m³/s) of the currently unused water; and they have applied for 69% (26,753 m³) of the total volume pending grants. It is estimated that at the total, nation-wide level a flow exists of 30,000 cubic metres per second usable for electric generation. The same tendency of concentrating water rights is repeated in mining activity in the dry northern region.

In view of all these antecedents, the debate about equity in access to water ultimately becomes a transcendent issue, since water is so vital for all economic sectors, for all citizens and for the entire environment, flora and fauna.
Notes
1. The author wishes to be as objective as possible; in any case, the text has been written in a strictly personal way.
2. The tariffs of companies selling drinking-water are governed by a regulatory system controlled by the Superintendency of Sanitation Services. In practice, apparently, this system does not function in an optimal way in the case of raw or treated waste waters.
3. This section mainly refers to irrigation water distribution systems and the problems among irrigators.
4. As will be seen later, the phenomenon of (temporary) rural-urban migration is an important reason for farmers' to resist shortening of the interval between irrigation turns (that is, intensifying the irrigation frequency).
5. This criterion, i.e. disregarding the length of turn granted, means a regular discrepancy between the practice of delivery of water volumes and the legal possession of water use rights.

References