SHARED WATER RESOURCES
THE CASE OF CHILE

RECURSOS HIDRAULICOS COMPARTIDOS
CASO CHILENO
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1. INTRODUCTION
1.1. The river basin and the States.

Man finds the water resources in natural form in a watershed or river basin, understood as a physic-geographical unit in which the water acts as one old main basin agents, combined with the other natural resources integrating such unit.

Then it is logical that the investigation, utilization and conservation of the resources be concreted in the basin environment where it belongs.

The basins utilization by man assumes the alteration of the natural equilibrium. In the specific case of water, the alterations caused by the projects destined to its beneficial use may provoke negative efforts. These denaturalize it or may transform it into a polluting agent. This circumstance implies the action of conservation processes.

Moreover, the action of man to establish the international boundaries between sovereignties and, currently between Nation-States, which have not respected the basins natural configuration, gave place to the Shared Water Resources (S WR) phenomenon. This adds a pc/i factor to those of natural character derived from the water resources utilization and conservation for human objectives.

The existence of Shared Water Resources gives way to the need for its definition, with the purpose of basing the political conversations between the Cosharing States on such definition, destined to agree on its utilization and conservation.

1.2. Definition, Tipification and quantification of the SWR

SWR means the precipitation water that, flowing naturally from its origin, contained in any water course, crosses or coincides, in the whole or in part, with the international boundary between two or more States.

This definition, besides offering a technically correct identification, looks to neatly stress the proper entity of the SWR, with respect to the water course containing it. In other words, the idea is to establish the difference existing between a volume of water with certain characteristics (which is the SWR) and a hydrographic phenomenon (river, lake, aquifer) as this last one has a complex nature derived from its interdependence with other natural resources conforming the ecological system of the basin to which the water course belongs.

The preceding de understood in its essential sense, means it is the case of precipitation water that flowing naturally - that is to say surface or groundwater, without human intervention - from its origin, coincides (contiguous) - total or partially - or crosses (successive) the international boundary between two or more States, and it should be measured, precisely, at that boundary or in other case.
— transboundary Water resources — establish the to value of the measure by means of
adding up the water contributions upstream from the international boundary.

From the above, one can deduce that the transboundary or successive Shared Water
Resources is made up, exclusively, by the addition of the upstream from the boundary
contributions. On the other hand, for the contiguous water courses, where the
international boundary coincides with the thalweg or axis of the water course, the
international law has established an equal distribution between the riparian States.

1.3. The Ecological System of the Basin and the S.W.R
Cossharing States. The SWR Cossharing States, are those by which territories the water
courses containing S WR flow.
Likewise, to those States correspond, exclusively, the right - and responsibility - to plan
and decide the destiny of the beneficial use of such water resources, understanding as
beneficial use the obtention of the sufficient optimum for the exploitation of the water
resources within the concept of the containing basin’s sustainable development.
Based on the above, i should be concluded it is not proper to make an unconsulted
unilateral utilization of the water course containing SWR, since the unitary, transcurrent
and renewable nature of it necessarily implies, that all the considerations and measures
concerning its conservation and utilization should count with the knowledge and agreed
intervention of all the Cossharing States of the water courses containing SWR.

1.4. Conceptual Aspects About the Utilization of Water Courses Containing S.W.R
A) Fundamental properties of the S.W.R
Water Resources in general conform dynamic units — if they are divided its entity
changes - because they are transcurrent and naturally renewable) determined its natural
characteristic (volume or discharge), superficial lever and distribution in time.
When varying some of them, the resource stops wing whit it was, losing its nature. The
SWR is defined according to what was said and, according to the definition given in 1.2.
its natural characteristics should be quantified at crossing of the international boundary or
in the stretch where it moves and coincides with said boundary, according to the case.
The maintenance of the natural characteristics has different effects, being one of the most
categories, evidently, the not transfer of SWR to other basins, as well as the water quality
preservation.
This means, the non pollution of it and the protection of the basin’s ecology. Particularly
important is in this sense - in the case of boundary lakes - the maintenance of its water
levels.
B) SWR’s Utilization
The unilateral utilization would be limited, according to a) to those uses not affecting the
containing water course natural characteristics, in such a way that the other or others
Cossharing States of the SWR would receive it denaturalized. The Utilization of SWR
implies conciliation of sovereignty exercise with the containing water course utilization, considering it as a unitary and dynamic Entity. Consequently, the utilization must because of Treaties, celebrated between Cosharing States and based on the previous admission of the Entity and natural characteristics of the water course containing the Shared Water Resources. The above is reinforced by the fact that the need for an agreement between the Parties surges from every utilization form, except those of natural and spontaneous kind not altering the natural characteristics of the resources.

Hence, the agreement becomes vital for regularization and consumptive use projects in the upstream country, since they alter the SWR at the international boundary, leaving it denaturalized, in a large or small degree to the downstream country; as well as downstream projects needing the maintenance of SWR natural conditions from the upstream country, at the international boundary. The precedent statement becomes categoric for eventual unilateral deviations or transfers to other basins.

C) The concepts of optimal use and equity. Utilization Criteria.

C.1 - The optimal use is, naturally, the technical and economical goal of every water resources development. Nevertheless, it must be determined that the concept of “Optimums” does not imply the Absolute optimum, which pretends the “major intensity”, but the “harmonic Optimum” that is to say “the most convenient intensity”.

We consider it is advisable to use the “Harmonic Optimum” concept, in the basic terminology for the beneficial and agreed use developments of the water courses containing SWR. Because that concept defines integrally the notion about the most convenient equilibrium, positive and flexible, among the parts or functions of the thing to which ii is applied.

C.2. Equity is, undoubtedly, the ethic rule which must lead any agreement for SWR development by two or more States, understood as. “The Rule which is perfectly adaptable to a relation and which responds to the ultimate nature of it”. Such is the definition proposed by numerous modern authors which may be synthesized, to our judgment, in Ilhering’s idea: Equity is the equilibrium between merit and retribution.

C3. Utilization criteria.

Having in mind that the Harmonic and Equitable Optimum use is the goal to be reached in dealing with the utilization of water courses containing SWR, this paper recommends the idea to elaborate a General Utilization Plan for the resource, considering the containing basin as a Hydrographic Unity.

The General Utilization Plan, which management should be integral and be planed as a whole in the context of an agreement between the Cosharing States, is proposed in this study instead of the method to impulse se isolated projects within a hydrographic system which is in practice a technically precarious form of planning the Organic Unit constituted by a Hydrographic Basin. Being this last an indispensable concept to take into account, in front of the unilateral interests of Cosharing States of a basin divided by their international boundaries. The projects from the General Utilization Plan, should be under an operation regime guaranteeing its operation and work, just as it may have been previewed in the General Plan.
The said regime can be a coordinated joint or integrated regime. In fact, the projects operation coordination, would be the minimum admissible formula, save punctual cases which nature would allow them to function autonomously.

The joint projects between Cosharing States, are derived from a technical need for common operation.

The integrated system assumes the most advanced alternative - and most technically recommendable - since it implies to maintain the resource’s unity within the parameters of the containing basin’s integral management.

2. HYDROGRAPHIC BASINS WITH SWR IN CHILE.

The international boundaries of Chile, determine the existence of practically all kinds of Shared Water Resources.

2.1. There are two geographical areas of the country where hydrographic basins with SWR are present (See Fig. 1): One is the North area, between parallels 18° and 27°S.L.; containing scarce, water resources, due to its aridity, and where there are important consumptive demands in cities and mining centers, of great relevance for the country.

The other area is in the South, between parallels 40° and 550 S.L. containing important water resources and where the demands will increase considerably in the future.

In the Northern area the SWR are determined by the layout of the international boundary with Peru, Bolivia and in pan with Argentina, being its global average discharge of less than 10 m³/s.

In the Southern area the SWR are fixed by the international limit with Argentina and are estimated, in whole as an average discharge in the order of 1.000 m In general, the most important utilization in Chile, is hydroenergy, being the existent potential estimated in 9.000 MW.

2.2. Shared Water Resources of Chile with Peru, Bolivia and Argentina.

With Peru, groundwater is shared in small basins discharging to the Pacific, in successive water courses, as, with Bolivia, there are a few successive rivers; some it them tributaries to the closed basin of “Salar de Coipasa” and others, tributaries to small closed basins.

In that context there are to be mentioned as specific water courses the rivers “Caquena – Cosapilla”, “Lauca” and “Cancosa”, which excepting the first one, are successive in its course.

The exception is the river “Caquena – Cosapillas”, which in pan is contiguous between Chile and Bolivia, continuing its course in Bolivian territory until flowing into the “Maurj” river coming from Peru.

With Argentina, there are two sectors presenting SWR:

a) North (from 22° 30’ to 27° S.L. approximately)
In this area there are small water courses, in closed basins, and one case of more dimension, with special characteristics since it produces a SWR between three countries. In fact, the Zapaleri river originates in Bolivia, flows by Argentina, and discharges in Chile, in the ‘Laguna de Tara’.

b) South (from 400 to 550 5.1. approximately)

From 40° S approximately and as south as Tierra del Fuego included, the International boundary between the two countries determines numerous cases of SWR, contained in basins that discharge predominantly to the Pacific Ocean, and in a smaller number to the Atlantic Ocean.

In this sector the rivers with SWR - except for some contiguous cases - are in the majority of successive course, including lakes cut by the boundary with the characteristic that Chile is mainly downstream Country.

Because of being particularly representatives within the general picture of the area there should be mentioned, from North to South, the SWR contained in rivers “Huahum Manso, and “Puelo, (which join in Ch territory forming one only river); “Futaleufú”; “Palena lake General Carrera-Buenos Aires (discharging into the Pacific Ocean through river Baker); Lake “O’Higgins San Martin” (discharging into the Pacific Ocean through river “Pascua”); “Rio Grande” in Tierra de Fuego; etc.

From the named cases, there are two different from the rest that, in total, finds Chile downstream. They are the river Palena, originating in Chile, crossing to Argentina through a lake cut by the boundary line flowing through that country and crossing to Chile again for discharging into the Pacific Ocean. The other case is the Rio Grande, where Chile is upstream and it discharges into the Atlantic Ocean. With the object of showing a more precise notion, we include drawings for the basins corresponding to rivers Zapaleri (North area) and Huahum, Futaleufú, Puelo and Rio Grande (South area), with developing perspectives in the short and medium term.

2.3. General situation of the SWR utilization. Protocol with Argentina. The utilization of SWR in Chile is a transcendental relevant task, in a foreseeable near future.

Argentina and Chile have taken significant steps destined to the development of the water resources they share. In fact, both countries sustained during several years - starting in 1969- conversations to get to a treaty about their SWR; until in 1991, a Protocol was signed, entitled Additional Specific Protocol On Shared Water Resources Between the Republic of Chile and the Argentine Republic” (See Annex).

It is an additional protocol to the Treaty Between the Republic of Chile and the Argentine Republic On the Environment, dated 2 August 1991. Its objective is to establish rules, concerning the utilization of the shared water resources, in order to priorities to be agreed between the Parties.

It is interesting to stress on the basic general concepts included in the Protocol. They are the following:

a) Selling rules on the development on shared water resources which are qualified with a priority by both Parties;
The actions and programs relating to the developmental water resources shall be undertaken according to the comprehensive watershed management;

- Not causing detrimental effects on the shared water resources, the basins which contains them or the environment;

- To accept the developments existing at the date of the Protocol recognizing the need for such developments to be taken into consideration when undertaking actions and programs on their relevant basin, in order to ensure their effective operation and harmony with the rest of the works to be scheduled;

- To define shared water resources as the water that flowing naturally, crosses or coincides, in whole or in part, with the Chilean- Argentine terrestrial boundary;

- To carry out the actions and programs for the development of shared water resources on a coordinated basis or jointly through the general utilization schedules.

Recently the Working Group established in the Protocol has been constituted, to determine and set priorities (or dealing on shared water resources and elaborate the corresponding general utilization schedules.

This Group selected the following water courses containing SWR in first priority: Zapaleri; Huahum; Puelo (Manso); Futaleufu and Rio Grande.

### 3. CONCLUSIONS

3.1. The Share Water Resources proposition for definition, allows its consideration, in precise terms in the study for utilization of water courses containing SWR.

3.2 The utilization study through a General Plan gives place to a coherent planning of water courses containing SWR; as the Plan should, necessarily, recognize the resource’s dynamic unity, expressed by its volume in time and by the special characteristic of the water resources of using renewable and transcurrent.

3.3 It is also postulated that the General Utilization Plan must be based on and be conducted through the principles of Harmonic- Optimum and Equity.

3.4. Likewise, the General Plan should be inserted in the integral management of the hydrographic basin containing the water course with SWR, subject of the Plan.

3.5. The water resources shared by Chile with Peru, Bolivia and Argentina set forward a complex picture of cases, including Contiguous Courses, Successive or Transboundary Courses, as well as Lakes divided by the international boundary.

3.6. The development of General Utilization Plans of watercourses with SWR is supported, with the Argentine Republic, by the Specific Additional Protocol About Shared Water Resources of 2 August, 1991 signed having present the Treaty Between The Republic of Chile and The Argentine Republic About Environment, of the same date.
SUMMARY

The river basin, divided by international boundaries between Nation-States, gives place to Shared Water Resources (S.W.R.), on which definition the political conversations among Cosharing States are based and with the purpose of agreement on its utilization and conservation. When defining Shared Water Resources a difference is made between a volume of water with certain properties (S.W.R.) and an hydrographic phenomenon (river, lake, etc).

The Cosharing States have the exclusive right and responsibility to reach the sufficient optimum in exploiting the S.W.R. together with the containing basin’s sustainable development.

One of the most categorical effects from maintaining the resource’s natural features is the nontransfering of S.W.R to other basins. As well as it is to nonpolluting and to protect the basins ecology.

The development of S.W.R, affecting the containing water course characteristics, implies the conciliation of sovereignty exercise and the development of S.W.R. Hence this development should be based on treaties, celebrated among the Cosharing States and based upon a previous reconnaissance of the entity and features of the water course containing the S.W.R. Agreement is mandatory for the upstream country regulating an consumptive use projects, since they alter the S.W.R. at the international boundary; as well as for the downstream country projects needing the maintenance of natural conditions of S.W.R. at the international boundary by the upstream country.

The concepts of Harmonic-Optimum Use and Equity are proposed. The Harmonic Optimum is recommended to be utilized for the development of beneficial use, agreed, of the water courses containing SWR.

Equity is the ethic rule that should lead every development agreement for SWR between two or more States.

With respect to utilization criteria, the idea is postulated that the Cosharing States should prepare a plan for the hydrographic system containing the SWR, which we call General Utilization Plan.

The projects resulting from the General Utilization Plan shall have an operation regime just as it was previewed in the Plan. Such regime can be, coordinated, joint or integrated; that is to say, at the least it should be coordinated, and it may reach a most advance degree of integration, in the context of the containing Hydrographic Basin integral management.

The S.W.R containing basins in Chile are described in a general way, showing their geographical location, dimension and flowing sense and ultimate discharge. Some S.W.R. containing basins are shown in more detail considering their features and development possibilities.

Conversation, carried out with Argentina to reach the Protocol about S.W.R. signed in 1991 are described. The Protocol title is “Additional Specific Protocol On shared Water Resources Between the Republic of Chile and the Argentine Republic”. Comments about the basic concepts of the Protocol are summarized: to establish in agreement, priorities
for development; watersheds integral management, not causing damages, to the S.W.R, to the basin or to the environment; to accept the existing developments; definition of SW.R development based on General Utilization Plans. The Protocol creates a Joint Working Group for proposing actions and programs for the development and conservation of the Chilean - Argentine S.W.R.

**REPUBLICA DE CHILE**

**MINISTERIO DE RELACIONIS EXTERIORES**

**AUTHENTIC TRANSLATION**

I-248/96

**ANNEX**

**DIRASAD**

**TRAUCCIONES**

**ADDITIONAL SPECIFIC PROTOCOL ON SHARED WATER RESOURCES BETWEEN THE REPUBLIC OF CHILE AND THE ARGENTINE REPUBLIC**

The Government of the Republic of Chile and the Government of the Argentine Republic, hereinafter, “the Parties”;

Bearing in mind the provisions of Article II item 3, of the Treaty between the Republic of Chile and the Argentine Republican the Environment, dated August 2, 1991 and the provisions o(the Act of Santiago on Watersheds, dated June 26, 1971: and

With a view to setting rules on the development of shared water resources which are given a priority by both Parties;

Have agreed as follows:

**ARTICLE 1**

The parties agree that the actions and programs related to the development of shared water resources shall be undertaken according to the concept of comprehensive water management.
The development of water resources in the territory of either party, pertaining to a common basin shall have no detrimental effects on the shared water resources, the common basin or the environment.

ARTICLE 2
The parties agree to the development existing at the date of this protocol. Notwithstanding the foregoing, the parties recognize the need for such developments to be taken into consideration when undertaking actions and programs on their relevant basin in order to ensure their effective operation and harmony with the rest of the works to be scheduled.

ARTICLE 3
The Parties shall come to an agreement as to the negotiating processes to be held at international fora on the matters subject to this Protocol.

ARTICLE 4
To all effects of this Protocol, shared water resources means the water that flowing naturally, crosses or coincides, in whole or in part, with the Argentine-Chilean terrestrial boundary.

ARTICLE 5
The actions and programs for the development of shared water resources shall be carried out on a coordinated basis or jointly through the general utilization schedules.

ARTICLE 6
The Parties shall establish a Working Group under the Environmental Subcommittee, to determine and set priorities for shared water resources and elaborate the general utilization schedules.

ARTICLE 7
The Parties shall conduct joint or coordinated studies on the common and associated hydrobiological populations, in order to carry out conservation actions intended for rational development.

To introduce hydrobiological species to the shared water resources, environmental impact assessments including the application of corrective rules, if applicable shall be conducted.
ARTICLE 8
Without prejudice to the general utilization schedules mentioned in the Fifth Article, the execution of the actions and programs referred to in this Protocol shall be mainly carried out through:

a) Exchange of legal, institutional and technical - scientific information, documentation and research.
b) Organization of seminars symposia and bilateral encounters of scientists technicians and experts.
c) Other actions that may be agreed upon in the execution of this Protocol.

ARTICLE 9
The general utilization schedules shall be submitted to the consideration of the respective Governments through the Environmental Subcommittee.

ARTICLE 10
This Protocol shall enter into force on the date the parties shall communicate to each other, through diplomatic channels, the fulfilment of the relevant legal requirements for approval. It shall have an indefinite duration and may be denounced by either Party upon at least six-month prior notice through diplomatic channels. Such denunciation shall not prevent the actions initiated during its effective term from being completed.

Done in Buenos Aires on this second day of August, one thousand nine hundred and ninety-one, in two counterparts, both texts being equally authentic.

[Signatures of Interior Ministers of the Republic of Chile and the Republic of Argentina]

For the Republic of Chile
Enrique Silva Cimma

For the Republic of Argentina
Guido Di Tella

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