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WATER REGULATION AND LAND USE:

A COLOMBIAN EXAMPLE

BY

JOSEPH R. THOME

Paper presented at the First Pan American Soil Conservation Congress, São Paulo, Brazil, April 1966.

The article is based on studies by the University of Wisconsin Land Tenure Center and supported in part by the Agency for International Development.

Water Regulation and Land Use:  
A Colombian Example\*

By Joseph R. Thome\*\*

The use of water regulation as a means of improving or modifying land use and tenure patterns has in recent years received great emphasis in Latin America. Chile's proposed new land reform statute, for instance, includes a whole section which would bring most of the nation's water resources under the control and administration of the land reform agency.<sup>1</sup> Similarly, Colombia's Agrarian Reform Institute has been given broad water regulatory powers within its projects,<sup>2</sup>

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1. Title V, Projecto de Ley de Reforma Agraria (Santiago de Chile: Imprenta del Servicio de Prisiones, 1965), pp. 77-90.

2. Articles 3, 51, 60 and 68 to 73, Law 135 of 1961 (Social Agrarian Reform Law); Article 13, Decree 1489 of 1962; Article 3, Decree 2824 of 1963.

and is concentrating most of its efforts in the construction of six large irrigation districts.<sup>3</sup>

As regards the regulation and use of natural resources, however, river basin planning remains as Colombia's most important innovation during recent years. The Cauca Valley, the valley of the Quindio, the Magdalena River Valley, and the Sabana of Bogotá, the four key river basin areas in Colombia, have all been provided with regional development corporations whose general purpose is to administer and promote the efficient use of the natural resources within their areas of jurisdiction.<sup>4</sup> All of them have undertaken important hydroelectric, irrigation, flood control, reforestation and other similar projects.

It is the purpose of this paper to examine the water-regulation powers, activities and problems of one of these corporations, the Corporación Autónoma Regional de la Sabana de Bogotá y de los Valles de Ubaté y Chiquinquirá (C.A.R.).

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3. Instituto Colombiano de Reforma Agraria, Segundo Año de Reforma Agraria (Bogotá: Imprenta Nacional de Colombia, 1964) pp. 35-36.

4. The Cauca Valley Corporation (CVC), the Corporation of the Valley of Quindio, the Magdalena Valley Corporation for the Sabana of Bogotá (CAR), respectively.

Emphasis will be placed in the situation actually existing in a particular valley, in order to make clear the water regulation problems that face an agency such as CAR.

CAR and Water Rights

CAR's existence dates from early 1961 when it was created by law as an autonomous and decentralized public agency with the purpose of promoting and directing the economic development of the region under its jurisdiction, particularly through the conservation, defense and administration of all its natural resources.<sup>5</sup> Among its specific functions, CAR was delegated the task of administering the public waters within its area of jurisdiction, including ground or subterranean waters.<sup>6</sup>

Such a function must of course be carried out in accordance with the legal norms and principles which regulate the use of public waters, most of which are derived from Civil Code and Decrees 1381 and 1382 of 1940. These

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5. Law 3 of 1961, Article 2.

6. Ibid., Article 4.

principles and norms are summarized below.<sup>7</sup>

1. Public Water Subject to Government Regulation<sup>8</sup>

These consist of all streams which pass through more than one property, lake or lagoons whose shores belong to more than one owner, as well as those waters which flow through artificially built canals but which are derived from public water sources.

2. Riparian Rights<sup>9</sup>

Until such time as the state exercises its right to completely regulate the use of the public water source involved, riparians maintain their ancient right to derive

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7. For studies of the water laws of Colombia, see Valerio Botero Isaza, Régimen Legal de Aguas en Colombia, Vols. I and II (Bogotá: Editorial Aguila, 1936); Luis Rios Aponte, Régimen Legal de Aguas y Fuerza Hidráulica en Colombia (Bogotá, Litografía Cahur, 1950); Guillermo Cano, Las Leyes de Aguas en Sud América (Rome: United Nations Food and Agriculture Organization, 1956); and Joseph R. Thome, Brief History of Colombian Legislation Affecting Irrigation (Bogotá: Centro Interamericano de Reforma Agraria, mimeo, 1965). Also, see Supreme Court decision of November 7, 1946, Gaceta Judicial, Vol. 61, p. 421.

8. Civil Code, Articles 677 and 678; Decree 1381 of 1940, Article 1; Decree 1382 of 1940, Articles 1 and 2.

9. Civil Code, Articles 892-894; Law 113 of 1928, Article 9; Decree 1381 of 1940, Articles 1, 4, 11, 15; Decree 1382 of 1940, Articles 9, 15, 42 and 47. Legislación de Aguas de Uso Público, División de Recursos Naturales (Bogotá: Ministerio de Agricultura, 1956).

up to 50% of its volume without any concession or permit from the government or agency delegated such function, provided they comply with certain conditions and obligations. Thus, a riparian must withdraw the water from and return it to the same source within the limits of the same property; he cannot prejudice prior acquired water rights; and he can derive only that amount necessary for the reasonable and necessary use within his own property. Riparians cannot assign or sell their water rights.

### 3. Concessions<sup>10</sup>

Non-riparians, as well as riparians who cannot meet the conditions for using water without a permit, desiring to make use of public waters, must obtain a permit or concession from the appropriate government agency.

Proof of title to the property for which the water is requested must be provided. In addition, the petition must contain a description of the land, crops raised, amount of water solicited, its projected use, a plan of the works to be constructed for deriving the waters, etc. Visual inspections are generally conducted before granting any concession.

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10. Decree 1381 of 1940, Articles 7 to 10; Decree 1382 of 1940, Articles 21 to 39, supra, note 9.

Concessions are only granted when there is a surplus remaining from riparian or other legally recognized uses. Their grant, however, does not preclude a subsequent regulation of an entire public water source (see below). Concessions may also be denied for reasons of public utility. They are subject to amendment or revocation if there is a charge of or non-compliance with the circumstances or conditions under which it was granted. A concession, for instance, is for the sole use of a specific property and may not be transferred without the prior consent of the granting agency.

The period covered by the concession is generally 20 years. It is usually renewable, but this is not a per se right.

#### 4. Regulations<sup>11</sup>

When it so deems it convenient, the water regulating agency may regulate the use of an entire public water source, establishing, through new concessions, a set distribution scheme among all its users, so as to ensure the most efficient use of the water supply and prevent

11. Decree 1381, Article 15; Decree 1382, Articles 42 to 50, supra, note 9.



conflicts. Riparians, however, are still preferred, and prior users suffering a reduction or elimination of their water right must be indemnified for their damage. These regulations are to be periodically revised and adjusted to changed circumstances.

#### 5. Water Easements<sup>12</sup>

Water concessions do not include the necessary easement right over the intervening land to obtain access to or for the drainage of the water granted. Such easements must be obtained through private negotiations with the concerned owner, or, failing this, through appropriate civil action,<sup>13</sup> which is very time consuming.

In certain cases, however, the agency encharged with administrating water rights may obtain the strip of land necessary for the easement through eminent domain procedures.<sup>14</sup>

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12. Decree 1382 of 1940, Article 8, supra, note 9.

13. Civil Code, Articles 919 to 930.

14. Decree 1382 of 1940, Article 8, paragraph 2, supra, note 9.

6. Enforcement, Inspections and Sanctions<sup>15</sup>

Aside from the power of the water regulating agencies to amend or revoke water concessions for failure to comply with certain conditions specifically described in Article 38 of Decree 1382--for instance, not making use of the water granted for a continuous period of five years--<sup>16</sup> the mayors and police officers of the municipalities, as well as other government officials specifically assigned such functions by subsequent laws or decrees, are entrusted with enforcing the proper conservation, vigilance and utilization of the public waters. These powers include the levying of fines up to 500 pesos (\$25 U.S.) for the violation of any of the conditions imposed on the users of public waters.<sup>17</sup> CAR personnel have not been granted such police powers, forcing the Corporation, particularly in cases regarding riparian users, to enforce its water policies through the local mayors or police chiefs.

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15. Decree 1381 of 1940, Article 16; Decree 1382 of 1940, Article 36, supra, note 9.

16. Decree 1382, Article 32.

17. Decree 1381, Article 20.

## 8. Expropriations of Water Rights

An acquired right over the use of public waters may be expropriated for reasons of public utility or social interest previously defined by the legislature. Expropriation requires a judicial process and prior indemnization.<sup>18</sup> The proceedings are subject to the norms contained in the Code of Civil Procedure,<sup>19</sup> or in other laws regarding eminent domain or expropriation procedures.<sup>20</sup>

## 9. Judicial Review<sup>21</sup>

After exhausting his administrative remedies, an individual may obtain review of any contested ruling before the Administrative Court system of the nation, with appeals up to its highest court, the Consejo de Estado.

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18. Constitution of Colombia, Article 30. See Supreme Court Decision of December 11, 1964, in which "prior indemnization" is defined. Cited in Subgerencia Jurídica, Sentencia de la Corte Suprema de Justicia (Bogotá: INCORA, 1964).

19. Chapter XXIV, Articles 852 to 861.

20. Ibid., Article 860. For example, refer to Law 135 of 1961.

21. Administrative Code, Articles 74 to 80.

The Situation in the Valley of Sopó

The Valley of Sopó is located in the Department of Cundinamarca, about 30 miles north of the capital city of Bogotá. It extends on a westward line along the River Teusacá from the site known as La Cabaña to the point where the Teusacá meets the Bogotá, the area's principal stream. The valley as a whole consists of 15,000 hectares, of which approximately 4,500 to 6,500 hectares are suitable for intensive agriculture under irrigation. The main crops grown in the rich soils of the valley are barley, potatoes and wheat, while there also exist many dairy operations, some of which are very efficiently operated. All of the products from the area have an easily accessible and vast market in the city of Bogotá.

Average annual precipitation for the region is approximately 980 mm.<sup>22</sup> Although it would appear to be sufficient, this amount of rain cannot ensure the two annual harvests which are common in Colombia, due to the fact that it is very unevenly distributed over the year.

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22. Development and Resources Corporation, La Hidrología del Area del CAR (Bogotá, Litografía Lucros, 1963) pp. 53-54.

Thus, there are extremely wet periods during the year, called inviernos (winters), during which most of the rain falls, and hardly any precipitation at all during the two dry periods of veranos (summers).

Periods of drought are also common, the last one being from the years 1958-1961, when the average precipitation was only 700 mm per year.<sup>23</sup>

As a consequence of the uneven distribution of rain, the volume of the Teusacá River shows much irregularity and variation during the course of one year. Floods are not uncommon during the rainy months, while during the summers, particularly the one from December to March, the amount of water is generally insufficient to satisfy all of the irrigation, cattle and domestic demands.

Nevertheless, many farms practice irrigation, although it does not appear to be carried out very efficiently; and water consumption as a whole is much less than would be required for intensive agriculture. What irrigation exists is carried out only by riparians, as under present conditions there are no surplus waters available for non-riparian users.

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23. Ibid.

Since most or all of the water used is derived from public-water sources, its use is subject to the obligations and norms contained in the laws, as well as to the special rules or conditions adopted or imposed by CAR. CAR, if it so desired, could regulate the use of the public streams in the valley, and in this way establish fixed volumes for each user, in accordance with the particular needs, crops planned, etc. But as such regulation has not to date been adopted, riparians may still utilize public waters without any permit, as long as they observe certain conditions imposed by law or CAR.

Unfortunately, CAR personnel have never been assigned the police powers necessary to enable them to directly enforce the water laws or CAR's own resolutions. Consequently, while CAR has jurisdiction to settle water conflicts, establish conditions, etc., it cannot enforce its own orders or resolutions but must rely on the local alcalde (mayor) or police chief to carry them out. In theory these officials are supposed to carry out CAR's decisions, as well as to properly enforce all the legal norms which rule the use of public waters. But in reality this is not a very efficient system.

Even if these local officials wished to cooperate with CAR, they are generally bound to the influence of certain local vested interests, who almost without fail are also the largest landowners, upon whom their political future depends. Consequently, there being a conflict between CAR's resolutions and certain local interests, it is not strange that the latter prevail and that the Corporation's orders not be carried out with any noticeable speed or efficiency.

In Sopó these problems are particularly evident during the dry seasons, when it is common for upstream riparians to use up most of the available water, seriously affecting the downstream users.

This behavior violates the legal norms which regulate riparian use of public waters. Consequently, upon becoming cognizant of this situation, CAR will generally issue orders or resolutions prohibiting such behavior, ordering the destruction of the works which permit it, and establishing a system of turns or quotas so that all users may satisfy their minimum needs.<sup>24</sup> These orders are communicated to

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24. Data obtained from the Natural Resources Section of the CAR.

the mayor or police chief of Sopó, but as they are often unheeded or not fully complied with, CAR has found itself obliged to exert pressure on these local officials through the intercession of the governor of the Department. Thus, the regulation of the use of public waters, which should basically be subject only to technical consideration, becomes enmeshed in political games making it difficult to establish a consistent and rational water policy.

Conflict with Bogotá's Municipal Water Company<sup>25</sup>

During the last few years the city of Bogotá has experienced an extremely serious population explosion, caused mostly by an influx of immigrants from Colombia's rural sectors. As a consequence, the city finds itself in the position of having to drastically increase its public services, such as water, sewage, and electricity, in order to prevent shortages of these basic necessities and ensure their provision in the years to come.

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25. The information contained in this section was obtained from conversations and file examination at the Natural Resources Section of CAR and the Municipal Company of Aqueducts in Bogotá.



For these reasons, the Municipal Water Company of Bogotá has undertaken a program of constructing new works to increase its water services to the city. Among the planned projects is the construction of a dam across the Teusacá River at the site known as El Tambor, located upstream from the Valley of Sopó and very close to the northern sector of Bogotá. The necessary petition for a water concession has been filed at CAR, whose prior authorization is required.

In this petition the Water Company assumed the obligation of allowing a constant flow downstream of 144 liters per second. CAR, while agreeing that the dam is necessary and would provide important supplementary benefits, such as regulating the river flow, feels it cannot grant the concession unless the company allows the flow of a sufficient volume to satisfy the existing downstream uses and needs, particularly during the dry seasons. This would require the release of 264 liters per second during the dry seasons and only 24 during the wet season, for an annual average of 144 liters per second.<sup>26</sup> The Water Company has filed

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26. Report of CAR's visual inspection carried out on the 11th of September, 1962.

objections, stating that this would require a much larger and costlier dam than planned, that municipal needs prevail over conflicting demands, and that the only solution for the lower valley would be the construction by CAR of a smaller dam downstream from El Tambor, where water could be stored during the winter.

This water conflict between the present riparian users of the Teusacá, with their long established rights, and the Water Company, representing the new interests or rights of thousands of city dwellers justifiably demanding an adequate water supply, has not as yet been resolved.

#### Summary of Problems

The factors which tend to prevent the development of an intensive agriculture based on irrigation are summarized below.

##### A. Human Factors

Most of the people who practice irrigation tend to use it very inefficiently. Water wastage and economically unjustified irrigation systems are common. At the same time, many who would benefit from it use little, if any, irrigation.

B. Hydrological Factors

The Teusacá River and its tributaries suffer from great variations in their volumes. Floods are not rare during the rainy seasons, while during the dry seasons, when irrigation is most needed, the volume of the streams sometimes decrease to a level barely sufficient to satisfy the needs dependent upon their waters.

C. Legal Factors

1. CAR does not have the power to apply or enforce its resolutions, orders and sanctions directly but must act through the local Mayor or Police Chief. This creates many problems with the local officials and makes it particularly difficult to control the use of public waters by riparians.
2. Since CAR has not used its power to regulate all of the water uses within the valley, riparians can use the public water without any permit or approved plan. This encourages the excessive and inefficient use of the limited water resources.
3. The conflict with the Municipal Water Company of Bogotá. Even if the conditions proposed by CAR would be accepted by the Company, this would do little more than protect the present water users. As the Company, however, is not willing to accept these conditions, it is likely that this conflict will have to be settled in the courts.

## Conclusions

The actual use of public waters in the Valley of Sopó for purposes of irrigation could be improved through the exercise by CAR of legal powers it already has or could presumably obtain. Below, then, we shall briefly consider the legal powers CAR could beneficially exercise, at three different stages in the development of the valley.

### A. Under Present Conditions

CAR officials must be provided with the same police powers which have been granted to other water regulatory agencies. Otherwise its policies for settling the bitter conflicts during the dry periods will continue to be frustrated.

### B. After the Construction of the Dam by Bogotá's

#### Municipal Water Company

Once this dam is completed, it would regularize the flow of the Teusacá River, preventing the floods common during the raining seasons and providing downstream users with a flow of either 144 or 246 liters per second during the summers, depending on whether the Water Company's or CAR's criteria is finally adopted. In any case, this would represent a larger volume than is generally available during the dry seasons.

Having a definite supply of water assured, it would be advisable for CAR to exercise its power to regulate all of the public water uses in the Valley of Sopó. That is, an over-all water plan for the valley would be adopted under which a fixed volume or percentage would be allocated to each user in accordance to his needs, or projected crops, etc. This plan or regulation would tend to assure an efficient and controlled use of the limited water resources in the valley.

C. After CAR Builds Its Dam at La Cabaña

The full development of an intensive agricultural exploitation within the Valley of Sopó is dependent upon the availability of water for supplemental irrigation during the dry seasons. An adequate irrigation system would not only assure a higher and more certain production within presently irrigated lands dependent upon unreliable supplies of water, but would also allow the irrigation of non-riparian lands which now have no access to water.

Because of the limited supply of water, however, the required works would not be justified until after the construction of a small dam downstream from the Water Company's dam at El Tambor. CAR is planning just such a project at the site known as La Cabaña.

Many advantages would be derived from this project, the following being particularly obvious: 1) it would put an end to the conflict between CAR and the Water Company, as the latter's only obligation would then be to allow a constant 144 liters per second to flow downstream, as it presently wants to do. Thus, the projected supply for the city of Bogotá would not be endangered. 2) It would enable CAR to store almost all of these 144 liters per second during the eight winter months for its later use during the dry months. 3) It would allow CAR to adopt a controlled system of water allocation in accordance with a development program for the region.

Maximum utilization of the water resources made available from the dam would be achieved by distributing the water through two canals parallel to the Teusacá River, each one located at the edge of the slopes at either side of the river and from which smaller irrigation and drainage canals would run towards the river. These would make water accessible to non-riparian lands, would permit most of the valley to be irrigated through gravity thus avoiding expensive pumping, and would also serve as interceptor canals for the small streams flowing down the mountains,

preventing their common flooding during the rainy seasons.<sup>27</sup>

The organization of an irrigation district to manage the water would seem to be advisable, particularly if construction of the canals is decided upon, for the following reasons:<sup>28</sup>

- 1) it would allow the recovery of at least part of the construction costs through special assessments.
- 2) Maintenance costs could also be covered through charging rates for the use of water.
- 3) Other tax or assessment powers could be used advantageously, such as imposing high assessments on lands not willing to receive irrigation.
- 4) Even if CAR is not assigned police powers, it would have greater enforcement powers as, having control over the water values, it could refuse to service those who don't comply with its conditions.

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27. According to the opinions of a Peruvian irrigation engineer at the Centro Interamericano de Reforma Agraria.

28. See Decree 1112 of 1952 which defines the powers and functions of government agencies who construct and manage irrigation districts.

- 5) It would enable the adoption and carrying out of valley-wide agricultural plans, as the District Management would have to approve planned crops before allocating water. Extension services could also be more efficiently provided.
- 6) It would give the local users an opportunity to participate in the District Management (initially only on an advisory capacity) through its representation on the Board of Directors.
- 7) It would encourage the Colombian Land Reform Institute (INCORA) to adopt an agrarian reform program for the area, if such was found necessary, as INCORA enjoys wider powers in such land-reclamation areas.<sup>29</sup>

INCORA participation would also be beneficial in that CAR could then be delegated certain powers which would enable it to apply faster eminent domain procedures, give it broader tax assessment powers, allow it to grant water easements, and otherwise widen its scope of activities.<sup>30</sup>

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29. Law 135 of 1961, Articles 68 and following.

30. Law 135, op. cit., Articles 4 and 19 to 21. See, for example INCORA Resolution No. 003 of January 3, 1963, through which INCORA delegated certain powers to the CVC, facilitating the construction of two irrigation districts.