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Instruments for Integrated River Basin Management in Mexican Environmental Law

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1. Introduction

In most countries, the system of distribution of environmental competences is characterized by its great complexity. Such is the case in Mexico, where, depending on which environmental sector is to be protected or type of activity is to be performed, competence may reside at the federal, state or local level. It is even possible for a single activity or sector to be subject to standards issued at all three levels.

Furthermore, in this field – perhaps more so than in any other – the traditional political division along federation-state-municipality lines does not guarantee these standards will be complied with. Environmental issues do not recognize borders and natural resources are so intimately inter-related that existing legal and political boundaries are useless for ensuring their conservation.

As Lozano Cutanda points out, there are issues of competence derived from the inter-sectorial nature of environmental protection, inasmuch as:

> the overall system of distribution of competences […] is further complicated due to the inter-sectorial and multidisciplinary nature of environmental protection which affects all areas of human activity. This explains *the incidence that other matters included in the constitutional scheme of distribution of competences may also have on environmental protection,* either because their object is some natural element (water, fauna, flora and minerals) or because they refer to certain potentially environmentally harmful human activities (agriculture, industry, mining, urban development)[1].

In light of these points, several authors have underscored *singular spatiality* as one of the characteristics of environmental law, emphasizing that:

1. Lozano Cutanda, Blanca, *Derecho Ambiental Administrativo*, 5th ed., Madrid, Dykinson, 2004, p. 106.

> ecological imperatives make the spatial reach of administrative action a function of the more-or-less imprecise area in which emission-transport-immision mechanisms operate. This reach may be large or small depending on the subsystems which are defined within the greater system and, in this way, boundaries essential to ensuring effective administrative action are demarcated[2].

In order for environmental administration to be effective, therefore, it is widely accepted that ecological subsystems should be identified and defined. Invariably, these will not coincide exactly with existing social systems that lead to the creation of political and administrative organizations endowed with their own or derived *imperium*. Carrying this out, however, would be enormously complex, considering that starting with the Mexican Political Constitution – the highest law of the land – and continuing with the General Act for Ecological Equilibrium and Environmental Protection (henceforth referred to as the LGEEPA), local constitutions and state environmental laws, the entire system of distribution of competences is based upon the conventional federation-state-municipality division and any attempt to operate without taking this into account would be doomed to run into political and, especially, legal roadblocks[3].

In the case of Mexican environmental law, oriented – especially towards protecting particular environmental sectors from the effects of pollution[4] – by the National Development Plan (henceforth referred to as the NDP) and by corresponding sectorial-based environmental programs at both the federal and state levels, the instruments which make law-based, integrated river basin management possible are, *a priori*, the following:

- Mechanisms which favor coordination between different departments and levels of Public Administration;
- Natural Resource Conservation Areas, as a category within Protected Natural Areas;
- Legal instruments which allow circumventing the traditional federation-state-municipality structure, including:
  - collaborative agreements;
  - payments for environmental services;
  - regional land use planning;

2. Martín Mateo, Ramón, *Tratado de Derecho Ambiental*, Madrid, Trivium, 1991, vol. I, p. 92.
3. *Cfr.*, García López, Tania, "Hacia una Política Ambiental basada en las Cuencas: La Cuenca de "La Antigua", in *Congreso Nacional y Reunión Mesoamericana de Manejo de Cuencas Hidrográficas*, México, Instituto Nacional de Ecología, 2006, available at: http://www.ine.gob.mx/dgioece/cuencas/descargas/cong_nal_06/tema_06/06_tania_garcia.pdf.
4. Forestry sector, wildlife sector, etc.

- Official Mexican Standards (henceforth referred to as OMS), as applicable to river basins;
- *sui generis* federal management programs, such as that which manages the country's water resources.

The existence of these instruments would seem to make taking legal steps towards protecting a particular river basin possible. In this paper, we will take a closer look at each one of them, delving into their potential and limitations for contributing to law-based, integrated river basin management.

2. The Distribution of Environmental Competences: the Principle of Concurrence

As regards environmental protection, the principle of concurrence of the three levels of government is established in the Constitution[5], which, after being reformed in 1987[6], states:

> Article 73, paragraph XXIX-G: "Congress has the authority to create laws which establish the concurrence of the federal, state and municipal governments in their respective areas of competence, as regards environmental protection and the conservation and restoration of ecological equilibrium."

This principle implies that there are environmental competences at the federal, state and municipal levels. These are to be found both in the LGEEPA[7] and in federal legislation which regulates some specific environmental component or sector[8].

Article 124 of the Constitution states the basic guideline for distributing competences between the Federation and States: "Faculties not expressly granted to federal authorities by this Constitution are understood to be reserved for the states."

In environmental matters, the solution adopted is to confer to the Federation the competence to regulate, in a general or framework Act, the distribution of relevant competences or concurrent competences. Concurrent competences are those which "federal authorities exercise but which states are not excluded from exercising, and thus there may be regulation on the part of both federal and state governments"[9], as

5. Political Constitution of the United Mexican States of 1917, O*fficial Journal of the Federation,* February 5 1917.
6. Reform published in the *Official Journal of the Federation,* August 10 1987.
7. General Act for Ecological Equilibrium and Environmental Protection, *Official Journal of the Federation,* January 28 1988.
8. General Act for Wildlife, General Act for Sustainable Forestry Development, National Water Act, etc.
9. Faya Viesca, Jacinto, *El federalismo mexicano: régimen constitucional del sistema federal*, México, Porrúa, 1998, p. 92, cit. in, Barragán Barragán, José, "Concurrencia de facultades en materia de medio ambiente", *Temas Selectos de Derecho Ambiental*, México, UNAM, PROFEPA, 2006, p.2.

well as that of municipalities, which, in environmental matters, enjoy a fair degree of authority. As Gonzalez Marquez points out,

> In environmental matters there is a concurrence of competences with limited boundaries. That is to say, the idea "in their respective areas of competence" arises from the supposition that each of the three levels of government exercises distinct authority in the matter[10].

The same author maintains that the concurrence referred to in Article 73, paragraph XXIX G:

> is not legislative but rather administrative and that therefore the distribution of environmental competences is only determined by the Constitution without risk that a law created by Congress could broaden the reach of competences granted to the other levels of government[11].

Upon this constitutional foundation, the LGEEPA was passed in 1988. In Article 1, paragraph VIII, it states that one of its objectives is to define:

> the exercise of environmental attributions that correspond to the Federation, the States, the Federal District and the Municipalities, under the principle of concurrence as expressed in Article 73, paragraph XXIX G of the Constitution.

Paragraph IX states the need for mechanisms which ensure coordination, induction and concertation between authorities, as defined in Article 11 and subsequent articles of the LGEEPA .

The distribution of competences granted to the Federation, states and municipalities in matters of forest management is laid out in the General Act for Sustainable Forestry Development[12]. The LGEEPA states in Article 4 (the article which refers to the distribution of environmental competences): "The distribution of competences in matters of sustainable harvesting, protection and conservation of forest and soil resources shall be determined by the General Act for Sustainable Forestry Development"[13].

10. González Márquez, José Juan y Montelongo Buenavista, Ivett, *Introducción al Derecho Ambiental Mexicano*, Mexico City, Universidad Autónoma Metropolitana, 1999, p. 79.
11. *Idem.*
12. General Act for Sustainable Forestry Development, O*fficial Journal of the Federation,* February 25 2003.
13. Artícle 4, second paragraph, General Act for Ecological Equilibrium and Environmental Protection, *op. cit*., added February 25 2003.

This paragraph in Article 4 of the LGEEPA was added on the day the Forestry Act was adopted and at the same time, Articles 5 paragraph XI, 100 and 104 were reformed and Article 28 paragraph VI was repealed.

The distribution of forestry competences is based, as with the LGEEPA, on the principle of concurrence as expressed in the Constitution. Article 12 and subsequent articles classify the relationship between federal, state and municipal authority in the matter.

3. The River Basins in the Mexican Environment Program

Included in the NDP is the recognition that "aquifer and river basin care is fundamental for conserving the systems which provide the water necessary to meet the population's basic needs"[14].

In terms of sustainable water use, the NDP states that it is necessary to encourage integrated and sustainable water management from a river basin perspective.

In the previous NDP (2001-2006), integrality was suggested as one of the essential pillars of Mexican environmental policy. In line with this argument, it was necessary to take into account "the inter-relatedness of water, air, soil, forests and biodiversity" in order to adopt an integrated environmental management approach. The National Environment Program of 2001-2006 established as one of its goals designating 13 river basins as part of an integrated river basin management scheme for the purposes of planning and environmental stewardship.

This lead to a shift in policy structure, with state environmental policies being formulated using the river basin as environmental unit. In so doing, the traditional political and administrative scheme based on the federation-state-muncipality division was replaced by another which took the singular spatiality[15] of environmental issues into account.

Most of the country's river basins cross state lines. A case in point is the Antigua river basin which covers parts of the states of Puebla and Veracruz. Furthermore, any one state may have more than one river basin, in which case conventional statewide environmental policies make little sense and ought to be replaced by river basin-specific environmental policies.

Despite the 2001-2006 National Environment Program's good intentions, little progress was made regarding integrated management of the country's river basins. The current Environment and Natural Resources Program of 2007-2012[16], unlike its

14. National Development Plan*, op. cit*, note 15, p.239.
15. Martín Mateo, Ramón, *Tratado de Derecho Ambiental*, *op. cit*., note 2, p. 92.
16. *Official Journal of the Federation,* January 21 2008.

predecessor, only mentions river basins in the section dedicated to integrated water management. The Program states as one of its objectives that of "achieving an adequate management and conservation of water in river basins and aquifers in order to ensure social wellbeing, economic development and environmental conservation"[17].

4. Coordination of Actions Stemming from the LGEEPA, the Forestry Act and the Planning Act

In order to overcome these restrictions of competence, Article 11 and subsequent articles of the LGEEPA provide for authorities from different levels of government to enter into collaborative or joint-action agreements. Possible partners include:

- Federation – State;
- State – State;
- State – Municipality;
- Municipality – Municipality.

Such agreements are voluntary and may be entered into with a view towards dealing with or resolving shared problems, such as those posed by the idea of integrally managing a particular river basin.

In regards to principles which shall be observed in formulating and executing environmental policies and issuing OMS and other instruments laid out in the LGEEPA, Article 15 refers again to coordinated action: "Paragraph IX. Coordination between government departments and public administration agencies and between different levels of government and concerted efforts taken jointly with society is indispensible for achieving effective environmental action."

The Forestry Act[18] also provides for entering into collaborative agreements with a view towards encouraging coordination, cooperation and concerted action between:

- Federation – States;
- State – State;
- State – Municipalities;
- Municipality – Municipality;
- Federation – Municipalities.

17. *Idem*.
18. General Act for Sustainable Forestry Development, *op. cit*., note 12.

The objective of these agreements may be the assumption of competences or the coordination of parties in order to take concerted action, such as unifying criteria with a view toward protecting a particular river basin.

As mentioned above, the NDP identifies coordination between the three levels of government as a strategy for environmental sustainability. When referring to land use planning, it goes into great detail on the topic and states that planning must allow for the formulation of integrated resource management policies which create opportunities for close coordination between states and municipalities". Unfortunately, despite the fact that these agreements may be very effective instruments for furthering integrated river basin management and administration, the fact that they are voluntary, i.e. each government body has the right to decide for itself whether to enter into them or not, makes achieving their respective objectives very difficult. Very rarely does the political will exist which would make it possible for different parties to come to an agreement on an integrated management plan.

Collaborative agreements have in the past been signed where the objective was the assumption by the state of competences, especially in the case of protected natural areas. Such has not been the case, however, for the protection or integrated management of natural resources to be found in a river basin or sub-river basin.

5. Regional Environmental Land Use Planning

Article 25 of the Planning Act[19] provides for the creation of regional programs. They must be congruous with the NDP and cover the same time period, although their provisions and projections may refer to a longer time period:

> Regional programs shall refer to those regions which are considered priorities and/or strategically important, in terms of the national objectives laid out in the Plan, and whose territorial extension exceeds a State's jurisdictional reach.

Article 20 Part 2 of the LGEEPA also refers to regional environmental land use planning. It states:

> State and Federal District governments, in accordance with applicable local laws, may formulate and issue regional environmental land use programs which contemplate all or part of a state's territory.
>
> When an ecological region is situated in the territory of two or more states, the Federal government, State and Municipal governments and where applicable the government of the Federal District, in accordance with their respective

19. Planning Act, *op. cit.*, note 27.

> competences, may formulate a regional environmental land use program. For this purpose, the Federation shall enter into collaborative agreements with the local authorities involved.

Article 20 Part 3 of the LGEEPA refers to the content which, at a minimum, any regional environmental land use plan must have. As mentioned in the previous article, for the elaboration of this content the respective competences of each level of government must be taken into account and one of the collaborative agreements provided for in Article 11 and subsequent articles of the LGEEPA must be entered into.

6. Official Mexican Standards as Applicable to River Basins

The LGEEPA, besides providing for regional land use planning – an instrument which, though always under the umbrella of state competence, transcends a state's geographic area and meshes perfectly with the idea of river basin management – makes other provisions for river basins as well.

Article 36 refers to the OMS in environmental matters which must be issued by the Environment and Natural Resource Secretary (henceforth referred to as SEMARNAT). It states that these must establish "[…] the requirements, specifications, conditions, procedures, goals, parameters and permissible limits that shall be adhered to in regions, areas, *river basins* (our underline) and ecosystems". Evidently, it is possible for there to be a specific OMS which establishes environmental standards for a specific river basin.

Article 111 of the LGEEPA, which refers to air pollution prevention and control, gives the SEMARNAT authority to issue OMS which establish environmental quality standards[20] for:

- areas;
- zones and
- regions.

It is also possible "[…] to formulate and execute air pollution emission reduction programs based on air quality as determined for each area, zone or region of the country"[21].

Furthermore, the article provides for establishing "[…] maximum permissible levels of air pollutants to be discharged by sources, areas, zones or regiones, in such a

20. Article 111. I, LGEEPA, *op. cit*., note 13.
21. *Ibid*, article 111. IV.

way that air basin assimilation capacity is not exceeded and Official Mexican Standards in matters of air quality are met"[22].

The same article contains provisions for tradeable emissions permits, which shall be allotted in accordance with air basin assimilation capacities.

7. Natural Resource Conservation Areas

In regards to Protected Natural Areas, Article 53 of the LGEEPA provides that among Natural Resource Conservation Areas there may be those dedicated to conserving and protecting river basins. In turn, these may include forest reserves and buffer areas around rivers, lakes, lagoons, springs and other water bodies. This kind of protected natural area lends itself to the provision of and payment for environmental services.

Article 90 of the LGEEPA also refers to buffer areas around water bodies, though not as a kind of Protected Natural Area but rather in relation to environmental services they provide by regulating runoff, infiltration and other processes that make up the water cycle.

8. Payment for Environmental Services and their Use in River Basin Conservation

Goods considered to be public goods are characterized by being non-excludable and non-rivaled. Non-excludable means that anyone may consume the good, i.e. no one may be effectively excluded from consuming it. Such is the case with most environmental elements: water, air, biodiversity; my consumption does not exclude anyone else from consuming the same good. The characteristic of being non-rivaled[23] means consumption of a good by an individual or group does not reduce its availability to other people. Such is the case again for many environmental components.

One of the fundamental differences between private and public goods is the existence of a market for the former, in which there are prices for buying and selling them. The non-excludability of public goods creates a problem for a price-based market, since once the good is available, a large number of people will benefit from it, whether they pay for it or not.

As mentioned above, many environmental goods, especially air and water, have these characteristics. As long as use or consumption by one individual costs others

22. *Ibid*, article 111. X

23. *Cfr*., García López, Tania, *Quien contamina paga: principio regulador del derecho ambiental*, México, Porrúa, 2001.

nothing, the marginal opportunity cost is equal to zero and thus the price must also be zero. These goods, therefore, will never be supplied by a free market.

Nevertheless, these goods are clearly beneficial and absolutely necessary for environmental stability and, in turn, for society which depends on a stable environment.

Markets require the help of governments in order for there to be an efficient supply of public goods. Here, the need arises for public goods and services to internalize environmental externalities, i.e. economic mechanisms must be created in order to ensure that the cost of pollution prevention and control is reflected in the good. Another way of expressing this is the cost of making the good acceptable for use or consumption must be internalized.

When an industry, for example, emits greenhouse gases, the industry's product has a lower price than what it really cost to produce it; you could say the product receives a subsidy from society as a whole, since it is society which assumes the environmental externality without asking for anything in return. The product's price on the market, therefore, is not a real price since it does not include the social cost of pollution (which is often referred to as "environmental liablity").

This reasoning is the basis of the payment mechanism for environmental services, an economic instrument which has been operating for several years in Mexico and which has proven to be very useful for river basin conservation, especially in the highlands.

The NDP mentions for the need to use economic instruments, such as payments for environmental services, in order to restore natural areas such as forests which are the key to halting the loss of aquifers and desertification processes in the country.

Part 2 of Chapter 4, titled Environmental Sustainability, refers to tropical and subtropical forests and underscores the environmental services they provide, including:[24]

- air purification;
- water catchment;
- mitigation of droughts and floods;
- soil formation and conservation;
- decomposition of organic wastes;
- pollinization of crops and vegetation;
- seed dispersal;
- nutrient recycling and transport;
- pest control;

24. *Ibid*, p.244

- climate stabilization and
- buffering the impact of meteorological events.

In regards to the payment for environmental services in matters of forest conservation, the NDP suggests the creation of mechanisms similar to the Clean Development Mechanism, although these have yet to be developed. So far, most environmental service payment programs which have been elaborated are financed by the public sector and focused on water issues. Carbon sequestration, however, is considered by the NDP to be an environmental service[25] and it suggests paying for it as a market-based instrument which, therefore, would not necessarily have to be financed by the public sector. In fact, market-based instruments are assumed to be privately financed and therefore they are based on the polluter pays principle, just the opposite of how current schemes of environmental service payments work, which are more like subsidies.

The 2007-2012 NDP describes "the destruction of millions of hectares of forest"[26] as one of the central causes of greenhouse gas accumulation in the atmosphere. For this reason, the Plan proposes action to halt deforestation, along with emphasizing the need to value in economic terms the myriad of environmental services provided by tropical and sub-tropical forests.

One of the Plan's highest priorities is that of conserving the country's existing vegetation and increasing the land area under conservation and sustainable management practices. It also proposes executing reforestation and restoration programs and designing and instrumenting environmental service payment mechanisms for communities which conserve and protect their forests.

The National Forest Program for 2001-2006 established as one of its objectives that of "generating the conditions necessary for conserving river basins, soil and biodiversity". It recognized that, for these purposes, it would be necessary to forge joint action agreements between states, municipalities and public and private organizations.

The role played by forests in regulating stormwater, surface water and groundwater has been recognized in the General Act for Sustainable Forestry Development, a law which also considers forests valuable both in their own right and economically.

Among the Act's objectives is that of contributing to "the social, economic, ecological and environmental development of the country, by means of the integrated and sustainable management of forest resources, as well as river basins and hydrologic-forestal ecosystems" and assisting with "the land use planning and rehabilitation of forested river basins".

25. *Ibid*, p.247
26. National Development Plan, *op.cit*., note 15, p. 259.

The Act also designates "the conservation, protection and restoration of forest ecosystems and their elements along with forested river basins" as being in the public interest.

9. River Basins and Water Rights

In accordance with Article 27 of the Constitution, water is ascribed to the public domain. As pointed out by Lozano Cutanda:

> A good of the public domain is, above all, *res extra commercium,* and its affectation, which has this essential purpose, may pursue several ends: typically, ensuring public use and distribution by means of private concessions, facilitating provision of a public service, stimulating the growth of national wealth […], guaranteeing the controlled and balanced management and use of an essential resource or others along the same lines[27].

Article 27 also defines which water bodies are considered national waters. Article 3 of the National Waters Act refers to this constitutional precept in order to demarcate them. The following are considered national waters:

- Territorial seas in accordance with International Law[28];
- Internal maritime spaces[29];
- Lagoons and estuaries which are in continuous or intermittent contact with the sea;
- Naturally formed internal lakes which are linked to a continuous stream of water;
- Rivers and their direct or indirect tributaries[30];
- Continuous or intermittent streams and their direct or indirect tributaries[31];
- Lakes, lagoons or estuaries whose courses, zones or banks are crossed by the borders of two or more states or by the border between Mexico and a neighbor-

27. Lozano Cutanda, Blanca, *Derecho ambiental administrativo*, *op. cit*., note 1, p. 395.

28. The United Nations Convention on the Law of the Sea, adopted in Montego Bay, Jamaica, in 1982, stipulates that a nation's territorial sea has a maximum extension of 12 nautical miles from its coastline, measured from the baseline (mean low water mark).

29. All those which have their external boundary on the baseline and their internal boundary on solid ground.

30. Starting at the point where continuous, intermittent or torrential waters begin, all the way to their discharge into a national water body, be it sea, lake, lagoon or estuary.

31. When all or part of its channel forms the country's international border or the border between two states, or when it crosses a state line or international border.

ing country, or when the banks are the border between two states or between Mexico and a neighboring country;

- Springs located on beaches, coastal areas, water bodies or banks of territorial lakes, lagoons or estuaries, and those to be found in mines;
- Channels, riverbeds or banks of lakes and internal streams, according to the length established by the law;
- Groundwater;
- The exclusive economic zone[32].

All waters not mentioned in this list are considered to be under state jurisdiction. Article 1 of the Water Act of the state of Veracruz[33] defines state waters: waters, channels, riverbeds and banks located in the state and not considered national waters.

For decades, river basins have been employed in Mexico as the country's unit of water administration.

River basins are defined in the National Waters Act as:

> A unit of territory, differentiated from other units, normally demarcated by a watershed – the polygonal line formed by the highest points in the unit – where water appears by diverse processes and then accumulates or flows towards an outlet, which may be a sea or some other internal water body, through a hydrographic network of channels which converge into a main course, or alternatively the territory where water forms an autonomous unit, differentiated from others, without draining into the sea. In this topographically demarcated space, may be found the natural resources water, soil, flora, fauna and other related natural resources. River basins in conjunction with aquifers constitute the basic unit of water management. River basins are in turn made up of sub-river basins and these in turn of micro-river basins[34].

They are also defined as:

> the basic unit of water management and the country is divided into 13 Hydrological-Administrative Regions for the purposes of organizing administration and conservation of national waters. The Hydrological-Administrative Regions are formed by groups of river basins and respect municipal boundaries[35].

32. In accordance with the United Nations Convention on the Law of the Sea, *op.cit*., note 48, the nation has sole exploitation rights over natural resources in the waters of the exclusive economic zone, which has an extension of 200 nautical miles from the baseline.
33. State of Veracruz Water Act number 21, Official Gazette of the State of Veracruz, number 130, June 29 2001.
34. Article 3, National Waters Act, O*fficial Journal of the Federation,* April 29 2004.
35. *Estadísticas del Agua en México*, 2007 edition, SINA, México, chapter 1.

Water management in Mexico is the responsibility of the National Water Commission (henceforth referred to as CONAGUA), a decentralized agency of the SEMARNAT which, in accordance with stipulations contained in the National Waters Act[36], is also responsible for administrating national waters and inherent public goods[37]. It is the highest administrative authority in matters of water in the country[38].

Among its functions, the CONAGUA proposes OMS, enforces the law, interpretes it for administrative purposes, levies fines and generally exercises authority in matters of water[39].

In accordance with the National Waters Act, reformed in 2004, attributions of the CONAGUA on a regional level must be exercised through government river basin agencies[40] which in turn exercise their attibutions through the support of River Basin Councils.

Prior to this reform, the Commission was organized into Regional Administrative Offices, one for each hydrological-administrative region.

There are 13 River Basin Agencies whose respective competences are the 13 hydrological-administrative regions. Nevertheless, replacement of the Regional Administrative Offices with River Basin Agencies has been more a matter of style than substance, due to the fact that both territorial boundaries and internal organization have remained the same.

River Basin Councils, for their part, are organizations in which the Federation, the states and the municipalities which share a common river basin are represented[41]. In the Councils, therefore, the three levels of government are present and they participate in river basin resource planning and management[42].

The River Basin Councils must follow stipulations laid out in the National Water Act:

> "Article 3. […] an organization dedicated to coordination and concerted action, support, consulting and advising, between the CONAGUA (including the corresponding River Basin Agency); government departments at the federal, state and municipal levels and representatives of water users and community organizations, all with a common interest in a shared hydrological region or river basin"[43].

36. Article 4, National Waters Act, *op. cit.,* note 54.
37. Described in Article 113, *Ibid*.
38. *Cfr*., García López, Tania, "Hacia una Política Ambiental basada en las Cuencas: La Cuenca de "La Antigua", *op. cit*., note 3.
39. *Idem*.
40. Article 12 Part 1, National Waters Act, *op. cit*., note 54.
41. These Councils may cover several river basins.
42. García López, Tania, "Hacia una Política Ambiental Basada en las Cuencas", *op. cit*., note 3.
43. Article 3, paragraph XV, National Waters Act, *op. cit*, note 54.

These agencies are part of a political and administrative structure that definitely breaks out of the conventional federation-state-municipality mold and yet takes these government levels into account by including the River Basin Councils[44] in river basin administration and management.

We can see, therefore, that in matters of water, the river basin is not only the basic unit of management but rather the basic political and administrative unit as well.

As previously mentioned, this tradition of managing and administering national waters using the river basin as its basic spatial unit has existed for some time. Both the national water authority – CONAGUA – and the National Waters Act[45] and its Executive Guidelines[46] are organized using the river basin as their basic unit.

One of the current problems facing integrated river basin management is the lack of uniform criteria for their demarcation. The National Institute of Ecology – a decentralized agency operating under the SEMARNAT umbrella and whose function is to perform research into a broad range of environmental issues – states:

> Each environment department in Mexico currently presents a different river basin cartography, whether hydrological-administrative, hydrological-forestal or ecological, all of which evidently makes the consensus-building process difficult in terms of the choice of a single territorial unit for the application of public policy. It also complicates sharing information and ensuring that geospatial data is comparable across regions"[47].

10. Integrated River Basin Management and the Principle of Interterritorial Solidarity

Legal consideration of river basins as environmental units, although not something unanimously present in existing legal norms aimed at protecting a particular environmental space, except in the case of water, can make possible more effective environmental management than that which is currently being achieved.

When we consider ecological, social and economic differences between parts of a river basin, for example between highlands, midlands and lowlands, such divisions are environmentally more logical than the traditional Federation-state-municipality

44. In these the three levels of government are represented.
45. National Waters Act, *op. cit.,* note 54.
46. Executive Guidelines for the National Waters Act, latest reform, O*fficial Journal of the Federation,* August 29 2002.
47. *Cfr*., "Unificación de criterios para la delimitación de cuencas hidrográficas a nivel nacional", México, Instituto Nacional de Ecología, available at http://www.ine.gob.mx/dgioece/cuencas/regionalización.html

division and facilitate efforts aimed at achieving the overall objective of integrated river basin management.

River basin-based planning also facilitates collaborative efforts based on the principle of solidarity which is much more easily understood than action taken based on the same principle yet between municipalities or states. Actions such as water sharing between a river basin with a surplus and one with a deficit are more understandable and logical than are similar proposals between states.

11. Conclusions

FIRST. In matters of environment, the traditional federation-state-municipality division which is employed to distribute competences does not guarantee reaching the objectives of legal norms because environmental components on many occasions spill over into neighboring states and/or municipalities. Such is the case of many river basins which, although they constitute well-demarcated environmental, economic and social units, often cross more than one state and therefore their natural resources are subject to different and often conflicting state and municipal regulations.

SECOND. Within Mexican environmental law there are instruments which make it possible to take legally justified actions towards integrated river basin management. Despite this, however, there is no uniform legal support to considering river basins as an environmental subsystem in our country, beyond that stipulated by water rights .

THIRD. In regards to mechanisms to ensure coordination of action between different levels and departments of Public Administration – collaborative agreements – these are in theory very useful for taking joint action, such as in the case of integrated river basin management; however, the fact that they are totally voluntary makes achieving objectives difficult when the corresponding political will is non-existent.

FOURTH. Regional programs as contemplated in the Planning Act, just as with regional environmental land use planning as provided for in the LGEEPA, may prove to be very useful for integrated river basin management, although they must be backed up by corresponding collaborative agreements as mentioned in the previous paragraph.

FIFTH. It is possible to issue Official Mexican Standards for a specific river basin, a fact that may be especially useful to establishing uniform criteria, particularly in matters of water and air quality. River basin-specific OMS also make the applicability of tradeable emissions certificates possible. Such economic instruments provide important incentives for complying with environmental quality standards.

SIXTH. One of the categories of Protected Natural Areas provided for in the LGEEPA is the Natural Resource Conservation Area, which may be used to further

the conservation and protection of a river basin. This category is highly compatible with payments for environmental services, an economic instrument which was initially proposed as a market-based mechanism although up to now it has mostly been implemented as a subsidy.

Along these same lines, Article 90 of the LGEEPA refers to buffer areas around bodies of water, though not as a type of Protected Natural Area but rather in terms of the environmental services they provide in the regulation of the water cycle.

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