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Brazilian Water Resource Policy in the Nineties

By Helena Kerr do Amaral

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Table of Contents

Summary

I. The historic role of government in Brazilian water resource regulation

A. The political-economic context

B. Institutional innovations

C. The policy networks, its leaders and stability

D. An explanation for the crisis of the old institutional arrangement

II. The Emerging Institutional Arrangements

A. Piracicaba River Basin

III. Water Resource Policy Perspective for the Nineties

A. Impact of the innovation on Brazilian water resource policy

B. Perspectives

Bibliography

Summary

Brazilian water resource policy has changed greatly in recent decades. My main interest in this essay is to analyze this transition, focusing on the decision-making process and on the emergence of innovative institutional arrangements(). The analytical tool that I am going to use is the policy network approach.

Brazil is a country rich in water resources though, like most continental countries, it has huge internal disparities. The Southeast region has benefited from the abundance of water available for its development. It has wide rivers that provided an easy way to conquer the hinterland during the first centuries of the nation. However, sudden industrialization and urbanization have brought, as side effects, the pollution of our rivers and groundwater, as well as a relative scarcity of water in the most industrialized regions of the country, such as São Paulo.

Water-regulation history began, as did most of the Brazilian State building, in the 1930s. The Water Code was adopted in 1934, after long debates over the hydroelectric power provision and the role of the public and private sectors in providing energy. This code was modern enough to propose the integration of the multiple uses of water. There were rules to assure adequate attention for all interests in the resource: irrigation, households, fisheries, energy generation, sewage, conservation, recreation, and so on. At that time, the country was basically an agrarian economy. The conflicts over this issue were easy to resolve.

However, in the 1950s Brazil pushed hard to industrialize. That meant that huge infrastructure investments were needed. During this period, power generation was the predominant use of water. Both industry and government disregarded the Water Code. Since industrialization and electrical power were providing an accelerated urbanization of the country, there was no dispute. Conflicts appeared at the beginning of the seventies. The use of water to generate energy, and the engineering alternatives chosen, made it difficult to provide the big cities drinking water and sewage services at the same time. Child mortality grew, in spite of the economic growth, and lack of adequate water and wastewater treatment were blamed for the diseases. There was a conflict between the use of public resources in wastewater treatment and sewage services versus their use in hydroelectric power generation. The legislation and the existing institutions proved to be inadequate to solve the conflict.

One has to understand not only the technical aspects of this policy but also its political and institutional features. When dealing with natural resources, there are geophysical characteristics and available technology that bring inevitable uncertainty and risks. There is a risk of not choosing the best technological alternative to produce and distribute drinking water. The Brazilian decision-making process generally has been closed and technocratic; it excluded most of the population until the middle of the 80s.

I would like to analyze the advantages of an inclusive decision-making process. With the democratization of the Brazilian political regime, and with the growth of the state and municipal budgets, new decision-making arenas have appeared -- the river basin committees -- that challenged the old centralized and bureaucratic pattern.

This essay is divided into three parts. In part one, I discuss the historic role of government in water resource regulation over the last 60 years. I describe: (i) the political-economic context of different periods; (ii) the institutional innovations; (iii) the policy networks of each period and their leaders and continuity, considering the conflicts and integration of interests into the policy process; (iv) an explanation for the crisis of the old institutional arrangement.

In part two, I describe the emerging institutional arrangements in water resource management by citing the example of the Piracicaba river basin committee.

In part three, I analyze the innovation of this experience, and its impact on the building of an adequate water resource regulatory agency for Brazil, a continental and heterogeneous country.

I. The Historic Role of Government in Brazilian Water Resource Regulation

A. The Political-Economic Content

The objective of this short overview on the Brazilian political-economic context in the last 60 years is to provide elements to understand why Brazilian public policies had to change in the last two decades. The analysis is based on existing studies in order to give the big picture of the characteristics of the on-going transition in the role of government.

Brazilian industrialization started in the 1930's (). The first push to industrialize the country was made within a non democratic government. From 1930 to 1945, Brazil had an authoritarian political system. Its president was Getúlio Vargas. During his administration, under a centralized government, a strong process of institution-building was undertaken. The first strong government institution and regulations were established in this period. Some of them lasted until the 1967 reforms, others until the 1988 Constitution. The 1930's movement represents the "building of an interventionist, regulatory, and administrative-bureaucratic control apparatus, which organizes in new bases the 'general interest' and the social domination", as Sonia Draibe explains(Draibe, 1985). She also says that the "government regulation and control were established in a fragmented, punctual and sectoral way" in the period from 1930 to 1945, and even in the 1950's.

During the 1950's, the industrialization process gained momentum, especially from 1955 on, with the Juscelino Kubitschek administration. The government invested in infra-structure, especially in electricity and in highways. It also gave incentives to several industries to produce in Brazil. There was a good partnership among government, national and international capital. Several multinationals started to produce in Brazil. The financing of this process, however, was inadequate. Inflation started to grow. Urbanization contributed to the growth of social movements. In 1964, Brazil entered a new dictatorial political regime. The main economic drives did not change, however. The military government improved the institutional building. It reformed the monetary system, created public agencies, and changed the public administration. One important change was the creation of a decentralized administration structure: the state-owned enterprises. They were more flexible than the core of the public administration. They were expected to be more professional and efficient, and they were for some years. The military government maintained the existing labor legislation (that had several restrictions on the free organization of labor). Democracy was withdrawn from Brazilians. The mayors of state capitals and the state governors were no longer elected, but appointed. The centralization of decisions grew even stronger than before.

The so-called "national-developmentism" that dominated from the 1950's until the end of the 1970's had several characteristics: (i) import substitution aiming to build a complete industrial base in the country (Tavares, 1977); (ii) bureaucratic-authoritarian pattern of public policy management; (iii) strong role of government in the provision of public services and infra-structure building; (iv) financing of policies based on borrowings in the international markets (Malan and Bonelli, 1990), among others.

After the "Brazilian miracle", from 1968 to 1973, when the Brazilian economy grew very fast, the growth of the economy lost its momentum (Bonelli and Werneck, 1978; Werneck, 1987; Lessa, 1981; Almeida, 1988; Malan and Bonelli, 1990).

The Brazilian social, economic and political environment changed dramatically from the end of the 1970's. Its development pattern, based on the import-substitution model, reached its limits.

In the 1980's, a huge financial and assets adjustment was made in Brazil. The political scientists call this phenomenon the "government privatization". Several economists have studied this process (Baer, 1993, Davidoff, 1993), through the following perspectives:

- the deterioration of public services. The state-owned public utilities have been used as instruments of economic policy (). The public sector became unable to sustain its activities and adequate levels of investment. The provision of public goods began to deteriorate;
- the destination of subsidized credits to the private sector;
- the centralization of the debt in the Central Bank, that was the borrower from international banks;
- the Central Bank use of defense mechanisms against exchange risks.

One feature that must be highlighted here is the substitution of the external for the internal debt during the 1980's (Cavalcanti, 1988). This trend increased the country's monetary instability.

Those economic problems have led Brazil to a very severe economic crisis. The challenge was, and still is, to change its pattern of development and start to grow again without the instability and the debt problems (Teixeira, 1993; Fiori, 1994).

The financing pattern exhaustion and the diminished economic growth have made the public sector unable to provide the services demanded by society. The urban problems grew because the urban population had increased from 50 to 80% of the total population from 1950 to 1990 (Faria, 1991).

The economic crisis was combined with the strengthening of civil society movements interested in the redemocratization.

The once stable relations between government and capital started to show signs of deep conflict. There no longer was money for civil works. This affected the relations with national capital. The lack of economic stability, required by business, generated complaints from both national and foreign capital. Only few sectors were satisfied with the economic policies, especially the bankers.

The Brazilian government stimulated commercial surpluses in the 80's, favoring some industries, which modernized their plants in order to compete. The intermediate goods sector grew significantly in this period, with major environmental impact. Those industries are big consumers of natural resources, as well as polluters.

Exports increased especially in the sectors that were natural resource intensive. (Coutinho and Ferraz, 1994).

| Industrial Complex | Sectors with competitive capacity |
|--------------------|--|
| Agribusiness | soy bean oil coffee orange juice |
| Chemical | oil petrochemical |
| Metalmechanics | iron mineral steel sector aluminum |
| pulp and paper | pulp and paper |

The Industries Competitive Study concluded that the main determinant of the competitiveness of these sectors was the low cost of raw materials, due to the good quality and quantity of available natural resource.(Coutinho and Ferraz, 1994, p.262).

Torres (1993) suggests that the Brazilian intermediate goods sector() has had special competitive conditions in the world market. They are characterized as environmentally dirty industries.

Unlike the developed nations, Brazil has been altering its industrial structure since the 1980's, moving toward a dirtier and more natural resource intensive industry (such as pulp and paper).

Among the explanations for the dynamism of the intermediate goods sector in Brazil are:

- available natural resource;
- low cost electrical energy;
- smaller environment restrictions than in the northern countries;
- governmental incentives.

This for the multinationals have made only limited transfers of technology in environment control.

The intermediate goods industry tend to concentrate in a few locations, a strategy that brings a bigger environmental impact. In 1980, eight regions had 51% of the sector's national production. There was no change from 1980 to 1990(). As an example, one may see the location of the chemical and pulp and paper industries in highly industrialized and urbanized regions of the country (Torres, 1993).

Intermediate goods industry

% share of all Brazilian industry

1980

| region | Total | Chemical | pulp and paper |
|------------------|-------|----------|----------------|
| São Paulo - % of | 27.6 | 21.4 | 32.0 |
| Campinas - % of | 4.4 | 10.5 | 3.6 |
| Santos - % of | 2.9 | 8.7 | - |
| Total | 64.5 | 72.6 | 68.7 |

IBGE. Brazil

Brazilian adjustment was different from that of other Latin American countries. Most industries have resisted adjustment (Tavares, 1993). The 1980's and the beginning of the 1990's, although democracy had been reestablished, were marked by uncertainty, unstable growth, high inflation (and even hyperinflation), and growing uneasiness, for there was no more growth and little mobility opportunities.

B. Institutional innovations

The state building in Brazil dates especially from the 1930's. The federal government, under the authoritarian government of Getúlio Vargas, became the owner of the natural resources. Access, provision, and control of the resources began to be an exclusive right of the federal government, removed from the states, the municipalities, and the private sector

Water resource regulation started in that period with the Water Code (1934). It was designed to regulate the hydroelectric power sector and the role of the public and private sectors in providing

energy (Lima, 1984 and 1989). This code was modern enough to propose the integration of the multiple uses of water. There were rules to assure adequate attention for all those with an interest in the resource: irrigation, households, fisheries, energy generation, wastewater treatment, conservation, recreation, and so on. At that time, the country was basically an agrarian economy.

During the 1950's, under a democratic government, some institutions were created to foster the provision of electricity, a real must to the industrialization process. The institutional arrangements were based on the sectors and not on the resources.

It was the country's industrialization that generated the concern about the quality of the environment, as the urban quality of living degraded quickly.

The first agency created to control pollution was created in São Paulo in the ABC region, the most industrialized region in the 60's(). It was created to face water scarcity, thermal inversions, and the absence of industrial control in a region characterized by industrial concentration. The Pan-American Health Organization had stimulated the agency's creation, an act supported by the Brazilian public health specialists and local authorities.

This regional agency was later transformed into the technological center responsible for controlling pollution in the state of São Paulo - CETESB.

Until 1975, the agency responsible for air pollution control was the Superintendência de Saneamento Ambiental - SUSAM, in the State Health Secretary.

In the state of Rio de Janeiro, it was also the concern about water pollution control that marked the creation of the Instituto de Engenharia Sanitária in 1961. It was only in 1975 that the Fundação Estadual de Engenharia do Meio Ambiente - FEEMA was created.

The national institution to protect the environment was created partly as an answer to the international pressures from the 1972 United Nations Conference. Instead of a ministry, a special secretary was created at the federal level of government, the Secretaria Especial de Meio Ambiente - SEMA.

The main environmental Brazilian law dates to 1981 (Lei no 6.938/81). The environmental institutions were created on the eve of the Brazilian redemocratization process. Their features reflect this context: they are not as authoritarian and centralized as most of the former Brazilian agencies.

The Environmental National System (Sistema Nacional de Meio Ambiente - SISNAMA) was conceived to share responsibilities among the three spheres of government: federal, states, and municipal. Some analysts believe that it is an innovative model, conceived by Paulo Nogueira Neto. It resulted from a debate in the house of representatives. Its management model is based on a systems approach, compatible with the Brazilian federation system (Zulauf, 1994, p.6). It is formed by an agency, with its staff, regional offices, and a Council. The same model was adopted in several states. The state councils are very active (CONSEMA). They are composed of environmentalist groups, industry associations and government appointees. They have to approve the Environmental Impact Assessments and the priorities of the government agency. The way it works is radically different from the rest of the Brazilian public administration, which is still very closed to the public.

The building of this bureaucratic apparatus can be summarized as follows:

- 1930/64: no national agency responsible for the environment. Intense use of natural resources for industrialization (first hydroelectric facilities, especially in the Southeast region of the country)
- 1964/74: consolidation of an institutional arrangement based on sectors: energy and water distribution and sewage services. Policies are centralized and fragmented in sectors. Military regime creates a robust public administration characterized by centralization of the decision-making process and by the specialization of agencies.

- 1974/1985: financing problems. State-owned public utilities used to attract foreign borrowings. The environmental issues begin to appear in the public agenda. Environmental problems due to the industrialization process lead to the creation of regional agencies and of the first national agency responsible for environmental issues. HPO and 1972 UN Conference influence the process.
- 1985/1996: redemocratization of the country and economic crisis favored the emergence of new debates about the priorities of the use of natural resources. New actors (NGO's, municipalities, courts, etc.). Initiatives toward a new institutional arrangement in some states. Federal and state Constitution with special chapters dealing with the environment and water resource. State reinvention experiences. Municipalities and states gain decision power from the new Constitution (Carneiro, 1994). Creation of new institutions to regulate and control the environment and water resource: less fragmented and centralized than previously.

The agency responsible for managing the water demand in the state of São Paulo has been the Department of Water and Electric Energy, o Departamento de Águas e Energia Elétrica (DAEE), since the 1950's. It started to lose its capacity of enforcement during the end of the 1970's. At the beginning of the 1980's, DAEE has decided to decentralize, aiming to increase its efficiency. The process started in 1983. For the first time in Brazil, the water basins were used as the basis for management units. The objective was to increase the planning rationality and to strengthen the autarky role as the management agency. Though well conceived, the decentralization program failed. The Water Basin Directories would become powerful. The regional degree of autonomy of the water basin chairmen would increase. The bureaucracy of the autarky resisted. In 1987, the new state government re-centralized the DAEE.

Worried about the growing scarcity of water in the state and the degradation of its quality, technicians of the water resource sector held a series of meetings at their associations in 1986. Those conferences were prepared to analyze bolder initiatives in the institutional field to improve water resource management().

The diagnosis pointed that DAEE was an old agency, with too many problems to be able to perform the role of water authority by itself in the state of São Paulo. The main cause of this inefficiency was the separation of the responsibility for the quantity of water in one agency (DAEE) and the quality in another (CETESB). Two different agencies were dealing with the same object. The institutional arrangement was inadequate also because the distribution of water and wastewater treatment plants, as well as the electric energy utility, was done by state owned public utilities with a high degree of independence from the regulatory agencies. The coordination of the uses of the resource was precarious.

The regulatory agencies were very fragile, especially after the administrative reform of 1967. Their regulation of the state-owned public utilities was too weak and inefficient. In the middle of the 1980's the regulatory agencies' inefficiency grew even more. Their challenge was to change the excessive centralization, and lack of coordination between water supply management and water demand management(). A group of experienced public officials from DAEE suggested the building of a strategic inter-organizational network. In 1987, the elaboration of the embryo of the Water Resource Integrated Management System was done through an innovative process of systematic panels with appointees of all the agencies responsible for the management of water resource or its use in state-owned public utilities().

Changing the traditional administrative pattern, this new model looked for an increased horizontal articulation among the several agencies responsible for the planning of use, conservation and control of water, as well as for the management of the public utilities that used water in a consumptive or non-consumptive way. The management should be collegial and integrated.

The collegial management presented an enormous change in this policy decision-making pattern. Part of the DAEE bureaucracy knew that either the agency need to become efficient and accountable or it

would not survive the next few years. It had to change. However, the innovative draft provoked reactions in the traditional state bureaucracy. The bill sent to the House of Representatives did not contain some articles that have given more autonomy to the river basin committees. Instead, it kept power in the state level agencies.

Several interest groups worked for approval of the original decentralized project. The professional networks held several seminars in their professional associations (ABRH, ABES, ABIR and ABAS). The draft was adopted by them and taken to a representative of an opposition party (PDS, Silvio Martini). This representative presented the draft as his proposal at the São Paulo House of Representatives (Bill N. 7663). Other interest groups saw the occasion as an opportunity to revise the bill and to include their interests in the law, such as the municipal associations (inter-municipal consortiums from the ABC region(), and the Piracicaba River Basin region), environmentalist groups (PT representative Ivan Valente), and workers union (SINTAEMA). The law was at last approved in December 1991. It is the product of the state officials inter-organization network()and interest groups fighting to increase the participation of local authorities in the decision process. The sector that was not satisfied with the outcome was the sewage services, which believed it would be under-represented in the new system.

The main argument for the new Water Resource Management System was the need for an alternative for the sectoral system that had dominated since the 1960's. The alternative was an integrated model, with collegial management. It was believed that this model would be more efficient in the allocation of natural resources and in the alteration of the environment, considering the different uses of water as well as the needs of present and future generations. It was a big change. The principle underlying the model was that shared responsibility was more efficient than centralized responsibility (Ostrom, 1990).

Besides, the model was intended to be responsive to the needs of each river basin. The regionalization could address much better the specific needs of each reality. The river basin management system was not a Brazilian invention. Most countries have applied this concept for a long time (Barraqué, 1992; Castor, 1989). International experience was very conclusive that this geographical unit could increase the ability to distribute and preserve water, especially because it is possible to stimulate regional interests commitment to the decisions (Ostrom, 1990). The willingness to pay fees to improve water quality depends on the credibility of the actual improvement of the provision. This is more likely to happen closer to the user().

Since 1991, several other Brazilian states have created water management system laws inspired by the São Paulo one. The model is more flexible than the previous one. Moreover, it stimulates municipalities and private users to conserve water and to finance the policy adequately.

C. The policy networks, its leaders and stability

The analysis of a public policy with the policy network tool enables one to perceive the potential changes in the policy or the strong points of resistance.

It is a meso level tool that can help to identify the professional influence impact, the technical rationality influence, the privileged position of a few interest groups, and the complex interdependencies of government structures.

Moreover, one can comprehend the differences within a policy in different periods of time. It can help to understand the resistance to change, the institutional practices, and forms of adaptation.

The concept of policy networks facilitates the understanding of transition processes as one analyzes the mediations exerted by the networks (Rhodes and Marsh, 1992).

0. The traditional policy network

Until the beginning of the 1980's, the water resource policy was relatively opaque and dominated by a professional network from the public and private sector. Economic interests related to the erection of an infra-structure for the generation of energy and civil works to build dams and sewage treatment facilities united them. The main characteristic of that policy community() was its functional linkage. The sectoral use of water interests built this policy network (hydroelectric energy and sanitation).

The professional network had a special role in the elaboration of those sectoral policies. There was a strong vertical independence and an insulation from other groups or policies (Gray, 1982). The professionals from the public sector and the engineers from the private sector had a mutual resource dependence. The coalition of interests was rather stable.

This network got stronger in the 1960's and 1970's, especially because there were financial resources available for civil works. The professionals moved from their jobs at the state-owned utilities to the regulatory agencies (such as ELETROBRÁS) and to the construction companies. It was a positive sum game, at least for those inside the game. Actually, their policy concentrated the benefits for those inside, and distributed the costs to the whole society (Serôa da Motta et alli, 1993). The network tended to become more exclusive to sustain policy continuity and its own position inside the group.

Those interest group organizations may be associated to a monocentric image, characterized by close and stable coalitions and by direct negotiation with the executive branch of government (Regonini, 1989). Fernando Henrique Cardoso calls this relationship "bureaucratic rings".

1. The transition

The innovation of the 1980's and 1990's is the formation of interest networks with a quite different relationship with the executive branch of government. Instead of bilateral and sectoral relationships, a multilateral and regional one dominates. The sectoral view seems to be replaced by an incipient environmental one. Other kinds of professionals contributed to this change: urban planners, architects, geographers, and public managers. The polycentric image would be more adequate to describe the plurality of actors involved in the policy and the multiple forms of relations among them (Regonini, 1989).

Now the game is no longer a zero sum one. The debate over the alternative uses of water flourishes. Different knowledge and interests analyze the risks involved in any human intervention in nature, including environmental impact assessments. The policy network, that invented the creative institutional arrangement -- the river basin committee -- internalized the conflicts in the issue network. Any decision reflects the forces inside the committee and may hurt several interests.

On the other hand, the social conflicts are reduced, because they are openly discussed in the committee. The medium and long run planning may be restored.

Now, such issues as the salvation of a river can put the old and new interests together and weave new webs, new fabrics, and give birth to new institutions.

The following table shows the differences between the authoritarian-bureaucratic policy network and the new one, as well as their main features.

| Dimension | Water Resource Policy Community in the bureaucratic-authoritarian model | 1990's emerging water quality Issue Network |
|------------|---|---|
| Membership | | <ul style="list-style-type: none"> • comprehensive |

| | | |
|--|--|--|
| <ul style="list-style-type: none"> • number of participants • type of interest | <ul style="list-style-type: none"> • very limited, some groups are consciously excluded • economic and professional dominant (energy and sewage treatment services) | <ul style="list-style-type: none"> • embraces most of the interests (local power, industries, environmentalists, part of the state bureaucracy) |
| <p>Integration</p> <ul style="list-style-type: none"> • frequency • continuity • consensus | <ul style="list-style-type: none"> • high, with high quality • little change in membership, values and outcomes • share of basic values and acceptance of the legitimacy of results | <ul style="list-style-type: none"> • the contracts vary in frequency and intensity • access varies • some agreement, conflicts always present |
| <p>Resources</p> <ul style="list-style-type: none"> • distribution within the network • distribution among organizations | <ul style="list-style-type: none"> • all participants have resources: the main relation is exchange • hierarchy | <ul style="list-style-type: none"> • some participants may have very limited resources; main relation is consultation • varied and variable distribution and capacity of control |
| <p>Power</p> | <ul style="list-style-type: none"> • equilibrium • the community survival depends on a positive sum game. | <ul style="list-style-type: none"> • unequal power, unequal resources. • it is a zero sum game |

Based on Rhodes and Marsch, 1992.

0. The new policy network

The new policy network appeared due to:

- i. the weight of the inter-organizational network promoted by DAEE;
- ii. the growth of the professional network of the planners;
- iii. the emergence of the mayors' network;
- iv. the strengthening of the environmental movement and the democratization process.

All those actors helped to disseminate information on the problems related to water quality and scarcity.

The intergovernmental network was promoted by DAEE in 1987 and 1988. As we have seen, the autarky was weakened but had to formulate the water resource policy and system. The strategy was to attract allies in the other public agencies and to increase cooperation among them through the integration of quantity and quality management. It was a large horizontal articulation with limited vertical interdependency, since there was no common responsibility for offering the services. The

strongest alliance happened between DAEE and the environmental secretary (Secretaria de Meio Ambiente, Planning Division and CETESB, the agency responsible for the pollution control).

Resistance to the network came from engineers in other public agencies that were part of the old policy network: energy and sanitation sectors.

One other source of resistance came from the central bureaucracy in the state agencies. They resisted decentralization and transparency.

Law no 7663 (Integrated Management System of Water Resource) is the fabric of the new alliances.

We have not identified producer networks active in the water issues. The economic groups are concerned with the environmental laws. They use their associations, that are still weak in Brazil, generally as a defensive position regarding environmental protection.

FIESP (the state federation association of industry) is involved with the studies to define the charge for water fees. Their lawyers are ready to sue the state government if the water tax favors an industry located near a federal river and increases the costs to another near a state river().

At the regional level, however, the economic groups are quite active, especially the most modern and export sectors, such as pulp and paper (RIPASA, in the Piracicaba river basin). Some sector associations are anticipating conflicts and even export constraints due to environmental problems. In this sense, they are preparing their associates to obtain the ISO 14,000 and to develop an environmentally friendly attitude().

The traditional sectors have two kinds of problems: the lack of resources to adjust to new technologies and the lack of an export market to push them to adjust. They are the greatest polluters and consumers, and have little participation in the water basin committees.

Summing up, the behavior of the actors can be classified as follows:

| interest groups | viewpoint | consequences |
|-------------------------------------|--|--|
| Consumers | <ul style="list-style-type: none"> • mostly uninformed. | <ul style="list-style-type: none"> • vulnerable to the media |
| Social movements and workers unions | <ul style="list-style-type: none"> • environmental groups vary a lot. Most concerned with nature • unions fear privatization of state owned public utilities | <ul style="list-style-type: none"> • dispute with social movements that ask for housing • conservative in general |
| Producers | Three kinds: <ul style="list-style-type: none"> • polluters • service producers • environment equipment producers | <ul style="list-style-type: none"> • complain of lack of resources to reduce pollution • demand public investment in infra-structure • new pressure group that may join environmentalists |
| Government | Three kinds of agencies <ul style="list-style-type: none"> • conservation, regulation and control | <ul style="list-style-type: none"> • try to build an environment policy community |

| | | |
|--|---|---|
| | <ul style="list-style-type: none"> state owned public facilities that provide water, wastewater treatment, energy and navigation infra-structure agencies (housing, transportation) | <ul style="list-style-type: none"> participate in inter-organization networks but are worried about the privatization process. have no interest in the environment policy community |
|--|---|---|

Part of the private sector has changed its attitude a lot about the environmental issues. Some Brazilian businessmen consider that it is cheaper to face them before the regulators do so. Their heterogeneity is huge. The next table shows the main characteristics and problems according to the attitudes of different economic interests.

| Type | Characteristics | Problems |
|---|---|---|
| <ul style="list-style-type: none"> old profile businessmen | <ul style="list-style-type: none"> predators use of old politicians to solve disputes with environment enforcement | <ul style="list-style-type: none"> conflict with environment agencies and judiciary |
| <ul style="list-style-type: none"> modern businessmen | <ul style="list-style-type: none"> incorporate environment language doubts about the choice of technology: control or process changes concern with competitiveness | <ul style="list-style-type: none"> try to negotiate schedules with the government |
| <ul style="list-style-type: none"> urban firms | <ul style="list-style-type: none"> actual difficulties to build effluent treatment units (space) high cost of treatment sectors: textiles, chemicals, food and cleaning products | <ul style="list-style-type: none"> old profile dominant disputes with environment agencies around job losses, costs and alternative locations |
| <ul style="list-style-type: none"> agribusiness | <ul style="list-style-type: none"> huge plants located on peri-urban or rural areas high pollution potential sugar-cane and alcohol, pulp and paper, citrus | <ul style="list-style-type: none"> there are both kinds: modern and old profile businessmen exporters ("moderns") concerned with non-trade barriers |
| <ul style="list-style-type: none"> industrial districts | <ul style="list-style-type: none"> high pollution potential (cement, petro and cloro-chemicals, steelworks, fertilizers) | <ul style="list-style-type: none"> there are both kinds: modern and old profile businessmen |
| <ul style="list-style-type: none"> agriculture | <ul style="list-style-type: none"> most of the properties still practice predator agriculture | <ul style="list-style-type: none"> poor preparation of environmental agencies in rural environment education |

| | | |
|--|---|--|
| | <ul style="list-style-type: none"> • excessive and inadequate use of fertilizers | |
|--|---|--|

In recent years, new interest groups have been formed, interested in the privatization of water distribution and sewage treatment public utility companies (Gazeta Mercantil, October 24, 1996).

C. An explanation for the crisis of the old institutional arrangement

One can differentiate the economic, political and social context in the developmentist period (1950's to the end of the 1970's) from the 1980's and 1990's.

Those elements may explain the failure of the bilateral, sectoral and centralized institutional arrangement that dominated the bureaucratic authoritarian period from the multilateral, regional and decentralized period, represented by the river basin committee innovative arrangement, as described in the following table:

| context | Bureaucratic authoritarian period | 1980's and 1990's |
|-------------------------|--|--|
| social-economic | <ul style="list-style-type: none"> • economic miracle • investments in industries regardless of environmental impacts • accelerated economic growth; high social mobility • accelerated urbanization • public utilities: monopolies state-owned • foreign investments as main financing source | <ul style="list-style-type: none"> • lost decade • Brazilian economy loses growth rhythm; mobility reduced • public sector cannot supply all demands caused by urbanization • exhaustion of the financing pattern of development • crisis in the provision in public services |
| political-institutional | <ul style="list-style-type: none"> • support to the national developmentalist model • building of national systems to provide and regulate public services • centralization of decision -making process (technical rationality and authoritarian regime) | <ul style="list-style-type: none"> • State reform (aiming lean governmental agencies) • questioning of the public provision of services • decentralization associated with redemocratization |

| | | |
|--|---|--|
| | <ul style="list-style-type: none"> • public-private articulation relatively stable • dominance of bilateral articulation between public agencies (sectors) and interests groups • states and municipalities with little participation in the decision-making process | <ul style="list-style-type: none"> • public-private articulation crisis • State crisis calls for a redefinition of interests disputes arbitration • increasing participation of states and local power in the decision-making process |
|--|---|--|

Moreover, the new policy network is the result of:

- i. the crisis of the former institutional arrangement. The exhaustion of the financing pattern threatened the stability of private-public sector relations;
- i. the growing concern with environmental quality;
- i. the increase of disputes related to the allocation of water among different users.

II - The Emerging Institutional Arrangements

Brazil is a country of huge contrasts. It is one of the most industrialized countries among the developing nations. It has, at the same time, the most advanced technologies in some industries (pulp and paper) and the most archaic in others. It has all the modern diseases, but is still fighting against cholera and other water transmitted illnesses. As 80.0% of the Brazilian population live in cities, the garbage production reaches 90 thousand tons/day. Only 3.0% has adequate garbage treatment and disposal. The unorganized urbanization process favored also an increase of flood damages in those big and poor cities. It is believed that 38 million inhabitants will be living in only three big metropolitan areas, São Paulo, Rio de Janeiro and Belo Horizonte by the year 2,000 (Faria, 1991). 67 million inhabitants will live in no more than 20 big cities with more than 1 million inhabitants each. In the 1970's most of the studies used to say that the problem of developing countries was their birth rate. Brazil has been decreasing significantly its birth rate. The social and environmental problems, however, keep on growing. The improvement in the health and sanitation areas, though insufficient, led to an increase in life expectancy, what will increase the demand for public services and housing.

Those urban problems are great, even in the most industrialized regions. The Southeast region has suffered a lot of the human environment degradation.

The region has benefited from the abundance of water (high hydroelectric potential) and mineral resources. Its high population density threatens the coastal area also, for most of the big cities are close to the sea (Zulauf, 1994, p.43).

It is in those regions that some initiatives are being experienced, trying to improve the quality of water and assure that there will be enough water for its several uses.

One might say that the experience of the Piracicaba river basin committee represents a watershed in Brazilian water resource policy. The shared decision-making process among water users, state and local public power officials is being tested in this innovative institutional arrangement: the river basin committee. Its framework inspired the new national water resource policy and management system. Its experience has helped the creation of several other river basin committees in the state of São Paulo. Fourteen river basin committees are already installed().

A. Piracicaba River Basin

The Piracicaba, Capivari and Jundiaí basin is one of the five river basins located in industrial regions in the state of São Paulo ().

The Piracicaba, Capivari and Jundiaí river basin is formed by 57 municipalities from the São Paulo state and 5 from Minas Gerais state, with an approximate population of 3.7 million inhabitants. It encompasses around 15.7 thousand square kilometers.

The pressures for management change in this region were:

- big water demand from the industries in the Campinas region. Those industries complained of instability in the water supply (especially chemical and pulp and paper sectors);
- social movement focused on the recovery of the basin quality. It started in 1984, with the association of engineers and architects from Piracicaba (Associação dos Engenheiros e Arquitetos de Piracicaba);
- social movement enlarged in 1987, presenting a demand to the governor ("Carta ano 2000 - redenção da bacia do rio Piracicaba");

The first public power response to those pressures was a decision that the basin should become a pilot-project of the new state water resource system and policy. In December 1987, the basin was considered critical (resolution number 5 from the Water Resource Council). A working group was created(). In 1988, it was considered a model of management (state decree no 28.489).

A regional network was born in the struggle for the Piracicaba river salvation. Its main actors were the environmentalists, the opposition parties' mayors, the agronomy engineers and some industrials, and the regional producers of bio-digestors.

Simultaneously with the elaboration of the water resource system by the public sector, the mayors of most of the cities in the river basin formed an inter-municipal consortium. This was quite new. There was no tradition of cooperation among them.

The former mayor of Piracicaba, one of the consortium founders and its first, president, has said that the city the most down stream depended upon the cooperation of the others. The city had its own identity related to the river and its waterfalls().

The cities' common problem was the scarcity of water, especially in Summer. Population started to complain a lot. The Americana mayor tried to solve the problem with groundwater, but soon realized it would not be sufficient().

The mayors network was formed including even cities upstream, as Bragança Paulista. The consortium has had continuity and has been able to deal with political differences, revealing the political maturity of its members.

The mayors were (and perhaps are still) skeptical about the Water Resource System. They do not believe the state government will actually invest regionally, according to the priorities set at the river basin.

However, the consortium was benefited by state government support, through the collaboration of specialists from DAEE and from the Environmental Secretary.

This region had been studied by several agencies, even with multilateral support to those studies (FUNDAP/UNDO, 1991). Those studies contributed to the conception of the river basin committee.

The Piracicaba, Capivari and Jundiaí River Basin Committee was created by Law no 7663/91.

The main goal of the committee installation group was to be "representative, legitimate, and democratic, aiming the integrated management of water resource in the basin" (FUNDAP, 1994, p.16). It intended also to "stimulate the different social actors to collaborate and to legitimize the new arrangement, that could not be imposed" (FUNDAP, 1994, p.16).

It took 15 months to install the committee, from September 1992 to November 1993.

Some difficulties faced by the installation team were:

- fair participation criteria;
- novelty.

The state bureaucracy had a stronger internal coalition than the mayors and users. Most of the mayors did not trust the state officials and tried to retard the pace of the committee installation.

At last, in November 1993, the representation inside the committee was considered legitimate by all actors involved.

There is still a debate over the main problems and responsibility for solving them by the three main actors: state public officials, mayors, and users.

The mayors, as well as the state-owned water enterprise (SABESP), were responsible for the precarious sewage treatment. However, they complain that DAEE does not assure adequate water flow. They also say the former governors have built a water system to provide water to the São Paulo metropolitan area, the Cantareira System, that takes water from the Piracicaba basin.

On the other hand, the DAEE officials say that the main problem in the Piracicaba river basin is bad water quality (poor, or non-existing, wastewater treatment).

The dispute between the Piracicaba river basin and the São Paulo metropolitan area (Alto Tietê river basin) is already twenty years old. Piracicaba has lost. The decision to build the Cantareira system was taken with little public discussion. The professional network says that the population in the Piracicaba basin does not evaluate the benefits: there are no more floods in the Piracicaba (). Professor Yassuda noticed also that the river basin committee enables a better management of the system. The former centralization of the operation in São Paulo and the lack of communication with the region might have caused water distribution problems. His hope is that with the basin committee, those problems will tend to disappear, for the control by several actors will lead to more accountability.

The degree of river basin committee autonomy is also a source of conflict between state and municipalities. Since the creation of the committees, the law demands the creation of a basin agency. Its role is to manage the resources collected as water taxes and to distribute them to those who will implement programs and civil works to reduce pollution and to preserve water quality. The agency also has to elaborate annual water quality reports.

The Piracicaba actors have wanted to install their agency since 1992. The mayors wanted it to be a deployment of their consortium. They wanted to control the financial and planning management.

No consensus has been reached yet concerning the agency's autonomy from the state government. Mayors wanted to have complete autonomy. Their argument is that since the effort of raising money to preserve water resource is done regionally, they may decide where and when to use it. The state authorities argue that water resource pollution does not stay in one river basin, but flows from one to another. There is a need of a central authority to arbitrate disputes, and to redistribute resources if necessary. In the Piracicaba basin the committee has approved a project that gives it greater autonomy than desired by the state government. The governor prefers a state generic law that will be applied all over the state. Since no agreement has been reached, the agency is not implemented yet.

The outcome of this debate is strategic to the successful accomplishment of the state water resource management system. The origin of the conflict is the definition of rules for resource allocation(). The last consortium president said that "we will be able to define parameters which will allow the state a certain discretion, so that the country will not be fragmented in autonomous regions, without losing the ability to define the Piracicaba basin priorities and allocate money in the region"(). The tension between state and local power must be seen as a sign of maturity in Brazil's democracy (Amaral and Baroni, 1992).

Prominent municipal leaders, such as Thame (PSDB) and Machado (PT) agree that sometimes the consortium has assumed a defensive position, even corporatist. Their enthusiasm comes from the belief that this growing regional energy is important to reach a quality of life throughout the region().

The tensions are growing. The consortium magazine calls it the "Water War"().

In the following table, one can see some of those conflicts:

Some water use disputes in the Piracicaba River Basin

| | between river basins | inside the river basin |
|-------------------------|---|--|
| Piracicaba x Alto Tietê | <ul style="list-style-type: none"> the Cantareira System withdraws 31m³/second from the Piracicaba river to provide São Paulo water | |
| Campinas x Vinhedo | | <ul style="list-style-type: none"> industrial discharges in Vinhedo generate operational problems to the water impoundment in the Capivari river, which provides water to Campinas. |
| Paulínea x Sumaré | | <ul style="list-style-type: none"> part of Sumaré's urban water provision comes from the Atibaia river, withdrawn in the Paulínea city area. |
| Itatiba x Jundiá | | <ul style="list-style-type: none"> the two cities want to dispute the same drinking water rights (to withdraw water from the Atibaia river) |
| Indaiatuba x Itu | | <ul style="list-style-type: none"> new water intake in the Piráí river |

Source: Tempo, 1995

Water dispute resolution has changed since the committee formation. The Piraí river case is a good example. Until 1986, the Piraí river provided drinking water only to the city of Salto. As Itu grew, the mayor discovered that he had to look for new drinking water sources for the city. He also wanted to withdraw water from the Piraí river. The regional dispute was mediated by DAEE. The autarky suggested that the Piraí could not be used unless all the other sources were exhausted. Moreover, DAEE wanted the two cities to build a regulating dam together.

In 1993, another city, Indaiatuba, asked to draw drinking water from the Piraí river. DAEE wanted the three cities to reach a consensus. In 1994, Indaiatuba prepared the documents to obtain the license required by DAEE; it has also elaborated a wastewater treatment plant.

By the end of 1994, the Piracicaba river basin committee promoted a regional conference on current and perspectives of water resource utilization from the Piraí river(). The objective was to learn the possibilities and the position of the four cities: Itu, Indaiatuba, Salto and Cabreúva. The former two agreed that Indaiatuba could withdraw the available water upstream of Salto. However, Itu asked that the subject should be discussed in the Piracicaba, Capivari and Jundiaí river basin committee(CBH-PCJ).

The committee president asked DAEE to examine the matter at the working group on licenses to prepare the committee meeting discussion. The working group considered that Indaiatuba should have a temporary license. Rui Brasil Assis, executive secretary of the committee, thought that it was still essential to build the regulating dam to assure adequate water flow(). In the Piracicaba basin committee meeting on December 21, 1994, the Indaiatuba license was discussed. Instead of a consensus decision, they voted. Indaiatuba won, but Itu was not satisfied(). In January 1995, Itu appealed to DAEE. Its superintendent approved the Itu license without consulting the Piracicaba river basin committee.

Instead of arbitrating the conflict and, thereby, contributing to the dispute resolution mechanism strengthening, DAEE recentralized the decision-making process. The water dispute resolution in the Piraí river illustrates how difficult it is to change public administration practices. It is even more difficult if one intends to decentralize the decision process. The Piraí case shows that the Piracicaba river basin committee can have a relevant role as an arbiter in water disputes inside the basin. The state authority should interfere only as a last resort.

The last difficulty faced by the Piracicaba river basin is the intergovernmental relations between states. The Piracicaba basin has one of its sources in the state of Minas Gerais. The environmental laws are less restrictive there. Minas Gerais state has even used this aspect to attract industries to that region. This can make any effort to clean up the river in the state of São Paulo almost useless. The newly approved national law will face its first test of adequacy trying to solve this kind of conflict.

III - Water Resource Policy Perspective for the Nineties

A. Impact of the innovation on Brazilian water resource policy

The creation of the river basin committees represents an institutional innovation. Those new institutional arrangements are inclusive and democratic. The body, composed of public agencies, mayors and user appointees, has shown a trend toward conflict-reduction and acceptance of the dispute-resolution mechanisms.

On October 23, 1996, the Brazilian federal House of Representatives approved Law no 2,249-b. After five years, the executive proposal was approved. It institutes the Water Resource National Policy and creates the Water Resource Management National System. The system creates the parameters of a national water policy. The Environment and Water Resource Minister, Gustavo Krause, celebrated the

project: "For the first time in history, we are going to have a water use general policy, putting an end to the sectoral and unruly strategies". His main concern was the need for planning within a ten years horizon. Otherwise a collapse might happen (Felício, 1996).

The national situation is even worse than São Paulo's. The World Bank advises investors not to risk their investments in places where there is less than 2,000m³ of water available. Pernambuco, Rio Grande do Norte and Ceará states are in that condition.

The innovation of the new system includes:

- the creation of strategic management mechanisms that give states, municipalities, businessmen, and environmental associations a greater role in the policy;
- the creation of water basin committees and agencies to lead the dispute resolution process;
- the public and private sectors shared commitment in preserving and controlling water quality and quantity;
- the creation of water taxes to assure regions self-reliance;
- the federal government's special role in promoting rational water uses among different users and generations.

B. Perspectives

Those new regional institutions are more adequate to assure the requirements for medium and long run planning. The river basin committees and the new water resource management system have their origin in the new policy network. This new interest network altered the relationship between the water interests and the executive branch of government: from a sectoral and bilateral one to a regional and diversified relationship. The environmental perspective of water allocation is becoming more important than the sectoral one.

The river basin committees are more inclusive. This is especially useful due to the geophysical characteristics and available technology for managing water resource: uncertainty and risks are unavoidable. The shared decision-making process contributes to a commitment to select the best technological alternative to produce and distribute drinking water. There is a trend toward more rational decisions.

In addition, the regionalization of the decision, with delegation and power transfer from the federal and state governments to the municipalities and to society, increases the cooperation opportunities to solve common problems.

The river basin committees that are being implemented in São Paulo state are a milestone in the building of a national system of water regulation in Brazil, more inclusive and ruled. This is absolutely necessary for the elaboration of a XXI Century Water Code. The accomplishment and the spread of those experiences are essential to prevent the existing committees from reducing their activities to the mere defense of particular and provincial interests.

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