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The limits of integrated water resources management: a case study of Brazil's Paraíba do Sul River Basin

Antonio Ioris

Geography and Environment, School of Geosciences, Aberdeen University, Elphinstone Road, Old Aberdeen, Aberdeen, Scotland AB24 3UF UK (email: geo539@abdn.ac.uk)

The transition to water sustainability involves challenging questions about problem assessment, stakeholder involvement, and response coordination. To overcome these difficulties, new approaches have been developed to inform regulatory changes and to help to improve the level of water sustainability. One of the preferred methods is integrated water resources management (IWRM) that combines different aspects and a plurality of goals associated with water use and conservation. However, important obstacles remain in the way of IWRM and, ultimately, water sustainability. A case study in the Paraíba do Sul River Basin in the southeastern region of Brazil illustrates the multiple barriers to appropriate integration of socioeconomic considerations into the sustainable management of water systems. The opportunity to improve environmental conditions and to engage local stakeholders has been frustrated by the contradictory directions of regulatory reforms. On one hand, IWRM-informed policies have introduced flexible instruments of water regulation and pushed for the reorganization of the river-basin committee. On the other hand, the focus has been restricted to technical and managerial solutions that tend to ignore the influence of social inequalities and political asymmetries and, as a consequence, undermine water sustainability.

KEYWORDS: river basin management, socioeconomic factors, water use regulations, water conservation, water management

Introduction

Since the major conferences and publications on environmental sustainability in the 1970s and 1980s, such as the Mar del Plata Conference (1977), the Brundtland Report (1987), the United Nations Conference on Environment and Development (UNCED) and Agenda 21 (1992), and the Johannesburg Conference (2002), questions pertaining to water management have received considerable attention. Both the assessment of water problems and the formulation of solutions have benefited from better comprehension of the social and ecological complexity of water use and conservation. The meaning of sustainable water management has itself changed, from simply meeting quantitative water demands to concerns about water quality and, more recently, to the integration of spatial and temporal scales of multidimensional water issues (Hermanowicz, 2008). However, the translation of sustainability principles into action has often been contentious. Reforming water management under the goals of environmental sustainability is a far from complete project, particularly because of difficulties in breaking the link between economic growth and water demand and reluctance to incorporate issues of fairness and community involvement into the decision-making process (Gleick, 2002; Syme & Nancarrow, 2006). This article discusses the extent to which new attempts to manage water resources in Brazil have responded to pressing demands for environmental sustainability.

In many parts of the world, the introduction of a new structure of water regulation has reflected the influence of international concepts and methodologies. One of the leading principles is integrated water resources management (IWRM), defined as "a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (Global Water Partnership, 2003). It is important to recognize the close association between sustainable development and the goals of integrated water management. As Simonovic (1996) observes, the sustainability agenda has reinvigorated attempts to better manage the water environment through appropriate policy making and integrated planning strategies. Some accounts describe the positive outcomes of IWRM-inspired experiences, such as those planned for the Fraser River in British Columbia, the Don River in Toronto, and the Thames River in England (Mitchell, 2005). Other assessments, particularly in developing countries, are more skeptical about IWRM's impact on the long legacy of social and economic demands

and lasting environmental degradation (e.g., Swatuk, 2005).

This international debate has important repercussions for the Brazilian experience where "the institutionalization of water norms has most strongly reflected the IWRM framework" (Conca, 2006). Policy tools informed by IWRM, such as catchment plans, water licenses, and bulk water charges, have been incorporated into national water regulation and form the basis of the 1997 Water Act (Law 9433/1997). The same act also established a national water management system that extends from the federal government to state authorities and river-basin committees (Abers, 2007). Although some authors have extolled the institutional reforms as a genuine new paradigm for dealing with water issues in Brazil (Formiga-Johnsson et al. 2007), insufficient attention has been given to operational problems and political disputes on the ground. A case study of the Paraíba do Sul River Basin shows that, despite repeated claims of success by the government and local water managers, the new regulatory approaches underestimate social inequalities and power asymmetries. Most of the public debate and stakeholder involvement in the area have been tied up with a single issue—the introduction of bulk water charges—that has paradoxically magnified the already contested basis of water use. Before moving to the case study, the article first considers several problems that are firmly entrenched in the IWRM model.

The Context and the Internal Contradictions of IWRM

The progressive industrialization of the economy and society's associated urbanization increased the rates of water use and land-use change in the last two centuries. The consequence was that problems such as water scarcity, urban flooding, and river pollution began to impact larger areas and affect a greater proportion of the population in many parts of the world. One of the first attempts to improve water management, and at the same time promote regional development, was the experience of the Tennessee Valley Authority in the 1930s that aimed to bring together social engineering and land and water management while benefiting from an unusual degree of political control (Selznick, 1949; Wescoat, 1984). In the subsequent decades, the idea that water could facilitate economic development influenced the construction of dams and the expansion of water infrastructure in the United States and other countries. Before too long, it became evident that focusing solely on the economic dimension of water projects was leading to operational inefficiencies and widespread impacts. At the end of the 1970s scientists and policy makers started to revisit concepts and techniques following an international call from water users and civil society organizations for a more comprehensive understanding of the social and environmental dimensions of water systems. A new comprehension of water problems has, particularly since the 1990s, exerted formidable influence on legal, technological, and administrative reforms around the world (Tvedt & Cooper, 2006), with gradual movement away from conventional interventions and toward a combination of regulatory, economic, and multistakeholder participation measures (Ballabh, 2008).

This reform of water-management policies has been closely related to the construction of a broader sustainable development agenda. The search for water sustainability requires flexible management of the water cycle and innovative forms of stakeholder contribution (Cui et al. 2007). Nonetheless, the association between sustainable development and water management is far from straightforward. While some authors still define water sustainability as basically the search for efficient use of water (Wilderer, 2007), growing attention is being given to the multiplicity of perceptions of the role of water management (Hermanowicz, 2008), the need to deal with environmental conservation together with social and economic demands (Ioris et al. 2008), and the fact that water sustainability entails a scientific mindset that recognizes the relevance of place and integration (Schmandt, 2006). Accordingly, a key concept of the contemporary water-sustainability agenda is the aforementioned IWRM, a body of knowledge that has informed the development of new legislation, the involvement of stakeholders, and the redesign of management approaches (Conca, 2006). IWRM's basic rationale is to foster an integration of socioeconomic development with physical planning and environmental protection (Savenije & Van der Zaag, 2008).

Ongoing efforts to integrate public policies undoubtedly represent an evolution in relation to previously fragmented and technocratic approaches. However, the translation of IWRM objectives into concrete management strategies has not been without its dilemmas. As will be discussed for the Paraíba do Sul, the reorganization of water regulation inspired by the IWRM doctrine has faced unexpected difficulties and delays in recent years. To a large extent, these obstacles can be related to a number of intrinsic limitations of the IWRM proposition. To begin with, despite various efforts to conceptualize integrated management, its epistemological grounds remain unclear. Most IWRM scholars persistently insist on the need to integrate plans and procedures (e.g., Bongartz, 2003; Faby et al. 2005; Hendry, 2006), but it is not easy to grasp what exactly should be priori-

tized and how responses should be integrated (Biswas, 2008). Water management is essentially about choosing between equally important demands, but elusive claims for wide-ranging integration, as in the case of IWRM, are unable to offer much help when dealing with specific water-management questions.

The practical experience in many countries (as in Colombia, according to Blanco, 2008) demonstrates the difficulty producing innovative answers to extremely complex water problems with only a vague set of ideas. In spite of calls for integration, some IWRM initiatives have suffered from the same old problems of administrative division (Fischhendler, 2008). On these operational weaknesses of IWRM, Rahaman & Varis (2005) point out that implementation in the field remains very challenging because, among other things, "the water sector is sparse in integrating its integrated plans."

It is crucial to recognize that the conceptual and operational limits of IWRM are deeply related to the political naiveté that characterizes most of the ongoing institutional water reforms. Many authors, for instance, still fail to acknowledge that power differences between social groups or spatial areas have a striking influence on water allocation and on the distribution of negative environmental impacts. It has been observed elsewhere that a critical limitation of IWRM is the entrenched attitude of water managers and hydrologists who treat socioeconomic and political demands as a deviation from the "purist" goals of water management (McCulloch & Ioris, 2007). These professionals tend to attribute the problems of implementing IWRM to circumstantial nuisances to be overcome or avoided, but certainly not to more fundamental political disputes (Blomquist & Schlager, 2005). As a result, IWRM advocates fall short of addressing the important political nexus between economic growth, environmental degradation, and social demands. These advocates need to remember that social and economic inequalities are integral features of environmental management, even more in countries like Brazil where conflicts over resources are linked to systems of political and economic control established already in colonial times (Bryant, 1998). Furthermore, if the politicized bases of water management are ignored, new attempts are likely to legitimize existing inequalities and social privileges (Zhouri & Oliveira, 2005).

The case study described below demonstrates that the internal limitations of IWRM (namely its conceptual impression, limited operationalization, and tendency to deny the essential politics of water) have significantly prevented satisfactory responses to the environmental and social problems related to water management in that river basin.

The Case Study in the Paraíba do Sul River Basin

Fieldwork Methodology and Interpretation Approach

The case study involved data collection in the Paraíba do Sul River Basin (PSRB) between March and May of 2007, following a preliminary visit to the area the previous year. The bulk of the research comprised 18 confidential interviews and subsequent e-mail discussions with water stakeholders (including industrialists, sanitation companies, nongovernmental organizations [NGOs], and professional bodies) and government officials (from municipal, state, and federal agencies). Interviews were recorded and transcribed and the most relevant parts were translated (by the author) into English.

The case study also included content analysis of documents, meeting minutes, and plans and observation at meetings of the river-basin committee. In addition, environmental monitoring and hydrological data were analyzed using statistical computer software to identify changes in long-term trends.

Examination of the collected data followed Sayer's (1992) recommendation that the world is not merely differentiated, but also stratified. Consequently, interpretation of the data concentrated on the dynamic relations among events, structures, and mechanisms. Following a critical analysis of a complex reality, explanations can emerge from the dialectical movement between the abstract (the isolation of particular attributes and relationships from the whole) and the concrete (the multiplicity of structures and events that comprise the world). Explanation was also tied to understanding the meanings, perceptions, and motives of local stakeholders, as well as to the antecedents of actions and the significance of current actions for those involved (Cloke et al. 2004).

The River Basin

The PSRB is located in southeastern Brazil and is one of the country's most dynamic economic areas.[1] Water availability and the river network have been historically important for regional development and urban growth. Because of its strategic location (between the states of São Paulo, Minas Gerais, and Rio de Janeiro), the river basin currently accounts for

[1]The PSRB encompasses 55,500 square kilometers between latitudes 20° 26' and 23° 00'. The average flow at the river mouth is 1,118.40 cubic meters per second (m^3/s) with low flow (Q_{95}) of 353.77 m^3/s. The river extension is approximately 1,100 kilometers, draining an area that includes 180 municipalities. More than 5.4 million people live in PSRB. The Paraíba do Sul is also used as the main source of water for the Rio de Janeiro Metropolitan Area and is the primary water supply for more than 12 million people (COPPETEC, 2006).

approximately 11% of national gross domestic product (GDP), but it has been a key economic region for more than 300 years. Already in the eighteenth century, the Paraíba do Sul was the main communication route between the coast (Rio de Janeiro) and inland gold mines. With the introduction of coffee production in 1770, vast areas of land were cleared and the natural vegetation removed to open space for plantation farms. By the end of the nineteenth century, because of significant rates of soil erosion and land degradation, coffee producers started to migrate to other parts of Brazil. Nonetheless, a new and stronger economic phase commenced around 1900 with the introduction of textile and food industries (Müller, 1969). The most significant milestone was the founding of the National Steel Company (CSN) in 1941, the first major steel plant in the country. The river basin now has a diversified industrial sector that includes more than 8,000 manufacturing units (CEIVAP, 2001). In conjunction with this process of rapid industrialization, more than 120 hydropower stations were installed in the river basin, with some new projects currently under construction.

Unfortunately, urbanization and industrialization have led to significant pollution problems due to sewage effluent (1 million cubic meters per day) and toxic industrial waste (7 tons per day).[2] According to the official environmental monitoring database (*Sistema de Informações de Recursos Hídricos da Bacia do Rio Paraíba do Sul*), the river's more polluted stretches have rates of coliform bacteria between 50 and 160 times the legal threshold. Water pollution is aggravated by the fact that only 17.6% of the sewage receives any form of treatment. The main public health consequence of the lack of sewage treatment is the high rate of hospitalization related to infectious and parasitic diseases and these disorders mostly affect the low-income population of the region. Treacherous biological conditions are particularly evident in the middle section of the main river where most industrial facilities and hydroelectric plants are located (Araújo et al. 2003). There is clear evidence of riverbed and reservoir contamination by heavy metals such as chromium that are released by industrial operations (Gruben et al. 2002). The total rate of water demand amounts to 263 m^3/s and this volume of abstraction imposes significant pressure on limited water resources (more than 74% of the water available during periods of low flow). Another important source of impact is the extraction of sand (for civil engineering) from the river floodplains that creates artificial lakes (1,726 hectares of lakes were identified in 2003) where the loss of water due to evaporation corresponds to the water demand of 326,000 inhabitants (Dos Reis et al. 2006). Additional water-management problems are related to persistent urban flooding, soil erosion, lack of adequate waste treatment, and construction of new hydroelectric dams. It is critical to realize that this precarious environmental situation has not improved in recent years.

The Limits of IWRM: When Theory Clashes With Practice

During most of the twentieth century, water management in PSRB meant basically the expansion of water supply and hydropower generation. The decision on where and how to invest was highly technocratic and centralized in the hands of the national government. While water supply and hydropower infrastructure were both targets for substantial public funds, there was minimal investment in effluent treatment and environmental restoration. In just a few decades, the quality of the environment in the main river and many of its tributaries was seriously compromised. The formal response to mounting water problems started in 1968, when the military dictatorship established the Paraíba do Sul Valley Commission (COVAP). The commission was ineffectual and was replaced in 1979 by a multiministerial committee called *Comitê Executivo de Estudos Integrados da Bacia Hidrográfica do Rio Paraíba do Sul* (CEEIVAP), also with negligible results. The membership in both organizations was restricted to public agencies and civil servants, without any mandate from water users and other stakeholders. The PSRB during these years became increasingly notorious for serious water quality and quantity problems. It was only in the 1990s, when the level of pollution started to attract growing international criticism, that the outlines of a more responsive structure were established. The new river-basin committee, *Comitê para a Integração da Bacia Hidrográfica do Rio Paraíba do Sul* (CEIVAP), was organized in 1996 under IWRM principles of catchment integration and stakeholder involvement. The PSRB was quickly turned into a showcase for the national government that financially supported CEIVAP to organize the agency's bureaucracy and to prepare studies and plans (Braga et al. 2005).

Despite the laudatory comments about CEIVAP in the media and academic circles,[3] after more than

[2]It is beyond the objectives the paper to list the full range of environmental problems in the Paraíba do Sul. The characterization that is provided here is from COPPETEC (2002; 2006). More information is available at http://www.ceivap.gov.br

[3]For example, CIEVAP was awarded the "Best Practices" prize by the United Nations Habitat Program in 2004 and the tenth anniversary of the committee in 2007 was extensively celebrated by its members and by the concerned public agencies. It is not possible to include here a full list of academic theses and dissertations (we have consulted more than forty) that repeatedly

ten years of activity, the new committee has largely failed to reduce environmental pressures and reverse water degradation. Several CEIVAP members contacted during this research expressed their concern, or even perplexity, with the negligible environmental results. Others complained about the restricted contribution of the new committee in terms of strategic thinking and long-term planning. Notwithstanding governmental support and an extensive bureaucratic structure, the fundamental problems of environmental degradation and fragmented management remain largely the same in Paraíba do Sul since the formation of CEIVAP. It is true that most committee members believe that the current troubles are transitory and, in the long run, the committee would be able to justify its existence. According to the majority of the committee members interviewed in our research, the river basin's geographical complexity was underestimated when CEIVAP was formed, in particular the difficulty integrating federal and (in the main river and in some major tributaries) state regulation (in most tributaries).[4] It is true that the dual domain—federal and state responsibilities for the same river basin—has been one of the major integration challenges for the management of larger catchments in Brazil. There exist today five sub-basin committees and eight municipal consortia in PSRB (the former have a legal mandate similar to the river-basin committee, while the latter have more targeted objectives such as waste and sanitation) that do not necessarily communicate with each other or with CEIVAP. The result is that instead of a more integrated structure the regulatory reforms have paradoxically exacerbated institutional fragmentation and—quite often—fratricidal competition for resources.

The positive expectations about the future of the new committee are certainly important and our research carefully considered that most committee members expressed optimism in relation to the circumstantial character of present difficulties. But at the same time, these opinions seemed overly influenced by IWRM's hegemonic ideology. Crucially, the stakeholders who expressed a more optimistic view are exactly those that, since the beginning of the reform process, endorsed IWRM principles. In other words, these stakeholders have a circular argument biased toward the new institutional framework, despite the persisting environmental degradation in most parts of the river basin. Certainly, as advocates of the current model point out, the internal fragmentation of efforts that arises from the unique federal configuration of Brazilian river basins, has had a major impact on the success of water-management initiatives. Nevertheless, the failures of the institutional reforms indicate more fundamental inadequacies in the IWRM-inspired regulation.

In fact, experience in PSRB seems to encapsulate the conceptual, operational, and political limitations of IWRM mentioned above. The new regulatory approaches have been presented to the general public as a significant step forward, but without any clear indication of how long-lasting problems would be effectively resolved. In other words, the plans and strategies so far produced remain very generic and have had partial implementation. Likewise, the public has had only limited opportunities to participate in decision making. Despite a discourse of democratic governance, the new river-basin committee has, for the most part, replicated the centralized, top-down mechanisms of water management (e.g., civil servants and academics have played a crucial role in the organization of the new river-basin committee [cf. Formiga-Johnsson et al. 2007]). Abers & Keck (2006) point out that the regulatory reforms require a multidirectional power transfer among a variety of policy arenas and actors, but that remains a fundamental challenge for the river-basin committee. It should be mentioned here that the shortcomings of its internal democracy led the committee to a period without regular meetings in the year 2007 and this interregnum only ended due to renewed calls from senior committee members and, more importantly, to pressures from government agencies. The consequence is that, despite all the effort, the committee has been largely powerless and often inactive in the face of old and new water problems.

The Main Distortion: The Narrow Agenda of Water Pricing

To understand the mismatch between IWRM's theory and practice, it is important to reflect upon how the river-basin committee has functioned in recent years. It is clear that CEIVAP has had a busy agenda of meetings and ceremonies, often involving ministers and senior authorities. Nonetheless, most of these activities have been focused on a single issue: the implementation of water-use charges (i.e., bulk water charges or water pricing) that constitute a fundamental tenet of IWRM-inspired regulation (to the extent that it serves to express the economic value of water). The case for water charges became stronger around the year 2000 when many committee members started to argue about the necessity of reducing financial dependence on central government grants. Between 2000 and 2002, opinions against and in favor of charges polarized the committee. The federal

praise the success of the new committee, in particular the instrument of bulk water charges (see below).

[4]According to the Brazilian Constitution, water has dual ownership: federal, for those rivers that cross more than one state or are shared with other countries, and state, for those confined to one state territory.

government, academics, and some NGOs supported bulk water charges. Opposing the charges were the representatives of agriculture, electricity generation, sanitation companies, and, especially, the industrial sector.

During this period, according to our interviewees, CEIVAP meetings were turned into a "battleground" where representatives of the critical sectors systematically questioned the rationale of the proposed charges. The fierce debate about the adoption of charges, instead of improving the quality of stakeholder engagement, emasculated initial enthusiasm for the new committee. In 2002, the controversy took a curious turn when the industrialists surprisingly changed their position and agreed to the proposed charges; the river-basin committee eventually approved the charging scheme and implementation started in 2003.[5] The reason that the industrialists altered their opinion was that, since the charges were effectively inevitable (due to the requirements of the 1997 legislation), the sector preferred to take pre-emptive action to secure reduced fees and, more importantly, to prevent the adoption of more stringent regulation. The general public was led to believe that the industrial sector was cooperating with the new water-management approaches, whereas it was in fact tacitly accepting the charges. The irony during those crucial committee meetings was the unexpected support that the industry received from environmental NGOs that declined to impose higher charges and alleged instead that it was better to agree upon the charging scheme at once.

Charging for bulk water has been a central policy of the new IWRM-inspired regulation in PSRB. Advocates claimed that the charges, as an economic instrument applied to environmental management, would mitigate ecological damage, induce rational water use, and reallocate water according to economic efficiency (Garrido, 2004). In practice, however, the income from the charges achieved little more than spurring modest investments by the river-basin committee in isolated sewage works and river-bank regeneration projects. Since the beginning, the controversy about charges has prevented the committee from considering the broader context of environmental problems and social issues related to water (at the time of our fieldwork in 2007 the debate in the river basin was concentrated on the revision of the charging scheme). In effect, between 2003 and 2006, the charging scheme was responsible for collecting a total of R$25.4 million, an amount that is considerably less than the estimated sum needed to restore the river basin: R$360 million per year in capital investments or R$4.6 billion by 2025 (COPPETEC, 2006). In 2006, a total sum of R$7.1 million was spent in fourteen municipalities (out of 180 in the river basin), but the money went to short-lived projects with only marginal environmental consequences.

Because the grants from the river-basin committee come in the form of donations, competition for resources has been fierce among the various municipalities and even NGOs. There is plenty of lobbying during the selection of proposals (for instance, it is common to notice mayors that attend CEIVAP meetings together with engineers of construction companies that have a vested interest in accessing committee funds), which only helps to poison the dialogue between CEIVAP members. Moura (2006) describes how the committee has unevenly invested the income from the water charges in the river basin, a situation that constantly feeds spatial conflicts and disputes among municipalities. A related problem is that the acceptability of the charging scheme has not improved (data provided by CEIVAP show that the income remained fairly constant between 2003 and 2007 at around R$550,000 per month) and, after more than five years, water users retain considerable suspicion and misinformation.

Notwithstanding the above problems, the main failure of the PSRB charging mechanism is probably that water charges have neither influenced the reallocation of water in the river basin nor curbed the expansion of water use. To some extent, the new regulatory framework has induced some industries to anticipate investments in effluent treatment, but this outcome only occurred in the companies that were already planning to acquire new equipment or technology. In a survey of 488 industrial facilities, Féres et al. (2005) found that most companies invested in pollution reduction mainly because of the risk of bad publicity vis-à-vis their corporate responsibilities. This point is consistent with other international studies that have observed that active engagement of stakeholders, instead of charges, is the most important factor for achieving water efficiency and sustainable water use.

Finally, the new regulatory framework has been paradoxically used to legitimize the degrading activities of industrial and agribusiness companies, as long as the charges provide a political excuse for not questioning their location, scale, and operation. In our interviews, as well as during the CEIVAP meetings, industrial sector representatives explicitly

[5] All water uses above a certain threshold (i.e., consumptive use above 1 liter/second and hydropower larger than 1 megawatt) must pay a monthly charge, calculated in accordance with the extraction rate, the percentage of use, and the quality of the effluent. The standard charge (R$0.02/$m^3$) is applied to industries, water suppliers, and mining companies, with discounts for agriculture and aquaculture. There is a charge of 0.75% on hydroelectric revenues, but the river-basin committee has limited authority in how this specific levy is spent. Note: at the time of this research, US$1.00 corresponded to approximately R$1.80.

claimed that they have completed their contribution to restoring the river, especially in the form of water charges. In practice, the regulatory framework means using the river-basin committee's activities and formal compliance with the new policy instruments as an excuse to avoid further financial contribution to river restoration and, more importantly, to evade the history of river degradation. This situation can be attributed to the fact that the new regulation treats all water users according to their payment capacity and this policy erodes the differences among stakeholder groups and, consequently, hides relative obligations for environmental degradation of the river basin. For all these reasons, the claim that water pricing is a success in PSRB on grounds of inclusiveness and technical efficiency (cf. Formiga-Johnsson et al. 2007) seems largely overstated. On the contrary, the opportunity to effectively improve water management has been squandered due to ideological pressures for the adoption of water charges and related IWRM-based policies.

Conclusion

This analysis is a relatively cursory account of a complex web of interaction and conflicts in PSRB, but it arguably illustrates the difficulties of translating IWRM goals into practice and, ultimately, achieving water sustainability. Environmental degradation and political asymmetries existed before the current institutional reforms, but the intrinsic limitations of IWRM—namely its conceptual, operational, and political shortcomings—have led to the persistence of water-management problems. Current attempts to improve water regulation in PSRB, representing just the most recent chapter in a long history of water management, have been largely unable to improve the river basin's environmental condition. Notwithstanding rhetorical changes, the new regulatory approaches—in particular the new river-basin committee organized under the influence of IWRM—have reproduced past contradictions and limitations. The consequence is that, after more than 300 years of intense agricultural, urban, and industrial activity, the river basin remains without any clear indication of how or when environmental conditions will be effectively improved.

The new regulatory framework that should be creating synergies between state and society has paradoxically widened the gap between public agencies and society at large, given that the river-basin committee has been dominated and manipulated by stronger political players, namely the federal government and business sectors, that have developed a sort of "veto power." The river-basin committee remains a semigovernmental entity (as warned about by Gruben et al. 2002), rather than a genuinely democratic decision-making arena where all stakeholders have equal opportunity. Instead of integrating ecological and social goals, as IWRM theory proposes, efforts in PSRB are as fragmented as ever and more than a dozen river-basin organizations are in daily competition with CEIVAP for financial resources and political space. The fundamental cause of these problems is that most of the regulatory effort has been concentrated on the introduction of water charges, an observation that confirms Brannstrom's (2004) point that water pricing is the central objective of regulatory reform in Brazil.

The ambiguities of the PSRB experience demonstrate that IWRM-inspired policy does not necessarily lead to adequate social and environmental solutions to highly complex and politicized water problems. On the contrary, the new policies introduced an economic rationality—the "user-pays principle"—that is blind to the uneven balance of power and to the historical context of environmental degradation. In the case of PSRB, the ongoing IWRM-inspired reforms have been unable to properly reconcile responsibilities for water problems and have failed to indicate a genuinely new direction for dealing with social demands and environmental conservation. That is the reason why Merrey et al. (2005) recommend that, instead of the currently ineffective approaches, water policies in developing countries should emphasize empowering poor people, reducing poverty, improving livelihoods, and promoting fair economic growth. In the same way, Swatuk (2005) suggests that it is important to reflect on the political nature of the IWRM proposition and be prepared to revise, or even discard, the basic assumptions and ideologies driving the reform process. Overall, the search for water sustainability requires, first and foremost, taking into account the full range of social and political pressures that shape the use and conservation of water systems.

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