

Public policies for negotiated water allocation: a dialogue between Thailand and Brazil¹

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Abstract

This paper presents the authors' reflections regarding the collaborative studies and discussions on water resources among researchers from Thailand and Brazil. First, the similarities and differences between the countries regarding water resource management and policies are noted. Subsequently, the experiences and challenges of both countries in the negotiated allocation of water resources are discussed. Finally, the researchers comment on the current proposed draft of Thailand's water law based on the experience in Brazil.

Keywords: Brazil; Negotiated water allocation; Thailand; Water law; Water policy

1. Introduction – the context of water resources in Thailand and Brazil

Thailand and Brazil may both be classified as developing countries with emerging economies. In the last 60 years, both countries have experienced rapid increases (more than 20-fold) in per capita income (World Bank, 2014) and have transformed from rural-based economies into urban and industrial-centered economies. Increasing revenues have enabled their governments and private sectors to modernize agricultural techniques and invest in mechanization and irrigation.

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In particular, as tropical developing countries, Thailand and Brazil share similar challenges with respect to water resources; the countries share concerns about an increased demand for irrigation for food and biofuels, conciliation with hydropower plants and the reservation of water for fast-growing urban centers. However, increasing pressure on water resources frequently leads to social and economic conflicts because both governments still lack the financial resources to develop sounder water management policies. The cultural differences between the two countries regarding laws, public policies and water user behavior may provide new insights into both Thailand and Brazil and shed light on new possibilities for the sustainable development of each (Box 1).

Although both Brazil and Thailand have experienced rapid urbanization, Thailand still has high demographic density in its rural areas (208.3 rural habitants per hectare of agricultural land in 2011, representing 66% of the country's population), whereas Brazil has a markedly lower rural density (11 rural habitants per hectare of agricultural land, representing 15% of the country's population) (World Bank, 2014). Irrigated agriculture is the main consumptive user sector of water resources in both countries (72% in Brazil (National Water Agency, 2014) and 94% in Thailand (Champhong et al., 2009)); however, the heaviest users in Brazil are large commercial farms, typically with more than 100 hectares of irrigated land per farmer, whereas the heaviest users in Thailand are small paddy field farmers in government irrigation projects. In this respect, it is particularly challenging for Thailand to negotiate with farmers when there are water shortages and to monitor the duties imposed by established agreements.

Box 1: Water resources and King Bhumibol Adulyadej

Thailand is a constitutional monarchy in which the deputies and the prime minister exercise political power, whereas the king has an important role as the moral and cultural leader of the Thai people. The current king of Thailand, Bhumibol Adulyadej, has dedicated much of his life to agricultural development and to researching and discussing better alternatives for the sustainable development of small farmers, in particular. In many homes and institutions, there are pictures of the king that depict him with a map in his hands, talking to local people about the relationship between land use and water management.

From 1994 to 1998, the king gave a series of lectures in which he put forth the theory of 'Sufficient Economy'. 'Sufficient Economy' incorporates ideas from Buddhism (the main religion in Thailand) and risk management, and focuses on planning and decision making at different levels of society, from the personal to the organizational levels (Thailand Development Research Institute (TDRI), 2003; National Economic and Social Development Board (NESDB), 2007). As a specific application of the 'Sufficient Economy' theory, the king proposed the 'New Theory', which is a model for sustainable production by small farms (Public Relations Department (PRD), 2007). In this model, one-third of the area in these farms would be devoted to water storage in ponds, which would be used for aquaculture and irrigation (Mongsawad, 2010). The eutrophication of these ponds for fish production would also improve the ferti-irrigation of crops in the dry season.

Although the idealistic 'New Theory' remains far from the reality experienced by most farmers, this concept reflects the relevant trade-off between the use of farmland for crops and its use for water storage, as water availability has become increasingly conceived of as a major limitation for farm production. Furthermore, both the 'New Theory' and the 'Sufficient Economy' theory are interesting examples of how changes demanded by sustainable development and water management can be enhanced through dialogue as well as respect for the cultural traditions of the population.

1.1. Development of water policies

1.1.1. Water policies in Brazil. The National Water Policy law of Brazil was enacted in 1997 and led the federal government to create an independent agency to monitor and regulate water use. The law stipulates that the federal government controls water use involving rivers that cross more than one state and that the states control the use of the remaining water resources. Subsequently, each Brazilian state also created its complementary water law and specific water agency to assume its shared responsibilities regarding water resources. The water law was mostly inspired by the French policy framework, with basin committees that propose master plans, water quality standards and water use taxes for their own basins. These proposals must be approved by the national or state water councils, which consist of government officials, water users and societal organizations. The committees are mainly consultative, although they can also solve conflicts (however, the parties can appeal such resolutions to the national or state water council). An overview of this institutional framework is available in [National Water Agency \(2007\)](#).

A Brazilian user of water resources must obtain specific permission from the national or state water agency, although certain insignificant uses for family subsistence do not require such permission. Brazilian Constitutional Law considers water a common good and forbids its privatization and the creation of property rights of water ([Tankha & Fuller, 2009](#)). In accordance with this conception of water, the Brazilian water law allows the government to change or even cancel water use permits to benefit society as a whole; in such a case, the particular user cannot argue for monetary compensation ([Almeida, 2003](#)).

Since enacting the National Water Policy law, Brazil has faced many challenges in turning the law's provisions into effective policy. The water agencies began with few human and financial resources and have only gradually been empowered. Over the last two decades, more than 170 water basin committees have been established ([National Water Agency, 2014](#)), mainly in the more populated basins (southeast region and coastal areas). Most of these committees have since approved their basin master plans. Nevertheless, most continue to face difficulties in proposing water quality standards and collecting taxes connected to the use of water resources; thus, such tasks still depend largely on the assistance of central governmental agencies.

1.1.2. Water policies in Thailand. In Thailand, responsibility for managing water resources is shared among many institutions. The Royal Irrigation Department (RID) within the Ministry of Agriculture and Cooperatives manages the irrigation process and contains most of the technical staff and monitoring structure for water resource management. Groundwater is regulated by the Department of Groundwater Resources within the Ministry of Natural Resources and Environment. The Department of Water Resources was created in the same ministry to manage both watershed planning and the use of water outside of irrigation projects; however, its role remains limited because most surface water policies are executed by the RID. Regarding the water supply for cities and villages, the Metropolitan Water Works Authority and Provincial Water Works Authority function within the Ministry of the Interior. Another important institution is the Electricity Generating Authority of Thailand within the Ministry of Energy, which controls Thailand's largest dams with multiple water uses (including hydroelectricity). The National Committee of Water Resources and Flood Policy (CNWFP) (created after the 2011 floods under the office of the Prime Minister) coordinates emergency activities. The CNWFP is advised by the Committee on Water and Flood Management.

The absence of centralized and structured coordination in Thailand's water policy has been frequently criticized in recent decades (Christensen & Boon-long, 1993) for having institutions with overlapping responsibilities (which hinders coordinated responses to both conflicts and/or emergencies), for the lack of data sharing among institutions and for enforcement problems with respect to decisions regarding water allocation, among other matters (Sethaputra et al., 2001). As a possible resolution for these issues, a water law that would coordinate water policies has been discussed in the Thai Congress for the last three decades (Bandaragoda, 2006). However, due to its contentious nature, no agreement has yet been reached on the final draft.

To further the water law debate, the Law Reform Commission partnered with a network of non-governmental organizations (NGOs) in Thailand to promote discussions of the current draft. These discussions were held in 2013 (Law Reform Commission, 2013). At that time, the NGOs planned to collect 10,000 signatures from Thai citizens to formally submit the draft to Congress. An analysis of the draft water law is the focus of subsection 2.2 of this paper.

2. Discussion

2.1. The negotiated allocation of water resources

2.1.1. Negotiated allocation in Brazil. In Brazil, each river has a limit for abstraction based on a percentage of the minimum flow over 10 years (for example, the rivers controlled by the National Water Agency have an abstraction limit of 10% of this minimum flow – Q_{90}) to maintain the environmental services provided by the rivers. The law requires that each water user obtain authorization from the water agency, which uses hydrological studies of the amount of water available in the basin in making authorization decisions.

However, when a conflict emerges over the use of water resources, the distance between the regulations and effective practice is apparent. Because the government has few structures in place to monitor water usage, conflicts frequently begin when the rivers are completely dry and users begin fighting among themselves (Santos, 2007). These conflicts are complex because water's economic importance makes the government reluctant to block the development of the country due to environmental concerns.

To address water conflicts, the national water agency and many states' water agencies began to develop the 'negotiated allocation of water resources' approach in which the agency delimits a conflict area and calls on water users to discuss (among themselves and with the government) cooperative plans to resolve conflicts. These practices have generated interesting results (Box 2). In many cases, negotiated allocation results in a collective authorization of water use in which a group of users is given the responsibility of managing the local sharing of water resources based on a community agreement. Despite positive results, the negotiated allocation and collective authorization of water use are not considered in the water laws and have thus far been parallel instruments with little legal enforcement, as noted by Minas Gerais (2011).

2.1.2. Negotiated allocation of surface water in Thailand. At the beginning of the dry season in Thailand (November), an inter-institutional and inter-sectorial working group (with RID as a secretariat) convenes under the office of the prime minister; the group evaluates how much water remains in the

Box 2: Negotiated allocation of water resources in Ceará State, Brazil

The state of Ceará lies within the semi-arid area of Brazil and has scarce water resources. Since the 1990s, the National Water Agency, State Water Agency and Basin Committees have initiated a procedure of negotiated water resource allocation for reservoir users who present water usage conflicts. This allocation process occurs after the rainy season (Pinheiro *et al.*, 2011; Oliveira & Luna, 2013), and the water users participate in a series of activities that include the following:

- presentations forecasting reservoir water levels and user demand;
- meetings to discuss prioritizing water uses, proposals for water allocation among users, and scenarios regarding reservoir operation;
- voting on the best alternative;
- the creation of a monitoring commission consisting of water users.

The proposal chosen is then submitted to the National Council of Water Resources and/or the State Council of Water Resources for approval.

The experience of Ceará State has been positive (Silva *et al.*, 2006; Lopes & Freitas, 2007) with respect to minimizing conflicts, increasing the participation of water users in water management and legitimizing the decisions made by public agencies.

Nevertheless, some studies have shown that even in that participatory scheme, those user groups that have better internal organization and better abilities to access and evaluate information on water resources typically receive more benefits in the negotiated water allocation (Formiga-Johnsson & Kemper, 2005). An analogous inequality has also been shown with respect to participation in state basin committees of Ceará (Taddei & Gamboggi, 2011).

main multi-purpose reservoirs and makes a general water allocation for each purpose. Subsequently, another working group convenes at the Ministry of Agriculture and Cooperatives to propose allocations within the irrigation projects.

The technical bases of the negotiated allocations are analyzed in detail by Divakar *et al.* (2011). The government-established priorities for water allocation are (from highest to lowest) domestic (urban) use, environmental flow (the prevention of salinization intrusion, navigation, water quality), agriculture uses and, finally, industrial use. However, this priority rank is only a general guideline and does not preclude negotiations. For example, a closer analysis of the constraints on users' sectors in dry years shows that the irrigation sector is more constrained than the industrial sector when there is a water shortage (Divakar *et al.*, 2011). This finding is consistent with the acknowledgement that constraining the industrial or urban sectors would cause substantially greater economic losses for the country. Divakar *et al.* (2011) studied the net economic return of each sector in Thailand regarding water consumption and found that hydroelectricity returns USD 3 per thousand m³ of water, irrigation returns USD 50, industry returns USD 250 and urban (domestic and services) returns USD 21,738. These values show how economic weight influences the negotiated allocation of water resources. Nevertheless, determining the value of environmental flows remains a complex challenge for econometric models (Dyson *et al.*, 2003).

In recent decades, Thailand has accumulated significant experience in negotiating water allocations with irrigators, thus enabling greater flexibility in negotiations while also reducing the economic losses from water shortages. Changes in irrigation management, such as closing the gates at collector canals to allow re-pumping, changing the crop calendar, and the conjunctive use of surface water

and groundwater, are some of the alternatives employed. Because there are periods when irrigation is particularly critical to crop development, the negotiations also include changes in water availability throughout the season. When irrigators in an area experience significant economic losses due to water allocation, an agreement is typically made in which these farmers receive water more regularly and in greater quantities in the following years, allowing them to cultivate more crops per year and thereby compensating them for their losses. However, after an agreement is reached, some adjustments are typically required as the season progresses due to the difficulty the government experiences in controlling water users' behavior, the subsequent economic and political negotiations, and changes in weather conditions. For example, because a steady flow of water in the canals near the coast must be maintained (to prevent salinization and to maintain minimum water quality standards after sewage discharge from the major cities), the farmers in these areas tend to continue pumping water from the channels, although this action conflicts with the proposed plan. This non-planned pumping must be compensated for somehow, such as by closing the gates of the irrigation projects upstream, i.e. by imposing more restrictions on other farmers. A broader study of conflicts with respect to agricultural water allocation in Thailand regarding spatial positions in the basins has been undertaken by [Molle \(2007\)](#).

2.1.3. Lessons for Brazil from Thailand regarding water allocation. The transition from centralized to participative water management is considered an important trend in developing countries. However, this transition is difficult because, in particular, it demands a change in the culture of governmental institutions that are charged with water management. To address these challenges, Brazil and Thailand have created space for negotiated allocation at different levels and with different approaches.

In Brazil, the regular analyses for water use authorizations remain largely in the hands of the technical staff of the water agencies, despite the local experience with negotiated water allocation. Brazil has almost no experience with an open political or inter-sectorial negotiation of water allocation, such as the negotiation that occurs in Thailand; thus, the Thai example can be used to show how decisions involving water use priorities have strong political and economic relevance. A Brazilian water user who receives a negative answer to a request for water use or who is faced with a seasonal or long-term reduction in his/her water rights is only informed that the decision was made based on a hydrological analysis of water availability. This approach conceals the necessity of broader inter-sectorial discussions regarding water use priorities in cases of scarcity.

One of the main objections of the Brazilian water agencies to open up this discussion is that doing so would increase the economic pressures for more water use and subsequently reduce the environmental flows. In this aspect, it must also be considered that, although a decision may be technically fair (embodying the water agency analyst's idea of the best allocation), it is also important that the decision is procedurally fair (i.e. that there was a fair dialogue between the agency and society before the decision was made). Although these two types of 'fairness' may sometimes appear to diverge, they are inter-linked because a broader discussion may give the water agency a clearer view of societal wishes. This perspective might lead to new ideas for water management and improve the collaboration of the various sectors of water users, thus reducing social conflicts.

One example of possible improvement in water allocation in Brazil relates to managing hydroelectric plant reservoirs. Until now, hydroelectric plant reservoirs in Brazil have been managed to maximize the production of energy regardless of other potential uses. This practice is rooted in Brazil's history of energy planning. Until 2001, Brazil had an electricity supply system that depended almost exclusively

on hydroelectricity. After experiencing a high risk of a national blackout in 2001 due to insufficient amounts of water in the reservoirs, the government stimulated the implementation of many backup thermoelectric plants based on fossil fuels. Today, hydroelectric and thermoelectric plants are interlinked in the same national power grid; thus, if there is a water shortage, the government need only turn to these backup thermoelectric plants to avoid a blackout. In this context, there is more flexibility now to implement strategies involving multiple uses for the water in these reservoirs.

The Thailand experience has shown that open discussions regarding water priorities may lead to a reservoir management strategy that decreases hydroelectricity production in favor of other water uses that bring greater social and economic development. In this way, a study of the net economic returns for different sectors of water users in Brazil (such as that by [Divakar et al. \(2011\)](#) in the Thai context) might stimulate these discussions and help lead to the proper multi-purpose management of Brazilian reservoirs. Whenever possible, such studies should detail sub-sectorial characterization and locational heterogeneity to provide information that is more tailored to the specific context of each basin or sub-basin.

2.1.4. A framework for negotiated water allocation. [Taylor \(2002, p. 65\)](#) proposed that as government institutions increase the participation of society and economic sectors in water resource management policies, these participants would begin to demand more legal security to ensure stability against the fluctuation of political decisions. This security is essential for creating public–private partnerships, for building multiple-use reservoirs and infrastructures, and for creating lasting agreements that resolve social conflicts.

[Iza & Stein \(2009, pp. 105–106\)](#) proposed that covenants be recognized by water laws as instruments for settling conflicts over water use. These covenants, although based on the mutual agreement of the parties, differ from private contracts because the covenants are witnessed by the state; additionally, if one party does not fulfill its commitments (and suffers penalties as a consequence), the covenant does not free the other parties from their obligations.

The Brazilian experience with local negotiation for the allocation of water resources has led to discussions aimed at developing a normative regulation for water allocation in the state of Minas Gerais. The discussions involve amending the state's water policy law ([Assembleia Legislativa do Estado de Minas Gerais \(ALMG\), 2012](#)) and an administrative regulation by the State Council of Water Resources ([Conselho Estadual de Recursos Hídricos \(CERH\), 2009](#)). In this regulation, the negotiated allocation of water resources would be undertaken with the participation of society and government representatives and would be mediated by the Basin Committee, with further approval by the National or State Council of Water Resources, as applicable. The Council of Water Resources would also have the duty to establish general criteria and rules for negotiated allocations of water resources and for the granting of water resources to collective entities.

The first issue discussed regarding the draft of the amendment involved inserting the concept of negotiated water allocation as an instrument of the water law. Thus, the current draft defines negotiated water allocation as follows: '*a participatory process through which a proposal addressing multiple uses of water resources is covenanted among water users*'. The legal enforcement mechanism follows this definition by simply stating that water resources will be subject to negotiated allocations in water conflict areas. A water conflict area is defined as '*a provisional area demarcated by the government water management institution based on a technical assessment that shows that the demand for water resources is higher than its availability*'.

In this manner, the transactional costs of the negotiated allocation are recognized, and the government would thus apply these extra resources only provisionally (not permanently) and only in conflict areas. The draft of the amendment also foresees that a possible outcome of the negotiated allocation process may involve covenants that water resource use rights will be granted to a legal entity consisting of interested users, who will collectively manage this water use. Notwithstanding the foregoing, it has been discussed that the amendment should allow the government water management institution to undertake the negotiated allocation of water resources – and to make collective grants – even when there is no demarcated water conflict area, in the interests of avoiding future conflicts.

The discussions in Minas Gerais State are limited to the procedure for the negotiated allocation of water resources (water use authorization); however, solving conflicts in the mid-term and long-term typically requires an agreement regarding not only the amount of water to be shared, but also myriad other actions for the integrated management of water resources. Along these lines, it would be useful if the object of the negotiations could be enlarged, whenever convenient, to include mutual agreements among users regarding commitments to actions that could increase the amount of available water. In these broader negotiations, the water users may voluntarily sign covenants among themselves that specify goals with respective terms consisting of the following: conserving soil and water, improving the efficiency of water use, and mitigating environmental and social impacts. These actions might include changing water use patterns and infrastructures, improving water supply systems, and implementing structures to increase aquifer recharge, regularize river flows and reserve water for shortages. These covenants might include the stipulation that the granted water use right might be suspended or partially reduced in the event that goals are not achieved or are only partially achieved.

In the collective negotiations regarding water allocation and actions for the sustainable management of water resources, those water users with greater financial capacity are able to undertake more actions and consequently receive a greater share of the water allocation in return, provided that the remaining users agree with this exchange. If a user does not execute the action in a covenant, his/her water use right is completely or proportionally revoked. In this manner, it is possible to generate private investment in regenerating river flows, thus benefiting all, whereas, according to market-based reasoning, the water right is also preferentially directed toward uses that can bring the greatest added value to the economy. However, unlike traditional market-based mechanisms for water rights, the requirement that the other users agree with this exchange may prevent the marginalization of low-income citizens in the process. The ultimate goal is to build a system that benefits everyone.

Negotiated water allocation is not incompatible with water markets; instead, water markets constitute one instrument among many other water management instruments. Putting a price on water can be a signal to measure its scarcity and in some contexts might be a parameter to facilitate mutual agreements in negotiations, including eventual compensation among users. The choice and the effectiveness of water market mechanisms in developing countries, however, can be a controversial subject that is looked upon both favorably (Rosegrant & Binswanger, 1994; Thobani, 1998) and unfavorably (Reddy, 1998; Shah, 2014). Clearly, some protection for low-income citizens can also be addressed in the regulation of negotiated allocations under a water market scheme. Conventionally, in locations such as in the western United States and in Mexico, those market mechanisms are characterized by regulations and restrictions addressing issues of equity (Bauer, 2010), such as regulating who can trade with whom or maintaining a reserve of non-negotiable water rights for humanitarian and environmental purposes.

2.1.5. Temporal and spatial strategies in negotiated water allocation. Although participatory approaches are highly thought of in water management policies, the transactional costs are significantly high, particularly for developing countries, which might face difficulties universalizing such practices in all basins. In this context, the experiences of Thailand and Brazil reveal different strategies for addressing temporal and spatial scale patterns in negotiated water allocation. Because Brazil has fewer water users in its irrigation sector, and the water conflicts remain mainly in smaller sub-basins (because there continues to be water surplus in the main large rivers), then it is relatively easier to engage in negotiated allocation directly with water users – or at least with the direct representatives of groups of water users.

In Thailand, particularly in the Chao Phraya Basin and the Thai segment of the Mekong Basin (these two basins, together, cover more than 65% of the country), conflicts regarding water use in drought periods involve the entire water system, which consists of several thousand small irrigators (Molle, 2004; Krittasudthacheewa et al., 2012). This context requires a rather complex negotiation process, which is mainly undertaken by sectorial representatives and sectorial government institutions, who, in their turn, undertake the feedback relationship with the water users.

Nonetheless, in smaller basins in Thailand, some direct participatory experiences have also been implemented. For example, for water crises on the eastern coast of Thailand (Rayong Basin, Thabma Sub-basin and Prasae Reservoir Basin), the government created provisional Joint Management Committees – JCMs – with direct representation of water users (Jumnianpol, 2010). The JCMs had strong popular participation that enlisted the assistance of NGOs and academic groups and helped negotiate water allocation during the dry season. In the Rayong Basin, projects have been undertaken that involve participatory water management planning to build resilience to droughts; these projects involve the collaboration of government institutions, academia and local communities (Koontanakulvong et al., 2009; Jampanil et al., 2011). The RID also adopted the strategy of JCMs for participatory water allocation for irrigation farmers of the Kra Seaw Reservoir, in Suphan Buri Province (United Nations, 2011).

The existence of water user groups not only helps in the negotiation process, but also opens the possibility of granting collective water use rights at the end of the negotiation. After granting collective rights, users can develop flexible and tailored schemes that would be difficult to implement under the conventional control of government agencies. However, it is advisable to maintain some surveillance of the operations of the legal entity formed by water users to avoid internal marginalization or corruption within the collective entity. The Unique Collective Management Organizations (*Organismes Uniques de Gestion Collective* – OUGC) that were implemented as part of French Water Policy after 2006 exemplify the regulation of such collective structures. The OUGCs are entities formed by irrigators in a territory that manage the allocation of surfacewater and groundwater for their water users (Erdlenbruch et al., 2013). Although the OUGCs are competent to define their own internal allocation rules in their territory, these rules require further endorsement from the government (Figureau et al., 2014).

Regarding the temporal pattern, the negotiated water allocation in Ceará State is performed every year in preparation for the dry season. In Thailand, the negotiated allocation also occurs in preparation for the dry season; however, when there is less water in the reservoirs and water conflicts are thus foreseeable, a broader structure is prepared for negotiation.

Conversely, in Minas Gerais State in Brazil, negotiated water allocation has been implemented only when requested by the water committees and only when an area is officially declared a water conflict area. If the agreement reached by the negotiated allocation continues to be satisfactory for the water users, then there is no need for further negotiation. In this way, the government tries to minimize the transactional costs associated with negotiated allocation. Another strategy to simplify the negotiations,

which has been used by Minas Gerais government, is to declare only the stretch of the basin in which there is intensive water use as a water conflict area and to maintain the conventional water permits in the upstream and downstream areas of the basin.

Still, some analysis should be performed regarding the relationship between negotiated allocation and conventional water permits. For example, it might be argued that a water user holding a water use permit would not willingly agree to reduce his/her use when facing a negotiated allocation. However, as explained in subsection 1.1.1 above, water users in Brazil cannot appeal for compensation when a water permit is changed by the government based on the theory that water is a common good. In Thailand, the lack of a law ensuring water rights also does not assist water users in claims for compensation.

Practical experience in Brazil, however, shows that all water users want to negotiate when facing critical scarcity – including those holding water permits – because these users understand that the government would have little power to enforce the rights associated with the water permit and to stop other users from (illegally) drawing off water. Instead, a dialogue with other users seems to offer a better chance to access at least part of one's water demand instead of holding a water permit for a river in which there is no water to withdraw. Moreover, participatory allocation might be an opportunity for users who agree to receive less water during critical periods to secure partial future compensation.

In juridical terms, it is possible to construe an agreement reached in a negotiated allocation as a revision of water use rights in a basin by means of an agreement among water users (or at least the majority of them) and the government. However, the specific context of each basin, including the pacification of water conflicts and weather behavior, will determine whether the allocation scheme will be maintained in the coming years or whether it must be periodically renegotiated.

Furthermore, the practice of negotiated water allocation may have long-term effects on water policies, as has been shown in the accumulated experience of water allocation in Thailand and in the Brazilian state of Ceará. As long as the government and water users find a forum for continuous dialogue in the allocation scheme, they can evaluate previous experiences and improve policies and plans in the future.

During meetings regarding allocations, water users sometimes find the space to discuss with the relevant government institutions what might be better priorities for broader water policies. As proposed in subsection 2.1 above, broadening the negotiations to include more than just water rights allocation might help integrate discussions on natural resource management related to water conservation, addressing themes such as land use, cropping patterns and infrastructure. The dialogues developed and agreements reached in these negotiations could be incorporated into the master plans for basins, land use management plans and public budgets. For example, the JCM experience on Thailand's eastern coast helped the government prioritize a subsequent investment in water infrastructure in the region (Koontanakulvong *et al.*, 2009; Jampanil *et al.*, 2011).

2.2. *Comments on drafting Thailand's Water Law*

Thailand's draft Water Law, as updated by the [Law Reform Commission \(2013\)](#), proposes a coordinated structure for water policies with a National Water Council operating at the highest level and the Water Resources Department assuming the role of the Secretary Office of the council. Many responsibilities are shared with the Basin Committees, allowing more participation by water users and organized society. The draft includes provisions setting priorities for water allocation and water permits, water management plans, a government fund to support the policy, emergency authority and duties in disasters and water shortages, wetlands protection, and penalties for misusing water resources.

Without diminishing the importance of the draft, some comments may be made on its content. For this purpose, experience in implementing the Brazilian water legislation may present items that might be relevant to the current Thai draft.

First, there might be an initial section presenting the general principles for the water law. This introductory section is standard practice in water and environmental laws in many countries and introduces the main guidelines for the overall policy in the law. The principles section is also important as a basis for the decisions of courts interpreting the law, particularly in cases that are not explicitly covered by statutory text. An example of the principles for such a section, based on the RULE program that is supported by the International Union for the Conservation of Nature (IUCN) (Iza & Stein, 2009) and also on the principles of water laws in Brazil and South Africa, is presented below (Box 3).

The proposed water law requires authorization for water uses. However, the draft does not discuss how the authorizations will be managed in relation to water pollution and water quality controls, which are currently regulated by the Enhancement and Conservation of the National Environmental Quality Act of 1992. This relationship is important because the pollution of surfacewater or underground water resources may preclude water uses that were previously authorized. In the Brazilian water law, for example, the polluter must apply for water use authorization in the same scheme as other users, with the understanding that the river water will be used to ‘dilute the pollution’ and therefore will be unavailable for other uses.

Another provision of the Brazilian law is that people may freely use the water collected directly from rain on their property. A similar allowance in the Thai water law could stimulate practices of water harvesting, traditionally known in Thailand as monkey cheeks and infiltration ponds, which have benefits for water storage, aquifer recharge and flood control.

To stimulate private investment in water resource conservation, the draft could also stipulate that the government would adjust water use rights, fees and taxes to benefit those users who agree to invest in

Box 3: A proposal of principles for Water Law, in coherence with Iza & Stein (2009) and water laws in Brazil and South Africa

- (1) Equity, sharing the benefits and costs related to water resources without prejudice regarding ethnicity, gender, income and age.
- (2) Efficiency, recognizing the economic, social and environmental value of water to maximize the use of water resources under rational patterns of consumption that can benefit most users.
- (3) Sustainability, ensuring the access to water for current and future generations, while protecting the needs for water to maintain the functions of the ecosystems.
- (4) Integrated Management of Water Resources, including atmospheric, superficial and ground water in its aspects of quality and quantity, as well as the management of land use and other natural resources in its linkages with the water cycle.
- (5) Coordinated decentralization of water management with public participation at all levels, considering the basins and their aquifers as management units.
- (6) Accountability for water resource availability and uses, which shall be available to all people, in order to achieve certainty and transparency in water management.

water conservation and storage. This strategy is effective because the water users assume the role of ‘water producers’ in the context of policies of payment for environmental services.

The draft also proposes the creation of a water fund. A tax on the use of water resources would be a primary source for the fund’s income. In Brazil, the fees collected in a basin must be invested in the same basin and are done so in the form of studies, programs, projects, infrastructure development and water management costs, according to the criteria proposed by the Basin Committee and approved by the National or State Water Council. Such a provision empowers the basin committees and also allows local users to see the ways in which fees are being used.

Thailand’s draft water law includes some special provisions for emergencies (floods and water shortages) that assure a centralized approach based on command and control instruments. Although these provisions may be useful in solving problems in the short term, complementary approaches with societal participation may be important to avoid recurrence in the mid and long terms. With respect to water shortages, a framework for negotiated water allocation and collective grants for water users’ associations, as discussed in subsection 2.1.4 above, is one idea to increase societal participation and resolve or avoid conflicts.

The draft water law makes the river basin committees responsible for developing an information system for each basin. It would be more effective if the law empowered the Office of the Secretary of the National Committee to develop and maintain a single integrated water resource system such that each basin committee could use the system as a decentralized module. A single integrated system would help the Secretary’s Office obtain a comprehensive picture of water resources in the country and would also be substantially less expensive for the basin committees. This integrated system would also help water management in cases where an underground aquifer encompasses more than one basin.

3. Conclusions

From the reflections presented in this paper, it is clear that Brazil and Thailand could benefit from sharing experiences regarding water policies. While Brazil might learn about opening an inter-sectorial negotiation about water allocation priorities, Thailand can learn from the Brazilian experience in implementing its water laws.

Both countries are facing challenges related to increasing societal participation in water resource management. The proposed normative framework for negotiated allocation may be one useful method (among others) to begin effecting these changes.

With the future approval and implementation of the Thai Water Law, we also hope that the procedures for granting water use permits would not become so rigid that they might hamper the practices developed through accumulated experience in negotiated allocation during the dry season. Conversely, the organized policy structure proposed in the Thai Water Law might be a great opportunity to increase transparency and reliability in the agreements made pursuant to negotiated allocations.

Considering the opinions expressed regarding the Thai Water Law draft in this paper, it should be acknowledged that what is technically defensible in terms of environmental legislation does not always coincide with what is politically viable. Although further discussions might improve the draft, even the approval of the current form would be important for Thailand to provide an organized framework for its water policy. The suggestions based on the Brazilian experience may also be useful for other countries that are reforming their water policies.

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