

Social Participation in Mexican River Basin Organizations: The Resilience of Coalitions

Eric Mollard, Sergio Vargas
and Philippus Wester

Dictatorship says 'Shut up!' Democracy says 'Yeah, whatever you say.'
Michel Colucci, comedian (translation)

In line with current ideas on social participation, this chapter shows that a relationship exists between participation and democracy. However, our argument reverses the formula proposed by advocates of participation: we suggest that participation is not a stage that precedes democracy, but that democracy is a precondition for effective participation. To grasp this counter-intuitive argument, it is helpful to recall that developed countries with long-standing democratic traditions only recently – and cautiously – started promoting participation.

At this point, it is necessary to briefly define social participation and democracy. Social participation is considered here through official organizations where people's voices are taken into account for collective decision on a specific topic. Social participation is then defined as a more or less socially open negotiation with some transparency in public decision-making. However, this type of decision-making is only the first stage of a full process. The second stage, which is the enforcement of the collegial decision, is far from being systematically implemented although the decision seems more legitimated to the extent that it represents the voice of the people. Indeed, other people can challenge the representativeness of the committee membership making the decision and impede its enforcement. As a result, legitimacy and representativeness are only two factors among others that characterize a democratic regime. We will put emphasis on factors related to the level of regulation of social powers in a society, which is supposed to avoid the imposition of one voice against others. As stated by Norberto Bobbio (1996), democracy is a set

of rules that establishes who is authorized to make the collective decisions and under which procedures. A rule decided by one, few, many or all would have to be obeyed by all. So, to avoid any imposed decision, we will see how important countervailing powers are, paying special attention to the public authorities and the importance of their regulation; we will consider democratic deficit, poor regulation and politics, everything having to do with the regulation of powers.

Mexico belongs to the Organisation for Economic Co-operation and Development (OECD), meaning that it is sufficiently developed to have working institutions and state machinery. It is an elective democracy where the multi-party system dates back to the early 1990s. At the same time, the country embarked on social participation, in particular in environmental issues (Foyer, 2003). In water management, new user associations successfully replaced the federal administration in large irrigation districts (Kloezen, 2002; Rap, 2004; Rap et al, 2004), and the 1992 water law created general participatory organizations for the management of river basins and aquifers (Wester et al, 2003).¹

This chapter draws on the first independent nationwide assessment of the functioning and outcomes of river basin councils or *consejos de cuenca* (Vargas and Mollard, 2005). In the first part, we first describe the typical situation of a river basin that is crippled by conflicts regarding the apportionment and different uses of water. Synthesizing different studies and common opinions, we then try to specify the analytical model that led to a common interpretation on the functioning and outcomes of the *consejos*. We call it the standard model of participatory negotiation, where many observers consider participation in *consejos* as a façade behind which the power of the federal administration remains secure.² Indeed, this kind of participation appears to be incomplete, biased in favour of the administration and even useless. In the second part, we look into the shortcomings of this analytical standard model, particularly when user participation turns out to be actual during the cooperative decision-making process or during the enforcement of decisions. As a result, this new interpretative model challenges the standard conclusion as to the sole responsibility of government agencies in the poor outcomes of *consejos*.

For that purpose, we first elucidate the concept of coalition, leading us to a broader examination of the sociopolitical system in Mexico (Sabatier and Schlager, 2000). Beyond changes in a government regime or institutional reforms, it is indeed possible to identify more permanent links between local politicians (whatever the party), certain organized groups (farmers, for example) and the federal administration. The power of such a coalition constitutes a major obstacle to any environmental public action, as evidenced by the *consejos de cuencas*, river basin organizations.³ More specifically, the process that led to deadlock in the participatory process enabled us to identify the actual power holders: the federal administration, itself highly dependent on local politicians, who are in turn under the influence of organized groups.

After identifying the persistent asymmetry in powers, which enables organized actors to continue monopolizing governmental rents and public

actions (that is, subsidies and development programmes) as well as to circumvent law in spite of institutional changes, we link the range of processes that hinder participatory actions with a democratic deficit as defined above. We discuss the notion of environmental democracies that suggests the need for cross regulation of countervailing powers, as exists in Western democracies (Crozier and Thoenig, 1975; Massardier, 2003). Mexico, however, is hampered by an incomplete system of checks and balances, as well as by the lack of independence of key actors (administrations, regional leaders, mayors). The enriched model then makes it possible to give an account of the Janus face of the administration: daily despotism in the face of incipient powers, as seen below in some *consejos de cuenca*, and institutional weakness elsewhere.

Interpretation of Participation: The Standard Model

After describing the physical and social characteristics of river basins in Mexico, we summarize the common interpretation of social participation in water management, which we call the standard model. We agree with the general standpoint – shared by researchers, observers and users – which describes the artificial character of social participation, often described as a façade behind which administrative intrigues continue unchanged. However, as this analytical model is unable to explain the failure of a few actual participation cases, we then analyse the methodological reductionism used to build this common interpretation as a transition to the second section, where we present a model enriched with political processes within the enlarged interplay of actors around water conflict management.

The Institutional Stakes of River Basin Organizations in Mexico

Water is unevenly distributed in space. Even if the rain falls uniformly, surface water flows or infiltrates and subsequently concentrates in springs and channels. Watersheds and river basins are areas of surface runoff in which water comes together and leaves through a single discharge point or alternatively concentrates in permanent or seasonal wetlands or a lake. In addition, the possibility of storing or diverting water towards privileged zones can convert natural heterogeneity into social inequality. Indeed, the history of water can be seen as one of inequality. Historically, shortages depended on the availability of technology and led to more or less permanent conflicts that varied with the regulatory modes of rights and powers (Wolf, 2003). Water also has a history of cooperation during which conflicts were overcome when large works were required. Cooperation provides an interdependent way of protecting people from being excluded from access to water by a third party. Very early on, water management required a higher entity than individuals or communities in the form of courts, possibly associated with religion, customs or with government agencies (Jaubert de Passa 1846).

There are many root causes of water disputes: unwarranted diversion of water upstream, lack of infrastructure maintenance, unintentional flooding or self-centred behaviour, difficulties in sharing water during dry years and more recently pollution, over-allocation or the allocation of new 'rights to reply' to urban, industrial and environmental water requirements. Population growth and the increased number of uses have multiplied the sources of conflict with, in recent times, a shift from local litigation to international controversies including regional meso-conflicts. This new scale of conflict was initially the consequence of giant hydraulic works and, more recently, the closure of river basins (Wester et al, 2008). A government can no longer resolve a conflict as before by tapping and distributing new water resources because all local resources are already being exploited.⁴

After the Spanish conquest of Mexico in the early 16th century, extremely large land holdings (*haciendas*) monopolized surface water. Depending on their financial means and the technology available, their owners diverted water, which led to conflict and litigation not only among themselves but also with the progressively dispossessed Indian communities. During the colonial era and after independence in the early 19th century, water was the concern of the municipal authorities, while the federal courts represented the ultimate recourse for water users, even though these courts were often biased or too expensive for the poorest users (Aboites, 1998). By the end of the 19th century, the federal administration had become increasingly responsible for water management and local litigation. From 1920 onwards, as a consequence of the revolution in 1910, as well as of the agrarian constitution, the federal administration put an end to despoliations of the poorest and was mandated to build large infrastructures for regional development. As its power increased, the federal administration replaced user associations and private contractors (Palerm, 2005). The nationalization of water at the end of the 19th century paved the way for development based on the assessment of hydrological river basins and provided for additional water uses that should not affect pre-existing rights. However, in spite of a centralized administrative framework, the failure of the federal administration to control illegal uses (for example, clandestine pumping from rivers, drilling and wastewater effluents), dependence on the one-party regime and local politicians, and corruption made it impossible to respect rational computations, administrative bans on water, or environmental needs (Güitrón et al, 2004). Current over-allocation of water rights, water shortages and conflicts are mainly the consequences of such past malpractices.

In the 1990s, Mexico did not have enough fiscal resources to maintain the state apparatus, in particular for agriculture. Participation was part of an economic package and participative water management was a response to state disengagement as well as a way to curb corruption, to re-legitimize public actions eroded by decades of underhanded dealings and to solve the increasing number of conflicts that arise when an authoritarian technocracy is unable to manage conflicts increasingly covered by the media. This is all the more true

when the new scale of meso-conflicts results in their politicization (that is, politicians and public authorities are directly involved in the conflicts) and puts pressure on the administration, which formerly conducted its negotiations in secret and was only accountable to political authorities.

When municipalities, states and countries share one or more river basins, scaled-up conflicts are also confronted with the fact that the physical watersheds and territorial governments do not match. For example, whereas more than 90 per cent of the Colorado River basin is located in the US, use of its water is periodically responsible for conflicts with Mexico, the latter having developed water-demanding agriculture for export at the mouth of the river on the Gulf of California (Cortes, 2005; Maganda, 2005). Conversely, along the same border Mexico controls the upstream reach of the Rio Bravo (or Rio Grande) river basin, because of the Rio Conchos sub-basin that concentrates run off from the rainy Western Sierra. The power to retain water during dry years has regularly revived tensions with Texas in spite of an early international water treaty signed in 1944 (Bravo, 2005; Walsh, 2004). Both cases required the intervention of the two presidents while the problem comes from the management of a particular dam, farming reclamation releasing highly saline water or the diversion of water in dry periods by farmers upstream.

The relatively small Cuitzeo basin (Table 6.1) provides another example of conflicts caused by deforestation that resulted in erosion and silting of the reservoirs, pollution from a paper mill and sewage from the state capital of Michoacán, diversions for irrigation with polluted water and agricultural pollution itself. The fate of the second biggest lake in the country located downstream, as well as the fate of fishermen, depends on the water uses in the entire basin and their regulation (Marie et al, 2005). An additional difficulty for negotiators is defining the limits of this type of lake. Indeed, Lake Cuitzeo is considered to be shallow with an average depth of 1.4m and a maximum of 3m. Depending on whether the year is dry or wet, it can flood its banks or retract dramatically due to natural causes. Human activities accentuate this imbalance and we will examine how the river basin council failed to solve the widespread crisis that overtook the region.

Table 6.1 Surface area of river basins in Mexico

River basins	Surface area (km ²)
Cuitzeo	4200
Ayuquila-Armeria	9800
Lerma Chapala	54,000
Grijalva-Usumacinta	91,000
Colorado	632,000
Rio Grande/Bravo	920,000

Interests and limits of the standard model

The standard model synthesizes the common interpretation of the poor functioning of Mexican *consejos*. In considering this model, we take into account different studies as well as opinions gathered through surveys and interviews, which rest on a simplified description of governance in the *consejos* and result in an interpretation emphasizing the role of the administration. In this section, we show that many *consejos* follow this pattern, but not all. First, we show that the law did not design participation as a countervailing power to the federal water agency.

The 1992 federal water law created the *consejos de cuencas* as advisory organizations. The purpose was to improve not only the different facets of water management, but also to tackle particular issues decided by the public authorities. In general, these hot issues relate to an apportionment of water rights for new environmental, urban or industrial needs. The federal water administration established and, since their inception, has chaired them. The *consejos* have to be consulted even though the final decision remains the sole responsibility of the federal agency. Moreover, the administration frequently co-opts the representatives of each water use, who sit beside the representatives of the governors. The *consejos* have no financial autonomy, not even to refund the expenses engaged by the representatives when they attend a meeting, and even less to launch projects or research as an aid for decision-making. Only civil servants have their expenses refunded. Had the legislators wished to create a façade without reducing the power of the administration, this would have been the method they would have selected.

As shown in different *consejos*, the federal administration controls the entire proceedings of the *consejos de cuenca* and government officials decide the agenda of the meetings. They sometimes cancel meetings without previous warning, showing little respect for the representatives of civil society and reinforcing feelings of rejection. Meetings are usually infrequent, although they have not completely disappeared thanks to the renewal of representatives and the possibility of obtaining knowledge or funding from water management plans. Depending on the civil servants concerned, it can happen that some discussions deal with a schedule of investments.

Such routine authoritarianism, typical of an administration with no checks and balances, cannot usually be resisted by non-organized and often dependent actors (mayors, state administration, user representatives). Such situations affect approximately 50 per cent of the *consejos* in Mexico. Using approximate figures originating from our experience and the nationwide assessment of *consejos* mentioned above, we try to characterize the effectiveness of participation in a simplified way with measurable elements, as well as with the subjective concept of conflict (Table 6.2). The frequency of meetings, their attendance, the openness of membership and the particular role of the government staff depend on the life stage of a *consejo*, so that such figures can be misleading. We prefer to pay attention to the formal aspects only for Levels 1 and 2 and to give emphasis to the presence of conflicts for Levels 3 and 4.

Table 6.2 Scale of participation

Level	Features
1	preliminary or intermittent meetings
2	regular meetings over a period of several years but with no conflict between representatives, and no group decisions made
3	regular meetings, open conflict and difficulties in decision-making; or limited conflict when a group decision is the result of previously allocated funding
4	group decisions are actually enforced

Whereas *consejos* were created throughout Mexico by administrative decision, commissions and committees were created as the result of local initiatives (government or local society). A commission is an organization for a sub-basin and a committee is local. Several *consejos*, commissions or committees were sometimes created in response to a conflict, the implementation of a development programme or the allocation of a budget. After the end of the emergency or crisis from which the organization had originated and many meetings, the organization stopped working, as was the case of the Conchos River basin commission created at the time of the dispute with the United States. Other examples are the Apatlaco River basin organization in the state of Morelos, which was created to find a solution for the high levels of pollutants that were causing conflicts and the Cañada de Madero committee, which disappeared after social unrest due to the inability of the organization to deal with such problems.

In Mexico, we have not been able to find any example of Level 4, namely an enforced decision able to solve the problem for which the participation took place.⁵ Fifty per cent corresponds to Levels 1 and 2 (roughly 20 per cent for Level 1 and 30 per cent for Level 2) for which participation is a mere façade controlled by the government agency. The remaining 50 per cent corresponds to Level 3. This estimate is optimistic due to the disappearance of a number of councils. Studies mentioned in Table 6.3 show that effective participation where antagonistic segments in the population have a voice almost inevitably leads to open conflict. As a result, a conflict becomes an indicator of Level 3 or actual participation.

Finally, our four-level categorization prompts discussion on the interactions between participation, conflict and the enforcement of any joint decision, as in the case of the Rio Bravo after the 2002 controversy or the cases of the Valley of Mexico City and the Balsas *consejos*. Instigated by the governor of Texas, the first dispute led the Mexican and US Presidents to sign an agreement to force peace by financing modernized irrigation in the upstream Mexican reach of Rio Bravo so that farmers would agree to give back part of the water they saved. The North American Development Bank asked for a participation clause under the control of the Border Environment Cooperation Commission (BECC). During the meetings, farmers did ask key

Table 6.3 Assessment of participation in some river basin organizations in Mexico

<i>Consejo</i>	Participation	Source
Ayuquila	2	André de la Porte, 2007
Costa de Chiapas	2	Vera, 2005
Grijalva-Usumacinta	2	Kauffer, 2005
Cuitzeo ^{(1)(*)}	2	Peña de Paz, 2005; Marie et al, 2005
Cañada de Madero ^(*)	2	López and Martínez, 2005
Lerma Chapala	3	Mollard and Vargas, 2005; Sandoval and Navarrete, 2005
Rio Bravo	3	Bravo, 2005
Papaloapan	3	Murillo and López, 2005
Colorado	3	Castro and Sánchez, 2005; Cortes, 2005

* No longer exists ** Project of a consejo

questions about the volume and the destination of saved water but the Federal Water Agency evaded the concerns. In this case, farmers' approval was determined by substantial funding, which avoided potential conflict on the future use of saved water. In spite of the positive opinion of the BECC on the formal participatory process led by the federal administration, we consider that the level of participation cannot be rated as Level 4 due to the absence of co-decisions, money being secured only with façade participation (Mollard and Vargas, 2006). The absence of conflict could even diminish the grade to Level 2. In the *consejos* of the Valley of Mexico City and Balsas, the conflicts on water were so intense that they had to be solved by political means outside the scope of the *consejos*. In both cases, participation has not been conflictive because hot issues were not discussed (Perló and González, 2005; Vargas, 2006).

The practices of the administration that are frequently cited confirm not only the participatory façade but also an unsuspected and perverse effect in that it not only deceives the public but also national and foreign observers. In the Grijalva-Usumacinta *consejo de cuenca*,⁶ Edith Kauffer (2005) identified a political discontinuity with the construction of two separate master plans for each state in the sole Grijalva basin, as well as the systematic agreement given to administration-led projects. In the Chiapas *consejo*, which jointly represents the small coastal basins between the mountains and the ocean, the representatives of water users were wary of the administration and supposed that the purpose of the *consejo* was to legalize water uses and to apply a water tax (Vera, 2005). It is possible that an error was made by the government official in charge of the *consejo*, but it is also possible that the federal administration was testing the reaction of a minor *consejo* to this type of strategy; in either case, the representatives of civil society were not encouraged

to work with the administration. Because of the many difficulties encountered, the frequency of the meetings dropped and fewer and fewer representatives attended. However, in this particular case, the administration-driven *consejos* succeeded in avoiding self-disbandment, which happened in Cuitzeo, as discussed in the next section.

The standard model correctly indicates that the *consejos de cuencas* are a failure resulting in lack of interest and discredit. The law did not want to or could not curb the power of the administration with any form of countervailing participation, probably due to the fact that any government agency is more prone to accept political instructions than uneasy and unpredictable citizens, who are considered by the political elite as being irrational, poorly informed or unskilled and having little knowledge about water culture. In its defence, one should not forget that for several decades, the one-party regime was crippled by corruption and personalized negotiations. Devolving power would have been a risk as many of the fractures in Mexican society, including in water management, could have deepened markedly. Indeed, the country has never had an open and legal way of resolving conflicts or institutionalizing social fractures except through corruption and clientelist agreements (see below) between local politicians, federal officials and territorial or corporate cacique-styled leaders (local political bosses). With the change to a multiparty system in recent years, the main drivers of the country have still not changed and it is unlikely that the *consejos* will change in the future.

Methodological limits of the standard model

The standard model suggests a lack of social participation for every *consejo de cuenca* and deduces that the administration is to blame. However, as we will see in the enriched model, an effective level of participation (50 per cent of the cases) has not alleviated the environmental crisis so far. Neither does the *consejo de cuenca* function better when the federal administration is excluded, as shown by the Cuitzeo *consejo*. The same is true of municipal management and some aquifer committees where participation failed even when the central administration was not represented (López et al, 2004). These two elements reveal the weaknesses of the standard model, which is unable to take into account the general failure of *consejos* and other participatory forums even if the federal water agency is missing.

The weakness of the standard model lies in the fact that careful examination stops at an *ex-post* description of a negotiation through records of meetings and interviews with direct stakeholders. It is thus impossible to identify who controls the key decision-making processes or to identify the social powers within the political governance. The solution recommended by the standard model, that is, more information and participation with less administration (Kauffer, 2005; Vera, 2005), is not well founded and is likely to be wrong.

As a result, the standard model of analysis overestimates the importance of speeches when practices would more accurately reveal the aims and the leeway of each actor, and when processes generated during the social interaction are the key elements in policy studies (Walley et al, 2007). The analysis of one actor's practices is not enough because speeches by other actors can reveal accusations directed at others. For example, in water conflicts it may not be easy to distinguish between the farmers who are widely assumed to waste irrigation water, the brokers who steal from the farmers, the politicians who do not work for the public good and the civil servants who are supposed to act contrary to the interests of the citizenry.

In addition, the concluding statement of the standard model 'more information and more participation' is in line with international doctrines such as good governance or integrated water resource management (Mollard, 2007a; Mollard and Vargas, 2005). Such convergence with ready-to-use maxims confirms the standard paradigm, but overlooks in-depth approaches that challenge action-oriented doctrines and systematically exclude the power dimension in negotiations.

To appreciate the political dimension of negotiations, that is the asymmetry of powers and over-determination imposed on the outcomes independently of the negotiating methods, it is necessary to identify social processes. It is then possible to look beyond appearances, for example, those of the supposed super power of the administration or those presented in actors' justifications.

The standard model of participation for *consejos de cuenca* is an apolitical model as long as it does not recognize contesting powers and their determining influence on the outcomes. This model is in line with research on management tools to promote and improve dialogues in accordance with formal international doctrines. Unaware of the social processes and the ability of organized actors to appropriate or hijack such doctrines, the risk is that organized actors acquire additional legitimacy by an appropriation of such apolitical doctrines. This kind of doctrine could then be counterproductive for public action and for solving environmental problems because such a scientific coalition between international doctrines, action-oriented disciplines and the standard model of governance builds a system of cross-legitimacy, which strengthens traditional coalitions between administration, political representatives and organized corporations, which are the very factors that lead to stalemate in negotiation processes.

Disciplinary fragmentation, superficial doctrines and the lack of a general theory capable of situating actors' practices and speeches within social and political systems are some of the many difficulties involved in going beyond the standard model. When territorial and institutional powers and their asymmetry (which continue after institutional and regime changes) remain undetected, this type of analysis is necessarily incomplete.

The Enriched Model of Social Participation

The standard model of interpretation of the *consejos* accurately shows that social participation is a façade behind which nothing has changed, confirming ‘the more it changes, the more it remains the same’ as Helen Ingram wrote in 1990 on water issues. However, the standard model is mistaken when it states that effective participation is the solution to environmental crises as we see it now. By incorporating the political dimension underlying the interplay between actors, the enriched model shows that participation implies a set of prerequisites that are seldom met, such as an operative, independent administration.

Political processes are varied and take place at different scales outside negotiations, including at the international level as seen for the doctrines mentioned above. To characterize some typical processes leading to stalemate in environmental negotiations, organizations in three river basins are examined that reflect a range of political dynamics: institutional innovation vis-à-vis the inadequacy of the official *consejo*, the political dependence of actors and inadequate representativeness and conflict politicization, which make it more difficult to bring antagonistic parties together.

Ayuquila-Armeria: diverting attention from genuine concerns

The commission of the Ayuquila-Armeria river basin belongs to the Middle Pacific Committee, which is co-chaired by the governors of Colima and Jalisco and the federal water administration (Silva, 2008). The commission discusses global diagnoses and management plans by avoiding important concerns, like the illegality of industrial and municipal effluents. Rather than enforcing the law, management plans are based on the multiplication of wastewater treatment plants. Indeed promising a better future is a way to stop social unrest among those who suffer from the poor quality of the river, while the first plants built still do not function at all or operate at a reduced capacity (Reynolds, 2002). Vacuous discussions that take place in the basin commission are not politically neutral because they enable the administration to avoid any confrontation with local authorities, in particular large municipalities that are unwilling to finance wastewater treatment, even though wastewater effluents are illegal. In other words, the administration decides on the agenda, focuses on diagnoses and management plans and recommends building new treatment plants to avoid the issue of simply applying the law and making existing treatment plants work.

Faced with deadlock by a local coalition that prevented an effective solution from being found, local organizations had to be created from scratch. This was the case in an inter-municipal initiative, which took over responsibility for the task allotted to the basin organization, as cited by the mayor of Tuxcacuesco:

I have concentrated on the inter-municipal initiative because in the commission, I know that I can't obtain more concessions, I know I have no right to vote ... There are good intentions but there is a lot of conformity, nothing much can be done. (André de la Porte, 2007)

The initiative unites ten municipalities of the Lower Ayuquila and was supported by academics of the state university. This organization made it possible to improve the quality of the river, to create brigades to control forest fires and to promote separation of solid waste to reduce pollution by seepage.

The official commission functions poorly and concrete outcomes are rare in spite of top-level meetings. Members endorse the agendas decided on by federal representatives and each representative seeks to obtain subsidies without playing the role of a simple citizen, that is demanding law enforcement and sanctions against the municipalities responsible for pollution. Since the river basin committee is controlled by a coalition linking mayors, governors and the federal administration, it can prevent application of the law and the emergence of initiatives within the official commission. It is itself in a position of stalemate and this encourages civil society to innovate outside, as happened with the inter-municipal initiative. In this case, it is worth noting the position of the administration in the coalition siding with the mayors.

Cuitzeo: political dependency

The Cuitzeo basin is a closed basin without outlets. The downstream lake, which acts as a natural regulator, has inevitably become the indicator of the social management of water in the whole basin, an indicator that varies depending on whether the riparian residents suffer from floods or the fishermen from dramatic drying out and pollution.

The problems in the river basins are well known and so are their solutions: treating urban and industrial effluents and building small dams within the lake to ensure the durability of parts of the lake, all of which can be implemented at a reasonable cost. But simple solutions were too costly or not attractive from an electoral standpoint, prompting the governor to create a basin commission under his control. In 1997, he emphasized the benefits of the *consejo de cuenca* for the environment and for economic development, adding that the involvement of civil society is the key issue in finding solutions: 'for Michoacán the moment had come to make this new stage of undeniable democracy profitable' (Peña de Paz, 2005). It should be noted that this statement was made after regional unrest caused by the scientific discovery that the fish in the lake were inedible due to contamination.

Three main facts distinguish the dynamics of this *consejo*:

- the federal administration was excluded (it did not recognize the legality of the *consejo* but sent an observer);
- development and environment were linked;

- the representatives of the *consejo* were mayors but there were no representatives of water uses, who, according to the governor, would have been unable to address the development aspect.

The *consejo* was made up of 13 mayors and 20 federal and state civil servants. Thus, it was in line with the World Water Council (2004), which states that water has to be a policy issue and directly involve authorities. However, although the provision appears to be based on common sense, it does not take into account the social processes of politicization, whereby a powerful actor facing few countervailing powers can make any organization an instrument for his own interest. Initially, enthusiasm was reflected in the many meetings that were held, and in the discussions to find solutions. But the mayors' dependency on the governor (since subsidies come directly from the state or in the case of federal programmes due to state mediation) prevented them from dealing with truly significant issues and led to 'the traditional petitioner's requests ... for treatment plants, cleaning of canals, support for constructions, fish farms, fishing nets, etc.' (Peña de Paz, 2005). In other words, people drew up a list of projects at municipal level, but nothing that would solve the overall problems of the basin, and did not create an inter-municipal initiative, such as Ayuquila-Armeria. They even did not make a simple request to enforce the law on wastewater, which in itself would have sufficed to protect fishing activities.

Peña de Paz (2005) is right in underscoring the traditional character of the social relations, but what drives such permanence within participatory organizations? The bond between the governor and the mayors is a bond of dependence that prevents disputes and hence prevents any solution being found for real problems. The error the governor made in trying to turn participation to his advantage was to reveal how his state had been functioning through political bonds and clientelist negotiations with the aim of controlling and obtaining support from the electorate. Indeed the mayors' financial dependence allowed the governor to give preferential support to certain mayors, so that the new participatory approach flagrantly globalized municipal demands when no mayor showed any interest either in the environment or in an inter-municipal initiative. Indeed, the only group initiative was to dismiss themselves when, after many ineffective meetings, they realized there would not be enough money to share. This decision clearly demonstrated their independence from the federal administration because no other administration-run *consejo* has been able to disband itself. Consequently, the absence of the federal administration means that the latter cannot be necessarily blamed.

Lerma Chapala: the heightening of antagonisms

The *consejo* of the Lerma Chapala river basin represents an exceptional case of full participatory negotiation because of the struggle between two governors around the survival of the largest natural lake in Mexico. The lake had lost

more than 90 per cent of its volume between 1980 and 2003 due to excessive diversion for irrigation and domestic water for four million people. The hydrological imbalance was accentuated by a rainfall deficit since 1980 (Wester et al, 2008).

The purpose of the *consejo de cuenca* was to restore the lake to a satisfactory level. The *consejo* met twice: in 1991, when the first surface water allocation agreement was passed but never enforced, and in 2003, when the lake was about to disappear. One of the successes of the process was a hydrological model (Güitrón et al, 2004) validated by all the negotiators, which rapidly resulted in the exclusion of the two most extreme requests: to maintain the lake at its maximum level and not to allow a drop in the lake before the dams had been filled with water.

The *consejo de cuenca* is organized around a monitoring and evaluation group (MEG) chaired by the federal water administration and composed of five governors and the representatives of six types of water use. As there are no general elections, but only the announcement of an assembly, few people attend. The representative of each use is co-opted in his state then elected by a restricted committee made up of the representatives of each state under the close scrutiny of the federal administration. Among different technical committees (water quality, for example), the group for management and distribution (GMD) is the most important due to the significance of rescuing the lake. As the *consejo* has no money of its own, each party has state-paid experts, who are either civil servants from the state administration or private consultants. The GMD evaluated different scenarios and their impact on the probable levels of the lake using a data-processing model provided by a Mexican research institute.

In 2003 and 2004, the GMD met regularly, sometimes every 15 days, and, at the end of 2004, all the governors signed an agreement. In spite of this apparently favourable conclusion, as mentioned above, the Lerma Chapala *consejo* only reached Level 3 for participation because of the lack of an enforceable agreement. Indeed, it is based on goodwill and revisable every year, meaning that in reality, no agreement had been reached at all.

On the one hand the negotiation was characterized by the absence of negative attitudes (everyone played his assigned role, including the administration's negotiators). It was a serious negotiation with a battle between specialists in hydrology within the GMD under the close scrutiny of the users' representative-based MEG. On the other hand, it revealed the processes responsible for deepening existing antagonisms. Any improvement of the dialogue would not have altered the final result given the power structure and the limited room for manoeuvre of the different actors. Such an external support would perhaps have modified the preliminary stages and provisionally reduced antagonisms, but it could not have influenced traditional, coalition-joined powers.

The politicians' leeway was limited by the need to avoid a mass demonstration, in particular by farmers. The peasant leaders' leeway was also

limited as will be seen below. The farmers' resistance in the face of the risk of having their water rights reduced could have ultimately turned into violence with occupation of the dams or kidnapping of civil servants. This potential for violence hovered over the negotiation and made obtaining the farmers' agreement indispensable.

The power structure (obviously not in the hands of the administration), as well as the clientelist way of dealing with conflicts (as exposed in the Cuitzeo *consejo*), meant the outcome of the negotiation was foreseeable. However, two particular processes (politicization and the place of the leaders) rendered the negotiation process harder and making protection of the lake more improbable.

The politicization of the conflict, that is, the partisan involvement of the political authorities, illustrates the absence of checks and balances applicable to the governors, which had the effect of reinforcing antagonisms. The conflict opposed Guanajuato and the farmers, who are large-scale consumers of irrigation water in the central part of the basin, on one hand, and the state of Jalisco downstream where Lake Chapala and Guadalajara city are located, on the other hand. The controversy thus placed the governors of the two states in direct opposition.

The politicization started in Jalisco where the governor took a conveniently ecological attitude, although Jalisco spent much less on the environment than the other four states (INE, 2003). The governor specifically attacked farmers in Guanajuato although Guadalajara also pumps a large quantity of water from the lake (200 million m³). The governor of Guanajuato appears to have felt trapped and his speeches antagonized both farmers and ecologists. Even though the two governors belonged to the same political party, neither the president nor the party head was able to calm down matters.

Politicization heightened existing antagonisms, particularly between farmers. Indeed, the water controversy became a conflict between authorities, and the farmers interpreted it as a moral justification for their arguments. They could ask for more, give up nothing and fight to the bitter end. They were not anti-lake, but defended their vital interests by arguing the natural variation in the level that had existed previously. At the GMD, governor-appointed experts criticized the hydrological database and the computational model and called for new knowledge and new models. In the Lerma-Chapala basin, the increase in difficulties is directly due to governors who acted without checks and balances. The governor of Guanajuato exemplified this all-or-nothing attitude when he initially managed the controversy neutrally and then became the main party in the dispute.

The second toughening process analysed in the enriched model is the choice of a leader within any social group. Although co-optation is a common practice that allows the administration to control social participation in the *consejos*, the federal water administration lost its opportunity as one leader had regional legitimacy vis-à-vis one governor and the farmers. The agriculture

representative was a democratically elected president of the largest irrigation district, which covers more than 100,000ha. Although legitimate, a representative cannot really negotiate on behalf of the farmers; he can receive but not give away (for example, give back part of the water that is saved in exchange for the technical and financial support required to save it). As soon as he makes concessions on agricultural water rights, he can be disqualified even by a minority within the farmers' organization. He may then be replaced, either with a more demagogic, tough leader using the argument that the representative lacked legitimacy, or simply due to violence if the minority invades a dam. As the challenger nearly became the regional leader, the fear of losing control of the peasant unrest led many, including the authorities, to advise the legitimate leader to take the lead in the fractious movement and preserve the gains of the negotiation.

The model enriched with politics incorporates toughening processes, such as politicization in a controversy that encourages conflicts between authorities, or difficulties in leadership, as described above. As a result, this analytical model shows that participation will not be able to solve the environmental crises without modifying the power of the traditional coalition in spite of skilled staff and goodwill, as the different stages of the negotiation testify. Participation requires certain preconditions to be fulfilled and these seem to be lacking in Mexico.

Towards a Model of Environmental Democracy

In Mexico, the federal water agency has the legal power to make decisions on everything related to water, which it has misused on many occasions. But when confronted with a major conflict, the administration shows how dependent it is on elected representatives. This traditional coalition is based not only on opportunistic interests, but also on dependence. It is also true of farmers and mayors associated with the governor-administration duo. The assumption of the necessary independence of actors for an efficient public action is clearly revealed in the governance of *consejos*. In other words, insufficient regulation or lack of countervailing powers hinders the achievement of social participation. By regulation we mean, more specifically, cross regulation, a concept we will now discuss before drawing conclusions about its implications in Mexico and for environmental democracy.

As far back as the 1970s, some researchers questioned the exclusive use of organizational charts, formal hierarchies and institutions to analyse the governability in a company or a government agency (Crozier, 1977). In spite of institutional changes the power structure is sufficiently solid to resist, as it was during the introduction of regional jurisdictions in France or the end of the one-party regime in Mexico. To characterize this governance of powers, Crozier and Thoenig (1975) proposed the concept of cross regulation, which is based on the interdependence of the elective and bureaucratic channels from Parisian centralism to the mayors of small

municipalities, especially before decentralization in the 1990s. Elected representatives and federal officials at each level needed one another and cooperation was essential to obtain a subsidy for a local project. The elected official relied on the administrative expert while the expert could get beyond the compartmentalization of government departments only through the elected officials.

Cross regulation at this period had shortcomings: secrecy, favouritism, top-down style and fear of public opinion. However, the concept reveals a smooth way for cross regulating powers by introducing a balance between central regulation and democracy. Cross regulation rested on two pillars that are absent in Mexico: independence and legitimacy. Independence for each actor produces collective interdependence, and legitimacy built up over time reinforces collective trust in institutions.

Our analysis of the *consejos de cuenca* underlined the strong asymmetry in powers, such as the coalition between the administration and the mayors in Ayuquila-Armeria, the dependence of mayors on the governor in Cuitzeo and the mere existence of governors in Lerma-Chapala. The mobilization of peasants represents disproportionate power vis-à-vis weak institutions at the price of violence if necessary, so governors have to take this seriously and prefer to share interests. Conversely, for farmers the coalition represents not only a form of interest sharing (in order to access government programmes) or the subjection of dependents but also a form of protection, which is accentuated when trust in institutions is missing. In Mexico, coalitions make the power highly asymmetric due to these different processes. The assessment of this imbalance leads us to examine some forms of regulation so that the independence of decision-makers could produce collective interdependence while avoiding a drift towards secrecy and favouritism.

The general process is the following: defective regulation of social powers generates asymmetry, which, in its turn, is accentuated by the mechanisms of coalition building. This is evidenced through the aggregation of dependents, the self-centred behaviour of power holders due to the absence of counter powers, and the need for protection when institutions are weak. Other processes influence the difficulties inherent in the exercise of participation. The identification of these processes through future research will help build a theoretical framework linking the environment and democracy. Perhaps such a political approach will put an end to normative doctrines – national or international – that are appropriated locally for their own interests by traditional coalitions. From a political standpoint, the role of international organizations and their doctrines has to be thoroughly studied too because this instrumentalization can be counterproductive to mitigating environmental crises in developing countries. To summarize, cross legitimacy between doctrines and traditional coalitions could be an evil to be rid of, whereas cross-regulations of traditional powers still has to be invented.

Notes

- 1 For the management of aquifers see Mollard et al, 2006.
- 2 Since 1989, the federal water agency has been the National Water Commission (CNA).
- 3 For the position in France see Mollard, 2007b.
- 4 With the exception of inter-basin transfers.
- 5 In a few cases, the *consejo* was able to find an enforced solution without conflict (industrial plants treating effluents), but was unable to manage further conflicts as occurred in Cañada de Madero.
- 6 This big *consejo* unites two large independent river basins and, purposely or not, makes the Chiapas Indians a minority.

References

- Aboites, L. (1998) *El Agua de la nación. Una Historia Política de México (1888–1946)*, CIESAS, Mexico City
- André de la Porte, C. (2007) 'Integrated water resources management: limits and potential in the municipality of El Grullo, Mexico', Master's thesis EPFL3735, Lausanne
- Bobbio, N. (1996) *El Futuro de la Democracia*, FCE, Mexico
- Bravo, G. (2005) 'Esquemas de participación comunitaria en la cuenca del Rio Grande/Bravo', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp356–367
- Castro Ruiz, J. L. and Sánchez Munguía, V. (2005) 'La experiencia de un consejo de cuenca en un contexto binacional: el consejo de cuenca de Baja California', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp316–330
- Cortes Lara, A. (2005) 'Hacia una gestión binacional de las aguas transfronterizas en la cuenca del rio Colorado', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp331–355
- Crozier, M. (in collaboration with Erhard Friedberg) (1977) *L'Acteur et le Système*, Le Seuil, Paris
- Crozier, M. and Thoenig, J. C. (1975) 'La régulation des systèmes organisés complexes', *Revue Française de Sociologie*, vol 16, no 1, pp3–32
- Foyer, J. (2003) *Complexification des Conflits Sociaux au Mexique : l'Exemple du Conflit Socio-Environnemental autour de la Réserve de Montes Azules, Chiapa*, Institut des Hautes Etudes de l'Amérique Latine, Université de la Sorbonne Nouvelle III, Paris
- Güitrón, A., Mollard, E. and Vargas, S. (2004) 'Models and negotiations in water management', *Proceedings from the Mexican Experience, IFAC Workshop on Modeling and Control for Participatory Planning and Managing Water Systems*, www.elet.polimi.it/IFAC_TC_Environment/Venice2004/poster/3v04mollard.pdf
- INE (2003) 'Diagnóstico biofísico y socio-económico de la cuenca Lerma-Chapala', www.ine.gob.mx/dgoece/cuencas/download/res_ejecutivo.pdf, accessed December 2008.

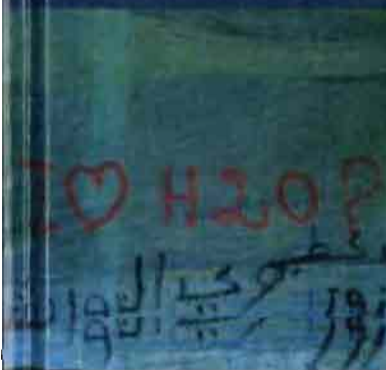
- Ingram, H. (1990) *Water Politics: Continuity and Change*, University of New Mexico Press, Albuquerque, NM
- Jaubert de Passa, F. (1846) *Recherches sur les Arrosages chez les Peuples Anciens*, 1981 reprint, 4 vols, Éditions d'Aujourd'hui, Grenoble, France
- Kauffer Michel, E. F. (2005) 'El consejo de cuenca de los ríos Usumacinta y Grijalva: los retos para concretar la participación y la perspectiva de cuencas', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp195–218
- Kloezen, W. (2002) 'Accounting for water: institutional viability and impacts of market-oriented irrigation interventions in central Mexico', PhD dissertation, Wageningen University, Wageningen, The Netherlands
- López, E., Marañón, B., Mollard, E., Murillo, D., Romero, R., Soares, D., Vargas, S. and Wester, P. (2004) 'Le gouvernement de l'eau au Mexique: légitimité perdue et régulation en transition', in A. M. Rivière-Honeger and T. Ruf (eds) *La Gestion Sociale de l'Eau: Concepts, Méthode et Application*, Territoires en Mutation 12, Université Paul-Valéry, pp223–243
- López Ramírez, E. and Martínez Ruiz, J. (2005) 'Actores sociales y conflictos por el agua en la microcuenca Cañada de Madero', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp155–171
- Maganda, C. (2005) 'Collateral damage: how the San Diego-Imperial Valley Water Agreement affects the Mexican side of the border', *Journal of Environment & Development*, vol 14, no 4, pp486–506
- Marie, P., Mollard, E. and Vargas, S. (2005) 'Cuitzeo, una cuenca a escala humana. Conflictos, fracasos, porvenir', in S. Vargas and E. Mollard (eds) *Los Retos del Agua en la Cuenca Lerma-Chapala. Aportes para su Estudio y Discusión*, IMTA-IRD, Jiutepec, Morelos, Mexico, pp226–248
- Massardier, G. (2003) *Politiques et Actions Publiques*, A. Colin, Paris
- Mollard, E. (2007a) *Les Pratiques Internationales Exemplaires dans le Domaine de l'Eau. Qui Doit Apprendre?*, IRD, Montpellier, pp12
- Mollard, E. (2007b) 'Jeux de pouvoir dans les négociations environnementales. Intérêts, portée et questionnement du cadre analytique de la gouvernance à partir du cas mexicain', in *La gouvernance: vers un cadre conceptuel*, IUED, Geneva (unpublished), pp12
- Mollard, E. and Vargas S. (2005) '¿A quién preocupa la gestión integrada del agua? Entre indiferencia social y utopía peligros', II Congreso Iberoamericano Sobre Desarrollo y Medio Ambiente, 26 October, Puebla, México, www.iiec.unam.mx/CIDMA2005/interiores/Memorias_Cidma2005.pdf
- Mollard, E. and Vargas, S. (2006) 'La participation sociale dans la gestion des ressources naturelles. Premier bilan pour l'eau au Mexique', Colloquium GECOREV Gestion concertée des ressources naturelles et de l'environnement, Université de Versailles-St-Quentin-en-Yvelines, 27 June
- Mollard, E., Vargas, S. and Wester, P. (2006) *The Lerma-Chapala Basin, Mexico. Report for the Comprehensive Assessment of Water Management in Agriculture, Comparative Study on River Basin Development and Management*, IWML, IRD-IMTA and Wageningen University, Wageningen, The Netherlands

- Murillo Licea, D. and López Ramírez, E. (2005) 'Organización social y producción en la cuenca del río Papaloapan', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp245–275
- Palerm, V. J. (2005) 'Políticas del estado en la administración y gobierno de sistemas de riego y redes hidráulicas', in J. M. Durán, M. Sánchez and A. Escobar (eds) *El Agua en la Historia de México*, Centro Universitario de Ciencias Sociales y Humanidades/Universidad de Guadalajara y El Colegio de Michoacán, Mexico, pp263–289
- Peña de Paz, F. (2005) 'Espejismos en el lago de Cuitzeo. ¿Participación social en la gestión del agua?', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp103–127
- Perló Cohen, M. and González Reynoso, A. (2005) *¿Guerra por el Agua en el Valle de México? Estudio sobre las Relaciones Hidráulicas entre el Distrito Federal y el Estado de México*, unpublished document from Universidad Nacional Autónoma de México-Coordinación de Humanidades/Programa Universitario de Estudios sobre la Ciudad, Friedrich Ebert Stiftung
- Rap, E. (2004) 'The success of a policy model: irrigation management transfer in Mexico', PhD dissertation, Wageningen University, Wageningen, The Netherlands
- Rap, E., Wester, P. and Pérez-Prado L. N. (2004) 'The politics of creating commitment: irrigation reforms and the reconstitution of the hydraulic bureaucracy in Mexico', in P. P. Mollinga and A. Bolding (eds) *The Politics of Irrigation Reform: Contested Policy Formulation and Implementation in Asia, Africa and Latin America*, Ashgate, Aldershot, pp57–94
- Reynolds, K. A. (2002) 'Tratamiento de aguas residuales en Latinoamérica. Identificación del problema', www.agualatinoamerica.com/docs/PDF/DeLaLaveSepOct02.pdf
- Sabatier, P. and Schlager, E. (2000) 'Les approches cognitives des politiques publiques: perspectives américaines', *Revue française de sciences politiques*, vol 50, no 2, pp209–234
- Sandoval Minero, R. and Navarrete Ramírez, A. (2005) 'El reto de consolidar la participación social en la gestión integral del agua. El caso de la cuenca Lerma Chapala', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp52–63
- Silva, P. (2008) 'Small-scale irrigation systems in an IWRM context: the Ayuquila-Armería basin commission experience', *International Journal of Water Resources Development*, vol 24, no 1, pp75–89
- Vargas, S. (2006) 'Los conflictos y la gestión del agua en la cuenca del río Amacuzac: notas para la implementación de un proceso de abajo hacia arriba', in S. Vargas, D. Soares and B. Nohora (eds) *La Gestión del Agua en la Cuenca del Río Amacuzac: Diagnóstico, Reflexiones y Desafíos*, Instituto Mexicano de Tecnología del Agua, Universidad Autónoma del Estado de Morelos, Jiutepec, Morelos, Mexico, pp23–46
- Vargas, S. and Mollard, E. (2005) 'Contradicción entre las expectativas ambientales de los agricultores y la defensa de sus intereses en la cuenca Lerma-Chapala' in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias*

- Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp64–82
- Vera Cartas, J. (2005) 'Participación, consejos de cuenca y política hidráulica mexicana: el caso de la costa de Chiapas', in S. Vargas and E. Mollard (eds) *Problemas Socio-Ambientales y Experiencias Organizativas en las Cuencas de México*, IRD-IMTA, Jiutepec, Morelos, Mexico, pp276
- Walley, J., Amir Khan, S., Karam, S., Witter, S. and Xiaolin, W. (2007) 'How to get research into practice: first get practice into research', *Bulletin of the World Health Organization*, vol 85, no 6, pp424–425
- Walsh, C. (2004) 'Agua Broncas: the regional political ecology of water conflict in the Mexico–U.S. Borderlands', *Journal of Political Ecology*, vol 11, pp43–58
- Wester, P., Merrey, D. J. and de Lange, M. (2003) 'Boundaries of consent: stakeholder representation in river basin management in Mexico and South Africa', *World Development*, vol 31, no 5, pp797–812
- Wester, P., Vargas, S., Mollard, E. and Silva-Ochoa, P. (2008) 'Negotiating surface water allocations to achieve a soft landing in the closed Lerma-Chapala basin, Mexico', *International Journal of Water Resources Development*, vol 24, no 2, pp275–288
- Wolf, A. (2003) 'Conflict and cooperation: survey of the past and reflection for the future', in F. A. Hassan, M. Reuss, J. Trottier, C. Bernhardt, A. T. Wolf, J. Mohamed-Katerere and P. van der Zaag (eds) *History and Future of Shared Water Resources*, IHP Technical Documents, PCCP series no 6, UNESCO, Paris, http://webworld.unesco.org/water/wwap/pccp/cd/history_future_shared_water_resources/survey_water_conflicts_cooperation.pdf
- World Water Council (2004) 'International Conference on Water and Politics', www.worldwatercouncil.org/fileadmin/wwc/Library/Publications_and_reports/Proceedings_Water_Politics/proceedings_waterpol_full_document.pdf

Social Participation in Water Governance and Management

Critical and Global Perspectives



Edited by Kate A. Berry and Eric Mollard

Social Participation in Water Governance and Management

Critical and Global Perspectives

Edited by

Kate A. Berry and Eric Mollard

earthscan

publishing for a sustainable future

London • Sterling, VA

First published by Earthscan in the UK and USA in 2010

Copyright © Kate A. Berry and Eric Mollard, 2010

All rights reserved

ISBN: 978-1-84407-885-1

Typeset by FiSH Books, Enfield
Cover design by Dan Bramall

For a full list of publications please contact:

Earthscan
Dunstan House
14a St Cross St
London, EC1N 8XA, UK
Tel: +44 (0)20 7841 1930
Fax: +44 (0)20 7242 1474
Email: earthinfo@earthscan.co.uk
Web: www.earthscan.co.uk

22883 Quicksilver Drive, Sterling, VA 20166-2012, USA

Earthscan publishes in association with the International Institute for Environment and Development

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data has been applied for

At Earthscan we strive to minimize our environmental impacts and carbon footprint through reducing waste, recycling and offsetting our CO₂ emissions, including those created through publication of this book. For more details of our environmental policy, see www.earthscan.co.uk

This book was printed in the UK by TJ International, an ISO 14001 accredited company. The paper used is FSC certified and the inks are vegetable based.

