

Adaptation and the state: Latin America and the challenge of capacity-building under globalization

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Received 4 March 2005; received in revised form 26 October 2005; accepted 28 October 2005

Abstract

In the managerial discourse of climate change, there are high expectations of nation-state leadership in promoting adaptation. Yet globalization has introduced new challenges for the state not only in terms of managing rapid economic and cultural integration, but also with respect to governance and decision-making, the use of science and information in policy, and the types of problems governments are called upon to address. Through concrete examples of the process of policy-making in Latin American countries, we illustrate not only the continued relevance of the state, but also the complex challenges posed by globalization to state-led adaptation.

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Keywords: Adaptation; Adaptive capacity; Globalization; Governance; Latin America

1. Introduction

Over the last few years, there has been a proliferation of studies focusing on the definition of adaptation to climate change and the most critical factors shaping adaptive capacity. The intrinsic applied nature of adaptation means that much of the burden of action has been increasingly moving from the scientific realm to nation states, multi-lateral and bilateral development organizations, citizen's groups and communities that will be expected to respond to negative impacts of a changing climate. The high uncertainties in climate change scenarios have made improving adaptive capacity—that is, the “potential and capability to change to a more desirable state in the face of the impacts or risks of climate change” (Brooks and Adger, 2004)—an alternative focus of policy efforts, rather than the promotion of particular adaptation options (Smithers and Smit, 1997; Yohe and Tol, 2001).

A review of the adaptation/adaptive capacity literature reveals a growing consensus around the factors believed to

build adaptive capacity such as free flow of ideas, knowledge and technology, more flexible and efficient institutions and governance schemes, policies that enhance human, social and political capital and more equitable flow of resources (Yohe and Tol, 2001; Smithers and Smit, 1997; Brooks and Adger, 2004). Whereas most authors seem to agree on the generic factors leading to adaptive capacity, how this capacity is actually built or enhanced in the context of day-to-day governments remains significantly unspecified. Moreover, while there have been attempts to better understand the impacts of multiple stressors in measuring differential vulnerabilities to climatic change (Handmer et al., 1999; O'Brien and Leichenko, 2000), less attention has been paid to what factors affect the development of adaptive capacity in the political and policy arenas where it will be needed. Indeed this literature has mostly sidestepped the discussion of what makes states more able of designing and implementing policy to increase adaptive capacity especially in the wake of structural transformations triggered by globalization.

We believe that the effects of globalization on the ability of nation states to respond to environmental change can be evaluated through an examination of the ways in which globalization is shaping more general aspects of state capacity. State capacity has been defined as “the ability of

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state leaders to use the agencies of the state to get people in society to do what they want them to do” (Migdal, 1988, p. xi; cited by Fox, 1992). Two other complementary concepts—those of policy capacity and administrative capacity—are germane to the discussions of what enables nation-states to implement policies. Policy capacity is defined as “the ability to marshal the necessary resources to make intelligent collective choices about and set strategic directions for the allocation of scarce resources to public ends”; administrative capacity is defined as the “the ability to manage efficiently the human and physical resources required for delivering the outputs of government” (Painter and Pierre, 2005, p. 2). These capacities are interdependent and iterative and speak directly to the primary functions and responsibilities of nation-states. In this article, we argue that the attributes of adaptive capacity cannot be distinguished from these functions and responsibilities; rather it is through them that capacity to adapt to climate change is realized. However, within the general scope of state capacity, it is possible to pay special attention to those attributes that will be critical to enable adaptation. Whereas, conventionally, the ability of nation-states to build capacity has been predicated in the availability and/or accessibility of political, financial, and human resources (e.g. political power, a professional and competent bureaucracy, financial and technical resources, etc.), only recently have the effects of globalization on state capacity and state capacity building become a focus of research.¹

We hypothesize two general forms of linkages—negative and positive—between state capacity, adaptive capacity, and globalization. First, globalization has introduced new and diverse challenges for the nation state not only in terms of managing rapid economic and cultural integration, but also with respect to governance and decision-making, the use of science and information in policy, and the types of problems governments are called upon to address (Stiglitz, 2003). Globalization may also have further strained the resource basis of nation-states and contributed to growing inequalities, especially in less developed countries (Huber and Solt, 2004; Wade, 2004). Processes such as neoliberal policy and administrative reform and the proliferation of multilateral trade agreements have complicated state action by transferring power both to lower scales of decision-making (decentralization) as well as to the private sector. While decentralization theoretically allows for better decision-making at the local level, it may also significantly constrain a state’s ability to regulate and distribute resources and requires that states develop new skills in negotiation, power-sharing and political leadership with fewer resources and a reduced mandate.

Second, globalization has expanded the sphere of public problems to include concepts of sustainability, climatic change, biodiversity, and human rights. The dissemination of new forms of governance and the emergence of new partners—such as markets and NGOs and the resources

they bring with them—may create positive synergies that enhance nation-states’ capabilities. The globalization of ideas and their incorporation in the governmental agenda also affords policy systems new tools for policy design and implementation that theoretically should provide the conditions for enhancing adaptive capacity. These conditions include technologies to improve administrative efficiency, the enhanced flow of information and knowledge, the process of democratic decentralization, the construction of social capital through enhanced civil participation and synergistic public–private partnerships.

In order to disentangle the various ways in which globalization is affecting the adaptive capacity of nation states, we argue that explicit attention must be paid to the specific processes that are transforming the character of the state, its roles and responsibilities and, critically, its relationships with civil society and the private sector at both higher and lower scales of decision-making. We believe that by examining what governments are doing right now we can better understand the opportunities and constraints to enhanced adaptive capacity. Although we recognize that many policy areas are critical to understand adaptive capacity building to climate change, we focus on three that resonate with theoretical work on the attributes of adaptive capacity and for which a substantial amount of empirical research focusing on Latin America is available.

First, we look at knowledge and the use and transfer of technology² by examining the adoption of genetically modified (GM) seeds in Argentina. We find that although the transfer of GM technology has increased productivity and growth in the agricultural sector, the use of GM seeds highlights deficiencies in the government’s capacity to regulate the private sector, manage real and perceived risks to health and environment and to channel the application of the new technology for development goals. Second, we examine the application of new governance paradigms in natural resources management, focusing on water and forests resources. While the application of decentralized, participatory and integrated management schemes can decrease the vulnerabilities of the livelihoods depending on these resources, empirical evidence in several Latin American countries shows that local politics and problems in local capacity and management coordination has meant that such schemes are falling short from their design goals. Finally, we study the effects of state retrenchment on agricultural policymaking in Mexico, illustrating that one outcome of the spread of neoliberalism as a policy package has been the reduction of financial and human capital in state institutions, which in turn has affected the capacities of the state to negotiate and collaborate with actors in civil society to achieve development and adaptation objectives.

¹See Painter and Pierre (2005).

²Although we are well aware that not all technology and knowledge transfer are benign (e.g. war technology), in this study we refer to those kinds that, in general, are assumed to improve adaptive capacity (e.g. decision-making support tools, new resource management paradigms and governance schemes, biotechnology, cleaner energy technology, etc.).

The reasons for choosing Latin America are twofold. First, as a less developed region heavily dependent on natural resource exploitation, it is expected to be affected significantly by climate change (Baethgen, 1997; IPCC, 2001, Chapter 14), and second, the effects of globalization and neoliberal policies on income distribution and state capacity in the region seem to have been especially negative (Wade, 2004; Hoffman and Centeno, 2003).³ Moreover, state capacity in the region may also be decreasing as the popularization of the so-called “new policy agenda” (Edwards and Hulme, 1995; cited by Bebbington, 2005) and the assumption that non-state actors (such as the market and NGOs) should play some of the roles previously played by the state may have triggered a governance crisis (Bebbington, 2005, p. 1756).⁴ Finally, the integration of Latin America in the world economy and the widespread adoption of neoliberalism may also have led to the implementation of regressive policies and effectively weakened governments’ abilities to improve income distribution or attenuate poverty (Hoffman and Centeno, 2003).

In the next sections, we look at the literature on adaptation and analyze a few policy examples *vis-à-vis* the dual effects of globalization on state capacity. Section two briefly reviews the adaptation literature, focusing on the factors contributing to adaptive capacity building. Section three discusses in greater detail the concept of state capacity, and examines the effects of globalization on the three policy areas mentioned. We conclude with a few general remarks on globalization and adaptive capacity we believe can inform both the scholarship and practice of adaptation to climate change.

2. What is adaptation and adaptive capacity?

Adaptation to climate change has been defined as a process of adjustments to anticipated (or experienced) adverse impacts of climate change that result in the reduction of vulnerability (IPCC, 2001). Although adaptation has not always been the focus of climate change policy response, it has now become a prominent issue in the negotiations of the United Nations Framework Convention on Climate Change (UNFCCC) and has been inserted into the agendas of multi-national and bi-national development agencies (Burton et al., 2002).⁵ As part of this effort, the

³For example, in Mexico, since the introduction of free-trade, the absolute income of the 10% wealthiest increased by 20.8% while the income of the 10% poorest decreased by 23.2%. And according to the United Nations, Gini coefficients in Latin America increased in “practically every country.” (Hoffman and Centeno, 2003, p. 368).

⁴For an in-depth analysis of the privatization and marketization of the state and its effects in public management and policy capacity, see McLaughlin et al. (2002), Christensen and Lægveid (2002a,b), Painter and Pierre (2005).

⁵For instance, Article 4.1(f) of the Framework Convention states that all Parties shall “Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to

UNFCCC is encouraging developing countries to undertake adaptation needs assessments and to outline possible strategies towards reducing their vulnerabilities through National Adaptation Programs of Action (NAPA).

While there is recognition that adaptations may often occur spontaneously and individually as particular economic actors perceive and respond to climate stresses (Smit and Skinner, 2002), the international discourse on global climate change also carries a logical expectation of specific, planned nation-state action. Nation-states are expected not only to mitigate their contribution to greenhouse gases but also to improve their capacity and that of their citizens to adapt to climatic changes that now appear inevitable. This call for targeted national policy interventions to address climate vulnerability within national boundaries is embedded within a larger discourse that emphasizes the need for improved institutions, market incentives and regulatory mechanisms at the global level to address the climate change challenge (Adger et al., 2001).

Much of this discourse is targeted at developing countries, which are often presented as having deficient institutional frameworks for effective development and thus poor adaptive capacity. The focus on capacity building in developing nations is also reflected in the pressure exerted on more industrialized nations (MDCs) by international governance bodies, NGOs and citizens to support capacity development in less developed states (LDCs) (Dixon et al., 2003). While support for adaptive capacity building in developing nations is justified by arguments related to the greater responsibility for emissions in MDCs and the comparative lack of resources in less developed countries, there is concern that this focus may distract attention from the need for capacity building in MDCs while possibly providing the opportunity for such countries to shirk their responsibility to reduce emissions (Forsyth, 1999).

Adapting to climate change entails the interaction of decision-makers, stakeholders, and institutions at different scales of government from the local to the national. Because of the combined complexity of the rule systems and the biophysical world being regulated, adaptation to climate change will require governance systems that are inherently intricate and subject to error (Ostrom, 2001). Speculating on what the responsibilities of specific actors might be is made more complex by the fact that the capacity for adaptation of any particular system is not all internally generated, but rather is a product of the interactions and negotiations of power within and between nation-states, civil society, businesses and international institutions.

While the full capacity of a system to adapt may not be apparent until the system faces direct challenges to its continued existence, a variety of proxies for adaptive

(footnote continued)

minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change.”

capacity have been proposed to facilitate an evaluation of the degree to which different systems will adjust to future change. In the abstract, adaptive capacity has been described in terms of a system's resilience, robustness, flexibility, stability, thresholds of tolerance and range of coping (see discussion in Smit and Pilifosova, 2001). In more concrete terms, a series of system characteristics relating to both physical elements (infrastructure, material wealth, technology) and social/institutional elements (human capital, political legitimacy, institutional strength) have been proposed as critical contributors to adaptive capacity (Smit et al., 2000; Yohe and Tol, 2001; Smit and Pilifosova, 2001) (Table 1).

All of these attributes could theoretically be applied at any scale of decision-making to evaluate adaptive capacity. In their review of the literature for the Intergovernmental Panel on Climate Change, Smit and Pilifosova (2001, p. 18.6.2) differentiate the enhancement of adaptive capacity by three scales of decision-making: global, nation-state and local. They emphasize the importance of global economic integration, market liberalization, and technology and scientific exchange for building capacity at the global scale while suggesting participation, democracy, and equity as critical elements in the development and implementation of

Table 1
Determinants of adaptive capacity

Determinant	Encompasses
Human capital	Knowledge (scientific, "local", technical, political), education levels, health, individual risk perception, labor
Information & Technology	Communication networks, freedom of expression, technology transfer and data exchange, innovation capacity, early warning systems, technological relevance
Material resources and infrastructure	Transport, water infrastructure, buildings, sanitation, energy supply and management, environmental quality
Organization and social capital	State-civil society relations, local coping networks, social mobilization, density of institutional relationships
Political capital	Modes of governance, leadership legitimacy, participation, decentralization, decision and management capacity, sovereignty
Wealth & financial capital	Income and wealth distribution, economic marginalization, accessibility and availability of financial instruments (insurance, credit), fiscal incentives for risk management
Institutions and entitlements	Informal and formal rules for resource conservation, risk management, regional planning, participation, information dissemination, technological innovation, property rights and risk sharing mechanisms

Adapted from: Smit and Pilifosova (2001) and Yohe and Tol (2001).

adaptation strategies at local scales. In their view, the nation-state should be responsible for facilitating information flows, targeting vulnerable regions in policy development, facilitating local, private sector initiatives, and generally promoting growth through global economic integration.

The perspective of the nation-state as an intermediary is also dominant in the UNFCCC and IPCC reports, which emphasize the importance of the creation of "enabling environments" for adaptation, in which fair trade policies, the removal of technical, legal and administrative barriers to technology transfer, sound economic policy, appropriate regulatory frameworks and transparency are encouraged in both developing and developed nations to enhance the flow of information and technology for adaptation (UNFCCC, 2001, p. 26).

While few would deny that opening access to knowledge, better regulatory frameworks and increased transparency are desirable not only for addressing climate change but also for addressing a whole host of development concerns, the process by which the "enabling environment" is created has received little attention in the climate change adaptation literature that has been rich in prescription, but slim in empirical examples. Moreover, there has been little discussion on how the adaptation literature can be informed by empirical research from other fields of inquiry focusing on governance and policymaking, which show that policy design is just one step of a very complex process and that the realities of policy implementation—or what happens when the best laid plans meet the real world—can crucially affect policy outcomes. We hope to contribute to the adaptation debate by focusing on a few empirical examples of policy implementation in Latin American countries, especially exploring the role of globalization in creating opportunities and constraints for building adaptive capacity.

3. Globalization, the nation-state and capacity

In response to the new political, economic, and environmental challenges of globalization, the relevance of the nation-state has been called into question (Drucker, 1997; Spruyt, 2002). Clearly, states are neither homogeneous nor static and the ability of state leaders to push for their agenda may vary substantially at different scales of governance (from the local to the global), from time to time, and from sector to sector. Yet globalization is having undeniable implications for nation-states and governance systems, in their diversity of forms and structures. The integration of markets, the extension and complexity of environmental change, and the increasing homogenization of culture and the lifestyle expectations that accompany these changes have expanded the scope of what formerly were considered primarily domestic problems while creating new challenges to governance that are only now being recognized. However, improved access to human and financial resources, the enhanced exchange of ideas,

knowledge, and activism across borders has also supported the emergence of new democracies around the world and may have increased the capacity of domestic actors both public and private to respond to the potential effects of climate change. Thus, it makes sense to speak of several “globalizations” (Guidry et al., 2000) whose complex interactions and the way they affect day-to-day decision making need to be assessed, if we hope to design and implement effective policy.

For example, the “denationalization” of statehood, reflected empirically in the “hollowing out” of the national state apparatus has reorganized old and new capacities both territorially and functionally on sub-national, national, supranational, and trans-local levels. Consequently, “there is a continuing movement of state power upward, downward, and sideways as attempts are made by state managers on different territorial scales to enhance their respective operational autonomies and strategic capacities” (Jessop, 2002, p. 206). As state capacities are challenged, they are also transformed, requiring new ways of evaluating the resources states draw upon to accomplish their goals. States today are often “only the first among equals” as they strive to forge partnerships for governance between a variety of state and non-state actors (Jessop, 2002). While these partnerships may weaken the centrality of the state, given the persistence of complex power struggles and shifts in balance of class forces, shared governance can also “enhance the capacity of the state to project its influence and secure its objectives by mobilizing knowledge and power resources from influential nongovernmental partners and stakeholders” (Jessop, 2002, p. 207).

The inclusion of non-state actors and organizations and the resources they bring to the realm of public policy-making should build adaptive capacity through the design and implementation of policies that can benefit from positive state-society synergies. Jayasuriya (2005, p. 21) proposes that capacity building under these new conditions requires a new theory that goes beyond the definition of capacity attributes (e.g. resources, professional and competent bureaucracies, etc.) to include the relationships between the state and these new actors. Yet, in practice, the role of these relationships in enhancing the adaptive capacities of the nation-state and particular vulnerable populations may be limited since it is unlikely that new institutions (such as markets and NGOs) will be accountable for the politically costly redistributive policies needed to increase adaptive capacity to the most vulnerable.⁶

Hence, it is increasingly clear that the usefulness and relevance of the state is far from over (Jessop, 2002; Aronowitz and Bratsis, 2002; Newell, 2002; Painter and Pierre, 2005). The state is not only an important actor in governance mechanisms at the local and global level but also a “de facto” distributor of resources, signatory of

international accords, policymaker, and locus for political mobilization and constraints. Indeed, in the context of the “democratic deficit” (Newell, 2002) existing in many less developed countries “bringing the state back in” maybe the only way to address rampant inequality and reduce vulnerability (Lowi, 2002). In the next section, we present three case studies in which the role of the state has changed in response to new ideas, greater economic integration, and changes in the presence and power of non-government actors. These cases illustrate how building adaptive capacity under globalization—while perhaps increasingly necessary—is not a straightforward task.

3.1. *Globalization, information, and technology*

Greater access to technology, particularly technology that enhances economic productivity while enabling more sustainable development, is seen as one of the many benefits of globalization and as central to facilitating adaptation (Handmer et al., 1999). With the inclusion of the Clean Development Mechanism in the Kyoto Protocol, the transfer of technology designed to reduce the vulnerability of particular countries and populations to climate change is now a central element in the UNFCCC and forms part of a stated effort to build capacity of developing nations to respond to climate change (UNFCCC, 2001; Forsyth, 1999) (See Table 1).

Given current patterns of technology development and dissemination, private international investment is likely to be the primary way in which technologies can be harnessed for vulnerability mitigation and adaptation (Forsyth, 1999). However, the literature focusing on environmental technologies (e.g., “specific adaptations”) suggests that for such private initiatives to be successful, a “generic” enabling environment must be created by a strong state. As Forsyth (1999) argues, technology transfer for addressing the concerns of climate change not only involves the movement of know-how from one place to another, but also managerial, technical and economic skills of all the actors involved, including public agencies. The responsibility of the state is particularly important in relation to especially vulnerable sectors that may not have the capacity to independently command technologies that are appropriate to their specific circumstances and needs.

Of particular concern is the control of technology and its development in order to address local or domestic priorities. Global efforts to protect patents and intellectual property through many bilateral and multilateral trade agreements may constrain the in-house technology development of technology by inhibiting learning-by-imitation and reverse engineering (CEPAL, 2002; Griffin, 2003). Conversely, globalization may actually facilitate domestic research initiatives by providing financial incentives for technology development (Pray and Naseem, 2003). The balance between a free-flow of information and technology and a supportive environment for domestic industries and innovators is often difficult to strike, particularly in the

⁶In Latin America, for example, there is evidence that the role of NGOs in addressing structural inequality and poverty has been limited (Bebbington, 2005).

context of the downsized states—such as those that increasingly characterize Latin America—that have been convinced of “the superiority of private-sector technology and practices” (Terry, 2005, p. 431).

The case of the spread of agricultural biotechnology, or genetically modified organisms (GMOs), is particularly interesting because the technology is viewed by some as a potential means of adaptation to climate risk (Panel on Biotechnology, 1999; Dooley, 2001), and in many ways epitomizes the opportunities and challenges of globalization. Some argue that a more aggressive use of GMOs is a necessary step in increasing world food productivity and addressing the challenge of future world food supply (Panel on Biotechnology, 1999; Evenson, 1999). However, the globalization of grassroots environmental and consumer movements (and the call for public participation in policy formation by the Cartagena Protocol on Biosafety) has also meant that the use of transgenic seeds has become highly controversial (Newell, 2003). Internally, different interests groups within national governments are increasingly involved in complex and apparently “schizophrenic” negotiations with each other, with vocal citizens’ groups, industrial and sector lobbies, and with international organizations and transnational agribusiness concerning the regulation of biotechnology (Newell, 2003).

Critically important is the fact that the development, promotion, and application of biotechnology are currently controlled by large multinational corporations (despite long histories of in-house agro-genetic research and technology dissemination in many developing countries such as India, Brazil, and Mexico). Realizing the benefits of biotechnology for vulnerability reduction—for example, drought and pest resistant seeds—while simultaneously controlling for potential environmental, social and economic impacts and managing public perceptions of risk, critically depends on state capacity for research, enforcement, management and for building public-private sector partnerships (Sharma et al., 2002; Cohen et al., 2004). In China and India, for example, aggressive long-term public investment in scientific research and an explicit integration of biotechnology in national policy goals has apparently led to the enhancement of government capacities to mediate public and private sector interests (Newell, 2003). In both countries, national research institutes and businesses have developed joint ventures and collaborative biotech projects with multinational firms. These partnerships do not guarantee a developmental use of the technology, nor do they ensure control over technology dissemination, however they do provide the opportunity for potentially constructive public sector involvement in what otherwise would be a largely private sector initiative controlled by one or two multinationals.

The cases of China and India may be exceptions. Public investment in agricultural research has been declining worldwide (Echeverría, 1998). Although extensive knowledge exists in Latin America on the development of technology appropriate to local conditions and vulnerabil-

ities, declining public investment has limited the commercialization and dissemination of this knowledge. The high cost of new agricultural technology (e.g., transgenic or biotechnology) implies that in the future many developing countries will have to depend to a greater extent on the private sector—principally on large multinational agribusinesses such as Monsanto—for the development of agricultural technology at the possible expense of “developmental” or social research objectives (Cohen et al., 2004).

The rapid adoption of genetically modified soy (GM soy) in Argentina after the government removed obstacles to the importation of GM seed in 1997 is illustrative of the potential for new technologies both to build and to challenge national capacities. The dramatic expansion of “Roundup Ready” soybean production (at an annual rate of 6.8% in the 1990s) was made more attractive by an aggressive market liberalization policy and fiscal reforms designed to stimulate exports and reduce government intervention in agricultural trade, input prices and infrastructure (Schnepf et al., 2001). Unlike in Brazil, where the Brazilian Agricultural Research Corporation has teamed up with Monsanto on transgenic seed development (Pray, 2001), in Argentina the seeds were developed and are now marketed exclusively by Monsanto and no national institutions were involved in the development of the technology.

Argentina now faces pressure from environmental groups and consumers to regulate the use of biotechnology while some farming groups—having substantially profited from the first GM soy harvests—demand greater access (Pray and Naseem, 2003). Concern has been raised in the popular media about the spread of herbicide resistant weeds, the loss of soil productivity, and the displacement of smallholder farmers and their more diversified farm systems (Branford, 2004). The government’s own position is divided. A 10% export tax imposed during the 2002 economic crisis allowed the government to benefit from the soy boom. According to some non-governmental groups, Monsanto, the owner of the patent for the GM soy, is now claiming that the country’s farmers owe over \$300 million in unpaid royalties, and has threatened to deny Argentina access to the technology if they cannot guarantee their profits (see Turner, 2004). The Argentinean soybean case raises questions about the capacity of national and local governments to manage the potential negative environmental externalities and risk entailed in GMO use. Furthermore, the implied dependence of both the farmers and country on an imported technology may in some ways be enhancing the vulnerability of the agricultural sector as a whole, both in economic and environmental terms.

Managing technology transfer for adaptation thus not only depends on public sector investment in research and a strong national policy framework for specific technology use, but also on the ability of governments to coordinate the pursuit of domestic policy goals while negotiating various obligations under international treaties and re-

sponding to the multiple and often conflicting demands of citizen groups, multinational business and domestic political coalitions (Newell, 2003). For example, Cullet argues that the Indian government has been struggling to create legislation that protects national sovereignty over its biological resources, while complying with the country's obligations under the TRIPs agreement (Trade-Related Aspects of Intellectual Property Rights) of the World Trade Organization's 1994 General Agreement on Tariffs and Trade (Cullet, 2001). In its new Biosafety Law, Mexico has justified its current restriction on the planting of commercial GM maize seeds through its ratification of the Cartagena Protocol on Biosafety, but the country may face challenges to this policy under NAFTA and the WTO (CEC, 2004) as well as by domestic lobbies. For this reason, investment in any one of the attributes listed in Table 1 is unlikely to enhance a nation's adaptive capacity substantially. Rather, as in this case, even the specific capacity to manage biotechnology for adaptation will require investment in diverse aspects of human capital, technology development, social and political organization and institutional frameworks.

3.2. *Globalization of ideas, decentralization, and stakeholder participation*

Theoretically, decentralized participatory institutions are assumed to foster many of the attributes that build adaptive capacity (Table 1). Thus, democratic decentralization should improve efficiency in the management of natural resources while promoting accountability and societal participation—especially of traditionally disenfranchised groups such as women and the poor. It should be better than central governments at incorporating local knowledge and human resources, which in turn, may lead to better-targeted policies and may reduce information and transaction costs (World Bank, 1997; cited in Larson and Ribot, 2005). In the context of democratic decentralization, positive state-society synergies may flourish; social networks and capital may be enhanced (Lemos and Oliveira, 2004); and public service performance and local institutional capacity may increase (Larson and Ribot, 2005; Gibson and Lehouq, 2003). Finally, decentralization may improve access to resources previously unavailable—such as water, irrigation, forest products, financial and informational resources, institutional and organization resources, etc.—which in turn, can substantially boost resilience to climate change (as well as other stressors).

The linkages between globalization on decentralization are mainly twofold and may suggest a vicious cycle. On the one hand, international agencies and organizations push for new governance paradigms that advocate devolution of power and government as a means to achieve sustainable management of natural resources. In the implementation of these paradigms, ideas, technologies, and synergistic state-society partnerships play an important role. On the other hand, the diminished capacity of the “hollowed out” state

to implement policies may negatively affect its ability to implement decentralization. For example, Schuurman (2000, p. 18) argues, “it is conveniently forgotten (...) that ideas like local government or local autonomy presuppose a phase of nation-building first where a civil society is firmly constructed”. Hence, in the absence of a well-established safety net (yet to be built in many less developed countries), the devolution of power to lower levels of government even more ill-equipped than the national level erodes even further the conditions conducive to capacity building.

Yet, the drive to decentralize is a truly global trend. For the past 25 years, roughly 60 countries have embarked in some kind of decentralization project (Agrawal, 2001; cited by Larson and Ribot, 2005; Bahl, 1999; cited by Gibson and Lehouq, 2003), including the privatization of services, decentralization of authority (from de-concentration to devolution), and the creation of deliberative governance or stakeholder councils of public and private actors (Manor, 2005). In the wake of the emerging democracies of Latin America, fiscally strapped governments are now attempting to off-load service provision either to private actors or to sub-national units, giving rise to oversight and/or consultative bodies.

The increasing redefinition of political regimes (from authoritarian to democratic), economic systems (from state-led to neoliberal) and the reconstruction of popular participation have redefined popular representation, forging new structures of relations between state and societal actors. Chalmers et al. (1997, p. 545) call these “associative networks”: structures that link state and societal actors through interpersonal, media, and/or inter-organizational ties in the context of problem solving interactions. The emergence of associative networks is related to a series of factors which influence state-society interactions in the context of a globalized world: (a) the decentralization of decision making, (b) the impact of new sources of communication and knowledge acquisition, (c) the emergence of new governance paradigms that advocate greater social and popular involvement in decision-making as a means to increase competitiveness and cost-effectiveness of public administration, and (d) the “political learning from elites and popular actors induced by the failure of established strategies and institutions to respond to changing political and economic realities” (Chalmers et al., 1997, p. 555).

While it may be too soon to assess the concrete outcomes of decentralization reforms, there are indications that in many Latin American countries decentralization is falling short from accomplishing its goals, particularly in the case of natural resources management. In fact, empirical research shows that democratic decentralization is barely occurring in the way it is expected to (Larson and Ribot, 2005).

For instance, broad efforts to decentralize water management in many countries in the region have yielded mixed results. In Chile—because of the country's strict

adhesion to neoliberalism—water has been privatized with little societal input. In most areas, full-fledged water markets have failed to materialize and to generate the expected advantages of market-led solutions; instead, since 1985, the “market” has been continually subsidized by the Chilean government (Bauer, 1997). In Mexico decentralization of water management has, for the most part, followed the fate of decentralization attempts in other policy areas, resulting in excessive government dominance and failure to build representative stakeholder participation (Wester et al., 2003).

In Brazil, an encompassing water reform has resulted in the creation of over one hundred river basin councils all over the country.⁷ In the state of Ceará, NE Brazil, the decentralization of water management has been critically influenced by both the action of international agencies such as the World Bank (which conditioned the award of water infrastructure loans to the implementation of reform (Kemper and Olson, 2000) as well as by the new global paradigm for water management spelled out in the Dublin Principles (Lemos, forthcoming). Here, the idea of integrated, participatory, and sustainable water management strongly inspired local policymakers to design and implement new institutions that adopted the river basin as the management unit and created bulk water permit and pricing systems. It also created deliberative stakeholder councils, which among other things, negotiate water allocation among different users. However, the reform has fallen short from implementing many of the attributes that could contribute to enhanced adaptive capacity (Table 1). For example, whereas the reform has increased participation of stakeholders in general and improved the sustainability of water use in the region (Formiga-Johnsson and Kemper, 2005), it has limited the participation of the less powerful and most vulnerable users (Lemos, forthcoming). In addition, local River Basin Committee members surveyed report lack of technical knowledge as the main source of inequity among decision-makers and one of the most important factors limiting democratic decision-making (Lemos, forthcoming). In this case, international agencies (such as the World Bank) and innovative ideas (democratic decentralization) may have increased local policy capacity up to a point, but the implementation of reform has been critically shaped by conservative politics and technocratic insulation.

In forest management, different sets of issues have led to similar outcomes. In Nicaragua’s decentralized forest management, Larson (2001) finds that even in the best-case scenarios (committed local government with access to outside human and financial resources), there are many obstacles to overcome, including lack of local capacity, commitment and resources. Although Larson is optimistic regarding the positive direction of many local governments’

learning curves, her research shows that building capacity is a complex issue in an environment of a weak, poor nation state. Similarly, Gibson and Lehouq (2003) found that in the case of decentralization of forest management in Guatemala, political pay-off (in the form of support from central government and local community pressure) was the most significant variable explaining local mayors’ commitment to implement forest management.

What these examples illustrate is that despite the positive outcomes expected from decentralization, its implementation has been complex. While decentralization may, in some cases, be improving the efficiency of the management of water and forests—resources that are expected to be affected by climate change—it is clear that decentralization alone is not sufficient for enhancing adaptive capacity, and, in fact, may simply highlight other areas in which adaptive capacity is lacking (e.g., in Table 1, political capital, financial and human resources, etc.). The successful implementation of democratic decentralization largely depends on the combination of a myriad of factors at different scales of governance and in order to accomplish it, more attention needs to be paid to the social, political, and institutional contexts in which such policies are being promoted.

3.3. Globalization, neoliberalism, and inequality

As the previous two cases illustrate, the adaptive capacity of nation-states does not lie exclusively within the physical domain of state agencies and institutions, but rather also in the complex relationships that exist between the state and private sector, the state and international institutions and the state and civil society. For these relationships to be functional, the state itself—its policy making organizations, its implementing and regulating agencies, its employees—must have the necessary resources (not only material, but also social, political and human) to fulfill its policy and administrative responsibilities. Many Latin American nations today are caught in a difficult position. The globalization of ideas and the influence of international finance and development institutions have inspired substantial economic, sectoral, and administrative reforms under the names of neoliberalism and New Public Management (Spor, 2000; Montecinos, 2005). To enhance market forces in national development, states have actively reduced public sector regulation and intervention. However, this process has also often entailed reductions in public investment and a reduced presence in sector activities, curtailing the capacities of states to manage the complex partnerships and negotiations their restructured economies demand.

Neoliberalism, characterized by the conviction that export-oriented market-led policies will lead to a more efficient use of resources, greater trade and thus more rapid economic growth, has been one of the more heatedly debated aspects of the current phase of rapid globalization (Spor, 2000; Stiglitz, 2002). One broadly advocated

⁷The Brazilian reform has as goals integration, public participation, sustainable use and the implementation of a permit and charge system to replace the previous sectoral and hierarchical management model.

neoliberal reform has been the downsizing and retrenchment of the state, although the forms in which state retrenchment have occurred have varied considerably from country to country and sector to sector. Throughout the 1980s and 1990s, however, there has been a consistent trend in Latin America of privatization of state-owned enterprises, public divestment from agencies supplying goods and services, and reductions in state payrolls (Bulmer-Thomas, 1996). Following what is now called the philosophy of New Public Management public administration has also been reformed to replicate what are perceived as more efficient and flexible models of management in the private sector (Terry, 2005; Montecinos, 2005).

In principle, with enhanced economic productivity and more efficient service provision as a result of retrenchment, the nation-state should benefit from greater social welfare and economic stability and thus potentially enhance adaptive capacity generically (CEPAL, 2002, p. 207). Yet in the Latin American context liberalization has not resulted in unequivocal improvements in economic stability and may have exacerbated trends in poverty and inequality (Huber and Solt, 2004; Hoffman and Centeno, 2003). According to the theorized attributes of adaptive capacity (Table 1), high inequality, economic instability and the social burden of poverty are all likely to increase a nation's sensitivity to climatic hazards and change, while simultaneously decreasing its capacity to respond proactively to climatic risks.

The possible implications of state retrenchment for adaptive capacity can be seen in Mexico's agricultural sector, which, like many economic sectors in the developing world, is both characterized by a large number of small-scale producers as well as relatively small numbers of large-scale capitalist enterprises. As the process of state retrenchment progressed in Mexico, public expenditure in agriculture and fisheries declined from 11% of the federal budget in 1990 to less than 4% in 2000 (Fox Quesada, 2003). Public investment in agricultural credit, insurance, research, and extension was also reduced dramatically, and many of these services are now available to farmers exclusively from private suppliers (de Janvry et al., 1995a, b; Calva Téllez, 2004). In addition, as responsibilities for agricultural program implementation and management have been delegated to state and municipal authorities, the civil service has been aggressively downsized through the government's Program of Voluntary Retirement. In the period 2001–2005, over 11,000 civil service positions were eliminated from the agricultural ministry, approximately 13% of the total eliminated positions in the federal government (Fox Quesada, 2005). Through joint private sector–public sector partnerships and co-pay arrangements, farmers are expected to find their own paths to productivity and livelihood stability with minimal government support.

While the resources available for sector investment and policy development were sliced, some new organizations (often without building, staff or budget) have been created,

including the Mexican Council for Sustainable Development, a decentralized commission composed of private and non-governmental farmer groups, agribusiness, governmental agencies and educational organizations. The language of participation, empowerment, and sustainable development now permeates national agricultural programs and policy. Yet, as Fox argues, the state now faces new logistical and accountability challenges in implementing policies that are oriented towards entrepreneurial individuals rather than the corporate rural entities that were the former channels of state-farmer relations (Fox, 1995). Program evaluations have illustrated that realizing the ambition of sustainability, participation, and “growth with quality” in the rural sector has proven difficult for administrators in the national government (see, for example, Fox and Gersham, 2000).

The most direct impacts of the reforms have been on farm households and entire agricultural regions, as the sector reforms and restructuring have excluded large segments of the rural population from participating actively in the agricultural economy (Cornelius and Myhre, 1998; de Janvry et al., 1995a, b). These impacts have in turn spawned a political crisis, produced by the incapacity of federal and state officials to manage the political volatility of the rural sector or to provide direction and leadership for the sector's future development. Changes in rural poverty related to the agricultural reforms are of particular concern. During the period of most aggressive retrenchment and liberalization, rural poverty has not improved, and some analysts believe that poverty has in fact increased (Kelly, 1999; Hernández Laos and Velásquez Roa, 2003). Without the technical and financial support to engage with the challenges posed by open competitive markets, rural households are increasingly turning to migration—both to Mexico's already unmanageable cities, and to the United States—and in the process are placing new demands on public service provision.

The smallholders that remain have become increasingly vocal and sometimes violent, taking over public buildings, holding federal officials hostage and blocking highways in protest of their marginalization and the adverse economic consequences of Mexico's participation in the North American Free Trade Agreement (see, for example Thompson, 2001). Their resort to extra-institutional methods suggests that farmers lack access to appropriate institutional channels to call attention to their demands and that federal and state officials, perhaps as a result of focusing too much on improving managerial effectiveness and efficiency, now lack the political savvy and accountability to constructively resolve the crisis (Christensen and Laegreid, 2002a, b).

In 2004, reflecting the type of “polycentric development coalitions” now being advocated by some scholars and international development agencies (Korzeniewicz and Smith, 2000)—coalitions that theoretically might contribute to enhancing the social and institutional attributes of adaptive capacity in Table 1—the agricultural ministry

attempted to diffuse some of the mounting tension through a long series of roundtable discussions with a diversity of farmer associations resulting in the National Agreement for the Countryside. While some groups signed on to the Agreement, not all groups were satisfied with the outcome and the process resulted in the fractioning of the farmers' movement. Many of the groups have since accused the government of not complying with its promises and are once again threatening widespread protests (Perez, 2003; Perez et al., 2005).

In this context, the government's current efforts to reduce vulnerability to climatic variability in agriculture—by encouraging these farmers to adopt “a culture of insurance” in collaboration with the private sector or to switch crops altogether (SAGARPA, 2003)—is likely to be challenged not only by the shortage of extension staff and institutional mechanisms for communicating new technologies to smallholders, but also by the growing anger and distrust smallholders have for public institutions, a result already anticipated by some critics of the New Public Management model of administration (for example, Terry, 2005). The adoption of the rhetoric of sustainability and participation reflects possible adaptive capacity-enhancing benefits of globalization for the state's agricultural ministry. Yet the ministry's inability to address the farmers' demands effectively and to establish legitimate participatory forms of policy development has undermined the government's political capital and suggests that far more is required before the appropriate institutional structures are available to address Mexico's agricultural crisis.

4. Conclusions

While the prediction of the “withering away” of the nation-state during this latest phase of global economic integration may have been exaggerated, it is clear that globalization has had important effects on what is considered the responsibilities of nation-states, their institutional form and their scope and capacity for action. The wide diffusion of new ideas about governance, participation, environmental management and human rights and welfare has contributed to change the ways policies are conceived and implemented. In relatively short timeframes, across Latin America, the landscape of government institutions has been transformed. Public agencies have been slimmed and state-owned enterprises have disappeared, new institutions have arisen, and the language of sustainability and shared governance is now permeating public discourse, media reports, and policy. The withdrawal of the state and the promise of public participation have given rise to new spaces for action, and now decentralization is being touted as an essential component of improved governance. According to theory, these trends should have enhanced policy capacity in a variety of dimensions, including the strengthening of institutions, the building of political capital and social organization, and the growth of human capital. The

indicators of adaptive capacity listed in Table 1 carry the implicit assumption that increased participation and local involvement in decision-making is inherently good, that economic growth will bring greater flexibility, that greater technological stocks will enable countries to address the needs of their vulnerable populations. This examination of how nation-states are managing their insertion into global markets and of how they are putting new governance paradigms into practice illustrates that the benefits of globalization for the adaptive capacity of national governments are unlikely to be immediate or necessarily easily obtained.

At the heart of the problem may be the inability of the reconfigured state to tackle the growing social and political inequality that is central to the vulnerability problem. As long as inequality persists, it is unlikely that the picture of increased vulnerability and low adaptive capacity among the poor in Latin America will change. While the pressure increases for states to manifest the concrete actions they have taken towards adaptation, the persistent high human and material losses to climate hazards around the globe reveals disturbing deficiencies in national capacities to address the underlying drivers of vulnerability. Efforts to facilitate adaptation to climate change cannot be divorced from the processes of policy reform that have long been underway in both developing and industrialized countries. It is clear that part of the source of the problem of capacity deficiency is tied to its proposed solution: the ways in which administrative and policy reforms have been implemented over the last decade in the name of “good governance” and institutional efficiency.

The rich empirical literature in the social sciences just briefly skimmed in this article suggest how the multi-faceted process of globalization is transforming the identity, capacity, and structure of nation-states. The issues of technology transfer and knowledge dissemination, state retrenchment and decentralization are only a few of the many changes that are now occurring which have practical implications for building national capacity for managing the present and future challenges of climate change. Our cases illustrate that building adaptive capacity under globalization is complex and multidimensional, demanding new skills and roles of decision-makers at all levels of government. While far more work could be accomplished in refining the particular attributes of adaptive capacity for particular places, there is also an urgent need to ground the theory and concept of adaptive capacity in the complexity of its creation and erosion in government offices, local communities, private businesses, and civil organizations.

Here, we agree with Lowi (2002) and his call for “bringing the state back in”. Only by designing and implementing much needed re-distributive policy, will Latin American countries be able to start the groundwork of building adaptive capacity among the groups more likely to be negatively affected by global climate change. Eliminating bureaucratic excesses, enhancing access to information, knowledge and technology, increasing public

participation and the decentralization and devolution of power and responsibility are undeniably noble goals. The effectiveness of these processes, however, depends critically on an active state with a fundamental role in protecting vulnerable populations and guiding development processes towards greater social equity.

Acknowledgements

This article was prepared with the support of a Tyndall Center for Climate Change Research Visiting Fellowship and the support of the Environmental Change Institute of Oxford University (November–December 2004). We are particularly appreciative of the insightful comments by two anonymous reviewers on an earlier draft of this article.

References

- Adger, W.N., Benjaminsen, T.A., Brown, K., Svarstad, H., 2001. Advancing a political ecology of global environmental discourses. *Development and Change* 32, 681–715.
- Aronowitz, S., Bratsis, P., 2002. State power, global power. In: Aronowitz, S., Bratsis, P. (Eds.), *Paradigm Lost: State Theory Reconsidered*. University of Minnesota Press, Minneapolis, pp. xi–xxvii.
- Baethgen, W.E., 1997. Vulnerability of the agricultural sector of Latin America to climate change. *Climate Research* 9, 1–7.
- Bauer, C.J., 1997. Bringing water markets down to earth: the political economy of water rights in Chile, 1976–1995. *World Development* 25, 639–656.
- Bebbington, A., 2005. Donor–NGO Relations and representations of livelihood in nongovernmental aid chains. *World Development* 33, 937–950.
- Branford, S., 2004. Argentina's bitter harvest. *New Scientist* 17 (April), 40–43.
- Brooks, N., Adger, W.N., 2004. Assessing and enhancing adaptive capacity. In: Lim, L.B. (Ed.), *Adaptation Policy Framework*. United Nations Development Programme, New York Also available from <http://www.undp.org/cc/apf.htm>.
- Bulmer-Thomas, V. (Ed.), 1996. *The New Economic Model in Latin America and its Impact on Income Distribution and Poverty*. Macmillan Press Ltd, London.
- Burton, I., Huq, S., Lim, B., Pilifosova, O., Schipper, E.L., 2002. From impacts assessment to adaptation priorities: the shaping of adaptation policy. *Climate Policy* 2, 145–159.
- Calva Téllez, J.L., 2004. El consenso de Washington y la problemática agropecuaria de México. In: Del Valle Rivera, M.d.C. (Ed.), *El Desarrollo Agrícola y Rural del Tercer Mundo en el Contexto de la Mundialización*. Plaza y Valdes, Mexico City, Mexico, pp. 71–78.
- Chalmers, D.A., Martins, S.B., Piester, K., 1997. Associative networks: new structures of representation for the popular sectors. In: Chalmers, D., Vilas, C., Hite, K., Martins, S.B., Piester, K., Segarra, M. (Eds.), *The New Politics of Inequality in Latin America*. Oxford University Press, New York, pp. 540–582.
- Christensen, T., Laegreid, P. (Eds.), 2002a. *New Public Management: The Transformation of Ideas and Practice*. Ashgate, Aldershot.
- Christensen, T., Laegreid, P., 2002b. New public management: puzzles of democracy and the influence of citizens. *The Journal of Political Philosophy* 10, 267–295.
- Cohen, J., Komen, J., Zepeda, J.F., 2004. National agricultural biotechnology research capacity in developing countries. Report for the Agriculture and Development Economics Division, FAO, Rome.
- Comisión Económica para América Latina y el Caribe (CEPAL), 2002. *Globalization and Development*. United Nations/CEPAL, Brasilia.
- Cornelius, W., Myhre, D. (Eds.), 1998. *The Transformation of Rural Mexico: Reforming the Ejido Sector*. Center for US Mexico Studies, La Jolla.
- Cullet, P., 2001. Intellectual property and environment: impacts of the TRIPS agreement on environmental law making in India. *Global environmental change and the nation state*. Proceedings of the 2001 Berlin Human Dimensions of Global Environmental Change Conference, Postdam Institute for Climate Impacts Research, Postdam.
- de Janvry, A., Chiriboga, M., Colmenares, H., Hintermeister, A., Howe, G., Irigoyen, R., Monares, A., Rello, F., Sadoulet, E., Secco, J., van de Pluijm, T., Stefano, V., 1995a. Reformas del sector agrícola y el campesinado en México. Fondo Internacional de Desarrollo Agrícola y Instituto Interamericano de Cooperación para la Agricultura, San José, Costa Rica.
- de Janvry, A., Sadoulet, E., Gordillo de Anda, G., 1995b. NAFTA and Mexico's maize producers. *World Development* 23, 1349–1362.
- Dixon, R.K., Smith, J., Guill, S., 2003. Life on the edge: vulnerability and adaptation of African ecosystems to global climate change. *Mitigation and Adaptation Strategies for Global Change* 8, 93–113.
- Dooley, J.J., 2001. The need for a biotechnology revolution focused on energy and climate change, Pacific Northwest National Laboratory, Report no. PNNL-13551.
- Drucker, P.F., 1997. The global economy and the nation-state. *Foreign Affairs* 76, 159–171.
- Echeverría, R.G., 1998. Agricultural research policy issues in Latin America: an overview. *World Development* 26, 1103–1111.
- Evenson, R.E., 1999. Global and local implications of biotechnology and climate change for future food supplies. *Proceedings of the National Academy of Sciences* 96, 5921–5928.
- Formiga-Johnsson, R.M., Kemper, K.E., 2005. Institutional and policy analysis of river basin management in the Jaguaribe river basin, Ceará, Brazil. Policy Research Working Paper 3649. World Bank, Washington, DC.
- Forsyth, T., 1999. Flexible mechanisms of climate technology transfer. *Journal of Environment and Development* 8 (3), 238–257.
- Fox, J., 1992. *The Politics of Food in Mexico: State Power and Social Mobilization*. Cornell University Press, Ithaca.
- Fox, J., 1995. Governance and rural development in Mexico: state intervention and public accountability. *The Journal of Development Studies* 32 (1), 1–30.
- Fox, A., Gershman, A., 2000. The world bank and social capital: lessons from ten rural development projects in the Philippines and Mexico. *Policy Sciences* 33, 399–419.
- Fox Quesada, V., 2003. Tercer Informe de Gobierno. Presidencia de la República, México, D.F.
- Fox Quesada, V., 2005. Quinto Informe de Gobierno. Presidencia de la República, México, D.F.
- Gibson, C., Lehouq, F., 2003. The local politics of decentralized environmental policy in Guatemala. *Journal of Environment and Development* 12, 28–49.
- Griffin, K., 2003. Economic globalization and institutions of global governance. *Development and Change* 34, 789–807.
- Guidry, J.A., Kennedy, M.D., Zald, M.N., 2000. Globalizations and social movements. In: Guidry, J., Kennedy, M., Zald, M. (Eds.), *Globalizations and Social Movements: Culture, Power, and the Transnational Public Sphere*. University of Michigan Press, Ann Arbor, pp. 1–32.
- Handmer, J.W., Dovers, S., Downing, T.E., 1999. Societal vulnerability to climate change and variability. *Mitigation and Adaptation Strategies for Global Change* 4, 267–281.
- Hernández Laos, E., Velásquez Roa, J., 2003. Globalización, desigualdad y pobreza: Lecciones de la experiencia mexicana. Universidad Autónoma Metropolitana, México, D.F.
- Hoffman, K., Centeno, M., 2003. The lopsided continent: inequality in Latin America. *Annual Review of Sociology* 29, 363–390.
- Huber, E., Solt, F., 2004. Successes and failures of neoliberalism. *Latin American Research Review* 39, 150–164.

- IPCC, Working group II, 2001. *Climate Change 2001: Impacts, Adaptation and Vulnerability*. Intergovernmental Panel on Climate Change, Geneva.
- Jayasuriya, K., 2005. Capacity beyond the boundary: new regulatory state, fragmentation and relational capacity. In: Painter, M., Pierre, J. (Eds.), *Challenges to State Policy Capacity*. Palgrave MacMillan, New York, pp. 19–37.
- Jessop, B., 2002. Globalization and the national state. In: Aronowitz, S., Bratsis, P. (Eds.), *Paradigm Lost: State Theory Reconsidered*. University of Minnesota Press, Minneapolis, MN, pp. 185–220.
- Kelly, T., 1999. *The Effects of Economic Adjustment on Poverty in Mexico*. Ashgate Publishing Ltd, Aldershot.
- Kemper, K., Olson, D., 2000. Water pricing: the dynamics of institutional change in Mexico and Ceará, Brazil. In: Dinar, A. (Ed.), *The Political Economy of Water Pricing Reforms*. World Bank/Oxford University Press, Washington, DC, pp. 339–358.
- Korzeniewicz, R.P., Smith, W.C., 2000. Poverty, inequality, and growth in Latin America: searching for the high road to globalization. *Latin American Research Review* 35, 7–54.
- Larson, A.E., 2001. Natural resources and decentralization in Nicaragua: are local governments up to the job? *World Development* 30, 17–31.
- Larson, A.E., Ribot, J., 2005. Democratic decentralization through a natural resources lens: an introduction. In: Ribot, J.C., Larson, A.M. (Eds.), *Democratic Decentralization through a Natural Resources Lens*. Routledge, New York, pp. 1–25.
- Lemos, M.C., (forthcoming). Whose water is it anyway? water management, knowledge, and equity in NE Brazil". In: Perry, R., Ingram, H., Whiteley, J. (Eds.), *Water and Equity: Apportioning Water Among Places and Values*. MIT Press, Cambridge.
- Lemos, M.C., Oliveira, J.L.F., 2004. Can water reform survive politics? Institutional change and river basin management in Ceará, Northeast Brazil. *World Development* 32, 2121–2137.
- Lowi, T., 2002. Progress and poverty revisited: toward construction of a statist third way. In: Tulchin, J.S., Brown, A. (Eds.), *Democratic Governance & Social Inequality*. Lynne Rienner, Boulder, CO.
- McLaughlin, K.S.P., Osborne, E.F. (Eds.), 2002. *New Public Management: Current Trends and Future Prospects*. Routledge, London.
- Manor, J., 2005. User committees: a potentiality damaging second wave of decentralization? In: Ribot, J.C., Larson, A.M. (Eds.), *Democratic Decentralization through a Natural Resources Lens*. Routledge, New York, pp. 193–213.
- Montecinos, E., 2005. Los estudios de descentralización en América Latina: una revisión sobre el estado actual de la temática. *EURE (Santiago)* 31, 73–88.
- Newell, P., 2002. *Globalization and the Future State*. IDS Working Paper 141. Institute of Development Studies, Brighton.
- Newell, P., 2003. *Domesticating Global Policy on GMOs: Comparing India and China*. IDS Working Paper 206. Institute for Development Studies, Brighton.
- O'Brien, K., Leichenko, R., 2000. Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change* 10, 221–232.
- Ostrom, 2001. *Vulnerability and Polycentric Governance Systems. Update—Newsletter of the International Human Dimensions Programme on Global Environmental Change*, No. 3/2001.
- Painter, M., Pierre, J., 2005. Unpacking policy capacity: issues and themes. In: Painter, M., Pierre, J. (Eds.), *Challenges to State Policy Capacity*. Palgrave MacMillan, New York, pp. 1–18.
- Panel on Biotechnology, 1999. *Biotechnology and Water Security in the 21st Century*. Report to the World Commission on Water Security in the 21st Century. Chennai, India.
- Perez, M., 2003. Exigen cumplir el acuerdo para el campo. *La Jornada Virtual*. August 8. <http://www.jornada.unam.mx/2003/08/08/015n1pol.php?printver=1&fly=1>, accessed October 18, 2005.
- Perez, M., Enciso, A., Urrutia, A., 2005. Violenta protesta campesina frente a Gobernación; zacapela con la PFP. *La Jornada Virtual*. February 8. <http://www.jornada.unam.mx/2005/02/08/008n1pol.php>, accessed October 18, 2005.
- Pray, C.E., 2001. Public-private sector linkages in research and development: biotechnology and the seed industry in Brazil, China and India. *American Journal of Agricultural Economics* 83, 742–747.
- Pray, C.E., Naseem, A., 2003. *Biotechnology R&D: Policy options to ensure access and benefits for the poor*. Report for the Food and Agricultural Organization, Rome.
- SAGARPA, 2003. *Reglas de Operación del Programa del Fondo para Atender a la Población Afectada por Contingencias Climatológicas (FAPRACC)*. Diario Oficial, Martes 27 mayo, 1.
- Schnepf, R.D., Dohlmán, E., Bolling, C., 2001. *Agriculture in Brazil and Argentina: Developments and Prospects for Major Field Crops*. Economic Research Service, US Department of Agriculture, Washington.
- Schuurman, F.J., 2000. Paradigms lost, paradigms regained? Development studies in the twenty-first century. *Third World Quarterly* 21 (1 February), 7–20.
- Secretariat of the Commission for Environmental Cooperation (CEC). 2004. *Maize and biodiversity: the effects of transgenic maize in Mexico*. Report for the Commission for Environmental Cooperation of North America, Montreal.
- Sharma, H.C., Crouch, J.H., Sharma, K.K., Seetharama, N., Hash, C.T., 2002. Applications of biotechnology for crop improvement: prospects and constraints. *Plant Science* 163, 381–395.
- Smit, B., Pilifosova, O., 2001. Adaptation to climate change in the context of sustainable development and equity. In: IPCC Working Group II (Ed.), *Climate Change 2001: Impacts, Adaptation and Vulnerability*. Earth Scan, Geneva.
- Smit, B., Skinner, M.W., 2002. Adaptation options in agriculture to climate change: a typology. *Mitigation and Adaptation Strategies for Global Change* 7, 85–114.
- Smit, B., Burton, I., Klein, R.J.T., Wandel, J., 2000. An anatomy of adaptation to climate change and variability. *Climatic Change* 45, 223–251.
- Smithers, J., Smit, B., 1997. Human adaptation to climatic variability and change. *Global Environmental Change* 7, 129–146.
- Spoor, M., 2000. Two decades of adjustment and agricultural development in Latin America and the Caribbean. Discussion Series #56 (LC/L.1352) CEPAL, Santiago.
- Spruyt, H., 2002. The origins, development, and possible decline of the modern state. *Annual Review of Political Science* 5, 127–149.
- Stiglitz, J., 2002. *Globalization and its Discontents*. Penguin, London.
- Stiglitz, J., 2003. Globalization and the economic role of the state in the new millennium. *Industrial and Corporate Change* 12, 3–26.
- Terry, L.D., 2005. The thinning of administrative institutions in the hollow state. *Administration and Society* 37, 426–444.
- Thompson, G., 2001. *Farm Unrest Roils Mexico, Challenging New President*. The New York Times On the Web, New York www.nytimes.com.
- Turner, T., 2004. Monsanto ups effort to collect GMO royalties in Argentina. Montag www.checkbiotech.org Accessed 12 November 2004.
- United Nations Framework Convention on Climate Change (UNFCCC), 2001. Report of the Conference of the Parties on its Seventh Session, held at Marrakesh from 29 October to 10 November 2001. Addendum. Part Two: Action Taken by the Conference of the Parties, United Nations.
- Wade, R.H., 2004. Is globalization reducing poverty and inequality? *World Development* 32, 567–589.
- Wester, P., Merrey, D.J., deLange, M., 2003. Boundaries of consent: stakeholder representation in river basin management in Mexico and South Africa. *World Development* 31, 797–812.
- Yohe, G., Tol, R.S.J., 2001. Indicators for social and economic coping capacity—moving toward a working definition of adaptive capacity. *Global Environmental Change* 12, 25–40.