The Governance of Hydro-electric Dams in Brazil

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Abstract. This paper examines the governance of hydroelectric dam planning in Brazil with a particular focus on two factors: first, governmental institutions that aim to provide participatory mechanisms for civil society, and second, new participatory institutions created by civil society to remedy the lack of meaningful participatory measures. One example of the latter are new collaborative research projects, which have changed dam building policies and governmental thinking about participation. It is argued here that these kinds of collaboration are fundamental to making dam-building policy more accountable to local citizens. The analysis demonstrates that lay/expert collaborations provide pathways through which affected people can contest inaccurate official scientific reports, in turn influencing the policy process. I examine six such participatory projects across the country: four are nationally based and two are international in scope. A four-pronged typology is used to analyse the processes and outcomes of these collaborations. This typology reveals multiple types of knowledge-sharing that constitute concrete means to implement participation in environmental policy, hence advancing the democratisation of environmental governance.

Keywords: participation, environment, Brazil, water, energy

Introduction

Many governments face the dilemma of creating more accountable, participatory institutions. A number of countries in Latin America, such as Mexico and Brazil, have begun to develop such models, and some researchers have argued that Latin American countries are more adept at practicing participatory forms of democracy than other regions.1 Scholars studying the

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1 See: Avritzer, Leonardo, Democracy and the Public Space in Latin America (2002, Princeton); Mainwaring, Scott, and Chris Welna, Democratic Accountability in Latin America (Oxford, 2003); Forment, Carlos, Democracy in Latin America, 1760–1900: vol. I, Civic Selfhood and Public
efficacy of these experiments have shown that more deliberative forms of democracy have the potential to make tangible changes in the lives of poor and disenfranchised people. While they acknowledge the complexity of issues regarding power and identity of those involved, they conclude that when feasible, participatory institutions hold great potential for positive social change.

Most research has focused on state-generated participatory institutions. In the cases of participatory budgeting, habitat conservation planning, and other efforts, some states have generated deliberative institutions. But even then, state capacities to fulfil the promise of such new institutions differ across national and sub-national levels. In many cases, deliberation is in fact limited by the state, rather than encouraged. Therefore, social movements have often arisen to try and advance more participatory mechanisms. Although a vast amount of literature on social movements has studied how they take advantage of political opportunities, there has been limited research to date analysing the resultant informal deliberative mechanisms that are sometimes constructed through such processes of contestation.

In addition, while participatory measures are generally constructed to facilitate the exchange of knowledge between different social groups, little attention has been paid to how different types of knowledge interact and the results of their intersection. This is a particularly interesting question in cases such as resource management, where expert knowledge is the basis of policymaking. Despite the scientific premise of policy-making, little study has been devoted to how creating participatory measures in science can be a window to deepening democracy.

One case in which deliberation has been generated by groups in civil society and has directly generated knowledge exchanges between lay people


Heller, Patrick, ‘Moving the state’.
and experts is the planning of large hydroelectric dams in Brazil. Despite
government innovations, these policies have been conflict-ridden and the
mediation of diverse interests has ultimately been supported by few institu-
tional arrangements.\(^7\) Therefore, reconciliation of conflict over these projects
has instead tended to depend on informal channels. Collaborations between
civil society representatives and researchers are one of the most important
mechanisms and researchers or academics have often initiated participatory
processes with the aim of drawing communities into governmental decision-
making processes. These involve both the expert knowledge of trained re-
searchers and the local, contextual understanding of lay people. As Gramsci
more broadly described this phenomenon, ‘traditional intellectuals’ trained
in academic disciplines help produce ‘organic intellectuals’ who emerge from
the working class.\(^8\) Lay/expert collaborations in Brazil represent a slightly
nuanced version of this phenomenon in that the academics involved are
often middle class, but they attempt to place their work almost entirely at the
service of dam-affected people.

These collaborations, between organic and traditional intellectuals
(generally informal but occasionally formalised) are requested and directed
by affected populations themselves, in particular the anti-dam movement.\(^9\)
The movement is composed of grassroots organisations, the Church,
workers unions, farmers and fishermen. These groups are largely disen-
franchised by the policy-making process, necessitating political mobilisation
and pressure on corporate interests in conjunction with lay/expert collabor-
ations. Such collaborations are critical to constructing the collective
identities of these movement groups, providing improved pathways for
participation, and shaping policy outcomes.

Collaborations operate almost entirely outside the purview of the state,
but also intersect with state institutions, in part by recommending the cre-
ation of formalised participatory measures and certain policy initiatives. By
functioning outside the margins of the state, these collaborative projects are
able to include a broad range of marginalised people, and to answer their
concerns directly. At the same time, the outcomes of these collaborations are
ultimately limited by the state’s willingness to incorporate their results.

This article provides an in-depth analysis of participatory projects with
anti-dam activists, or dam-affected people, and researchers in Brazil. It argues

\(^7\) Goulet, Denis, ‘Global Governance, Dam Conflicts and Participation’ Human Rights
Hidrografica Do Alto Tiete, Sao Paulo. Brasilia, Projeto Marca da Agua’ (Brasilia, 2001).

\(^8\) Gramsci, Antonio, ‘The Intellectuals’, in Selections from the Prison Notebooks, translated and

\(^9\) McCormick, Sabrina, ‘The Brazilian Anti-Dam Movement: Knowledge Contestation as
that lay/expert collaborations – partnerships between researchers and activists which critique existing science or construct new knowledge – play an important role in making dam building policy, and the scientific assessments upon which it is based, more accountable to local communities. The article aims to make three principle contributions. First, it helps to illuminate the black box of participation – who is involved, how they interact, what they are able to achieve, and their limitations. Second, while most research on participation has focused on state-initiated projects; this analysis focuses on the critical role of social movement activists who instigate new participatory measures. It is important to understand how these types of participatory mechanisms might be better, less effective, or at least different than others. Finally, the importance of knowledge transfer in participation is highlighted. In so doing, the article draws on two literatures that are usually separate: theories of deliberative democracy and work on participatory research. It has become increasingly important to understand their intersections since the results of such research are often cited as the basis for policy-making.

The article reviews and analyses six existing collaborations in Brazil to show how these participatory research projects have affected the scientific understanding of dam impacts and altered dam planning. A typology of participation is outlined in order to illustrate how different types of knowledge are transferred up, down and across social groups through lay/expert collaborations, and how new, hybrid knowledge is constructed. The typology comprises four types: Researcher Educator, Researcher Activist, Citizen/Science Alliance, and Collaborative Forum. The following analysis details the direction of knowledge sharing, the changes in knowledge and discourse that result, and the main activities involved in each type.

Studying these participatory mechanisms is driven by several priorities. First, researchers have very little understanding of how deliberation takes place in practice. The informal and civil society-driven nature of these cases presents an opportunity to examine how deliberation works in different specific settings. Second, scholars argue that non-experts or community members should be a part of policy-making; this article provides an empirical analysis of some of the institutions that are being developed to such ends. These interactions are increasingly important as more and more

policy is based on scientific judgments rather than citizen input. In addition, while research has examined state-generated deliberative democracy, models not embedded in the state may assume a different shape and have alternative outcomes. Finally, relatively little research to date has specifically addressed the functioning of the anti-dam movement in Brazil and its broader implications; this article constitutes a reflection along these lines.

Informal collaborations regarding hydroelectric dams fit into a larger social landscape of participatory processes in hydrological management in Brazil. Lemos and Oliveira explored the effectiveness of new, participatory measures for water management, such as river basin committees. They found that such institutions depend on networks outside the state, and claim that support from groups in civil society could improve decentralization measures. At the level of the municipality, water management has been decentralised, in part, so that tariffs can be collected. Like the lay/expert collaborations discussed in this paper, these developing management systems are partially made accountable by non-governmental organisations. However, there are still tremendous barriers to their accountability to individuals outside these organisations. Developments that affect hydrological sources or the environment more broadly also relate to debates about the environmental licensing and impact assessment process legislated in Brazil. As Eve et al. have pointed out, environmental impact assessments are often inadequate, reflecting the broader lack of effective implementation of environmental law and policy. Public hearings of these assessments are not always held, even though there is often popular demand for them. The formalised nature of environmental assessments also allows for corporate influence on the outcomes. Debates over the effectiveness of public hearings and analyses of participatory state institutions suggest the importance of civil society in deepening democracy and improving participation.

Deliberative democracy and participatory research

The rationale for carrying out research and planning a more democratic process involving non-experts can be traced to two main bodies of theory: deliberative democracy and participatory research. While theories of deliberative democracy offer a broad background for understanding the rationale for participation and its different forms, study of participatory research elucidates how lay people and researchers function together in practice. Read together, these theories can provide a basis for understanding how the democratisation of knowledge can work to deepen democracy.

Deliberative democracy

Theorists of deliberative democracy argue that politics should be justified through deliberation. In this process, citizens or members of civil society are expected to exchange ideas, reflect on differences of opinion, and come to mutual agreement about policy recommendations. Community members engage in a learning process and have the opportunity to develop an agenda of common action. Although it has only recently become more mainstream, research about deliberative democracy has addressed a vast number of facets. These include the methods for incorporating the voices of community members in local contexts such as aid projects or on transnational issues, the moral and ethical rationale of such deliberative practices, and their weaknesses and limitations. Recommendations for particular practices have also been offered, based on a broad range of case studies, including assessments of the mechanisms through which citizens can engage with policy-making, such as citizen juries and citizen conferences. This broad range of work has only broached the role of lay knowledge in participatory institutions.

18 Dryzek, John S., *Deliberative Democracy and Beyond*.
Knowledge in Deliberation

Theorists of deliberative democracy have only recently begun to discuss how and why knowledge plays an important role in deliberation. Although deliberative democratic theorists are generally less concerned with knowledge itself than they are with the structures in which it is exchanged, they inherently deal with the conflict between experts and lay people. Technocrats, who are a certain kind of expert, conduct policy-making. As Niskanen argues, political decision-making is often based on centralised knowledge that is detached from legitimate local realities.\(^{24}\) Like most deliberative democratic research, he argues that non-expert perspectives should be included in technocratic systems. The key to improving policy formation is understood to be through bringing ‘ordinary knowledge’ into decentralised spheres of political decision-making.

Fung and Wright claim that implementing knowledge held by local actors in deliberative spaces makes policies more effective.\(^{25}\) They argue that solutions to novel problems may be better devised by citizens who have direct experience with the problem in question. The underlying intention should be to shorten the decision-making chain, consequently increasing – they argue – accountability and effectiveness. Instead of experts pre-empting popular participation, citizens provide active input resulting in lay/expert ‘synergies’. This is in direct contrast to the kind of command and control decision-making usually performed by experts. In the best case analysis therefore, disenfranchisement and distrust is replaced by empowered individuals who can apply their intimate contextual knowledge to a particular problem.

Creating deliberative processes in development has been shown to be more effective than those based solely on expert opinion.\(^{26}\) In fact, participation has become a catchword for many development interventions. Estlund’s rationale for this is based on his conceptualisation of ‘epistemic proceduralism’.\(^{27}\) He argues that the cognitive nature of moral dilemmas faced by society should be recognised. Rather than basing decision-making on majority rule or correctness, they should be based instead on epistemic

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value, which involves recognising different types of knowledge as legitimate. Estlund’s theory can be applied to an analysis of collaboration between technocrats and the public, where both bodies of knowledge are utilised to generate tangible results.

Deliberation involving different types of knowledge has also been shown to improve deliberative practices as a whole. Gambetta argues that transfer of information between different parties is a fundamentally important outcome of deliberative processes. Deliberation involving different types of knowledge has also been shown to improve deliberative practices as a whole. Gambetta argues that transfer of information between different parties is a fundamentally important outcome of deliberative processes. Deliberation involving different types of knowledge has also been shown to improve deliberative practices as a whole. Gambetta argues that transfer of information between different parties is a fundamentally important outcome of deliberative processes. Since social actors possess different levels of knowledge, for any number of reasons, deliberation can provide an opportunity to update beliefs and opinions based on shared resources.

**Participatory research**

Theories of participatory research address a slightly different phenomenon, but ultimately lead to the same conclusion as deliberative democracy theorists: lay participation in expert decision-making is critical to making policy more accountable. Lay participation is often defined as a local or affected population working in conjunction with governmental decision-makers in planning. It is otherwise referred to as community-based participatory research (CBPR) or participatory action research. These theorists argue for the incorporation of non-expert knowledge in research, and have begun to explore the structural forms through which lay people and experts can collaborate effectively.

Involvement of lay people in research has taken multiple formats. The forms of lay/expert collaboration most essential to the cases at hand are citizen/science alliances and popular epidemiology. The citizen/science alliance is a lay-professional collaboration in which citizens and scientists work together on issues identified by lay people, therefore transforming the insular nature of expert systems into one that takes local experience into account.

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30 Minkler, Meredith, Nina Wallerstein, and Budd Hall, *Community-Based Participatory Research for Health* (Thousand Oaks, 2002).
The citizen-science alliance has been shown to play a key role in (1) supporting activism; (2) changing attitudes and practices of scientists and activists, and; (3) providing a new value structure in some areas of research.

This formalised interaction is a form of popular epidemiology – people engaging in lay ways of knowing about environmental and technological hazards and then working with professionals to inform environmental health effects. This process has the potential to influence the methods through which research is conducted due to new ideas introduced by those usually excluded from the scientific realm. Activist’s involvement in scientific methodology allows them to use their personal experience as a factor in scientific study, and to therefore serve as a bridge between the lay population and scientists.

Most research has historically been conducted without input from the affected population, and has often not been particularly useful to those communities. Some researchers and advocates urge public involvement in order to remedy the irrelevancy of research to public concerns by countering unexamined scientific norms that are idealised as ‘objective’, but that are, in fact, structured by a specific value system. In this context, advocates can represent otherwise neglected social values. Scientists are more concerned with scientifically identifiable risks, while the public is more aware of ethical, social and ecological risks, making public involvement necessary to keep those other concerns in the frame. Lay people representing popular interests in public involvement can also balance – at least to some extent – the economic interests of financially powerful industries whose revenue-generating motives often shape scientific research. This process is similar to the concept of ‘participatory democracy’; that is, it is a result of public participation. Dutton states that the rationale for democracy in science is the same rationale for democracy in political decision-making, the consequences of which include, according to Rousseau and Mill, the education of citizens,

34 Brown and Mikkelsen, *No Safe Place*.
the facilitation of legitimate decisions, and human capital development essential for an effective democracy.

**Participatory democracy and collaborative research**

Both deliberative democracy theorists and theorists who study participatory research point to the balancing effect lay knowledge can have when implemented in conjunction with expert perspectives. Such scholars point to the limitations of science and democracy without that participation. The need for local perspectives is particularly clear in the case of environmental problems, since it is often local people and communities that are immediately affected by them. However, many environmental policies are based on science and expert opinion without the formalised inclusion of citizens. As a result, citizens increasingly engage with experts in an attempt to influence the production of state-generated knowledge, deepen democracy and ultimately change governmental policy. These are often attempts to bridge the gap between political representatives and citizens, or between scientists funded by the state and non-experts who are affected by state policies.

**Methods and data**

This article is based on qualitative data collected via several methodological tools: (1) a nationally-representative set of interviews with social movement representatives (36 in all), government officials (19), and researchers (23); (2) ethnographic observations of anti-dam groups and the researchers with whom they collaborate over a period of eight months; and (3) revision of documents from governmental and non-governmental organisations in all regions of Brazil. Data collection spanned a period of three years. In order to assess the number and breadth of collaborations, a broad range of representatives from the anti-dam movement and researchers with expertise in this area were selected and interviewed. For movement interviewees, a purposive sample of organisational representatives was used, followed by a snowball sample aimed at capturing those involved throughout the duration of each movement and the areas where it had taken place. Researchers initially interviewed included those who had long been involved in movement activities as well as researchers at COPPE (Coordenação dos Programas de Pós-graduação de Engenharia), a prestigious interdisciplinary energy-planning institute at the Federal University of Rio de Janeiro where energy-related research is conducted. A nationwide snowball sample which involved

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universities, governmental agencies and research institutes in every region was subsequently used. Ultimately, data was collected on as many cases as possible in which lay people and experts collaborated.

**Hydroelectric dams in Brazil: conflict and deliberation**

For many years, dams were symbols of progress and development, signs that a nation was entering a modern age. The famed term for dams – ‘temples of progress’ – coined by Jawaharlal Nehru, the first Prime Minister of India, exemplifies this attitude. Developing nations followed the United States and Europe in beginning, in the early twentieth century, a long phase of dam building. However, in the late 1970s and early 1980s, as Brazil underwent the transition from military dictatorship to democracy, hydroelectric dams became hotly contentious, engendering conflict between state administrators and civil society. This contention resulted in the formation of one of the first transnational environmental movements in the shape of the anti-dam movement.  

Conflict over hydroelectric dams developed in response to their widespread construction. Brazil has the third largest installed hydroelectric capacity in the world. It has the greatest potential of any nation; larger than found in other entire continents and, today, Brazil has more than 600 dams. The anti-dam movement began in the late 1970s and early 1980s, taking advantage of the political opportunities that arose from the democratic transition in order to bring pressure on state institutions. The movement began in the southern region then moved to the northeast, following the trend of dam building. It gradually reached the southeast and the north as large dams were also constructed in those locales.

Conflicts over hydroelectric dams have traditionally taken place between anti-dam movement groups or local communities and governmental institutions. Since the privatisation of the electric sector in 1995, private corporations that fund the building of large dams have become an additional object of contestation, and anti-dam groups now hold sit-ins in corporate offices or dam construction sites. These powerful economic interests would seem to be impervious to groups as marginalised as dam-affected people (atingidos). However, a key moment in the planning process, when they

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become vulnerable, is during the approval stage when they are obliged to present an environmental impact assessment to state institutions and potentially affected communities. In what social movement theorists might explain with reference to the concept of political opportunity, the anti-dam movement has taken advantage of this moment to insert new science and knowledge into the planning process. Such a moment of exchange has made science and knowledge of pivotal importance to conflicts over dams, and to the participatory processes that might resolve them.

In the following sections, the relevant state institutions and their related participatory mechanisms are described, followed by analysis of the lay/expert collaborations in which the anti-dam movement has been involved in an attempt to move beyond representative democracy and improve community participation.

**State institutions for energy and water**

There are five main federal bodies that have a role in the planning, building or regulation of hydroelectric dams. They include the National Electrical Agency (ANEEL, Associação Nacional de Energia Elétrica) and the Ministry of Mines and Energy (MME, Ministerio de Minas e Energia), both of which oversee electrical energy generation. ANEEL is the agency that actually plans where dams can be built. The National Water Agency (ANA, Agência Nacional de Águas), the Ministry of the Environment (MMA, Ministerio do Meio Ambiente) and the federal environmental agency (IBAMA, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis) are charged with regulation and protection of water resources. IBAMA is directed by the MMA, and regulates the environmental impact assessment process. It verifies that the construction of hydroelectric dams works in conjunction with other water needs. Federal-level IBAMA also has state agencies which it oversees. When a dam project is on a river that crosses state borders, federal-level IBAMA oversees it, while a river within state borders is supervised by a state agency. Similarly, Eletrobras is the federal-level electricity agency. It has regional-level agencies in the five regions of Brazil that are all at least partially privatised. These agencies have been undergoing constant reorganisation since the inception of democracy, and even more since the privatisation of water and electric sectors some ten years later. This restructuring process has resulted in intra- and inter-agency confusion and disjuncture, ultimately facilitating capture by private interests. As the electric and water sectors have been privatised, state regulatory agencies have lost much of their power.

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Eletrobras is the governmental institution that was historically charged with the regulation of dams, and has been most involved in mediating conflicts between communities and dam builders. Eletrobras officials are quite familiar with the anti-dam movement and some of them have worked directly with local communities to mediate in conflicts about dams. Several upper-level Eletrobras officials pointed to the influential role of communities in bringing local concerns into energy planning. However, they explained that there were currently no formal institutional mechanisms through which this could take place. COMASE was developed with the intent of creating more participatory mechanisms in dam licensing, but the effort was abandoned in the 1990s when privatisation was instituted. As regional-level sectors have been privatised, Eletrobras’ mission has become unclear. As a result, agency officials claim they now play no role in dealing with local grievances, arguing that these problems should be the remit of private dam builders rather than state agencies.

Experts who generate environmental impact assessments (EIAs) in dam planning have consequently become important actors in the approval process. In fact, expert opinion is largely the basis of dam planning and building. Whether it is knowledge developed through lab models of dams or experiments with soil or water flows, current dam planning policy is based on expert assessments. This is demonstrated both by the insulated structure of ANEEL and Eletrobras in particular, as well as the studies they perform in the planning process, usually topographic, hydrological, geological and environmental. These studies have three problems that will be discussed in more detail below: the lack of information regarding community impacts, the low expected cost of environmental preservation, and the frequently inaccurate data utilised in studies.

**IBAMA and the public hearing**

The national environmental agency (IBAMA), and its state affiliates, have historically been the main institution with a formal mechanism for non-expert participation. IBAMA is responsible to the Ministry of the Environment that formulates its overall policies. Through the environmental hearing process, IBAMA decides whether or not a dam can be constructed. Researchers at IBAMA evaluate environmental impact assessments performed by companies proposing a dam. Many of IBAMA’s officials are aware of the need to take community impacts into account. However, there are several limitations to that process.

First, stronger economic and political interests often override IBAMA. Economic interests, such as a corporation funding a dam project, often intercede in the regulatory process. Second, IBAMA’s involvement is limited to
judging the adequacy of a particular site. This is also the only stage at which local perspectives are taken into account. On a related note, governmental officials are particularly worried about environmental concerns being incorporated into project planning at a late stage. Environmental impacts tend to get accounted for only after a site has already been chosen, rather in advance. Government officials are also attempting to resolve a fourth problem: the lack of coordination between environmental concerns, economic issues and energy needs that undermines efficiency. A dam may be approved by the water agency, only to be vetoed by the environmental agency that finds it in violation of environmental law. This means dam building takes more time and is more complicated than necessary. The majority of social and environmental concerns are also not taken into account in initial project planning for two reasons. First, environmental impact assessments are not required to include a broad base of data. Second, the assessments are often inaccurate and only made more so and more accountable when activists are involved. That makes corporate cost estimates very inaccurate.

The formal dam licensing process is supposed to follow several steps. Since the enactment of environmental legislation in 1986 the dam-building process consists of three licenses: (1) preview, (2) building and (3) operating. The preview stage consists of the prospective company submitting an environmental impact assessment (EIA) to the government. Following the approval of the EIA, a building license is granted. After the construction is approved, an operating license is provided. The only window for public participation in decision-making is prior to the first phase of licensing, when communities can engage in a public hearing.

An open public hearing can follow the EIA if the local community requests it within 45 days of being notified of construction. The hearing involves the presentation of the official EIA by a consultant, statements by government officials, and testimonies by local communities or their representatives. IBAMA, or the state government environmental regulatory agency, oversees the public hearing process, one of the primary institutional spaces for the participation of civil society in environmental policy making. However, this space is far from adequate because, as the IBAMA National Director of Licensing pointed out:

Public hearings provide a very limited basis for what you can do because they are so short, [lasting only] four or five hours, and the public doesn’t have very much information.42

Government and local communities also felt that hearings only occur when local movements bring pressure on state institutions. Yet many communities

42 Interview, Nilvo da Silva, Director of Licensing for IBAMA. March 2003.
said they had not been officially notified of dam plans, so many hearings are not held because of public ignorance.

Problems also arise when local people cannot understand what is written in the technical report. Considering that 60% of the Brazilian population has only finished the third grade of primary school, it is almost impossible to expect that rural farm workers will have the background to assess the validity of a technical engineering report; the literacy skills to engage and criticise such a report is generally lacking. A lack of formal community decision-making power at the hearing also means that even if the community does participate, it does not necessarily have any influence. The public hearing is, in theory, based on expert knowledge about the affects of dam construction, but is also meant to be a forum where public opinion can be heard and incorporated into governmental decision-making. So, activists attempt both to voice their concerns and to manipulate expert knowledge in order to advance their interests. Community members engage with researchers, often professors at federal universities, then use the outcomes of such interactions in the public hearing process.

In addition to the lack of public involvement in the development of the EIA, reports are usually biased due to the profile of the researchers who conduct them. EIAs are generally carried out by professional research consultants hired by prospective dam builders. These engineers are not trained to assess social costs, and use methods appropriate to measuring only certain outcomes. Generally reports are drawn up by engineers and physical scientists. On occasion social scientists are hired to carry out assessments or develop community programmes, but social costs do not have to be included in impact assessments. In short, physical scientists are integral to understanding the productive capacity of a project, and social scientists are extraneous to that mission.

Research is often carried out by flying above the river in question to count existing forest acreage and observable numbers of settlements, meaning that reports often miss vital details. For example, one movement leader and church representative explained that:

You go to look at EIAs in the computer and practically all of them are the same. We observe that an EIA of one location has the exact same photograph as an EIA in another location. One is practically a copy of another.

Since the environmental impact assessment is the one point at which environmental concerns about dam building can be incorporated into the planning process, it is critical that these reports are accurate. Because funders often shape the outcomes of the research that they support, dam-building companies face a conflict of interest when conducting these studies, as do the consultants they pay. More broadly, decision-making about dams is driven by an ‘adaptability paradigm’ which tends to prioritise economic gain and delegitimise local realities. This conceptual approach leaves decisions in the hands of technicians rather than those of potentially displaced people.

As previously mentioned, estimates of environmental costs that also encompass impacts on affected communities are not well accounted for, constituting a minor category in EIAs. For example, an assessment of the proposed Rio Madeira dam planned in the northwestern area of the Amazon exemplifies such data limitations. In the last section of a seven-page document detailing the estimated costs of the Rio Madeira dam, the last section, entitled ‘Other Social and Environmental Concerns’, lists the costs for conservation of flora and fauna, improvement of water quality and costs for other environmental damages that would result from the dam. As is the case with most EIAs, the first three areas that are studied in assessments are based on technical, quantified methods and are carried out by researchers generally trained in engineering. The national governmental guide to identifying the hydroelectric potential of river basins uses sources such as the annual Brazilian Demographic Statistics (Anuário Estatístico do Brasil), state governmental information and scientific publications in order to assess environmental and social impacts. These sources tend to be quantitative and provide little information about local context.

**Overview of the collaborations**

Since the building of the earliest hydroelectric dams in Brazil, information and knowledge about dams has been a contested issue. The government tended to provide little information when a dam was being constructed and, if challenged, often provided misinformation. As a result, researchers began to play a critical role in informing community members about dam planning, consequently playing a central role in initiating the anti-dam movement. They provided accurate information to potentially affected local groups and

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represented these communities before governmental planning agencies. For example, the University of Passo Fundo and the regional college of Ereirim in Rio Grande do Sul were key academic groups in developing a critique of the need for more energy, initiating community awareness of the dam project and educating local populations about the effects of dams.46

After the transition to democratic government, the anti-dam movement brought pressure to bear on governmental institutions to try and secure more participatory planning. The use of public hearings and Environmental Impact Assessments became the norm. However, communities have protested that these processes are quite authoritarian in nature and rarely take their views into account. As a result, anti-dam groups have used a number of tactics outside these institutions to stop single dams and attempt to alter federal policy. They have also tried to make their voices heard within the environmental impact assessment and public hearing processes in order to affect planning. Through these collaborative projects, researchers have brought activists into contact with government officials, creating a discourse and dialogue that has transcended the gap between these two groups. While they have had different processes and outcomes, these collaborations between lay people and researchers have often served as effective participatory mechanisms.

Lay/expert collaborations regarding dam building exist on an international level and in three of the five regions in Brazil. There are two stages in which we can see the outcomes of lay/expert collaborations. (See Table 1 for outcomes.) Preliminary outcomes include experts sharing knowledge with lay people and educating the local community, followed by mobilisation of community members and movement development. While these preliminary steps are not those traditionally associated with participatory institutions, they are of pivotal importance in a context where social movements play a fundamental role in increasing accountability and participation. The second phase of outcomes is complex and varies from case to case. It includes cases where lay people inserted their knowledge into science, ultimately leading dam-building policies to be altered. In the process,

46 Rothman, Franklin, ‘From Local to Global’.
participation advances a discourse about sustainability. The following typology signals the different kinds of participation that have led to these outcomes.

**Typologising collaborations**

Lay/expert collaborations assume several forms (see Table 2). In each case, lay people include dam-affected people and members of social movement groups. Researchers and experts generally include university professors and independent researchers whose main professional activities include the generation of articles, reports and ‘extension projects’. These projects are funded by the university in order to support professors to undertake work oriented to benefit the community. First, in the Researcher Educator mode, researchers serve as educators of movements. Second, researchers act as movement leaders or political representatives by being Researcher Activists. Third, researchers and lay people work side-by-side in Citizen/Science Alliances in order to construct new research about the impacts of dams or to analyse existing environmental impact assessments performed by hired consultants. Fourth, lay people and experts officially document dam projects together and present this documentation to governmental bodies through the Collaborative Forum. These are instances in which lay people and experts officially comment on existing sciences and policy around the subject.

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<thead>
<tr>
<th>Lay/expert form</th>
<th>Direction of knowledge transfer</th>
<th>Changes in knowledge and discourse</th>
<th>Main activities</th>
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<tbody>
<tr>
<td>1) Researcher Educator</td>
<td>Top-&gt;bottom</td>
<td>Expert language sharing</td>
<td>Researchers serve as educators of movement representatives or lay people</td>
</tr>
<tr>
<td>2) Researcher Activist</td>
<td>Top-&gt;bottom</td>
<td>Construction of a new discourse outside of collaborative space.</td>
<td>Researchers serve as movement leaders or political representatives</td>
</tr>
<tr>
<td>3) Citizen/Science Alliance</td>
<td>Bottom-&gt;top</td>
<td>Discussion and deconstruction of official knowledge. Counterering of expert and lay claims</td>
<td>Construct new research about the impacts of dams or analyze existing environmental impact assessments performed by hired consultants</td>
</tr>
<tr>
<td>4) Collaborative Forum</td>
<td>Bi-directional</td>
<td>New, official codifications of knowledge</td>
<td>Lay people and experts construct official documentation of dam projects</td>
</tr>
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</table>
of contestation in a governmentally-sponsored setting. The first mode informs and educates affected populations. In the second, researchers increase the movement's legitimacy and political know-how. In the third and fourth forms, lay knowledge is translated up to a more official level. While these collaborative types often overlap, at times they may also reflect different phases of researcher involvement. If so, these phases often proceed in the order listed in the typology and indicate the advancement of local organisation and sometimes movement success. The following collaborations demonstrate how each type functions.

**National collaborations**

Four such collaborations were identified in Brazil. They function at the local and national levels, spanning the breadth of the country and the temporal duration of the anti-dam movement. They include: (1) the MAB/IPPUR group that has traditionally focused on the southeastern region but now extends to the whole country; (2) the Movement for Development of the Trans-Amazon and Xingu (Movimento Pelo Desenvolvimento da Transamazônica e Xingu, MDTX) in the Amazon, professors at the University of São Paulo, and International Rivers Network; (3) researchers in Belo Horizonte and dam-affected people in Northern Minas Gerais, as well as researchers at the University of Viçosa and the surrounding community, and; (4) groups affected by Tucurui Dam in the eastern Amazon and researchers at the Geoldi Museum and the Federal University of Pará in the same state. Each of these projects has a different history, slightly varying agendas, and distinct forms of lay/expert collaborations. (See Figure 1 for a map of the collaborations.)

**MAP/IPPUR**

As the anti-dam movement began to become formalised, activists from the far south who established the Movement of Dam-Affected People (Movimento dos Atingidos por Barragens, MAB) approached researchers at IPPUR (Instituto de Pesquisas e Planejamento Urbano e Regional), an urban studies institute at the University of Rio de Janeiro (the collaboration is hereafter referred to as MAB/IPPUR). These communities were beginning to organise but had very little political power. There were also no institutions available through which they could influence the planning process. When a dam was proposed, they had no choice but to be displaced from their community with no compensation. At that point, government institutions were only beginning to become democratic and extend some accountability to dam affected people.

Over the past twenty years, these groups have worked together in several ways to alter planning processes around a number of dams in several regions.
of the country. MAB/IPPUR has affected government policy at national and state levels and laid the groundwork for many other groups to follow suit. Researchers at the IPPUR have been the main partner in collaborative projects with MAB. Experts at the Federal University have advised and educated communities in multiple regions of the country, acted as community representatives to government agencies and in public forums, and worked side-by-side with affected people to study the ramifications of dam building. The MAB/IPPUR collaboration has taken multiple forms and demonstrates the different roles assumed by researchers working with the movement. As one researcher explained, confidentially:

I began to teach them courses about environmental legislation and law and social and environmental impacts of big dams. I had this kind of experience [and used it] to prepare them for hearings, showing them how it works [in practice]. We played roles with each person representing different players in the hearing. We also made
a report on environmental assessment studies. I re-analysed environmental impact assessments ... They asked me to support them technically. I call it technical assistance and training courses ... training materials to educate grassroots organisations on legislation.

Lay/expert collaborations first provided the movement with technical and political assistance, as is typified by the Researcher Educator role. Researchers organised training courses to advise leaders about how to intervene in the political processes underlying energy policy. Organic farming methods have also been shared. In addition, researchers have served in the Researcher Activist role by advising activists about movement tactics. For example, one researcher suggested that MAB coordinate an international meeting of anti-dam organisations. The leadership followed his suggestion and held a meeting in 1997. The collaborative approach of those projects lent them credibility, enabling them to secure financial support, especially from foreign foundations that want to support grassroots work with infrastructure and guidance. As a result, the group has gained several sources of funding, such as state academic institutes, and private sources such as the Ford Foundation. In addition to financial resources, researcher participation within the movement has offered credibility and knowledge.

As activists and educators of the movement, researchers have helped effect political change. The Citizen/Science Alliance is the most participatory type of institution existing to date. Currently two such projects are taking place. First, researchers and lay people have been developing resource guides on a variety of energy-related topics, including environmental policy and governmental institutions so that MAB can use these in its organising efforts. Researchers write some chapters and lay people write others. The formalisation of this knowledge-sharing is striking since many MAB representatives are almost entirely uneducated. The resource guide’s form clearly legitimates the perspectives of lay people and evidences the support of IPPUR researchers. Together, the authors of the book develop an alternative way to frame dams and development that counters the state’s expert, distant conceptualisation. While some chapters detail the specific impacts of dams that governmental sources often deny, others describe local struggles. The authors use this diverse approach to suggest a new paradigm of democracy and development in dam building. The MAB/IPPUR presentation is grounded in local experiences, but at the same time it encompasses an ‘expert’ understanding of the broader social and environmental situation. Whether or how the information will be incorporated into governmental discourse has yet to be seen.

47 The first international meeting of dam-affected people was held in 1997 in Curitiba, the capital of the state of Paraná.
The second IPPUR/MAB Citizen/Science Alliance has involved the production of a database of environmental and social characteristics of seventy to one hundred large dams. IPPUR, MAB, International Rivers Network and the International Committee on Dams, Rivers and People (ICDRP) came together to apply for funding from the Ford Foundation to support this project. It is an internet-based resource which permits dam-affected people to add their local knowledge to a comprehensive picture of dam impacts. Activist communities that need official information can utilise the database, although academics may use it also. This Citizen/Science Alliance is a unique example where the democratisation of knowledge not only implies the collaborative generation of expert knowledge, but also a fairly open and accessible format of presentation in that the entire database will be available on-line. However, data protection issues and the lack of generalised access to the internet mean that locals have to go through researchers or other organisations to interact with the database. This signals some of the limitations to feeding information back to the community.

Limited engagement with the mass base of the movement has to some degree been a feature of the MAB/IPPUR projects. IPPUR researchers have more frequently adopted the role of working with the national-level MAB leadership, relationships which have been cohesive and fundamental to movement organising. The discourse and critiques developed at this level have trickled down to the rest of the movement through organising tactics. However, conflicts and discussions over information and expert knowledge have often persisted at the upper echelons of MAB’s leadership. While these leaders are mostly dam-affected people, they are not representative of the mass base of affected people that still live on farms and in local villages in the affected areas. This is a potential limitation of the lay/expert collaboration.

The MAB/IPPUR collaboration has grown in strength and geographic reach since the first days of its inception, involving an increasing number and type of projects in the past ten years. Their outcomes have informally shaped the planning of specific dams, as well as the overall accountability of Eletrobras to local communities. Most recently, the Chair of IPPUR (the most involved researcher in the team), was appointed as a special advisor to Eletrobras. This appointment shaped IPPUR’s relationship with MAB, first by raising hopes that government relations would improve, only to be followed by disappointment. The initial openness to movement representatives by President Lula’s administration, demonstrated by the meetings high-level officials had with movement leaders and the more conciliatory discourse adopted by politicians, held out the prospect of the

48 Carlos Vainer.
incorporation of movement perspectives into governmental discourse, even though this has often been a problematic process. Lay/expert collaboration continues to be a pivotal factor in bringing lay people into direct connection with political institutions and representatives.

University of São Paulo and the northern region

The University of São Paulo rivals the Federal University in Rio as the premier university in Brazil. Both are internationally acclaimed, especially for their sciences. In common with researchers at IPPUR, several individuals in the Department of Energy Planning at the University of São Paulo (USP) are involved in multiple lay/expert collaborations. These researchers work with the Energy Working Group, International Rivers Network (IRN), and the MDTX. São Paulo researchers’ most important national collaborations are with the MDTX in the north. The Citizen/Science Alliance between USP researchers and northern activists played a central role in defeating the Belo Monte dam proposal in 1989 and again in 2003. At the time of the first proposal, activists built an international activist coalition to try and stop dam construction. Later in the 1990s, the government developed a new model of Belo Monte meant to reduce its potential impacts and deal with these activist concerns. This new model was technically far more complicated and innovative. However, serious problems persisted. USP and MDTX worked together to analyse this new model and develop a technical critique of government proposals. Technical problems, in conjunction with a lawsuit advanced by community members, eventually led to the demise of the project in 2003.

The stages leading up to the dismissal of the Belo Monte construction plans involved public meetings where hundreds of indigenous people dressed in traditional clothing filled local halls. A panel of MDTX representatives and São Paulo researchers explained where the dam would be built and who would be affected by it. Through their own research and by receiving information presented by these local people, researchers offered a critique of the dam that was supported by local knowledge of the area. These researchers presented this information to governmental bodies. Belo Monte was controversial in many ways: for example, one of the main problems with this site, in common with that of many other proposed Amazonian dams, is that the topography is flat, which necessitates the creation of a large reservoir in order to provide sufficient force to generate energy when water flows through dam turbines. Local people knew this to be the case, and they knew that rainfall patterns were so erratic that the reservoir would only enable the dam to function during part of the year. This claim was presented against the dam construction. In these ways, researchers provided new
technical legitimacy to the movement and represented public concerns with scientific data that could be utilised by government institutions. While the Researcher Educator and Researcher Activist roles were fundamental in creating a new public discourse about Amazonian dams, collaborations between the two groups forced Eletronorte, the most authoritarian and least participatory region of Eletrobras, to take local perspectives into account in their planning.

In June, 2005, Belo Monte was approved by Congress. The environmental impact assessment was evaluated by state agencies and deemed sufficient. However, questions have been raised about the viability and motivation for the project. Much of the energy would be used to process aluminum for Chinese companies, and government representatives stood to profit from their financial investment. Therefore, in 2006, the Ministério Público raised concerns that may result in the plan being rejected again.

The State of Minas Gerais – the Federal Universities of Belo Horizonte and Viçosa

Two collaborations have occurred in the state of Minas Gerais; in the southeast, around Ponte Nova, and in the northern dry region. Local communities in Minas Gerais have long engaged in lay/expert collaborations which have created a completely unprecedented movement/government engagement, stopped several dams, resettled communities, taught illiterate people about the technical aspects of environmental impact assessments and energy policy, and at the most basic level, alerted community members to the new construction of a dam about which they were not previously aware.

The first lay/expert collaboration in the southeastern region of Minas began in the mid 1990s at the Federal University of Viçosa. The Pastoral Land Commission (Comissão Pastoral da Terra, CPT), the Catholic Church, dam-affected people and researchers from the Federal University of Viçosa came together to attempt to prevent further dam construction in the town of Ponte Nova and surrounding areas. A professor in the Department of Rural Economy who had researched and written his Ph.D. dissertation on the issue instituted an ‘extension project’, a collaboration of community members and

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50 The Ministério Público is the independent legal representative within the state that protects the constitutional rights of individuals and upholds constitutional and legal procedures. It is sometimes called the fourth power as it is independent from the executive, legislative and judicial branches.
a multidisciplinary group of professors. The professor contacted other researchers in his university in order to initiate a study of the situation. He was already involved in a rural education project that linked him to an activist studying to be a priest. As community members began to hear about the new project, they became involved and the group of both local people and professors grew. Together, locals and researchers identified four main geographic areas where dams were being built and where the communities affected needed technical assistance. State funding to support research closely tied to the 'extension project’ came through in 1997, involving over ten students and four or five professors.

One graduate student who participated in the project claimed that the lay/expert collaboration was critical to creating local participation in dam planning. Basing his depiction of environmental law and licensing of hydroelectric dams on his personal experience, he described dam building in Brazil as premised on three foundations: patrimonialism, individual-level negotiation, and disinformation to local populations. The lay/expert collaborations in which he participated attempted to interrupt the rent-seeking behaviour of officials, and to make negotiation a more participatory process. It also aimed to counter the disinformation provided to locals. Between 1996 and 1998 the collaborative group was able to halt the construction of four dams. However, actions like those in Minas are not always effective. Problems with the public hearing, such as lack of formal decision-making power on the part of locals, have limited the ability of local groups to effect change. In addition, corporate co-optation of public officials and the dam planning process itself have often prevented the application of improved scientific understandings to policy-making.

The group has stopped several dams and, as of 2005, was attempting to prevent further dam construction by the Alcan corporation. While not all of the research group’s projects were successes and several dams they protested against were in fact built, in several cases where contested dams were built, activists and researchers were subsequently invited to advise on the design of indemnification projects. In one such project, the state authorised anti-dam activists to help advise on a resettlement plan. These activists asked researchers from the University of Viçosa to assist in this process. Researchers agreed to take part because they felt that in spite of the decision to construct the dam, this was an important chance to improve the lives of local people.

The second of the two main lay/expert collaborations in the state of Minas Gerais began in the late 1990s, when researchers at the Federal University of Minas Gerais (UFMG) began to work with a community in the

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51 Rothman, Franklin and Pamela Oliver, ‘From Local to Global’.
northern part of the state that was soon to be flooded. A research team, organised by a professor of anthropology at the Federal University of Minas Gerais (UFMG), worked to educate the community about the potential impacts of the dam. This professor was interested in part because she was also affected by a dam in her home county in Minas. Without the resources needed to transport the community fourteen hours south to the capital where it could occupy governmental or corporate offices, the opportunity to stop the dam lay mainly in the local public hearing. Researchers educated the community about the proposed dam, served as representatives to governmental bodies and then analysed the EIA with the participation of the community. In this way, they utilised the Researcher Educator, Researcher Activist, and Citizen/Science Alliance modes.

Local groups affected by Tucurui Dam and researchers at the Geoldi Museum and the University of Pará formulated the most recent project, an attempt to secure resettlement packages for many downstream communities that had not been compensated for over twenty years. Construction of Tucurui first began in 1974, and was continued in a second phase in 1998. Its purpose was to generate energy for the growing industrial sector. In the 1980s the communities upstream from Tucurui Dam allied with other affected groups in the northeastern region. Yet both these groups faced serious challenges: they were isolated, extremely poor, and had very tense or combative relations with government agencies. The collaboration between affected communities and researchers at Tucurui provided activists – both upstream and downstream – with a new sense of power and legitimacy.

A Collaborative Forum was formed in 2003 when a meeting was organised by the researchers, activists and Eletronorte (the regional electric sector that managed Tucurui). Entitled ‘Popular Movements, Teaching and Research Institutes, and Regional Development in the Area of Tucurui’, this Collaborative Forum was a meeting which aimed to provide a space where all stakeholders had an opportunity to share their perspectives. The three stated purposes were: (1) to discuss a 1.97 billion reais (around US $65 million) development plan for the next 20 years; (2) to identify ways to increase the involvement of local populations in these plans and; (3) to reinforce

LaRovere, E. L. and F. E. Medes, ‘Brazil Case Study: Tucurui Dam and Amazon/Tocantins River Basin’, Cape Town, South Africa, World Commission on Dams (Cape Town, 2000).
relationships between research institutes and social movements in the region. A few phrases on the front page of the pamphlet – ‘transparency and information for the debate’, ‘popular elaboration on regional development plans’, and ‘science at the service of the people’ indicate the combination of governmental, expert and lay discourses about development at the meeting.\footnote{Popular Movements, Teaching and Research Institutes and Regional Development in the Area of Tucurui (Tucurui, Para, 2003).}

The presentations given by researchers from Museu Geoldi and the University, activists from a variety of groups including fishermen, indigenous groups, quilombos, workers, the movement of dam-affected people, and government representatives from a variety of departments reflect this discursive mixing. This event in turn led Eletronorte to initiate discussions with downstream communities about indemnification. This outcome is remarkable and stands in stark contrast to the previous marginalisation of downstream groups by government.

The lay/expert collaboration between Museu Geoldi, the University of Pará, and groups affected by Tucurui dam is the only national-level collaboration that fits the Collaborative Forum model. It resulted in the official incorporation of lay and expert work into government discourse. The singular nature of these Tucurui projects makes it difficult to generalise and claim that other Collaborative Forums will always be similarly successful. However, it is still important to note that in this case international norms of democracy, involving international pressure to ensure democratic practice rather than unaccountable, unjust policies, were adopted in a national-level project, and that lay/expert collaboration was critical to this process. The Tucurui project is one of the few instances where this process can be seen so clearly.

In these four case studies, as researchers worked with local people, several advances occurred. State agencies and funding bodies were challenged and policies and dam plans were changed in several cases. Affected people and their affiliated local and regional organisations were consolidated and empowered. While these collaborations did not always lead to tangible policy outcomes, they did produce changes in discourse and also science that helped alter dam-building policy.

*International collaborations*

Two international collaborations of anti-dam activists and researchers have brought new discourses and knowledge to bear on the construction of dams in Brazil and throughout the world. First, pressured by anti-dam organisers
around the world such as International Rivers Network and Brazilian anti-dam organisers, the World Bank initiated the World Commission on Dams (WCD) in 1998 in order to examine global impacts of large dams. One component of its mission was to develop seven assessments of dams worldwide. This included a case study of Tucurui Dam in the Amazon, involving activists, researchers and government officials. Second, Brazilian researchers work with a group of NGOs called the Brazilian Forum of NGOs and Social Movements (FBOMS). These two projects are different in their form, intent and outcomes.

**World Commission on Dams**

The WCD was a global assessment of the impacts of large hydroelectric dams funded by the World Bank. It was meant to be a multi-stakeholder forum where government, civil society and industry assessed seven large dams around the world. The WCD functioned under the auspices of the United Nations Environment Program (UNEP) and the Dams and Development Project (DDP). The World Bank had been a long-time funder of large dams around the world, engendering hostility from many activists. Although there were many movements involved in instigating the WCD, the Brazilian movement proved pivotal. The final WCD report examined the Tucurui dam in Brazil, one of the few dams in the Amazon.

Construction of Tucurui first began in 1974, and was continued in a second phase in 1998. The additional construction heightened long-allayed controversy over the dam, because it added several turbines and increased the area of flooding.

The multi-stakeholder framework and methodology of the WCD was determined in the initial study’s structure, but had long been demanded by Brazilian, and other, activists. Because of this mandated structure, locals, activists, researchers and industry representatives all played a role in elaborating the report. In this way, and because it reignited interest in the impacts of Tucurui, the study stimulated community collaboration. Before the WCD initiative, local activism was fragmented into upstream and downstream communities. These subsequently came together and were able to initiate negotiations with Eletronorte, to try and secure indemnification for downstream communities which had previously considered unaffected.

The reception of the World Commission on Dams report demonstrates both the pitfalls and successes of lay/expert collaborations that are not

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*LaRovere, E. L. and F. E. Medes, ‘Brazil Case Study: Tucurui Dam and Amazon/Tocantins River Basin’ Cape Town, South Africa, World Commission on Dams (2000).*
formalised through governmental structures. While many government officials were aware of the contents of the report, as of 2005, the Ministry of Mines and Energy and IBAMA had not implemented the WCD goals. In this way, the report publicised the need for more participatory planning, but government agencies were not mandated to implement it. Nonetheless, the WCD report achieved two outcomes: first, it provided legitimacy for previously marginalised concerns. As one WCD official confided:

In some senses what the commission has done is to provide one clear focal point. So if there is a conflict around large dams in Brazil then the commission report becomes a key text around which that debate takes place.

Therefore, the release of the report alone provided a discursive platform for future change.

However, the report received mixed reviews from local communities. For example, the movement in Minas Gerais has been loathe to use it as a platform because activists claim it failed to reflect the needs of local people. However, it was also too radical to be adopted by the World Bank. WCD interviewees said that the Bank had largely rejected WCD recommendations and stated that it is not interested in initiating any similar commissions in the future. The Brazilian government gave the WCD report a mixed reception and has no future plans to incorporate it into policy. This is despite the fact that the report’s discourse filtered down to even local government. An institutional reading of the WCD report as too radical to be adopted, and the movement interpretation that it is insufficiently radical, reflects the continuing disjuncture between government/industry alliances that plan and build dams and civil society groups affected by them.

Energy Working Group

Initiated much earlier than the WCD, in 1991, the Energy Working Group is less formalised but has possibly had greater influence than the WCD. The Group is composed of representatives from Brazilian environmental NGOs that work with professors from the University of São Paulo coordinating a project called the Brazilian Sustainable and Democratic Project (*Projeto Brasil Democrático e Sustentável*). This collaboration has generated a multi-directional process where lay perspectives are incorporated into expert discourse which is then translated into policy recommendations. For example, lay people and researchers have worked together to write several letters to government officials in order to oppose dam-building. They have also collaborated on books together, with parts being written by activists, and others by researchers. Activist groups support the public consumption of this expert knowledge through publishing companies, established as a part of their organisational structures. For example, FASE (Federação de Órgãos
para Assistência Social e Educacional), an organisation that opposes deforestation and unsustainable development, runs a publishing trust that published a book series on a variety of environmental topics, including dam building. Its work has resulted in direct connections between the anti-dam movement and high-level government officials, the consolidation of groups across the country working on energy-related issues, and coalitions with groups outside of Brazil.

Both the Energy Working Group and the World Commission on Dams are participatory institutions that aim to shape dam planning. The Energy Working Group takes the form of Researcher Educator, Researcher Activist and Collaborative Forum. The WCD has operated within the Citizen/Science Alliance and Collaborative Forum modes. The Group and WCD forums had discursive, paradigmatic outcomes and some concrete policy outcomes. This process signals the frequent need of movements to establish an oppositional public discourse or alternative paradigm before governmental policy becomes responsive to new ideas in civil society. The lay/expert collaboration is a forum through which an oppositional discourse can be developed and legitimated both by dam-affected people and researchers.

Changes in science and policy

In Brazil, lay/expert collaborations have worked to bridge the gap between community needs and governmental institutions. The three main steps of lay/expert collaborations identified here are: (1) experts sharing knowledge with lay people, and; (2) lay people inserting their knowledge into science that ultimately led to; (3) alteration of dam-building policy. Most frequently, researchers provide information to community members. They then join with community members in participatory processes in order to evaluate dam planning. Through these groups, they bring pressure to bear on governmental institutions. These lay/expert collaborations are a facet of broader anti-dam organising that has been reported on elsewhere. While the political pressure and public attention generated by the movement was fundamental to the successes discussed here, collaborating with experts was also a vital movement tactic.

Expert knowledge-sharing with locals

In general, experts shared their knowledge on three topics: the planning of dams of which governmental agencies had not informed them, general

governmental policy and practice, and non-toxic farming methods. In several of the previous cases, experts played a fundamental role in demanding that IBAMA hold a public hearing in which community members could express their perspectives about the dam. For example, this occurred in the initial stages of the movement in the south of the country and during the most recent activism in Minas Gerais. Researchers contacted communities and informed them about dam projects the government was planning. As this process advanced with researchers and experts becoming collaborators, they developed new scientific assessments that could be used at the hearing. This allowed local groups to develop a critique of these projects before the public hearing was held. This is in marked contrast to the critique of public hearings offered by the Director of Hearings for IBAMA. He claimed that communities do not have enough time or resources to participate in hearings in a meaningful way.\footnote{Interview with Nilvo da Silva, Director of Licensing for IBAMA. March 2003.} Expert knowledge-sharing therefore advances participation and enables a deepened democratic exchange.

Changes in science

Changes in science took place as lay people and experts engaged in research projects through the Citizen/Science Alliance. These changes included alteration of Environmental Impact Assessments and dam planning policies. For example, in the case of Northern Minas, the team generated a new EIA that was evaluated by the state. By working together to assess these EIAs and add information that had been omitted, researchers and activists provided a new expert account of environmental and social impacts. This was one of the most important new bodies of scientific knowledge to emerge from the process. The Assessment found ‘innumerable pieces of missing information (maps of Irape [the area], for example) and insufficient data, as well as incorrect information, such as the area that would be inundated and the impacts that would be incurred by the dam’.\footnote{Zhouri, Andrea ‘Parecer sobre as Informacoes Complementares ao EIA/RIMA da UHE Murta. Grupo de Estudos em Tematicas Ambientais (Belo Horizonte, Minas Gerais, 2002).} The authors also pointed to the lack of transparency regarding the methodologies used in the official environmental impact assessment, and claimed that the data they had generated was more accurate. Citizen/Science Alliances in Minas Gerais, in the World Commission on Dams Study, with the University of São Paulo and MDTX, and the MAP/IPPUR group resulted in new understandings of the impacts of specific dams and an overall appreciation that official environmental impact assessments were often inaccurate.

Lay/expert collaborations also played a role in creating a larger culture and discourse of participation in dam planning. While discursive or normative
shifts did not always have immediate impacts, they were part of a process enabling longer-term sustainable change. The existence of this discourse allowed movement actors to develop critiques of the current form of policy-making and suggest changes. For example, upon first entering his new governmental position, one high-level governmental official claimed that he was seriously concerned with affected populations and was committed to addressing their needs. He clearly articulated the problems concerning lack of participation and with the research used to quantify dam impacts. The newest energy model also incorporates participation in a more effective way.

Changes in policy

As a result of lay/expert collaborations, specific changes in dams were made, and the construction of some dams, such those in Belo Monte and several in Minas Gerais, were completely halted. Resettlements have also been shaped by lay/expert collaborations. In southern Minas Gerais, a researcher was the main advisor to a resettlement project once a dam that had been protested was approved. Before offering suggestions, he communicated with community members. He also insisted on bringing community members to governmental meetings regarding the resettlement.

These collaborations are also currently influencing policy construction on a grander scale. The new energy model developed by the Lula administration in early 2004 specifically responds to some of the critiques put forward by local communities. For instance, dam-affected communities wanted environmental impact assessments to be conducted before the licensing process began in order to pre-empt the influence of powerful industry representatives. Alternative energy generation in the form of wind, solar and biomass is also being considered more thoroughly. Both of these concerns have been added to the model so that EIAs will be conducted before the licensing process begins and alternative energy sources will be more seriously considered. These advances may have been achieved by the Collaborative Forums previously discussed, or possibly through the researchers aligned with the movement who assumed new, influential positions following President Lula’s election in October 2002. One of these researchers became the Special Advisor to the President of Eletrobras, the national energy company, while another became an advisor to the Minister of Mines and Energy. While this new model may increase accountability, activists are concerned that the economic and government pressure to accelerate the licensing process may undo any advances it has the capacity to effect.
Without the previous existence of these lay/expert collaborations and decentralisation measures in other sectors, President Lula would not have been able to create improved models of participation or access researchers who were well-connected with the concerns of civil society. In some ways these collaborations have both stimulated and provided the resources for the new model of the electrical energy sector. Although communities have typically had to work reactively in order to create policy change, alterations in the structure of the energy sector are potentially great proactive strides.

**Conclusions**

The analysis in this paper provides some insight into the black box of participatory mechanisms which vary in their levels of informality/formality and in their relation to the state. It also demonstrates how knowledge exchange between groups in civil society and experts functions, by showing how lay perspectives have been incorporated into expert and governmental discourse. In some instances this has led to concrete policy change. In other cases, discursive changes have occurred, sometimes even on a global level. The typology presented here offers a framework for comparing lay/expert collaborations. It delineates the importance of several types of knowledge-sharing: from experts to locals, that takes place in the Research Educator type, and the equal exchange between the two groups in Citizen/Science Alliances. In this sense, it points to a hitherto ignored facet of participatory mechanisms; the importance of different kinds of knowledge being transferred between groups.

This article has also aimed to contribute to our understanding of participatory mechanisms instigated by groups in civil society. One important finding is that there are several types of collaborative methods used by these groups that are not traditionally considered a part of deepened democratic practice. The typology presented here represents a broader definition of deliberative democracy than that which is usually utilized. For example, expert representation of community groups in governmental decision-making is not generally considered a part of deliberative practice. However, it does reflect a more consultative process than representative democracy and can shorten the feedback loop in situations where local communities are not afforded authority or formalised decision-making power. In response to one of the initial questions posed – what happens when the state does not develop such mechanisms, despite a need indicated by civil society? – this aspect of collaboration indicates that researchers may be one of the first groups to bridge the gap between government and civil society.
The Researcher Activist form worked for groups from all backgrounds because lay knowledge possessed by both NGOs and grassroots groups is often discredited. Lay people may critique science and expert knowledge, but scientific and bureaucratic norms keep their knowledge from being considered legitimate within those systems. Although NGOs have more power to express their opinions and influence policy, their lay perspectives were often not viewed as legitimate. This form of lay/expert collaboration provides legitimacy for government sources and movement actors, hence improving the probability that movement groups will be able to participate in government or influence policy. The Researcher Activist method was one of many tactics, including protests and sit-ins, that movements used to gain the attention of government and exercise power.

All four types of collaboration were used in international and national-level collaborations. International and national projects offered support to one another. Topics addressed by international collaborations addressed the concerns raised by national-level collaborations. Similarly, international collaborations would have been impossible without the previous organising and collaborative work national-level groups had achieved. The form of lay/expert collaboration utilised in each instance was related to the identity of local communities. The marginalised nature of lower-class communities resulted in the Researcher Educator collaboration type. There was a lack of governmental information transfer to these communities because of their political disempowerment and their low educational status. Researchers acting as educators transferred information and knowledge to them. This process was critical because the possession of specialised knowledge allowed local populations to initiate the participatory process.

The Citizen/Science Alliance created the most fundamental changes in science and policy. It was motivated by local concerns about the inaccuracy of official expert knowledge and the marginalisation of local people in governmental decision-making. It was advanced by grassroots groups and local people who knew the environment and social conditions. The occupational status of these communities meant they had a perspective that non-residents could not hope to possess. For instance, many communities displaced by dams comprise small farmers, farm hands for large landholders, or fishermen. They are the only groups who can know the immediate local impacts of the dam. Lay people shape the construction of research as a result, constituting in fact the only way that movements can construct new expert knowledge that takes their interests and experience into account. In common with several other movement methods, it also consolidates movement groups.

Finally, the Collaborative Forum is stimulated by the need for and lack of formal avenues to legitimate lay perspectives. It can also involve lay people
of a variety of backgrounds. In some senses the Collaborative Forum signifies the most successful type of participatory practice, because through it local interests are incorporated into governmental practice. However, community perspectives were consistently more radical and their demands higher than government was willing to accommodate. These results suggest that the role of knowledge in deliberation deserves further analysis, and that participatory institutions that are outside the margins of the state, but that intersect with governmental decision-making, are an important resource for furthering state/society synergy.