

# **Towards Inclusive Environmental Governance: a Study of the Expert-Lay Interplay in a Brazilian Social Movement**

**Ana Delgado Alemán**



**UAB**

**Universitat Autònoma de Barcelona**

Dissertation for the degree philosophiae doctor (PhD)  
at the University of Bergen

2009

Dissertation date: 17<sup>th</sup> April

Institute for Environmental Science and Technology, Autonomous University of Barcelona

and

Centre for the Study of the Sciences and the Humanities, University of Bergen

Phd, joint degree/cotutelle

## **Preface**

This Joint Degree dissertation is the result of collaboration between the Centre for the Study of the Sciences and the Humanities at the University of Bergen and the Institute of Environmental Science and Technology at the Autonomous University of Barcelona. Under the supervision of Roger Strand and Louis Lemkow, I have worked in both centres between 2004 and 2008.

The dissertation builds upon of the master thesis presented at the Autonomous University of Barcelona in October 2005 entitled: “Symmetry in the Co-production of Knowledge about Seeds: Conversations between Agroecological and Lay Knowledges in the MST (Movimento dos Trabalhadores Rurais Sem Terra/Landless Workers Movement)”. The main research focus of that work was the relation between scientific and non-scientific knowledges about agro-biodiversity. In the master thesis I approached this topic by interpreting it mainly as an epistemological problem. The present dissertation addresses the same general topic, namely, the relation between expert and lay knowledges. However, as the doctoral research proceeded, the epistemological perspective appeared limited and to some extent beside the point, and the dissertation may be said to apply a primarily sociological perspective. Hence, it looks at the complexities of the expert-lay *interplay* in MST.

The dissertation is based on ethnographic work and it has been organized in four papers. First, it explores how MST, originally a Marxist movement, is moving towards environmentalism. This change, which I have called the ‘green turn’, goes hand by hand with an increasing ‘expertification’ of MST. Second, it looks at trust in ecological experts and expertise within this social movement. Third, it focuses on how ecological expertise is recognized and redistributed within the movement. Fourth, it provides a description and a pragmatically oriented reflection on inclusive environmental governance.

The work has been intended to be sensitive to context as well as taking on a partly normative character. Whether the attempt was successful, the reader will judge. Probably, researchers with a background in the social sciences and humanities will assert that in spite of my claims of contextuality, the work lacks a ‘proper’ historical background and more description of the policy context. Although this criticism might have something for it, to a certain extent that is due to the constraints imposed by the format of the journals to which the papers have been submitted. Researchers working in more interdisciplinary fields (such as environmental sciences) may find the papers too long (8000 words!), tedious and probably not practical enough. My intention has been to produce a piece of work that is accessible to (at least) a broad academic audience.

## Acknowledgements

If I were to thank all the people that made this PhD dissertation possible, I would have to expend another 8000 words or more. Unfortunately, it is not possible to mention them all by name. My supervisors, Roger Strand (SVT-UiB) and Louis Lemkow (ICTA-UAB) have provided me with unconditional support. I cannot imagine how I could have had better supervisors. From this relation I have definitely learned something about the responsibility that being an academic should entail. I will keep on trying to transmit this learning. I deeply appreciate the collaboration with Roger which resulted in paper IV. Working together in this way was really inspiring and great fun. Paper IV received economical support from the UiB project “Regions and Alternative Processes of Modernization”. I am profoundly grateful to Rasmus Slaattelid (SVT-UiB), leader of this project, for giving me the opportunity to participate in it. Paper I is the result of the collaboration with Kjetil Rommetveit (SVT-UiB). Kjetil’s theoretical advice has been invaluable. My most sincere thanks to my colleagues working at the Centre for the Studies of the Sciences and the Humanities (SVT-UiB) and the Institute of Environmental Science and Technology (ICTA-UAB). Seminars, talks and laughs have been crucial sources for the realization of this piece of work. Especially, I want to thank Judith Ann Larsen for helping me to improve my written English in the papers of the dissertation in which I am the only author. I am grateful to Joan Martínez-Alier for welcoming me into the PhD Program in Ecological Economics at the UAB and for being my supervisor during the master. To MST farmers, leaders and technicians that have contributed to this work, I am extremely grateful for their infinite patience. Thank you to my colleagues (in alphabetical order) Edson Cadore, Gracielle Dainese, Kamilla Kjølberg, Renata Menasche, and Fern Wickson for intellectual feedback and support and for making my life very enjoyable while being in Brazil and Norway. During the period of the fieldwork, I have been a visiting researcher in the Federal Rural University of Rio de Janeiro and the Federal University of Rio Grande do Sul. This PhD work has received economical support from the Spanish Ministry of Education and Science (Beca FPU 2005-2007). Finally, I

would like to express my gratitude to the rectories and the administrative staff of the University of Bergen and the Autonomous University of Barcelona who made it possible to submit this PhD work as a Joint Degree dissertation.

A mis padres, a Cristina y a Kjetil.

## **Abstract**

First and foremost this dissertation concerns itself with inclusive manners of environmental governance. In a broad sense, it addresses the science-politics interplay in environmental governance. It focuses upon two main issues: the expert-lay interplay and the inter-relation between activism and science. Particularly, the dissertation looks at how these relations take place within the MST (Movimento Sem Terra/Landless People's Movement), which is one of the largest social movements in Latin America. During the last ten years, a fraction of this movement has transformed itself towards taking a more environmentalist stance. Such a change has come along with an increasing process of "expertification" of the movement and a renewed interest in the "democratization of science". Within MST there is an important debate on how to include local and traditional knowledges in the production of "scientific facts".

To a large extent, the arguments and descriptions presented in this work are based upon an ethnographic research carried out by the author between January 2005 and September 2006. The dissertation includes collaborations with Doctor Roger Strand and Doctor Kjetil Rommetveit. The arguments presented here build upon theoretical approaches of science and technology studies as well as environmental studies (mainly sociology and anthropology). The thesis tries to integrate empirical and descriptive work with theoretical and normative reflection. The ethnographic descriptions show how the environmentalist fraction of MST has adopted, reinterpreted, contested and mobilized scientific images and claims, adapting them to MST's political agenda. Furthermore, the dissertation presents some conceptual suggestions in the pursuit of more inclusive environmental governance.

The arguments are organized around four main issues: 1) the social perceptions of science, identity and collective action; 2) trust in science and experts; 3) the

constitution and social distribution of expertise; 4) inclusive environmental governance. These issues are investigated and discussed through the four papers that make up the *corpus* of the dissertation. In general terms, the dissertation concludes that the expert-lay interplay should be understood as deeply embedded in particular contexts of power relations. Categories such as “expert”, “science”, “ecology”, “lay”, “citizenship”, “transparency” or “democracy”, are given different meanings and uses by different actors, in accordance with particular contexts of action. Those categories are partly the result of power relations. But in part, they are also re-conceptualised and mobilized in new social struggles. They shape new realities of environmental governance in the global and local levels. Science and politics (in this case, science and environmental activism) are co-produced in complex and often unpredictable ways. In the pursuit of “real” inclusive environmental governance, empirical work on how this co-production takes place is needed.

## Resumen

Este trabajo de investigación ha estado guiado por un interés en la búsqueda de formas de gobernanza ambiental inclusiva. En un sentido amplio, este trabajo explora la relación entre ciencia y política en procesos de gobernanza ambiental. La investigación ha constado de dos focos principales: la interrelación entre conocimiento experto y lego, y entre activismo y ciencia. En concreto, la tesis analiza estas relaciones en el marco de uno de los mayores movimientos sociales de Latinoamérica, el MST (Movimiento dos Trabalhadores Rurais Sem Terra). Durante los últimos diez años, una fracción importante del MST ha entrado en un proceso de cambio hacia el ambientalismo. Este cambio ha ido acompañado de un creciente proceso de “expertificación” del movimiento, así como de un renovado interés por la “democratización de la ciencia”.

Hay un creciente debate interno en el MST sobre como incluir los saberes tradicionales y locales en la producción de “hechos científicos”. Las descripciones y

argumentos de la tesis están en gran medida basados en un trabajo de investigación etnográfica que la autora llevó a cabo entre enero de 2005 y septiembre de 2006. La tesis incluye colaboraciones con el Doctor Roger Strand (Universidad de Bergen) y el Doctor Kjetil Rommetveit (Universidad de Bergen). Para el análisis se ha usado un enfoque que trata de aunar perspectivas de los estudios de ciencia y tecnología (science and technology studies) y estudios ambientales (antropología y sociología fundamentalmente). La tesis intenta integrar trabajo empírico-descriptivo con argumentos teóricos y reflexiones normativas. Las descripciones etnográficas muestran cómo la creciente fracción ambientalista del MST ha adoptado, reinterpretado, contestado y movilizado imágenes y argumentos científicos, acomodándolos a su propia agenda política. Además, la tesis incluye algunas propuestas conceptuales para una gobernanza ambiental más inclusiva.

Los argumentos de esta disertación se organizan sobre cuatro ejes fundamentales: 1) percepciones sociales sobre la ciencia, identidad y acción colectiva; 2) la confianza en la ciencia y los expertos; 3) la constitución y distribución social de “expertise”; 4) gobernanza ambiental inclusiva. Cada uno de estos temas se investiga y discute en los cuatro artículos que componen el *corpus* de esta disertación. Cada uno de estos artículos incluye una serie de conclusiones concretas. En términos generales, la tesis concluye que el “expert-lay interplay” debe entenderse como profundamente arraigado en contextos particulares de relaciones de poder. Categorías como “experto”, “ciencia”, “ecología”, “lego”, “ciudadanía”, “transparencia” o “democracia”, adquieren distinto significado y uso para los distintos actores y en relación a contextos particulares de acción social. Estas categorías son en parte resultado de relaciones de poder, al tiempo que son movilizadas en nuevas luchas sociales, dando formas a las nuevas realidades de gobernanza ambiental en el nivel global y local. Ciencia y política (en este caso, ciencia y activismo ambiental) se co-producen de maneras complejas y muchas veces impredecibles. En la búsqueda de una gobernanza

ambiental “realmente” inclusiva, es necesario trabajo empírico sobre cómo la ciencia y la política se constituyen mutuamente.

## List of publications

1. Ana Delgado & Kjetil Rommetveit: “Our Strength is Diversity”: Imaginaries of Nature and Community in a Brazilian Social Movement”. (Submitted to Social Studies of Science)
2. Ana Delgado: “Activist trust: the Diffusion of Green Expertise in a Brazilian Landscape. (Accepted for publication in Public Understanding of Science).
3. Ana Delgado: “Opening Up For Participation in Agro-biodiversity Conservation: the Expert-Lay Interplay in a Brazilian Social Movement” (Published in the Journal of Agricultural and Environmental Ethics).
4. Ana Delgado & Roger Strand: “Looking North and South: Ideals and Realities of Inclusive Environmental Governance” (Submitted to Geoforum)



# Contents

<b>Preface.....</b>	<b>3</b>
<b>Acknowledgements.....</b>	<b>5</b>
<b>Abstract/Resumen.....</b>	<b>7</b>
<b>List of publications.....</b>	<b>11</b>
<b>Introduction.....</b>	<b>15</b>
<i>Environmental Governance, Social Movements and Science.....</i>	15
<i>Looking at Nature, Politics and Science.....</i>	23
<i>Methods: Adjusting to the Context.....</i>	29
<i>Papers Presentation and Discussion.....</i>	33
<i>Looking Further on: the Role of a Social Scientist in a Knowledge Society.....</i>	40
<i>References.....</i>	42

**Paper I:** “*Our Strength is Diversity*”: *Imaginaries of Nature and Community in a Brazilian Social Movement*”

**Paper II:** “*Activist trust: the Diffusion of Green Expertise in a Brazilian Landscape*”

**Paper III:** “*Opening Up For Participation in Agro-biodiversity Conservation: the Expert-Lay Interplay in a Brazilian Social Movement*”

**Paper IV:** “*Looking North and South: Ideals and Realities of Inclusive Environmental Governance*”



# Introduction

## Environmental Governance, Social Movements and Science

In this section, I will review the aims and scope of this dissertation. This is a work within the fields of environmental and science studies. It addresses the expert-lay interplay in biodiversity conservation. Particularly, it looks at how this interplay functions within the frame of a social movement. On a normative level, the dissertation seeks for conceptual means toward inclusive forms of environmental governance.

By the end of the 1980s, citizens all around the world received news about 'Our Common Future' (WCED, 1987). This report deeply changed the way in which 'the publics' imagined themselves, now members of a global society. The Brundtland Report influenced a shift in ideas of nature, now defined as 'the environment', both a scientific and a global issue (Jasanoff, 2001). Just a few years later, we received news of the Fall of the Berlin Wall. In Europe as in other parts of the World environmentalism was on the rise. Green parties, NGOs and movements emerged. The leftists, the critics and the activists, placed the global environmental crisis at the very centre of politics. The environmental crisis was given the status of 'hard fact'. In 1992, the Rio Summit brought optimistic ideas. The environmental crisis might lead, after all, to a global political reform: towards more transparency, accountability and public participation. In environmental sociology, these institutional developments have been identified as elements of the so called '*ecological modernization*' (Spaargaren and Mol, 1992 and Mol, 1996).

The 'ecological modernization' has been described by critical authors as a set of conflictive processes in which different political forces were competing for the definition of the environmental problems (Hajer, 1995, Torgerson, 1999). The awareness of the environmental crisis has informed new forms of collective action, social struggle and identities. To a certain extent, the environmental crisis has influenced a general redefinition of politics and particularly, a certain 'greening' of the traditionally 'red' leftist politics (Hajer, 1995) (red in the sense of socialist/Marxist or social democrat positions). With policy decentralization as a central feature of the 'ecological modernization' (Buttel, 2000), social movements and non-governmental organisations have increasingly taken on roles as relevant policy actors (or counter-policy actors) (Hajer, 1995).

In science studies, some authors have argued that the awareness of the environmental crisis has influenced a partial shift in the social contract between science and politics (Irwin and Michael, 2003). Disenchantment and loss of public trust in science and technology (Wynne, 2008) have come together with the enchantment and expectations placed on environmental sciences and 'green' technologies. This paradox characterizes the relation between the environmentalist movement and science: the environmentalist movement is critical towards science as well as deeply dependent on it (Yearley, 2005). Environmentalist social movements have been main protagonists in the dissemination of ecological knowledge and environmentalist values (Jamison, 2002). They have actively supported, contributed or called for the production of new scientific facts. They have given legitimacy to a number of academic disciplines and they have mobilized science to gain credibility and to develop their own goals. New alliances between academics and social movements are emerging. A remarkable event coming up in 2009 is the "World Social Forum Sciences and Democracy: towards a political dialogue between scientists and social movements across the planet". Increasingly, social movements request experts and expertise with the purpose of making activist use of science.

The dissertation concerns itself with the relation between activism and science in environmental issues. A systematic analysis of this relation is a challenge for the (self-) critical anthropological and sociological strands of environmental and science studies. Particularly, this dissertation looks at why and how an environmentalist movement produces, reframes, disseminates, contests and mobilizes scientific expertise. The next two sections give an account of my choice for biodiversity conservation as the environmental issue to be studied and of my selection of the MST (Movimento Sem Terra/Landless Peoples' Movement) as a relevant social movement to be studied.

### ***Biodiversity in Situ Conservation***

Biodiversity conservation appeared to me as an interesting topic for the study of social movements and particularly social movements of the South. Differing from other disputed environmental issues (such as climate change or nuclear wastes), in biodiversity conservation the lay knowledge has, to a certain extent, a recognized status. Part of the international scientific community has recognized the value of the indigenous, local and traditional knowledges. This value has been stated in the Convention on Biological Diversity, the main international policy frame for biodiversity conservation. Indigenous, traditional and local knowledge has been framed as potentially useful for the goals of conservation (Le Preste, 2002). In 'mega-diverse' countries such as Brazil, indigenous, local and traditional knowledge are being included within national environmental and agricultural laws. It can be said that a number of social movements of the South have taken advantage of this kind of 'opportunity structure', translating their claims and causes into the language of biodiversity conservation. In addition, biodiversity has served to re-evaluate and reinforce local identities (Escobar, 1998). Whether social movements get involved in biodiversity conservation because of strategy or identity (or indeed both), can only be

answered empirically. In any case, biodiversity conservation brings about a number of interesting questions on the relation between global science and local knowledges. This dissertation looks at how this relation takes place in agro-biodiversity conservation. Particularly, it is about the production and diffusion of knowledge about seeds.

### *The MST: Context and Process*

At this point, I shall present MST (Landless Peoples' Movement) and why I took it as an interesting case study. In the first place, I will refer to the Brazilian socio-political context and the role of social movements in it. In a socio-political context characterized by extreme class inequalities and conflict, grassroots mobilization has been a central element of the political life. Grassroots movements in Brazil are numerous and represent citizens regarding a large diversity of social problems. The Brazilian public sphere is made up by social movements and other intermediate groups rather than individual citizens (Holston, 2008, Gohn, 1997). Brazil is no doubt an extremely interesting country when it comes to the understanding of the "insurgent citizenship" (Holston, 2008).

Particularly, in the rural world, the Pastoral Commission for the Land (grassroots Catholic Church groups), the rural syndicates and the rural movements have had a central role in mobilizing and organizing poor people. These groups have acted as representatives of landless people and poor farmers, mediating between them and the state (Medeiros.Marques, 2006; Wolford, 2003). Among these movements, MST consolidated during the 1980s as the most dynamic, best organized, and effective social movement" in the history of Brazil" (Petras 1997:18). With over 1.5 million members, it is probably the largest rural movement in Latin America. The main goal of MST is agrarian reform. MST leaders and activists organize landless people to occupy unproductive lands. After the lands are occupied, the 'landed' farmers continue

belonging to MST. The movement is organized in different sectors: media and communication, health and production (rural extension), among others. Furthermore, the movement runs basic schools for MST children and technical schools for adults. MST combines a Marxist Leninist ideology with elements of the theology and pedagogy of liberation. Knowledge is taken to have a central importance for farmers' liberation. Up to the 1990s, MST leaders and activists promoted industrial agriculture. The technical expertise used within MST was agronomy.

During the 1990s, MST's option for industrial agriculture became unpopular within part of the Brazilian left (paper I). As in other countries, part of the left had gone through a green 'conversion'. During the 1980s, environmentalism was up and coming in urban centres of Brazil (Hochstetler, 1997). This was so especially in the South of Brazil, the same region where MST had emerged and consolidated. In the city of Porto Alegre, José Lutzenberger, a main founder of the Brazilian environmentalist movement, created the Gaia group. This group was pioneer. During the 1990s, a large number of environmentalist movements, NGOs and other green groups were created. The end of the military regime together with the Rio Summit have been pointed out as major causes of the growth and consolidation of the Brazilian environmental movement (Alonso and Costa, 2005). Rio brought about new ideals of transparency, accountability and inclusion of the civil society in environmental governance. The same year, Brazil signed the Convention on Biological Diversity (one of the Rio Conventions). It became one of the so called 'Mega-diverse' partners. Biodiversity conservation merged as a major issue of Brazilian environmental politics.

During the late 1990s, some rural movements stated to move toward environmentalism, MST leading this shift. Throughout the dissertation, I have indicated a number of motives that may have moved MST to adopt an environmentalist view (see especially paper I and II). MST has been studied by a large

number of western scholars. As far as I know, there are no studies on MST's environmentalist turn. This turn seemed radically interesting to me because of the way in which MST has used ecological knowledge to inform its new agenda. MST has adopted a new field of knowledge: agro-ecology. This field is increasingly becoming popular among rural movements of the South. In Brazil, it has informed the public policy on agro-biodiversity conservation. The government, NGOs and movements collaborate in multi-partnership agroecology projects. Agroecology has become a common language for negotiation. Furthermore, it has been used as a language for confrontation, especially for contesting scientific and ethical claims of the biotechnology lobby. Grassroots movements, and particularly MST, have made alliances with 'experts'. Represented by these experts, the movements have taken part in legal battles for the control over local seeds (see paper IV).

One more reason to choose MST was that it provides an opportunity to look at how social movements adopt scientific expertise in a process scope. MST is involved in the kind of environmentalist turn described above just from the late 1990s. The head of the movement has declared biodiversity conservation as a main action line. A new sector has been created within MST organizational structure: the National Front for Environment. The movement has invested in a number of projects and education in agroecology. However, the new ecological view has brought also an internal fragmentation within the movement. One fraction wants to continue doing industrial agriculture. The process of moving toward environmentalism is being contested within the movement. To convince the other fraction is requesting a lot of work on the side of the environmentalist leaders and activists. This raises a number of interesting questions: is it possible to combine pluralistic democracy in the production of knowledge with a sense of environmental urgency within MST? Which are the motives of the environmentalist fraction of the movement to 'convince' the other part? Which is the value and meaning of ecological expertise within this environmentalist turn? Which strategies are used for disseminating the new ideas about nature? To what

extent is agroecological expertise trusted? How is this new expertise mobilized? These and other questions are addressed through out the four manuscripts that make up this dissertation.

In short, this dissertation is on nature, politics and science. It looks toward the point where environmental governance and ecological knowledge meet. My choice has been to study the adoption of ‘biodiversity conservation’ by a social movement of the South. The primary goal has been to explore why/how knowledge about biodiversity is valued, recognized, disseminated and mobilized within MST-Brazil. This goal was addressed by exploring four issues, delivered in the four papers that make up the dissertation (by order of appearance):

- Imaginaries of science and nature (identity and social action).
- Trust in the diffusion of knowledge.
- Expertise: democratization, production and distribution.
- Inclusive environmental governance.

In addressing these issues, I have had to draw upon a number of approaches of the social sciences. The next section presents the theoretical developments of this attempt.



## **Looking at Nature, Politics and Science**

### *From Nature to Natures*

Especially during the 1980s and 1990s, a number of authors in ecological anthropology focused on how knowledge about nature was produced and transmitted in local communities. These topics were addressed from different approaches within the field. Knowledge about nature has been conceptualized in terms of mental structures (Descola, 1996), perceptions and feelings (Ingold, 2000; Milton, 2002) or practices and performance (Richards, 1986). In the case of the MST, all of these approaches open for interesting lines of research. For instance, how do MST members perceive, understand or classify nature (seeds)? To what extent is knowledge about seeds shared? A common characteristic of this kind of analyses in ecological anthropology is that they focus on the cognitive content of knowledge and so giving de-politicized characterizations of it. However, implicitly, this kind of approaches in ecological anthropology enables a very political understanding of knowledge as it presupposes that knowledge about nature emerges in context, in the course of human action. This understanding involves a strong epistemic claim. In a nutshell, it suggests that there is no one nature but a diversity of natures (a plurality of knowledges). This can be read as a call for ‘epistemic pluralism’ (Healy, 2003). Understanding knowledge about nature in these terms has been a conscious methodological and political choice in my research. In other words, my claims for inclusive environmental governance are partly based on the belief that non-scientific views about nature must be seen as having intrinsic value.

Certainly, it might be argued that a major limitation of this dissertation is that it does not take nature into account as an active element in the making of the social order. This is precisely a major concern for the authors of the actor network theory (Callon, 1999, Latour, 1993). Thus, my dissertation might have benefited from using that type of approach. For instance, by describing the practices through which the native seeds became ‘*in situ* biodiversity’ within MST networks. The relations between MST technicians, farmers, the seeds, the experimental fields or the agribusiness and state laboratories could have been described using network theory. As Bruno Latour has argued, within such kinds of socio-natural relations, scientific knowledge about nature is ascribed a privileged status (1993). Latour points to the relation between knowledge and power. However, in his analysis he avoids to address the question of power directly (Strathern, 2002; Escobar, 1999). This is the main reason why I have not taken an ANT approach. Nevertheless, in accordance with ANT, I recognize the importance of taking a relational point of view. In my analysis of the expert-lay interplay in the MST, I have mainly focused on how expertise is recognized, negotiated and disseminated within socio-political relations.

### ***Politics***

A relevant source for thinking about how knowledge is recognized and negotiated within socio-political relations is the field of post-colonial studies. The work of Stuart Hall (2003) emphasizes questions such as how are the ‘others’ represented? How are these representations created? How do they change the socio-political order? Especially the third paper addresses this kind of questions. In MST, the two cultures (expert and lay) meet within the same social movement. MST environmental technicians recognize the value of lay knowledge by labelling it “traditional”, “local” and “indigenous” knowledge. A number of authors whose work can be placed at the intersections between ecological anthropology, post-colonialist studies, development studies and political ecology, have made systematic critiques of the concept of indigenous and traditional knowledge in biodiversity conservation (See Ellen et al.

2000 and the special issue of the International Social Science on Indigenous Knowledge in September 2002). As a main representative of this group of authors, Arun Agrawal (2002) has argued that by representing local knowledges as traditional or indigenous, old colonialist power relations are reproduced. Non-scientific knowledge is validated, but just in scientific-western terms –in terms of the sciences of conservation-. Agrawal’s critique of these dynamics of validation is highly useful when thinking about science democratization in development contexts. It has inspired paper III of this dissertation. The same author also argues that we should dismantle the divide between scientific and non-scientific knowledges (Agrawal, 1995)<sup>1</sup>. However, the work of some other authors (in the same field) suggests that this recommendation is based upon a somewhat de-contextualized view of the expert-lay interplay. Melissa Leach and James Fairhead have described how the meaning of categories such as “indigenous” or “citizen” emerge within the particular histories of post-colonial contexts. In such contexts, these categories may not just have oppressive effects but may also be strategically reinterpreted and used by lay-people in their everyday struggles (See Leach and Fairhead, 2002). These authors present the expert-lay divide as deeply embedded in particular contexts of action. My research has been inspired by this approach at least in two ways. First, I have prioritized these research questions: *to what extent and how do MST members adopt, reframe, mobilize and use science?* (Paper I). Second, I have argued that whether the expert-lay divide should be dismantled or re-shaped can only be assessed in light of empirical work (see paper III).

In MST, leaders and activists mobilize people and knowledge in the pursuit of control over natural resources (mainly seeds and land). Conflict, struggle and safety (importantly food safety) are central elements to understand MST’s environmentalism. The first paper of this dissertation aims to address these issues and for this it borrows from political ecology and political anthropology. It is inspired by Richard Peet and

---

<sup>1</sup> This claim is also central in the work of some authors of science studies (See Latour, 1987).

Michael Watts' (1996) notion of 'environmental imaginaries' as well as it uses Anderson's (1991) idea of 'imagined community'. In their analysis, Peet and Watts have focused on the political role of knowledge about nature. As other authors of political ecology, they have looked at the power-knowledge interplay (Agrawal, 2005; Escobar, 1995). In this view, knowledge appears as embedded in institutional relations; it is a resource as well as a source of identity. To a certain extent, my dissertation could be catalogued as 'political ecology' as it is concerned with power, conflict, knowledge, values and identity. However, I have not used too extensively theories and concepts of political ecology. My reason for not doing so is that, as far as I know, the field of political ecology lacks of a systematic analysis of ecology as a 'science'<sup>2</sup>.

Taking my clue from science and technology studies, my view is that 'ecology' should be seen as a scientific knowledge field, a product of a particular historical moment (after the II World War). Ecology can be characterized as a knowledge-power category. Its definition and use entangle socio-economic implications. Ecological knowledge may influence environmental policies. In this sense, ecologists as well as political ecologists may become themselves agents of what Sheila Jasanoff and others have called the "co-production of science and social order" (Jasanoff, 2004). I believe political ecology could benefit from adopting a reflexive view, placing itself within this "language of co-production" (*ibid*). Furthermore, STS could benefit from using the tool-kit of political ecology. Political ecology could provide STS scholars with valuable conceptual tools for more complete political analysis. The combination of STS and political ecology would be extremely fruitful for the analysis of environmental governance (Notably, for the analysis of environmentalist grassroots activism). This is a line of research that I would like to continue in the future.

---

<sup>2</sup> See Forsyth, 2002.

Environmental Governance and the democratization of science is a central focus of this dissertation. Paper IV builds upon political theory and particularly, Maarten Hajer's (1995) ideas of ecological modernization and inclusive environmental governance. In a North-South comparative analysis, the paper looks at the expert/policy maker/citizen interplay. The paper emphasizes the significance of the political culture for understanding this interplay. Sheila Jasanoff's (2005) recent empirical work shows that ideas about democracy, citizenship and legitimacy influence how expertise is recognized and distributed throughout society. This is an inspiring, fertile and relevant line of research and I may continue my work in this direction. This line might lead to a better understanding of different styles of 'citizen science' (Irwin, 1995).

### *Science*

Mentioned above, in order to understand MST's environmentalist turn, it is important to situate ecology (and particularly agro-ecology) as a western science. Agro-ecology is a new type of expertise that is rapidly spreading among rural movements the South. The present research needed to include a focus on 'expertise', a view from the science and technology studies. Concretely, I have taken my clue from the so called, studies of expertise. These studies have provided valuable elements to tackle two central issues of this dissertation: 'participation' and 'trust' in knowledge production and diffusion.

Harry Collins and Robert Evans (2002) have introduced the question of 'how far should lay participation in technical decision making be extended?', in other words, whose knowledge should count as expertise? This question has aroused an interesting debate in science and technology studies. For Collins and Evans, expertise should be defined on the basis of knowledge standards. The final decision on whether some

citizen groups have a valid knowledge that should be included in technical decision making, corresponds to the academic experts (ibid). In my view, these authors have introduced an extremely relevant question (which I used as a point of departure in paper III), however they present a rather divided and static picture of the science/society interplay. For instance, Collins and Evans do not really take into account that there has been a transformations of the traditional uses of science as well as the spaces where scientific knowledge is produced. They still defend that it is possible to establish a distinction between facts and values, or science and politics. However, today science is deeply embedded in business as well as it has moved to the streets. The expert-lay interplay is increasingly taking hybrid and unforeseen forms (Irwin and Michaels, 2003). As the case of MST shows, the border between experts and lay people, values and facts, has become fuzzier than ever. Hence, it is not that clear that the decision on whose knowledge may count as expertise corresponds to 'the experts'. The definition of 'expertise' is not a matter that concerns just Collins and Evans and other STS scholars, it is not just an academic subject. On the contrary, it is a highly disputed political issue. Increasingly, citizens organize themselves to legitimate or contest this definition (for instance, activists of the environmental movements may claim that scientific knowledge on GMOs is uncertain, so it should not count as reliable expertise).

The debate about the definition of expertise raises further relevant questions, for instance: how should direct and representative democracy be combined in process of knowledge production and dissemination? On what should this representativeness be based? Trust in experts and expert knowledge is the topic of paper II of this dissertation. That paper uses and discusses Brian Wynne's (1996) concept of 'trust as if', which has become a classic within the studies of expertise. In his work, Wynne portrays lay people as sceptical individuals. They distrust of experts and experts' knowledge. However, they depend on expert institutions. Hence, lay people act *as if* they trust experts. Wynne emphasizes the role of identity and values as sources of

(dis)trust. My arguments in that paper built upon this point. However, Wynne's picture provides a rather monolithic image of science as well as lay people. I found that Wynne's idea of virtual trust did not entirely suit for describing the developments of agro-ecology in the South of Brazil. There, some groups of lay people trust in this new expertise which brings empowerment for them. Lately, Wynne has contributed to put forward a more situated North-South view of the expert-citizen interplay (Leach, Scoones and Wynne, 2005). To my knowledge, there is still a lack of analysis about 'trust' in expertise and expert knowledge under this last view.

STS has often taken science as an 'a-cultural' or 'trans-cultural' phenomenon (McNeil, 2005). However, when a field of expertise (as agroecology) is exported to non-western contexts it enters a different set of social relations, acquiring new meanings and functions. As suggested above, I see that STS should be combined with postcolonial approaches in order to produce more adequate understandings on the developments of science and technology in such contexts. My own work might have benefit from combining these two views more systematically.

### **Methods: Adjusting to the Context**

This section contains a reflection on my position as a researcher. It also reflects on the selection and use of methods. In broad terms, I have taken a hermeneutic/phenomenological (interpretative/descriptive) approach (see Kvale, 1996). I have assumed that knowledge emerges in context, in the course of social action.

This positioning relies implicit in my methodological choices (presented above). Furthermore, it has informed my concern for grounding my methods. This concern is characteristic of ethnography (Hammersley and Atkinson, 1995; Bryman, 2001; Silverman, 2001). I have proceeded by adjusting the original design of my research to

the particular contexts and in view of new findings. I believe by this way of proceeding, the research has gained in quality.

From a more practical point of view I consider that ‘adjusting’ to the context has been an effective choice when working within MST. This is grounded in MST’s organization and particularly the ways in which outsiders are included in it. As an outsider one will be sent to certain MST settlements and will be welcomed to stay with farmers. This has become a routine within the movement. I entered MST through a good friend who was also a technical coordinator. I had the opportunity to travel all along the Southern region of Brazil together with MST technicians. I soon realized that in order to be accepted by MST people, I also had to carry out work (for instance, occasionally I taught -see paper. I-). Participation in the organization of the movement is an internal rule for its members. As an outsider, by doing some work for the organization one may become ‘a friend of MST’. Taking this role entailed the risk of losing analytical distance. I have put considerable effort into maintaining this ‘analytical distance’ while reflecting carefully on the possible negative impacts of the research on MST. Being in that position, I have carried out my participant observation. Taking a more engaged position (or even doing a kind of activist action research) was neither a possible nor an appropriate option for me in this particular context.

An important advantage of getting included within the networks of MST was the amount and richness of the ethnographic materials I had access to. The disadvantage was that on many occasions I could not choose where to go or what to do. Rather this was ‘indicated’ to me (*‘indicado’*, as it is said within MST), as for instance, with whom I should travel and in which settlements I should stay. To a certain extent, then, the research had to be conducted by *how things happen within MST*. My choice was to adapt my research plans and to take advantage of situations as best as possible (interviews with technicians during car transportation being one example). Staying

open to such opportunities often led to relevant findings. Such situations could be understood as ‘conducted serendipity’, meaning by serendipity some unplanned event that could be read as a research opportunity (Merton and Barber, 2004).

The reader may find included in each paper a description of the methods used. What follows is a brief reflection on the use of such methods for addressing the issues of this dissertation.

### *Observations, interviews, talks, texts and images*

As I evaluate it, participant observation has produced the most interesting insights on why and how knowledge about biodiversity, was recognized, disseminated and mobilized within MST. It has provided a solid basis from which the interviews, documents and visual materials could be interpreted.

I carried out semi-structured in-depth interviews (Bernard, 2002) with MST activists ( $n = 50$ ), farmers, technicians, technical coordinators and leaders. During the fieldwork in 2005, these interviews had four main focuses: 1) life trajectory/education in agroecology; 2) Ideas of nature and the value of biodiversity; 3) Value and nature of knowledges; 4) Role of technicians and farmers in knowledge production and dissemination. In addition, I took notes of a number of talks (non-structured interviews). For the interviews, I thought that the most appropriate was to have a list of general topics. I adjusted my way of talking and the questions to the informants (I knew all of them in advance). For instance, in many occasions it felt inappropriate to ask farmers about ‘biodiversity’. Especially in 2005, many did not recognize this term. When I introduced the term in informal talks, the situation turned uncomfortable. Some farmers apologized for being ignorant, others pretended they knew. This had changed in 2006 when many of them had taken courses in agroecology. These

reactions produced valuable information regarding farmers' understanding of science and scientific authority (my unintended authority in this case). They also led me to re-adjust the interviews. In addition, by maintaining the interviews rather open, "emerging concepts" (Bryman, 2001: 281) and topics came about. For instance in 2005, informants referred to 'trust' (and trustworthy knowledge) in the interviews and talks. In 2006, I maintained the four general topics presented above and included trust (paper II) as a main focus of the research. Interviews and talks also revealed emerging concepts, for instance the notion of 'ecological talent' (paper III).

Interviews gave me access to MST members' knowledge claims and to the basis for action. However, the interviews presented limitations for a number of reasons; I just name two of them. First, in many occasions farmers felt insecure as they thought that what they answered might put them in some kind of danger. Sometimes, talks produced more relevant information than tape-recorded interviews. Second, a number of informants tended to reproduce the official discourse of MST. Regarding sensitive topics (like trust, in paper II), the interpretation of the interviews would have been poor without the ethnographic observations. In addition, interviewing was not a sufficient manner to get access to some topics such as 'imaginaries of nature and society' (paper I).

As well as the observations, interviews and talks, I have analyzed a number of documents. Policy documents were used to contextualize the action of MST (paper III) as well as to show MST attempts to influence the Brazilian policy on agro-biodiversity (paper IV). In addition, I have analyzed a number of documents produced and used within MST. For Instance, the technical handbooks used in MST schools provided interesting insights in imaginaries about nature (paper I). Drawings made by MST children, a set of pictures taken by the technicians, websites and the periodical journal of the movement have been primary sources to access imaginaries, moral worlds and

meaning. For future research I would like to learn more about how to use visual methods (photography, video and others). I think the use of these methods is promising to explore the public understanding of science, nature and power. The expertise of visual anthropology could open for new ways of conceptualizing and accessing knowledge.

## **Papers Presentation and Discussion**

In this section, I present the research questions and conclusions of the papers that make up the *corpus* of the dissertation and point out their interconnections.

### **Paper I: “Our Strength is Diversity”: Imaginaries of Nature and Community in a Brazilian Social Movement”**

This paper aims for an understanding of MST’s adoption of ideas and practices of biodiversity conservation: Why and how is this adoption happening? To what extent is it transforming MST? In order to tackle these questions, the paper looks at imaginaries of natural and social order. It describes how leaders and activists of the movement are promoting an image of nature as bio-diverse, and how new scientific claims have served to re-imagine the collective identity of the movement. These claims are accommodated to different groups within the movement (women, young people, i.e.). According to the new imaginaries of nature and society, MST has redefined its lines of action. Nevertheless, the new imaginaries of nature and society are put up in continuity with MST previous ideals. Still, the ‘struggle’ for a more equal society (where farmers’ life is safe) is presented as the main motive justifying the existence of MST. Claims about nature merge with political claims.

In short, MST mobilizes scientific knowledge in order to achieve its ideals and practical goals, and by doing so, it partially transforms itself. The paper emphasizes how ecological knowledge is crucial in this transformation. It provides MST members

with a frame to interpret their actions; it endows the movement with credibility and legitimacy and it generates empowerment as well as expectations of safety for part of the farmers. The framework presented in this paper can be seen as a theoretical contribution to the study of the relation between social movements and science: first, imaginaries provide a good entry point for understanding ways in which abstract scientific and political knowledge claims are translated into meaningful terms for lay actors; Second, imaginaries can be seen as mid-scale mediators, they connect the collective identity of the movement as a whole with the changing identities of different groups within the movement. Third, thinking in imaginaries allows for an action oriented analysis.

The next paper builds upon the idea of MST's collective identity and action. Again, it emphasizes how scientific knowledge is given an activist use and value. It is mobilized for the sake of MST's empowerment and it serves to empower certain groups of farmers within the movement. In addition, this second paper follows up on a line of argumentation already presented: the link between ecological knowledge and safety. All these elements are brought about when exploring the sources and role of 'trust' in experts and expertise within MST.

## **Paper II: "Activist Trust: the Diffusion of Green Expertise in a Brazilian Landscape"**

This paper looks at the diffusion of ecological knowledge within MST. Particularly, it looks at how trust in experts and expert knowledge is built within MST's main project for biodiversity conservation (Bionatur). How does trust work when experts and lay people belong to the same social movement? In order to address this question, the paper uses and discusses two significant approaches to the expert-lay interplay in

science studies: ANT and Brian Wynne's<sup>3</sup>. The paper argues that these approaches are not always sufficient, as well as they may provide a too static picture of experts, lay people and their relation. As in other social movements, in MST 'experts' and 'non-experts' share a collective identity and an action plan. Trust is based on identity as well as it is used as a strategic resource. In addition, in MST, the expert-lay border is fuzzy. Members of this movement have many times hybrid roles (as they are activists/technicians/farmers). This hybrid character of the roles influences the working of trust.

The paper highlights the contextual character of trust. It compares two different geographic areas where the Bionatur project is being implemented. In these two areas trust works in very different ways. Hence, within the same social movement there is *trust as if* or virtual trust in experts as well as *real* trust. The paper shows how the trust or dis-trust in experts is influenced by further elements like the local economic conditions and the local political culture. Trust building processes are embedded in particular historical processes.

At least for the case of Bionatur, trust in experts and expert knowledge displayed a reciprocal character. MST technicians would trust some groups of farmers as they appeared more likely to get enrolled in MST's environmentalist turn. These farmers' knowledge received a special recognition and so, they were empowered (paper III builds upon this finding). In response, these farmers' trust in experts was reinforced. Taking account of that empowerment, the paper insists that STS studies of trust might benefit from including more situated views on the expert-lay interplay. In contexts of extreme social un-equalities as the Brazilian rural world, trust in (some) experts and

---

<sup>3</sup> The paper refers to Brian Wynne's work on the expert-lay divide during the 1990s, particularly, 'May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide'.

their knowledge may acquire an existential meaning for some groups of lay-people. Being a ‘healthy sceptical individual’ probably introduces uncertainty in the life of many Southern Brazilian farmers. Hence, the analysis of the experts-lay relation should avoid projecting too Northern and academic-like images of citizens, lay-people or experts. The paper IV of this dissertation is coherent with this point and so, it provides a North/South comparative analysis.

To finish the presentation of my work about trust, I will briefly indicate how this paper can contribute conceptually to STS studies. The paper argues in favour of Alan Irwin’s and Mike Michael’s (2003) concept of science-society “hybrid assemblages”. This concept allows for thinking the expert-lay interplay in a more updated, dynamic and context based manner. I believe it is a useful concept for (re)-thinking processes of trust building. However, I argue, for the case of some social movements (as MST), the relations between experts and lay people might also hold an intimate dimension (as members share their every day life and concerns). Hence, I propose the notion of “intimate hybrid assemblage”. Finally, in MST, the sources of trust are both, affective and effective. Interests, identity and social recognition are interviewed. Looking at these complexities, the paper proposes the concept of ‘activist trust’.

### **Paper III: “Opening Up For Participation in Agro-biodiversity Conservation: the Expert-Lay Interplay in a Brazilian Social Movement”**

Inclusive environmental governance is the topic of this paper and paper IV. Particularly, paper III reflects upon the following question: how far should lay participation in knowledge production be extended? (Collins and Evans, 2002). The paper consists of a normative discussion and a description of the case of MST. It starts by giving an account of the general participatory turn that has taken place in environmental governance within the last 20 years. It continues arguing that green democracy as well as democratically oriented environmental sciences entails a

fundamental dilemma: when the citizens do not make the sustainable choice, how to combine a democratic *plurality of values* with a *sense of environmental urgency*?

Some authors of STS, anthropology and environmental studies have recommended dismantling the expert lay-divide for the sake of democratizing science. Sympathetic to this view, I still argue that for the case of biodiversity conservation the expert-lay divide should not be deconstructed *a priori* and uncritically. Rather it should be reshaped in a *better way*. One way of doing so is by creating new types of expertise. Collins and Evans (2002; 2007) made an interesting contribution by proposing a new type of expertise that they call “interactional”. Paper III claims that environmental experts and researchers should add a kind of ‘reflexive interactional expertise’ to their own knowledge. This type of expertise should combine a reflexive view on ‘science in action’ with a sociological knowledge (a capacity for creating interactions among lay groups).

In order to ground these normative claims, I appeal to the case of MST. To inform its new conservationist agenda, the movement has adopted agro-ecology. As it is characteristic of biodiversity policy frames, agroecology assumes that indigenous, traditional and local knowledges are useful for conservation. This assumption introduces a distinction among lay knowledges. There is a tendency within MST’s environmental fraction to redefine expertise. Knowledge in industrial agriculture is labelled as ignorance while other part of the local knowledges is redefined on the basis of their ecological value. The result is a new map of expertise within the communities. Agroecology has brought to the local communities both empowerment and exclusion. Nevertheless, whether scientific expertise appears as causing empowerment or exclusion depends on the scale of the analysis. In the micro-scale of Bionatur project scientific expertise can be seen as generating empowerment. However, in a regional scale, this expertise may also generate the exclusion of certain groups. In any case,

paper III shows that what could be read as a conflict of values underlying two models of agriculture was interpreted by local farmers and technicians as a matter of ignorance/expertise. This framing closed down possibilities for interaction between the different groups and may eventually lead to fragmentation and conflict within the communities.

In line with the other papers, paper III emphasizes the importance of thinking the expert-lay relation in context. It looks at the framing of the expert-lay interplay, and at some implications of such a framing (exclusion). In the case of MST, a ‘reflective interactional expertise’ would take into consideration this framing for the sake of opening up social spaces for dialogue and action. Hence, the paper suggests, the adequate extension of lay participation in knowledge production should not be formulated in abstract terms. Rather, one should look at the particular contexts where the expert-lay distinction works, in order to reshape this distinction in the pursuit of a more inclusive environmental governance. The latter point makes up a main line of argument in the next paper.

#### **Paper IV: “Looking North and South: Ideals and Realities of Inclusive Environmental Governance”**

Paper IV is intended to approach the expert-lay interplay, and particularly the issue of lay participation, from a new angle. The paper is inspired by Marteen Hajer’s (1995) critical view on ecological modernization. Hajer, together with other well-known authors of science and environmental studies, calls for a more *real* inclusion of lay people in environmental governance. The arguments of paper IV are sympathetic and built upon this view. However, the paper argues, this kind of view often entails quite general implicit assumptions about experts, decision-makers and lay people. For instance, Hajer (1997) proposes the ideal of “technological citizenship” in which lay people want and should share technological responsibility with experts. The paper

claims that real (empirical) participatory processes of environmental governance should not be forced into abstract models; rather “ideals should be test in light of different realities” (Paper IV: p. 31). Thus, “looking North and South”, the paper analyses comparatively two cases of inclusive environmental governance: the case of the dredging of a polluted harbour in Northern Norway and a major MST’s project for agro-biodiversity conservation in the South of Brazil. The question that the paper addresses is “how do real actors of environmental governance deal/engage with their roles as experts, decision-makers or citizens when provided a framework of inclusive governance?” (Paper IV: p.32).

Beyond marked differences, the paper emphasizes how the specific political cultures, administrative traditions and policy contexts may constrain the actions of the actors involved in environmental governance. The paper portrays this particular processes of environmental governance as ‘choreographies’. It shows the indeterminacies involved in the definition of the problems (regarding dredging pollution, for instance). It also describes how the different actors implicated had to improvise, adjusting their decisions in accordance with new situations. Rather than seeking for scientific truth, they seek for ‘working solutions’. Furthermore, resuming a line of argument opened in paper II, paper IV emphasizes how actors involved in environmental governance may play different roles, taking on hybrid positions. Hence, in some cases, the expert/policy-maker/citizen divide appears as a continuum. In short, paper IV argues that the expert-lay interplay should be understood as embedded in complex relationships of trust, dependency, respect and opposition. Ideals of inclusive governance should include a view on these complexities. Inclusion, transparency and accountability “would be better expressed as regulative norms for practice rather than ideals from which an acontextual model or structure may be deduced” (Paper IV, 32). Hence, the paper proposes an analytical perspective on the basis of a pragmatic reflexivity. This can be seen as complementing that another type of reflexivity understood as self-critical reflection (presented in paper III).

## **Looking Ahead: the Role of a Social Scientist in a Knowledge Society**

Above, I have pointed to some shortcomings of this dissertation as well as some lines of research that I would like to continue. I shall close this introductory section by resuming some of these lines. Whether it is biodiversity conservation or a different environmental issue, the production and distribution of expertise in society, and in particular the relation between activism and science, will remain the focus of future research. My following research projects should be more policy oriented and embedded. I see that one good way of doing so is by emphasizing comparative analysis and by further exploring the relation between political cultures and expertise. By political culture I mean the “particular cultures of action and decision” (Jasanoff, 2005: 15).

My aim is to include the European environmental governance as a main focus of my research. Looking at environmental governance in Europe, a number of authors have emphasized the relevance of making comparative analysis in the national, local and regional levels (GoverNat, 2006; Porsborg *et al.* 2008). The EU is pursuing the construction of an integrated political identity. This project entails a revaluation and redefinition of categories such as ‘nation’ and ‘region’ as well as ‘citizenship’, ‘legitimacy’ and ‘representativeness’ (among others). At the same time the EU intends to establish itself as a leading knowledge based and environmentally friendly economy. In spite of EU efforts for restabilising public trust and legitimacy (Wynne, 2008 Trustnet, 2007, EC, 2007), citizen groups often express their uneasiness with the developments of science and technology in Europe. There is an increasing tension

between, on the one hand, the EU organizing participatory processes trying to ‘engage’ citizens and, on the other, citizens groups organizing themselves, challenging those very processes<sup>4</sup>. Conflicts and disagreements regarding science and technology manifest a diversity of political cultures and social understandings of expertise (Jasanoff, 2005). It is interesting to explore differences in how, in polemic topics such as climate change, expertise is accredited and political decisions legitimized (or contested). The analysis of citizens’ relation to science, technology and the environment would be incomplete without a view on the way in which the European public sphere(s) is taking a new shape. Hybrid (science-policy) notions as ‘citizen science’ (Irwin, 1995) or ‘civic epistemologies’ (Jasanoff, 2005) should be further investigated. Furthermore, as some recent works have suggested, more attention should be paid to how social action is organized in the different scales, and how the different levels of environmental governance should communicate (See van de Vijver *et al.* 2008). Combining elements of STS with perspectives of political science (as the multi-level governance approach or a serious understanding of deliberative and representative democracy), should open for new ways of framing environmental problems, and accordingly, for new ways of action. Especially after writing paper I (in collaboration with Kjetil Rommetveit), I see the importance of keeping a focus on the intermediate level of social organization (as social movements and other emerging science-society ‘hybrid assemblages’). This kind of collective-action oriented approach provides more significant insights on processes of science-society co-production than an individual-oriented view.

In a Mode 2 society, social research should become more ‘relevant for society’. Knowledge should be “socially robust” (Nowotny, et al. 2001). Although I am sympathetic towards this idea, I also see the risk of “robust knowledge” being reduced and identified with “useful knowledge” (mainly in utilitarian-economic terms). As

---

<sup>4</sup> As manifested during the “3<sup>o</sup> Living Knowledge Conference” celebrated in Paris in August 2007.

Marilyn Strathern (2005) has suggested, the notion of “robust knowledge” should be understood critically. It is needed to pay attention to the values and assumptions implicit within the already extended discourse of ‘science democratization’, as it is used by a multitude of social actors. That being so, what should the role (s) of social researchers in a knowledge based or Mode 2 society be? In the last annual Meeting of the Society for Social Studies of Science, this issue was discussed in several sessions. As pointed out by a number of these scholars, “interactional expertise” (Collins and Evans, 2002)<sup>5</sup> appears to be a promising notion for thinking the role of social scientists (and particularly STS scholars) in a Mode 2 society. This expertise consists in experienced-based knowledge on how to open lines of communication and interaction among different social groups within today’s network societies. Of course, ethnographic skills are useful for translating among different languages of valuation (for instance to communicate different citizen groups’ affected or concerned by environmental issues with the corresponding governmental bodies). This work of translation is not a particular new role for the social sciences. However, in a Mode 2 society, critical work of translation should be informed by new research values and procedures. As mentioned, this includes a critical view on the values and epistemic assumptions of Mode 2 societies. Because of the urgency of current technological and environmental problems there is (perhaps today more than ever) a need for researchers to engage in socio-political contexts of action. The ‘interactional expertise’ described here does not consist *just* of anthropological or sociological knowledge. Ethical commitment, capacity of judgement, humbleness and social responsibility might be main requirements of the Mode 2 social research.

## References

---

<sup>5</sup> For a discussion on this topic see paper number III of this dissertation.

- Agrawal, A. 1995. "Dismantling the Divide Between Indigenous and Western Knowledge." *Development and Change* 26 (3):413-439.
- Agrawal, A. 2002. "Indigenous Knowledges and the Politics of Classification." *International Social Science Journal* 173:325-336.
- Agrawal, A. 2005. *Technologies of Government and the Making of Subjects (New Ecologies for the Twenty-First Century)*. Duke: Duke University Press.
- Alonso, A., Costa, V. and Maciel, D. 2005. "The Formation of the Brazilian Environmental Movement". ([www.edis.org](http://www.edis.org))
- Bernard, H. *Research Methods in Anthropology. Qualitative and Quantitative Approaches*. New York: Altamira Press.
- Bryman, A. 2001. *Social Research Methods*. Oxford: Oxford University Press.
- Buttel, F. H., 2000. "Ecological Modernization as Social theory". *Geoforum* 31 (1), 57-65.
- Callon, M. 1999a. "Some Elements of Sociology of Translation: Domestication of the Scallops and the Fishermen of Saint Brieuç Bay", in M. Biagioli (ed), *The Science Studies Reader* (London & New York: Routledge): 67-83.
- Collins, H.M. Evans, R. 2007. *Rethinking Expertise*. Chicago: University of Chicago Press.
- Collins, H.M. Evans, R. 2002. "The Third Wave of Science Studies. Studies of Expertise and Experience". *Social Studies of Science* 32(2):235-296
- Descola, P. 1996. "Constructing Natures. Symbolic Ecology and Social Practice", in P. Descola & G. Pálsson (eds), *Nature and Society. Anthropological Perspectives* (London: Routledge): 82-103.

Ellen, R., Parkes, P., Bicker, A. 2000 (Eds.) *Indigenous Environmental Knowledge and Its Transformations*. Amsterdam:Hardwood.

Escobar, A. 1999 "After Nature. Steps to an Antiessentialist Political Ecology"

*Current Anthropology* 40: 1-30.

Escobar, A. 1995. *Encountering Development: The Making and Unmaking of the Third World*. Princeton: Princeton University Press.

Escobar, A. 1998. "Whose Knowledge, Whose Nature? Biodiversity Conservation and Social Movements Political Ecology." *Journal of Political Ecology* 5:53-82.

European Commission, 2007. *Taking European Knowledge Society Seriously*. Report of the Expert Group on Science and Governance to the Science, Economy and Society Directorate, Directorate-General for Research, European Commission.

([http://ec.europa.eu/research/science and society/index.cfm?fuseaction=public.topic&id=119](http://ec.europa.eu/research/science_and_society/index.cfm?fuseaction=public.topic&id=119)).

Forsyth, T. 2002. *Critical Political Ecology: the Politics of Environmental Science*. London: Routledge.

Gohn, M. G. 1997. *Teoria dos Movimentos Sociais. Paradigmas Clássicos e Contemporâneos*. São Paulo:Edições Loyola.

Governat (Multilevel Governance of Natural Resources: Tools and Processes for Water and Biodiversity in Europe). 2006. *From Government to Governance for Biodiversity in the European Union: the Experience in the New Member States*. Working paper, N°1.

Hajer, M. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford: Oxford University Press.

Hall, S. 1996. "When was the Postcolonial'? Thinking at the Limit", in L. Chambers & L. Curti (eds), *The Post-colonial Question. Common Skies, Divided Horizons* (London and New York: Routledge): 242:261.

Hammersley, M. & Atkinson, P. 1995. *Ethnography. Principles in Practice*. London and New York: Routledge.

Healy, S. 2003. "Epistemological Pluralism and the 'Politics of Choice.'" *Futures* 35:689-701.

Hochstetler, K. 1997. "The Evolution of the Brazilian Environmental Movement and Its Political Roles". *The New Politics of Inequality in Latin America* 26:192-217.

Holston, J. 2008. *Insurgent Citizenship. Disjunctions of Democracy and Modernity in Brazil*. Princeton: Princeton University Press.

Ingold, T. 2000. *Perception of the Environment: Essays in Livelihood, Dwelling and Skill*. London and New York: Routledge.

Irwin, A. 1995. *Citizen Science. A Study of People, Expertise and Sustainable Development*. London and New York: Routledge.

Irwin, A. & Michael, M. 2003. *Science, Social Theory and Public Knowledge* Philadelphia: Open University Press.

Jamison, A. 2002. *The Making of Green Knowledge. Environmental Politics and Cultural Transformation*. Port Chester: Cambridge University Press.

Jasanoff, S. 2001 "Image and Imagination: the Formation of Global Environmental Consciousness", in C. Miller & P. Edwards (eds), *Changing the Atmosphere. Expert Knowledge and Environmental Governance* (Cambridge, Massachusetts: MIT Press) 309-39

Jasanoff, S. (ed). 2004. *States of Knowledge. The Co-production of Science and Social Order*. London and New York: Routledge.

- Jasanoff, S. 2005. *Designs on Nature. Science and Democracy in Europe and the United States*. Princeton and Oxford: Princeton University Press.
- Kvale, S. 1996. *Interviews. An Introduction to Qualitative Research Interviewing*. London: SAGE.
- Latour, B. 1987. *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge, MA: Harvard University Press.
- Latour, B. 1993. *We Have Never Been Modern*. Cambridge, Massachusetts: Harvard University Press.
- Le Preste, P.G. (ed). 2002. *Governing Global Biodiversity: the Evolution and Implementation of the Convention on Biological Diversity*. Sidney: Ashgate.
- Leach, M., Scoones, I. & Wynne, B. (eds). 2005. *Science and Citizens. Globalization and the Challenge of Engagement*. London and New York: Zed Books.
- McNeil, M. 2005. "Postcolonial Technoscience." *Science as Culture* 14(2):105-112.
- Medeiros-Marques, M. 2006. "Relação Estado e MST: Algumas Fases e Faces". *Lutas e Resistências* 1:184-196.
- Merton, R. & Barber, E. 2006. *The Travels and Adventures of Serendipity. A Study in Sociological Semantics and the Sociology of Science*. Princeton: Princeton University Press.
- Milton, K. 2002. *Loving Nature: Towards Ecology of Emotion*. London and New York: Routledge.
- Nowotny, H., Scott, P. & Gibbons, M. 2002 *Rethinking Science: Knowledge and the Public*. Cambridge: Blackwell.
- Petras, J. 1997. "Latin America. The Resurgence of the Left". *New Left Review*. 223:17-47.

- Porsborg Nielsen, A., Lassen, J., Sandøe, P., 2007. "Democracy at its Best? The Consensus Conference in a Cross-national Perspective". *Journal of Agricultural and Environmental Ethics* 20 (1), 13-35.
- Peet, R and Watts, M. 1996. *Liberation Ecologies*. London and New York: Routledge.
- Richards, P. 1986. *Boekbespreking: Coping with Hunger - Hazard and Experiment in an African Rice Farming System*. London: Allen and Unwin.
- Silverman, D. 2001. *Interpretative Qualitative Data. Methods for Analysing Talk, Text and Interaction*. London: SAGE.
- Spaargaren, G., Mol, A.P. 1992. *Sociology, "Environment and Modernity: Ecological Modernization as a Theory of Social Change"*. *Society and Natural Resources* 5 (4), 323-344.
- Strathern, M. 2002. "Externalities in Comparative Guise", *Economy and Society* 2 (31): 250-267.
- Strathern, M. 2005. "Robust Knowledge and Fragile Futures", in A. Ong & S Collier (eds), *Global Assemblages: Technology, Politics and Ethics as Anthropological Problems* (New York: Blackwell): 464-482.
- Torgerson, D. 1999. *The Promise of Green Politics. Environmentalism and the Public Sphere*. Duke University Press, London.
- Trustnet-in-Action, 2007. TIA. Final Report. <[www.trustinaction.com](http://www.trustinaction.com)>
- van de Vijver, F., van Hemert, D. A., Poortinga, Y. H. 2008. *Multilevel Analysis of Individuals Cultures*. Sussex: Lawrence Erlbaum Associates.
- World Commission on Environment and Development. 1987. *Our Common Future*. Oxford and New York: Oxford University Press.

Wolford, W. 2003. "Producing Community: the MST and Land Reform Settlements in Brazil". *Journal of Agrarian Change* 3(4):500-520.

Wynne, B. 1996. "May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide.", in B. Wynne, Lash, S. & B. Szerszynski (eds), *Risk, Environment and Modernity: Towards a New Ecology* (London: SAGE): 44-84.

Wynne, B. 2008. "Public Engagement as a Means of Restoring Public Trust in Science - Hitting the Notes, but Missing the Music?" *Community Genetics* 9: 211-220.

Yearley, S. 2005. *Cultures of Environmentalism. Empirical Studies in Environmental Society*. Basingstoke: Palgrave Macmillan.