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Doctoral Thesis

Environmentalism of the Dispossessed: Mapping Ecologies of Resistance

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"If the world were merely seductive, that would be easy. If it were merely challenging, that would be no problem. But I arise in the morning torn between a desire to improve the world and a desire to enjoy the world. This makes it hard to plan the day."

–E.B. White

UNIVERSITAT AUTÒNOMA DE BARCELONA

Abstract

Institut de Ciència i Tecnologia Ambientals

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Around the world environmental conflicts are invading new spatial and symbolic spaces. This process has been described as the "environmentalization" of social struggles, whereby ecological issues are increasingly used to both legitimate and contest political and scientific structures and practices.

This dissertation responds to the need to examine the motives and energies and strategies of resistance to environmental dispossession, considering the forms they take, the values they express and the meanings we can ascribe to them. I do so firstly by examining specific sites of resistance and then broadening out through multi-case analysis. Finally I introduce a framework for a cross-comparative "statistical political ecology" that aims to integrate activist knowledge with social and biophysical data.

I start by asking the overarching questions: (i) How are such conflicts expressing themselves? (ii) What are the politics such groups are employing? (iii) and to what effect? I then refine these into five sub-research questions (a) under which conditions does effective resistance against a commodity resource frontier emerge? (b) What are the politics of knowledge employed by such movements? (c) How can we understand how they pick their strategies and tactics to stake their claims? (d) What are the inter-connections of groups mobilizing across scales? (e) And how can a political ecological/ecological economics analysis be put to use to support such struggles?

To examine these questions, I engage with literatures drawing on concept and theories from ecological conflicts, forms of environmentalism, accumulation by dispossession, social metabolism, politics of activist knowledges and social movement theory, among others. I also engage in comparative cross-national analysis to observe movements and groups across different settings, but with some commonalities as regards aims, perspective and forms of mobilization. I aim to analyze how groups in these different contexts contest power imbalances, how they leverage power to do so, and how they achieve their goals and become successful in both rolling back unwanted and imposed projects. Finally I am interested in the role of such activism in wider transformative agendas that can question and challenge broader political and institutional structures.

I conclude this dissertation by bringing light to environmental conflict struggles and analyses focusing on the following five lessons:

1. Setting prices for nature is neither conducive to conservation nor to environmental justice because the technical and political process of setting prices deepens and reproduces structural inequalities with negative distributive effects;
2. The foreclosing of participation for different social actors is catalyzing new forms of participatory democracy and the co-production of "situated" technical knowledge;
3. The re-assignation of rights to biological productivity and the incorporation of actors into new agrarian structures transforms not only social relations and accumulation strategies, but also reproduces nature with profound impacts on ecosystem energetics and corresponding livelihood strategies.
4. Local movements have achieved the most success when they have been able to unite broad coalitions of groups with complex and multidimensional agendas. Environmentalist discourses are deployed as a key "apolitical" strategy by groups across scales while identity politics are both a powerful tool for mobilization as well as a divisive force that can lead to local ethnic conflict.
5. There is a need to develop new methods for analyzing the global and interlinked aspects of localized environmental struggles, that allows going beyond dynamics at local scales to understand crucial processes and relations generating environmental inequalities at broader regional, national, and global scales. I offer such a framework within a new praxis for environmental justice research.

Finally, I offer the concept of the environmentalism of the dispossessed to explain the motivations of environmental movements today. It's defining characteristics include: the use of politics to challenge state power based on a structural critique of capitalist accumulation; a conception of the environment as being co-produced and contingent rather than being conceived a singular "nature"; informed by a "global materialism" that considers how local processes are embedded with global social metabolic flows through commodity chains; and increasingly willing to use disruptive and contentious tactics to respond to ecological dispossession.

Keywords: environmental justice, political ecology, ecological conflicts, social metabolism, collaborative research, contention, activist knowledge, accumulation by dispossession, agrarian politics, capitalism, crisis, commodity chains

A lo largo y ancho del mundo, los conflictos ambientales invaden nuevas geografías y espacios simbólicos. Este proceso se ha llamado la "ambientalización" de las luchas sociales, y consiste en el uso de los problemas ecológicos para ganar legitimidad y así desafiar tanto a las estructuras como a prácticas políticas y científicas.

Esta tesis busca examinar los motivos, energías y estrategias de resistencia a la desposesión ambiental considerando sus propias formas de expresión, los valores expresados y el significado que yo otorgo. En este sentido, primero examino lugares específicos de resistencia y luego a través de análisis y comparaciones de múltiples casos amplío el alcance del estudio. Finalmente, presento un marco comparativo de la estadística en la ecología política que busca integrar el conocimiento activista con información social y biofísica.

La tesis comienza con algunas preguntas generales: (i) ¿Cómo se expresan estos conflictos?; (ii) ¿Cuáles políticas utilizan estos grupos? (iii) ¿Con qué finalidad? Luego, refino estas preguntas en cinco sub-preguntas de investigación: (a) ¿bajo qué condiciones emerge una resistencia efectiva contra la frontera de las mercancías?; (b) ¿cuál es la política o políticas del conocimiento utilizadas por dichos movimientos?; (c) ¿cómo podemos entender el proceso por el cual estos movimientos escogen sus estrategias y tácticas para defender sus reivindicaciones?; (d) ¿cuales son las interrelaciones de grupos movilizados a diferentes escalas?; (e) ¿como puede utilizarse un análisis desde la economía ecológica/ecología política para apoyar estas luchas?

Para examinar estas preguntas me vuelco en aquella literatura que se basa en concretos y teorías sobre: conflictos ambientales, formas de ambientalismo, acumulación por desposesión, metabolismo social, política de los conocimientos activistas y teoría de los movimientos sociales, entre otras. También desarrollo un análisis comparativo entre naciones para observar a los movimientos y grupos en diferentes escenarios, considerando siempre sus puntos de encuentro en cuanto a objetivos, perspectivas y formas de movilización. Asimismo, busco analizar cómo los grupos en estos contextos tan diferentes desafían a los desbalances de poder, cómo consiguen ganar poder, y cómo estos grupos obtienen sus objetivos y resultan exitosos en su resistencia a proyectos impuestos. Finalmente, estoy interesada en el rol del activismo en la construcción de una agenda transformadora más amplia que se pregunte y desafíe las estructuras políticas e institucionales.

Concluyo esta tesis iluminando las luchas por conflictos ambientales y sus análisis al enfocarme en las siguientes cinco lecciones:

1. Establecer precios de la naturaleza no contribuye a la conservacion ni a la justicia ambiental porque el proceso técnico y político para definir precios profundiza y reproduce las iniquidades estructurales con consecuencias negativas a nivel distributivo;

2. La prohibición a la participación de diferentes actores sociales puede catalizar nuevas formas de democracia participativa en el territorio y la coproduccion de conocimiento tecnico "situado";
3. La reasignación de los derechos a la productividad biológica y la incorporación de actores en nuevas estructuras agrarias transforma no sólo las relaciones sociales y las estrategias de acumulación sino también modifica a la naturaleza influyendo en gran medida en la energética de los ecosistemas y por ende en las estrategias de vida de las poblaciones;
4. Movimientos locales han conseguido sus máximos logros al ser capaces de unir en amplias coaliciones a grupos con agendas complejas y multidimensionales. Los discursos ambientalistas son utilizados como estrategias "apolíticas" clave por grupos a diferentes escalas mientras que la política de identidad puede ser una herramienta poderosa para la movilización pero puede conducir a la atomización que puede confluir en conflictos locales étnicos.
5. Existe la necesidad de desarrollar nuevos métodos que analicen los aspectos globales e interconectados de los luchas ambientales locales, para así tanto trascender de las escalas locales y conseguir entender los procesos y relaciones que generan las iniquidades ambientales a escalas más amplias como regionales, nacionales y globales. Ofrezo este esquema dentro de esta nueva praxis para la investigación en justicia ambiental

Finalmente, en mi tesis presento el concepto del ambientalismo de los desposeídos para así explicar las motivaciones de los movimientos ambientales en el presente. Las características que definen al ambientalismo de los desposeídos incluyen un uso de la política como desafío al poder del estado basado en una crítica estructural a la acumulación capitalista. El ambiente se concibe como co-producido y contigente en vez ser concebida como una más "naturaleza" en singular. Asimismo, el ambientalismo de los desposeídos está informado por una conciencia planetaria y un "materialismo global" que describe los procesos locales como incrustados en flujos socio-metabólicos globales a través de las cadenas de mercancía, y finalmente, el ambientalismo de los desposeídos utiliza de manera activa tácticas de disrupción muchas veces contenciosas para responder a esta desposesión ecológica.

Palabras Clave: justicia ambiental, ecología política, metabolismo social, investigación colaborativo, contención, conocimiento activista, acumulación por despojo, política agraria, capitalismo, crisis, commodity chains

This thesis is in many ways a collaborative effort; which makes including here all those who have stimulated, inspired, helped, argued over, provoked and painstakingly reviewed the present work; as well as those who have offered moral, intellectual, emotional and financial support a not inconsiderable challenge. But I offer my humble gratitude to (a shortlist of) the following:

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To Nico, my sounding board and my rock en el ultimo tramo.

To all the collaborators from around the world that have contributed their struggles to the EJatlas and to all the activists everywhere who are still dreaming.

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To the memory of my father who always taught me to resist authority
and to the spirit of my mother, who makes struggle fun

Preface

Background

I situate the origin story of this thesis to the TERI center in Delhi, India, in December 2006, to a press conference during the 10th International Conference of Ecological Economics.

I had been invited by Joan Martinez-Alier, the acting President of the society at the time, as a sort of Journalist of the event. It was my first academic conference and my first real exposure to ecological economics apart from a few lectures of Joan's that I had attended.

The conference itself was mind-opening for a young activist scholar and introduced me to many heterodox lines of thought that have inspired the present work. Eco-feminists such Ariel Salleh, Mary Mellor, Vandana Shiva and Terisa Turner spoke of the economic crisis as one of reproduction. Jennifer Clapp and Peter Utting chaired sessions on corporate accountability while Sunita Narain gave an unforgettable keynote on "the economics of excrement" and Amartya Sen spoke on how the environment is not only a satisfier of basic livelihood needs but allows the deployment of human freedoms.

The question at the Press Conference that rattled came from Giuseppe de Marzo, another invitee of Joan's, and a Marxist social movement activist from Italy. He and his organization ASUD have collaborated and written on subjects such as the ecological debt and Buen Vivir (de Marzo 2011). He leaned forward and somewhat provocatively asked "But what does ecological economics have to offer to activists?" I don't remember the answer, although it seemed to underwhelming to me at the time, but the question stuck in my brain and lingered. Another presentation by Hali Healy at the conference had asked a similar question: How can we teach ecological economics to civil society?

Following the conference, I wrote an article for the ISEE journal, entitled "Beyond talking across disciplines - Why ecological economics should engage with civil society". In the article I argued that EE, despite considering itself a post-normal science dealing with issues where, 'facts are uncertain, values in dispute, stakes high, and decisions urgent' (Funtowicz and Ravetz 1993) and thus where expert opinion is no longer sufficient and the facts must come from an extended peer community of stakeholders, was still falling short in creating 'useful knowledge' and translating its

findings into direct action. I argued that what was lacking to achieve this goal was a deeper alliance between Ecological Economics and civil society.

In the article [1], I outlined some needs and potential paths for collaboration; that I reproduce here in part:

- When an organization or a group of stakeholders confront corporations or governments they need good information but often do not have the special research skills needed. Ecological Economists can be a force in providing this research where it can be applied in the field.
- Ecological Economics can also provide an alternative framework for decision-making, along the lines of multi-criteria analysis.
- Speaking with social groups and activists will allow Ecological Economics to gear research towards the needs of those working towards social and environmental justice.
- Further collaboration can thus help express EE ideas in the language of grass-roots advocacy groups. Activists can help to reduce jargon and hone in on which ideas are most accessible to the public. Their input can also help to resist existing structures that generate research that is inaccessible and irrelevant to those working for social justice.
- Actively involving civil society and rural leaders in selecting cases to study will increase the relevance of the research and can be then translated into public information campaigns. The publicity generated through such campaigns will bring EE to a much larger audience, and demonstrate that its science offers practical applications.
- Increased appreciation amongst ecological economists that much NGO and International NGO activity (such as the increasingly popular trend of 'partnership' building between NGOs and big business) is founded upon mainstream neoclassical thinking, and as such unwittingly supports the status quo;
- Willingness on the part of academia to work to find ways to integrate the principles and tools of ecological economics into civil society and NGO practice, without compromising the integrity of the field; and finally,
- Acknowledgement of the critical role that Southern development NGOs have to play in defining a new global economic framework, especially if the South is to defend its interests against those of the North in the process of its development.

[1] Temper, Leah. Beyond talking across disciplines - why ecological economics should engage with civil society. ISEE newsletter. January 2007. http://isecoeco.org/pdf/Newsletter_2007_Jan.pdf

I concluded:

> The above agenda requires building egalitarian and mutually supportive relationships between academics and activists. A new mode of science calls for new forms of interaction with others working towards social and environmental justice (activist science, if you will).

The above "manifesto" has guided my work over the past seven years. With the momentum from Hali Healy, it became a starting point for the research project CEECEC (described in greater detail in chapter 2), a project that aimed to learn and teach ecological economics with civil society; as well as the more ambitious EJOLT project, that builds on "activist knowledge" to enhance the science and the praxis of Environmental Justice scholarship. The question of how to practice an engaged science that can extend beyond the academy is a core one of this thesis and an ongoing project that extends beyond it.

This thesis represents a culmination of work and learning that has taken place over a period of almost eight years (1998 2014) and is part of a continuing project. The chapters are based on published or soon to be published articles. I have been the primary and corresponding author for all the papers presented except for Chapter 4 (TAV), wherein my contribution was 25%. For all the remaining papers, I was responsible for the first and second drafts of the texts, although I counted on invaluable feedback and comments from my co-authors that helped me improve the text. All the papers included in this dissertation have also been through peer review, sometimes several times, and I must deeply thank the anonymous reviewers who have contributed to vastly improving and fine-tuning the ideas presented herein.

A version of Chapter 3 has been published in Ecological Economics, with Joan Martinez Alier as my co-author. Chapter 4 has been published in the Economics and Policy of Energy and the Environment, along with co-authors Lucie Greyl, Hali Healy and Emanuele Leonardi. Chapter 5 was published as working paper n.5 in the Land Deal Politics Initiative Series. Chapter 6 has recently been resubmitted following major revisions to the Journal of Peasant Studies, with Joan Martinez Alier as my co-author. Chapter 7, co-authored with Daniela del Bene, Bea Rodriguez Labajos and Joan Martinez Alier, is currently under review after being resubmitted following revisions for the Transactions of the Institute of British Geographers.

Before presenting the key contents of the thesis, I will briefly highlight some of the key experiences that have shaped my way of thinking, doing and researching.

I began my doctorate and still do it for political reasons. Key questions entail how my work be used to "do work" politically and theoretically speaking and how it can open political space and communicate to a non-academic audience.

My academic trajectory is multi-disciplinary. I completed a Bachelor's degree in Journalism and Media Studies in Montreal. Following participation in the anti-globalization movements of the 1990s, I decided to study a Masters in Economic History at the Autonomous University of Barcelona. The thinking was that to deconstruct a system, one should understand its logic first.

I was soon introduced to Environmental and Agrarian History through professors such as Enric Tello, Ramon Garrabou and Joan Martinez Alier. My first published scholarly article "Creating Facts on the Ground" (Temper 2009) helped me answer a question that I had been engaging with from a young age - the materiality of the Jewish occupation of Palestine. and the agrarian history of the establishment of the State of Israel. I also undertook an energy balance accounting to understand how resource control and appropriation was linked to environmental justice issues across the green line.

Beyond being multi-disciplinary, I have applied a multi-media approach through the production of press articles, videos and media activism.

Following the conference in India, Joan Martinez Alier and I traveled to Orissa, India to visit the bauxite mining conflicts there. Anthropologist Felix Padel and BP Rath, a scholar of pre-Vedantic India were our guides. At the time, the battle for Kucheipadar, ALCAN/Hindalco bauxite mine project was still raging. Three tribal men had died in Maikanch and in 2001 during a protest against the mine, and women were lathi-charged and brutally beaten. The stakes of what they were defending and what the tribal peoples were willing to risk became clear on that first field trip during the numerous interviews I conducted. The involvement of ALCAN, a Canadian company based in Montreal, sharpened my involvement with the processes I witnessed. That trip and the following led to several articles published in Economic and Political Weekly (Temper and Martinez-Alier 2007), Down to Earth magazine and Ecologia Politica (Martinez-Alier and Temper 2007), and to an Op-ed piece in the New York Times. These articles highlighted how rather than environmentalism

being a "luxury for the rich"; countries such as India wouldn't have the luxury of getting rich and then "cleaning up" later.

At the time of our first visit to Niyamgiri, the sacred bauxite mountain that is the seat of the "Truthgod" of the Dongria Kondhs, the court case against the Vedanta Niayamgiri Project was just beginning, and I have been following it over its 10 year history, with return visits, and a few times being arrested and detained under the pretense of "Naxalite activity" in the region.

My fieldwork in India has also led to several other articles and video works. "Delhi Waste Wars"(attached in annexes) documents the struggles of waste pickers in India for recognition. Meanwhile, I analyzed another success story that of "Hiware Bazar" - a documentary [2] and an article in the Solutions Journal (Temper and Singh 2014). I have also contributed to two group articles studying social metabolism1 and conflicts in India (Martinez-Alier, Temper and Demaria 2014, Singh et al. 2012). While not included as chapters, in the conclusions I also integrate work done on fossil fuels resistance in Ecuador, Nigeria and Canada. This includes several articles and reports on Climate Justice and "Leaving Oil in the Soil" (Martinez Alier and Temper 2007; Temper, Fonseca, and Coelho 2012). I have been following the trajectory of the Yasuni proposal since a 2007 visit to Yasuni that was documented in video and included in another documentary film "The Sarayaku Case"[3].

In 2012, along with the EJOLT crew I also visited the Niger Delta and wrote several in depth blogs documenting the legal battles of the contaminated communities who had brought their cases to company headquarters in Europe and the US. I also edited the EJOLT report "Towards a Post-Oil Civilization: Yasunization and other initiatives to leave oil under the soil". This ongoing project of documenting these communities of resistance has also recently brought me to Canada to document the "living" blockade against the carbon corridor of the Unistot'en resistance camp (draft documentary included in annex), a First Nations community that has re-asserted sovereignty over their unceded territory and re-imagined a free prior informed consent protocol.

The documentation of such conflicts also entails a re-imagining of political possibilities and alternative futures. In this line, I also directed one of the first documentaries on de-growth, touching on both civil (such as transition towns and local currencies) and uncivil (Enric Duran's bank expropriation) de-growth practices. A recent trailer for a degrowth book is also included in the annexes. Other work that has not made it into this collection of articles include co-editorship of a Special Issue on Ecological Conflicts (Martinez-Alier et al. 2010).

[2] Hiware Bazaar Millionaires, Leah Temper https://www.youtube.com/watch?v=0GrUvNHYO$_k$

[3] El Caso Sarayaku, Arturo Hortas. https://www.youtube.com/watch?v=cCC4oxX $\_yE$

Another key aspect of my research praxis is based in my involvement throughout the doctorate of co-writing and co-coordinating two science in society (FP7) projects, that aimed to see how activists, and ecological economists could support each-other's work. I will discuss these further in the methods section.

I have also been teaching in Economic History, Demography, Natural Resource and co-designed and taught modules for 3 years in an online course of ecological economics for civil society organizations. This process culminated in a text-book that I am co-editor of called "Ecological Economics from the Ground Up"(Healy et al. 2013).

While the entire body of work is not included in this manuscript, these experiences and countless more that I have no space to mention have contributed to the development of my thinking and the on-going project that this dissertation represents.

Chapter 1

Introduction

1.1 Background

> *'Today. In this small park, a great many conflicts are colliding. There is the tree that started this, and the fight for the rights of nature against the cold machinery of progress. There is the fight to protect the commons: to save one of the few public spaces that still exist from its transformation into a private space dedicated to the production of personal capital. There is the issue of democracy: that the people have the right to speak out, and the necessity to be heard by those they have empowered.*
>
> *This is no longer a story about a tree, a park, a politics or a cause. It is a story of a people, all over, knowing that they are standing on the global frontline of history. It is not a struggle to change the story, its the struggle to be allowed to write it.'*
>
> - Breathing Gezi (Buckland, 2014)

The quote above is from the memoir of a close friend who (ecstatically) got caught up in the Gezi Park uprising while he was in Istanbul organizing a "Global Power Shift" Climate change summit. As the author explains, the Gezi movement was about many things -democracy and religion, urban

development and poverty, the expression of difference and neo-liberal economic development (Farro and Demirhisar 2014, Ors 2014). What is striking perhaps, is how all these frustrations were able to coalesce and find their expression over the cutting down of a few trees in a park.

The story of Gezi is remarkable, but it is not unique. Around the world environmental conflicts are invading new spatial and symbolic spaces. This process has been described as the "environmentalization" of social struggles (Acselrad 2010), whereby ecological issues are increasingly used to both legitimate and contest political and scientific structures and practices. A few further snapshots: In Post-Communist Romania, the 'Save Rosía Montană' campaign against a proposed gold mine recently brought a million protestors to the streets of the capital, in what is now regarded as the largest civic movement in Romania since the 1989 revolution (Velicu 2012). An action under the "Idle no More movement", in Canada, has recently led to a violent stand-off between the Royal Canadian Mounted Police (RCMP) and First Nations communities in New Brunswick (Ornelas 2014). While blockades and other potential forms of economic disruption by First Nations communities against mines, dams and logging projects threaten to logistically shut down Canada's natural resource-based economy. Meanwhile, "fracktivism" has made its way into the living rooms of middle class families, from America to Poland to Tunisia, exposing new audiences to debates about energy provision and "climate justice". These latter are both part of what (Klein 2014) has recently termed "Blockadia" - a vast but interwoven web of resistance to fossil fuel development that is transforming environmental activism.

Opposition to capital accumulation is increasingly being contested over environmental terms. This dissertation responds to the need to examine the motives and energies and strategies of these resistances, considering the forms they take, the values they express and the meanings we can ascribe to them. I do so firstly by examining specific sites of resistance and then broadening out through multi-case analysis. Finally I introduce a framework for a cross-comparative "statistical political ecology" that aims to integrate activist knowledge with social and biophysical data.

1.1.1 Research Questions

The nature of contentious resistance movements over the environment is thus the fundamental question of this thesis in which I aim at exploring the theory and praxis of movements for environmental justice. In this thesis we examined this "ecologizing" of political conflicts and "politicizing of ecological conflicts" and attempt to underline the defining dimensions that are necessary to understand current forms of contentious activity over the environment.

This thesis starts by asking the overarching questions: (i)How are such conflicts expressing themselves? (ii) What are the politics such groups are employing? (iii) and to what effect? I then refine these into five sub-research questions : (a) under which conditions does effective resistance against a commodity resource frontier emerge? (b) What are the politics of knowledge employed by such movements? (c) How can we understand how they pick their strategies and tactics to stake their claims? (d) What are the inter-connections of groups mobilizing across scales? (e) And how can a political ecological/ecological economics analysis be put to use to support such struggles?

To examine these questions, I engage with literatures drawing on concepts and theories from ecological conflicts, forms of environmentalism, accumulation by dispossession, social metabolism, politics of activist knowledges and social movement theory, among others. I also engage in comparative cross-national analysis to observe movements and groups across different settings, but with some commonalities as regards aims, perspective and forms of mobilization. I aim to analyze how groups in these different contexts contest power imbalances, how they leverage power to do so, and how they achieve their goals and become successful in both rolling back unwanted and imposed projects. Finally I am interested in the role of such activism in wider transformative agendas that can question and challenge broader political and institutional structures.

This thesis contributes to the study of environmental movements and contentious environmental activism at a global scale and gives insights into the main actors involved in resistance movements, their corresponding mobilisation strategies, the action forms they employ, the alternative visions they

propose, the shape of alliances between movements across scales, and the outcomes of mobilizations.

1.1.2 Context

Several key contemporary transformations lead to the need for a deeper enquiry into the nature of environmental contestations within this multi-disciplinary approach.

Firstly, the world's expanding and shifting patterns of social metabolism in terms of energy and materials are producing new geographies of extraction, production, consumption and waste disposal in different parts of the world. Particularly relevant in the cases we examine is how the impact of the multiple financial, energy, food and fuel crisis has led to a "greening of capitalism" and the subsequent creation of new commodity flows, which include the creation and/or expansion of both real (biofuels, aluminium) as well as fictitious commodities (carbon credits, ecosystem services or virtual water), along with the construction of new values and associated rights and markets (Martin 2013).

These processes reconfigure social-environmental and economic relationships across scales, leading to the emergence of (new or recast) environmental movements arising to ?contest these changing forms and strategies of capital accumulation.

Secondly, local political ecologies are becoming increasingly trans-national and interlinked across geographies: grandmothers are chaining themselves to earth-moving machinery in Texas in cross-continent pipeline blockade against tar sands oil from Canada (Temper *et al.* 2013). Famous court cases confront giant oil or mining companies such as Chevron (Texaco), Shell, and Rio Tinto in their home countries, as activists attempt to pierce the veil of corporate impunity (Pigrau *et al.* 2013).

While local groups and their supporters question the private appropriation of communal livelihoods and articulate claims of local sustainability (Martinez Alier 2002; Pellow 2000) and are often organized around ad-hoc

groups made up of localized "single-issue" movements, they are simultaneously increasingly supported and forming alliances with extra-local organizations, sometimes "environmental justice organizations (EJOs), across borders. New points of convergence between trans-national movements are manifold as campaigns around biofuels and food sovereignty, land-grabbing, climate and food justice simultaneously address sectors such as agriculture, energy generation, water management and financial markets.

Environmental issues are thus contested in sometimes new institutional structures and spaces; as well as through politics enacted outside of the international framework (Smith and Duncan 2012). This blurring and remaking of governance boundaries presents both challenges for campaigners and social movements as they navigate new institutional spaces (Borras, Franco, and Wang 2013), along with new advantages as well as frictions (Tsing 2005) across networked coalitions. Some authors have gone so far as to frame this as a "sub-system of world politics" (Smith and Duncan 2012).

Thirdly, many of these environmental movements are becoming increasingly politicized and engaging in antagonistic framings and contentious politics. Across locations, direct action tactics are increasing - in the United States in March 2014, 400 youths were arrested while participating in a nonviolent civil disobedience sit-in; the largest youth act of civil disobedience at the White House in a generation. In India, pitched battles of farmers refusing to relinquish their land at any price has led to numerous project cancellations and policy reversals. Further, we also see the opening of important new policy spaces as contentious groups use environmental issues to engage in politics above, below and at the level of the nation state to agitate for structural changes to the economy.

As Chatterton *et al.*(2013) have argued, in particular in relation to climate change politics, and counter to Swyngedouw's (2010) argument that environmental questions are becoming part of a new "post-political" consensus, I will argue that social movements and grassroots environmental justice organizations are repositioning environmental questions within a large critique of unequal social relations and the neoliberal capitalist globalization process they are embedded in.

1.1.3 Outline of the Thesis

The thesis is built upon five publications and a concluding section that synthesizes and discusses the results of these publications. The first two are empirical studies focussing on how the "politics of knowledge" are deployed within specific local conflicts, one in the "global South" and one in the "global North".

Chapter 3 (publication 1, published as Temper and Martinez-Alier 2013) centers on a contested bauxite mine in India and provides an environmental and institutional history of the highly politicized and contested process of setting a Net Present Value (NPV) for forests in India, in a context of increasing conflicts over land for development, conservation and indigenous rights. The objective of this publication is to show how monetary valuations are not merely isolated phenomena whereby finding the right methodology can allow you to get the "numbers right" but are embedded within institutional and distributional settings within which such values are expressed (Martinez-Alier *et al.* 2002).

Contests over how nature is valued are part of broader commodification processes, which involve symbolic, institutional, and discursive devices to transform nature intro tradeable commodities devoid of cultural and social attachments. We conclude that without attention to the political processes and aims behind such exercises, the "tragedy of the well-intentioned valuation" (Gómez-Baggethun and Ruiz-Pérez 2011) may result despite even the most noble of aims. The chapter engages with how place-based attachments motivate struggles for recognition of alternative epistemologies and world-views and documents how through a legal framework, a struggle for "cultural distribution" was waged and won. It contributes to long-standing debates on the valuation of nature (O'Connor 1993,Castree 2010) and also serves as a warning to activists over the strategic dimensions of engaging in valuation excercises.

The 4th chapter (Publication 2, published as Greyl *et al.* 2012) provides an example of a rising trend of conflicts in the global North opposed to what

has been termed "useless and imposed" mega-infrastructure projects[1]. The "NO TAV" movement is the grass-roots movement of the Susa Valley population against the construction of a high speed train line from Turin to Lyon (Treno Alta Velocita Italian, or TAV), planned at the intersection of 2 main European axes that aims to cross the alps to complement the European railway network by increasing the transport of passengers as well as goods. This chapter draws from discourse analysis to explore the motives and rationale of opponents and proponents, highlighting the role of power relations and an underlying clash of ideologies. It aims to show the determinants of the success and longevity of the NO TAV movement and how it has transformed from a movement rooted in defense of the territory to engage in a new form of democratic politics that has broadenedinto a larger more cogent critique of enforced development from above.

This chapter contributes to the understanding of the emerging shape of environmental resistance movements in a Europe in crisis. In particular, it demonstrates how the protesters have contested exclusion of participation through new forms of active citizenship. It also contributes to literature on the growing "degrowth" movement: a project of radical socio-ecological transformation calling for decolonizing the social imaginary from capitalism's pursuit of endless growth (Kallis 2011) that positions itself as a potential ally of environmental justice movements in the South (Martinez-Alier 2012).

Chapter 5 (3rd publication: Temper 2012) is an exploratory exercise that introduces a new methodology for the understanding of ecological distribution conflicts through social metabolism analysis at the local level. It aims to link the emerging 'biomass-economy' and local socio-ecological transformations and explain how new geographies of production lead to both conflicts and new alliances amongst and between local users and other interests. It contributes to methodologies of the study of socio-metabolic transitions at different scales, and demonstrates how analytical tools from socio-metabolism can yield complementary insights on how local resources are reproduced, appropriated and distributed among human and non-human groups.

[1]The Network against Imposed and Useless Mega-infrastructure projects includes in its goals to to discuss the causes, background and social context of these mega-projects as well as alternatives to them and visions for society see more: http://xn–drittes-europisches-forum-xec.de/english/friday-26-july-2013/

It is a contribution to integrating the "ecology" back into the political ecology of the "land grab" phenomenon (Vayda and Walters 1999), something that remains significantly under-studied,with some exceptions (Duvail *et al.* 2012). While social relations around land-grabbing have been extensively covered, very few papers have examined the processes of local and multi-scale environmental impacts the land rush entails. It can thus be seen as an exploration into how ecological distribution issues as well as economic distribution issues can be empirically situated in the land-grab.

Chapter 6 then moves from the local level to provide a comparative multi-case analysis of how contentious movements against the "land grab" phenomenon, introduced in the previous chapter, are mobilizing across scales. The objective is to show how land-grabbing is contested through diverse discursive, political and economic strategies. Its major contribution is to understanding determinants of successful mobilizations that have led to projects being stopped or suspended by government and corporate actors. It also highlights the role of tensions and alliances among actors and the use of identity politics and financial activism in rolling back unwanted development projects.

Chapter 7 explains the approach of a large-scale collaborative activist-research project aimed at understanding the constituents and determinants of resource extraction and waste disposal conflicts globally through a collaborative mapping initiative: The Atlas of Environmental Justice. This is a project I have been involved in for over 5 years, from conception to project management to atlas editor. The chapter introduces the EJatlas mapping process and its methodology and offers an explanation of how it contributes to both the praxis and theory of environmental justice and geographical scholarship. It explains the need for a collaborative and engaged research approach between academia and civil society, describes the process of co-design and development of the atlas, and assesses the initial outcomes and contribution of the tool for activism, advocacy and scientific knowledge. Finally, in this chapter I demonstrate how the atlas can contribute to a new statistical political ecology framework that can theoretically enrich EJ studies by going beyond the isolated case study approach to offer a deeper systematic evidence-based enquiry into the politics, power relations and socio-metabolic processes surrounding environmental justice struggles globally.

In Chapter 8, I summarise the main lessons learned, highlighting the thesis' contribution to the fields of political ecology, ecological economics, environmental justice and social movement studies and introduce the concept of the environmentalism of the dispossessed to explain the movements of ecological resistance surveyed.

Chapter 2

Conceptual Review and Methods

2.1 Theoretical Foundations

To understand ecological conflicts within a global framework (Sikor and Newell 2014) and as part of interlinked multi-scale processes embedded in shifting global patterns of social metabolism (Martinez-Alier *et al.* 2010), this thesis draws from multiple theoretical fields including ecological economics and industrial ecology, political economy and ecology, geographies of social movement theory, agrarian political economy and science and technology studies. The following section sketches some of the conceptual ideas that have informed the present work. Further relevant concepts and literatures are examined within the individual chapters.

2.1.1 Ecological Conflicts & Environmentalism

Capitalism, through the cumulative effects of cost-shifting, tends to destroy the conditions of production on which it depends (O'Connor 1988). As put by O'Connor (2003): "The combination of crisis-stricken capitals externalizing more costs, the reckless use of technology and nature for value realization in the sphere of circulation, and the like, must sooner or later lead to a "rebellion of nature," i.e., powerful social movements demanding an end to ecological exploitation."

Socio-environmental conflicts can thus be seen as a reaction to the expansion of capitalist accumulation that deteriorates the social and environmental conditions for reproduction. Political Ecology concerns itself with issues of power and justice in the study of environmental changes (Robbins 2012) to examine how human agents intervene, resist and reshape the inherent drive of capitalism to expand. It seeks to track environmental winners and losers through narrative, to understand persistent structural inequalities in power relations and how humans and nature are co-produced (Rocheleau, Thomas-Slayter, and Wangari 1996, Castree 1995).

Political ecology draws heavily on Marxist thinking to explain how capitalism expands and resolves it's internal contradictions and crises through expanding commodification to find new outlets for capital accumulation (Harvey 2006).

David Harvey's adaptation and redeployment of Marx's notion of 'primitive accumulation' (Marx 1867)- under what he terms 'accumulation by dispossession' (2003) extends the concept which can be defined as the subsumption of resources previously not in the market necessary to create the preconditions of capitalism through the 'historical process of divorcing the producer from the means of production', transforming 'the social means of subsistence and of production into capital' and 'the immediate producers into wage labourers' (1967:714); as an ongoing mechanism through which new outlets for accumulation are constantly created, especially when accumulation is in crisis (Glassman 2006).

According to Harvey, the concept reveals a wide range of processes. These include the commodification and privatisation of land and the forceful expulsion of peasant populations; conversion of various forms of property rights (common, collective, state, etc.) into exclusive private property rights; suppression of rights to the commons; commodification of labour power and the suppression of alternative (indigenous) forms of production and consumption; colonial, neocolonial and imperial processes of appropriation of assets (including natural resources); monetisation of exchange and taxation (particularly of land); slave trade; and usury, the national debt and ultimately the credit system.

For ABD to take place, it typically involves a state that is willing to expropriate resources from one class for another for a set of purposes that it seeks to legitimize through claims to the public good. This typically entails 'extra-economic' means involving the use of legal or political power and/or (the threat of) force, to free up resources for capital accumulation.

Recent debates have focussed on whether processes of ABD need entail appropriating resources 'outside of capitalism' or can also entail processes emanating from within mature capitalism (Levien 2012). For example, property passing from a small family farm to a multi-national, or other transformations of the mechanisms of control. Because most populations are integrated into the market system in some way, distinguishing clearly between capitalism's "inside and outside" can sometimes be difficult. My prime interest is rather in how the expansion of capital accumulation leads to specific forms of dispossession and cost-shifting and how populations mobilize to counter these processes. I will return to this discussion in the concluding chapter.

2.1.2 Social Metabolism Accounting & Incommensurability of Values

The process by which peoples take matter and energy from their environments, transform and digest it, and give back waste in return is called social metabolism(Fischer-Kowalski and Haberl 2007, Fischer-Kowalski 2009, Cussó *et al.* 2006, Martinez-Alier 2009).

As global consumption of resources and human populations increase and even without economic growth (since the energy from fossil fuels cannot be recycled and materials are recycled only to a small extent), the commodity frontiers expand, leading to greater social confrontation (Martinez-Alier et al. 2011). Often those most heavily impacted are marginalized sectors of the population. This leads to growing inequality in the distribution and access to environmental resources and services and the rise of movements to reclaim rights of access and use. Thus, from a physical point of view, as in the ecological economics tradition (Martinez-Alier 1987), the root cause of conflicts on resource extraction and waste disposal is the increase in social metabolism: The study of social metabolism examines economies as systems that reproduce themselves not only socially and culturally, but also physically, through

a continuous exchange of energy and matter with their natural environments and with other socio-economic systems. Indicators which track these processes, much as GDP tracks economic growth, include Material Flows analysis, Human Appropriation of Net Primary Production and other biophysical indicators at appropriate scales, which can enrich the understanding of ecological distribution conflicts, as I do in Chapter 5. Metabolic processes may be further divided into: Appropriation, Circulation, Transformation, Consumption and Excretion. And may be analyzed at any pre-defined spatial scale or temporality. (Navarro and Toledo 2014).

Despite advances in socio-metabolic analysis and the adoption of material flow analysis by Eurostat for example, very little research has attempted to integrate socio-metabolic analysis and questions of political economy/ecology. Some work has been done at National scales. For example, (Martínez Alier, Temper & DeMaria 2014) discuss social metabolism and conflicts (for India), while Vallejo et al have for Ecuador and Colombia (Vallejo 2010, Vallejo, Pérez Rincón, and Martinez-Alier 2011). Even less has been done at the local level, with some exceptions (Singh and Haas 2013). In Chapter 5, I further develop the application of the HANPP indicator to a local case study employing social metabolism to examine distributional questions. I am particularly interested in HANPP because it is one of the only social metabolism indicators that has been developed in a spatially explicit way at a high resolution.

Another key concept is that of global commodity chains (Mintz 1985, Gereffi and Korzeniewicz 1994). Combining insights from ecological economics and political ecology (PE) enables a framework that sees commodity flows as embedded within social metabolic patterns. Such a fusion can enable us to see beyond the isolated "cries along the commodity chain" that manifest in ecological conflicts (Robbins 2014) to examine how socio-natural relations are produced and by whom and how processes of neo-liberalization and globalization are actualized in ecological conflicts (Swyngedouw and Heynen 2003a).

2.1.3 The Politics of "Activist Knowledge"

A central consideration of the PE approach is that the environment is constituted through struggles both over material practices and over meanings

(Bryant 1998). This need for a discursive analysis has been highlighted by those calling for a post-structural political ecology (Escobar 1996). Tracing the lines between the construction of knowledge and power lays bare how asymmetrical power relations produce situated "ways of knowing" about the environment. Contributions from the field of Science and Technology Studies highlight the ways that knowledge, be it local or scientific or newly co-produced (Jasanoff et al 2004b), becomes a political tool that can express and exercise power.

Culturally specific ways of knowing and political culture will influence how science and technology are received (Jasanoff 2005). For example, the incidence of certain conflicts in some places and not others also opens new research questions around questions of how different citizenries "produce" science and understand risks. Why is nuclear power conflictive in Germany and not in France? Why is incineration not conflictive in Northern European countries and so conflictive in Southern Countries such as Italy and Spain?

In this thesis, I explore how local grassroots organisations produce new and alternative knowledge with which they can challenge dominant discourses. The theories and contributions of activists, sometimes elaborated in tandem with academics or technical scientists (Conde 2014) are a source of "activist knowledge" that feeds back into science (Martinez-Alier et al 2014). At the same time, these knowledges leads to new processes of re-subjectification, whereby activists become experts in their own right, and create a science informed from their own values and experiences. This is what (Haraway 1988) has termed "situated knowledges." In Chapter 7 I expand on how Environmental Justice research must engage with locally produced activist knowledge to both understand and further it's aims.

2.1.4 Value-systems

Another key concept in ecological economics is about incommensurability and plurality of values and the different languages of valuation that complaints are expressed in. Incommensurability, i.e. the absence of a common unit of measurement across plural values; entails the rejection not just of monetary reductionism but also any physical reductionism (e.g. eco-energetic valuation). However it does not imply incomparability. It allows that different

options are weakly comparable, that is comparable without recourse to a single type of value (Martinez-Alier, Munda, and O'Neill 19983)

In Chapter 3, I ask the question "How many tonnes of bauxite is a tribe or a species on the edge of extinction worth? And more importantly, how can you express the value of these things in terms that a minister of finance or a Supreme Court judge can understand?" I highlight how in decision-making processes, economics becomes a tool of power in the hands of those who know how to wield it. Against the economic logic of dollars and cents, the languages of valuation used by the peasants and tribals go unheeded. These may include the language of indigenous environmentalism, the use of territorial rights and ethnic resistance against external exploitation, international human rights law such as the ILO Convention 169, which guarantees free, prior and informed consent for projects on indigenous land, or in India the protection of adivasi peoples by the Constitution and by court decisions such as the Samatha judgment. Other appeals could be made to ecological and aesthetic values, or to sacredness.

While local discourses often focus on the defence of human rights, the urgencies of livelihood, the need for food security, the defence of cultural identity and territorial rights, the respect for sacredness; the language of Western environmentalism is increasingly used for strategic reasons (communication, visibility, protection), because it fits well into their demands and because there is a globalization of environmental concerns. In Chapter 6, I examine whether socio-environmental movements who succeed in getting an international visibility are ones who have combined a specific cultural identity (including territorial rights, livelihood, sacredness) with elements of Western environmentalism (ecosystem conservation, biodiversity).

2.1.5 Forms of Environmentalism

Environmentalism is defined as socio-political movements which seek to ameliorate the relationship between humans and their natural surroundings. Martinez-Alier's seminal (2003) work on environmentalism outlined three main varieties of environmentalism. The first, which he terms "Cult of the Wilderness" has as its prime concern the preservation of pristine nature, enacted by setting

aside natural areas and wildlife where humans and market values can be excluded, and nature can be actively protected for its ecological and esthetic values. It is represented today by organizations such as the Wildlife Conservation Society, Nature Conservancy, WWF, or the IUCN (Martinez-Alier & Anguelovski 2014) but also by radical environmental movements such as Earth-First! This position prioritizes conservation over social justice issues, and sometimes resorts to "fortress conservation" strategies (Peluso, Afiff, and Rachman 2008) to exclude local populations from decision-making, for example in the creation of natural parks and reserves.

This form of post-materialist environmentalism is sometimes termed the 'ecology of a uence', as theorists consider it was born from a transformation of values, whereby aesthetic and quality of life concerns become a priority over production and distribution and personal security (Inglehart 2009).

The 2nd stream of environmentalism Martinez-Alier highlights is the "Gospel of Eco-efficiency". This is best summed up by ecological modernization approaches that see continued industrial development, technology, and the efficient use of resources as offering the best option for escaping from the ecological crises. This form of environmentalism finds expression in what Wolfgang Sachs (1995:20) defined as "global ecology" - the 'rational planning of the planet for Northern security For example, Southern forests, the atmosphere and biodiversity are classified as part of the "global commons and managed as carbon sinks and for biodiversity preservation. This represents the view of the World Bank and other organizations for example as regards the new "land rush" described in Chapter 4 - that given proper management and productivity increasing technology, global demand for farmland to ensure food security can be met in non-forested areas or in areas with 'yield gaps(WB 2010, quoted in McMichael 2011).

While case studies and comparative work on environmental movements in the South have been done since the 1990s if not before (Bryant and Bailey 1997, Peet and Watts 2004, Rocheleau, Thomas-Slayter, and Wangari 1996). Martinez-Alier's contribution (Martinez-Alier 1997,Guha and Martinez-Alier 1997) was to argue for a third stream of environmentalism termed "environmentalism of the poor??, that represented the perspective of third world ecological movements, which have their main interest "not in a sacred reverence for Nature, but a material interest in the environment as a source and

a requirement for livelihood; not so much a concern with the rights of other species and of future generations of humans as a concern for today's poor humans" (Martinez Alier 2002:11).

The environmentalism of the poor explains the mobilizations of peasants and other marginalised social groups who tend to defend their surrounding environment because they strongly depend on it for their survival (Guha and Martinez-Alier 1997), yet may not consider themselves environmentalist. This materialist environmentalism opens the potential for environmental concern to be embraced by diverse, plural constituencies and offers powerful and salient opportunities for mobilization across classes, cultures, and positions in the world economy.

The Northern parallel to these movements is the environmental justice movement, which has also served to expand to reframe and reshape the contours of environmentalism (Di Chiro 2008). EJ literature firstly set out to prove that "pollution is not colour blind" by demonstrating that disparities of environmental exposure exist among racial lines (Bullard 1990, Bryant and Mohai 1992), although the causality of this phenomenon remains disputed (Mohai and Saha 2006). Yet over time, the EJ framing has engaged with multiple spatialities and forms of inequalities (Walker 2009, Schlosberg 2013), serving to bring a far wider range of issues under the umbrella of what is the environment. This included redefining the environment as "the places where people live, work and play" but also going beyond this, considering how corporate globalization and uneven geographies of power impact on individual bodies (Di Chiro 2008).

Schlosberg's trivalent understanding of environmental justice (Schlosberg 2004) is based on distribution, recognition and participation. Recognition can be seen as a pre-condition to participation and distribution. It entails firstly being recognized as a valid spokesperson or representative. In EJ, this is often referred to as "having a seat at the table" or by the expression of the US EJ movement: "we speak for ourselves." Across the chapters, we also see how new communities of interest, such as pastoralists and waste recyclers (Temper, see annexes) claim for recognition of their livelihoods through dynamic framings and negotiations of identity. We find that in battles over recognition common tactics include media work, legal approaches and recourse to identity politics.

Procedural justice is about how decisions are taken and who can participate. Methods of valuation applied to decision-making processes will always be context dependent and contested and can be understood as "value articulating institutions" that determine the values that can be expressed, the way they are expressed, and that bound the universe of possible outcomes. These structures determine the procedures that frame debates and define what can be negotiated, how and by whom (Vatn 2005).

When spaces of participation are foreclosed, groups claiming for procedural justice sometimes resort to rescaling tactics (Swyngedouw 2000) through the creation of new forms of participatory processes from below: for example alternative assessment mechanisms and decision-making institutions which may include challenges to the EIA, referenda and local consultations. The question of at what level and how such decisions should be taken is covered in Chapters 3 and 4.

Distribution can entail contests about the distribution of both environmental bads and goods, as well as the distribution of risks. When the focus is on improving or calling attention to such mal-distributions, groups may engage in strategies such as strikes, agitating for better incorporation or other forms of negotiation for improved compensation as well as direct action, legal strategies, or other action forms aimed at stopping the proposed activity at all costs.

More critical strands of environmental justice research (Newell 2005) emphasise the ways in which uneven exposure to environmental benefits and harm is often not accidental and unintentional, but rather a product of a particular way of organising production and its constitutive social relations.. While these scholars acknowledge the importance of site-specific and local conflicts, they argue that these mobilizations needed to be situated within the broader dimensions of global political economic structures and the socio-ecological webs of production, consumption and exchange interlinked through commodity and financial flows across locations (Newell and Mulvaney 2013). This thesis positions itself and is a contribution to this more critical perspective.

2.1.6 Strategic, Tactical and Discursive Repertoires

Social movement theory (Della Porta and Rucht 2002, Tarrow 2005, Giugni, McAdam, and Tilly 1999, Tilly 1993) seeks to explain why and how social mobilization occurs, how it manifests itself, and what the outcomes are. Movements and organizations rely on a wide repertoire of contention to counteract powerful actors and achieve their aims, ranging from institutional means (lobbying, public hearings, campaigns, testimonies, political pressures during elections, etc) to direct action tactics (protest, demonstrations, boycotts, denunciations, shaming, strikes, etc)(Tilly 1978, Tarrow 1998).

The question of what strategies are viable in different political contexts will depend on what SMT scholars refer to as shifting "political opportunity structures (POS)(Tilly 1978, Tarrow 1991): the context and resources that facilitate or constrain the possibilities for collective action (Della Porta and Tarrow 2005, Tarrow and Tollefson 1994). Strategic and tactical choices will further be shaped and nuanced by the local historical and political context, as well as by the biophysical properties of the commodities themselves, and how their production or appropriation reproduces nature.

For example, Gadgil and Guha (1993) list seven forms of action of environmental protest in India, such as dharna, the sit-down strike, the hartal, the general strike, or forcing shops to close shutters, the gherao, surrounding an office or an official for days, and the rasto roko, the transport blockade. The hunger strike, as an other example, is also very common in India and dates from the Bhagavad Gita, while others come from the Gandhian tradition. In many cases they were successful in achieving the scrapping of contested projects or the renegotiation of compensation measures. In Brazil, Chico Mendes used the term empate ('draw' in english) to apply to the peaceful confrontation again deforesting bulldozers (Martinez-Alier 2002).

At the same time, innovation in tactical repertoire is also a powerful tool that has proven effective in leading to desired outcomes (Kroger 2011). New action forms appear and are diffused across locations and cultures. For example, recently a wave of popular community-organized consultations has taken place across Latin America to oppose and open democratic spaces against projected mining projects (Urkidi and Walter 2011). The ability to challenge

EIAs has improved in some countries, while groups are also using new strategies such as legal appeals to the Rights of Mother Nature in court cases in some Latin American countries[1].

Financial divestment campaigns and some forms of shareholder activism have also become more prevalent in recent years. The question of "what strategies work under what circumstances?" is considered to be one of the most underdeveloped in Social Movement Theory (Giugni 1998) and this dissertation contributes to this line of enquiry and proposes a novel framework for further systematic exploration of this question. William Gamson's Strategy of Social Protest (Gamson 1990) is still considered the most ambitious and systematic effort yet to analyze the impact of social movements and outcomes. One of the prevailing themes from the book is the question of whether disruptive tactics lead to successful outcomes for social movements, as opposed to moderate ones. Gamson's study found that the use of violence and, more generally, disruptive tactics (sit-ins and strikes) were associated with success. Other evidence shows that groups that alternate between engagement in direct negotiations with the state and confrontational action (i.e. protests or lawsuits) tend to receive positive responses to their demands (Della Porta and Rucht 2002, Tilly 1978).

When traditional action forms become ineffective, groups will intensify the contentiousness of their actions (Kousis 1998). This may entail boycotts or legal tactics at other scales in an attempt to apply pressure as well as blockades, direct action and other disruptive tactics. Tactics that manage to disrupt "business as usual" to pressure for state and corporate accountability have proven effectiveness in winning concessions (Bullard 1990, Pellow 2001, Pellow 2007).

The role of extra-local actors, often national and international NGOs or EJOs is another key enabling factor that can both encourage the emergence of local mobilizations and increase the likelihood of concessions on target actors (Keck and Sikkink 1999). As we will see in Chapter 6, trans-national

[1]The first successful case was presented before the Provincial Court of Justice of Loja in Ecuador on March 30, 2011 by two concerned citizens who opposed the widening of the Vilcabamba-Quinara road. The operations would have deposited large quantities of rock and excavation material in the Vilcabamba Riverhttp://therightsofnature.org/first-ron-case-ecuador/

advocacy groups can play an important role in framing and situating the conflict or issue within broader trends in geo-political dynamics. By elevating their struggles beyond the local level and situating them within "master frames" at the national or global level, activists increase the chance of their struggle being recognized and of achieving their goals. Activists engage in "scale jumping" turning local conflicts into "glocal conflicts" (Keck and Sikkink 1999, Urkidi 2010, Swyngedouw 1997, Swyngedouw 2004); while trans-national activists "jump down" to support local groups and win tactical victories to further broader strategic aims. These processes of articulation amongst groups are key to success, but are not without their own tensions, as we see particularly in the case studies covered in chapters 2 and 6 of this dissertation.

Environmental justice conflicts are by definition glocal - because they entail environmental processes taking place across scales and inevitably entail the tensions between how environmental burdens are distributed across scales (Towers 2000). As commodity chains expand, the distance between the scale of production of environmental impacts and where they are felt expands. While meanwhile processes of globalization have also opened up new scales at which conflicts can be resolved, or at least new scales of governance in which contentious groups aim to press their demands. As Kurtz writes (2003:891) "the very concept of environmental injustice precipitates a politics of scale, as the locally experienced problem of burdensome pollution can hardly be resolved at the local scale, whether by capital or the state, when it originates in political and economic relationships that extend well beyond the scale of the locality".

2.2 Methods

'How might those of us interested in diverse economies choose to think and theorize in a way that makes us a condition of possibility of new economic becomings, rather than a condition of their impossibility?'
- (Gibson-Graham 2008)

2.2.1 Activist Research

This thesis is an output of an (ongoing) project to integrate activist perspectives into ecological economics research. Thus it can be considered in the line of approaches including "participatory research practices" (Fuller and Kitchin 2004, Bacon et al. 2013) and entails working with the environmental justice activists to explore the issues at hand, and to effect social change through the research process.

The approach I have taken can also be called "performative" research, following Gibson-Graham (2008), whereby the academy itself is treated as a 'vast uncontrolled experiment', continually producing information about "how it could be improved as an agent of change... and how....we may find many ways to perform new worlds from an academic location."

I often documented movements (in India, Ecuador, Kenya, and Canada) first from a journalistic angle, going there to shoot a documentary film or write an article. It was often years later in a stretched out doctorate (I was a key member in what Joan always referred to as being part of the "slow thesis" movement) that I would turn to writing about these cases academically once the story evolved before my eyes, enabling an understanding of its historical significance and the key questions of the case. This approach can be termed an "emergent method", defined as one that begins with the empirical world and builds an inductive understanding of it as events unfold and knowledge accrues (Charmaz 2011). Social scientists who use emergent methods can study research problems that arise in the empirical world and can pursue unanticipated directions of inquiry that may not be immediately apparent at the beginning of the research process. This is a reflexive approach to research whereby once I was familiar with the processes of each case study, I was then able to choose the appropriate methodological strategies.

I also rely on methods from political ecology such as progressive contextualization (Vayda 1983: 265)- a path of inquiry where human-environmental interactions are explained by "placing them within increasingly wider or denser contexts". This entails analyzing relationships between various actors and events and the connections between them across different scales.

The video ethnographic approach I use also contributes to the reflexiveness of the process, causing the researcher to keep in mind how the subject is portrayed and changed through representation. The footage I gathered has also often been used to create documentary films to support the struggles of the actors documented.

Other data collection methods include interviews, documentation and direct and participant observation. Local, provincial and national documentation (archives, letters, reports and "grey literature") and interviews with local farmers, pastoralists, political authorities, legal experts, academics and activists. Interviewees were selected to represent a broad spectrum of interests and knowledge.

I also apply methods for the study of social metabolism, in particular analyzing biomass use and flows in 2 villages in the Tana Delta Kenya (chapter 5). This entailed carrying out surveys with villagers about biomass production, use and consumption, walking around weighing artefacts and speaking with local officials. The methodology is further described in chapter 5.

Much of the content of this thesis is informed by my participation writing and coordinating two Science in Society projects over the past 7 years. The first project I helped conceive of and write and worked on for 2 and a half years was called the CEECEC project, a European Commission funded project to enable CSOs to engage in and lead collaborative research with ecological economists. The overall focus was not on theory but on case study learning, whereby CSOs and academics identified and explored key issues for research in areas such as water management, waste disposal, transport and trade, tourism, nature conservation, extractive industries, forestry and agriculture, based on CSO knowledge, needs, and interests. The work on CEECEC culminated in Chapter 4 of this dissertation, written together with other scholars and with Lucie Greyl, of the EJO CDCA.

One of my initiatives within the project was something I termed "Live Ecological Economics Sessions", which entailed inviting EJOs to participate in CEECEC presentations during conferences of the International Society for Ecological Economics and asking them to present their case studies where we would brainstorm together on the spot about potential "ecological economics" approaches that would help support their struggles. In the 2008 conference

in Kenya we invited Nature Kenya and the East African Wildlife Society and Chapter 5 grew out of the ongoing collaboration I developed with them, that has continued through the EJOLT project.

Following CEECEC I helped conceive of and co-wrote the more ambitious EJOLT project involving 23 organizations: seven university research institutes, two think-tanks, one independent laboratory, and 13 EJOs. The EJOLT project is geared to support research on two key questions: Which are the causes of the increasing ecological distribution conflicts at different scales? How can such conflicts be turned into forces for environmental sustainability?

My work in EJOLT has been as co-editor for the EJOLT blog and the EJOLT videos, in the thematic areas biomass and climate justice (where I co-edited various reports), and in the legal work-package. I am the main editor and the project manager of the Environmental Justice Atlas and am responsible for both scientific and technical aspects as well as for dissemination of the atlas outputs and user-friendliness for a general audience. The key difficulty of this task is creating a tool that can both serve the activist community as a dissemination and networking platform and resource, while also generating useful knowledge that can enhance the science and understanding of ecological conflicts.

Chapter 7 describes the data collection process of the Environmental Justice Atlas in detail. For this project and future research I draw heavily on collaborative data collection with activists, as well as GIS data.

Chapter 3

How much for your God? Net Present Value, indigenous territorial rights and sacredness in a bauxite mining conflict in India

Keywords: Cultural Distribution, Conflicts, Mining, Sacredness, Environmental justice, Indigenous rights, Forests

3.1 Introduction

On 18th April 2013, the international press announced that the Supreme Court of India had dealt a blow to the British Vedanta company's plans to dig for bauxite on land deemed sacred by local people in the state of Odisha[1]. The Supreme Court rejected a request from the company to end a ban on the proposed mine. The local councils would have three months to state whether they wanted the mining to proceed. The Court ruled that if the project affects the inhabitants' right to worship their deity known as Niyam Raja, that right has to be protected[2].

[1] Also known as Orissa. The name was changed in November 2011.

[2] Andrew Buncombe, The Independent, 18/4/2013, http://www.independent.co.uk/news/world/asia/indian - supreme - court-rules-to-protect-sacred-hills-against-uk-mine- operation-vedanta-resources-8578954.html

This chapter explains the background to this court decision, that might be reversed depending on local and national politics. For the time being, religion has trumped the economy. Some would argue however that a proper economic accounting would align the economic values with the religious values. This chapter questions whether the establishment of a monetized regime of management for the loss of natural forests is an effective method for protecting forests, and whether it could even be counterproductive by simply enabling the powerful to buy the rights to destroy forests and "compensate" for it through afforestation plantation projects or by putting money into a fund. The argument is developed through the examination of proceedings in the Supreme Court of India over several years before 2013 dealing with the use of the payment of Net Present Value (NPV) of forests. The arguments by activists around "properly done" cost-benefit analysis are also analyzed, in this conflict over bauxite mining in the Niyamgiri hills of the Dongria Kondh in Odisha, India.

This chapter is thus concerned with what former Indian Environment Minister Ramesh (2011) called the "two cultures", referring to C.P. Snow's original divide between the sciences and the humanities but converted in Indian politics into a debate over environment and development. Ramesh proposed that the opposition between environment and development could be bridged by implementing regulatory norms and by proper economic valuation, saying: "What we cannot measure, we cannot monitor and what we cannot monitor we cannot manage." (ibid). This chapter attempts to show that contrary to Ramesh's intent, proper economic valuation is not a panacea to resolve the conflict between conservation, environmental degradation and the rights of India's "ecosystem people" (Gadgil and Guha 1992, Guha, 1989, 2006).

The methodology for determining the NPV includes environmental goods and services provided by the forest ecosystem – timber, non timber forest produce, firewood, fodder, grazing land, tourism, carbon sequestration, water cycling and flood control, biodiversity and more. However, the results of the exercise depend on doubtful economic valuations of non-market goods and services as there is no agreed upon "proper" way to monetize environmental attributes and NPV values are driven by the choice of a discount rate that is arbitrary. Moreover spiritual and cultural associations do not fit easily into this economic paradigm.

Problems over the valuation, capitalization, and commodification of nature have been amply covered in the literature (Gowdy *et al.* 2010, Harvey 1996, Kallis *et al.* 2013, O'Connor 1994, Sagoff 1998, Smith 2007, Spash and Vatn 2006). One contribution of this paper is to examine how the economic valuation of forests was institutionalized and then mediated through political struggles in the Indian context and how discourses around development, sustainability, rights and values are constructed and tradedoff against eachother in the world's largest democracy. Further, I bring a social and environmental justice lens and an examination of power relations to bear on the distributional aspects of pricing forests in practice and how such pricing has exacerbated structural inequalities and led to increased uneven development.

3.2 Methods

Data from interviews, documentation and direct observation have been combined after field trips taken to the region and to Delhi to collect court documents and archival material in 2005, 2007 and 2009. Semi-structured or in-depth interviews with local villagers, political and administrative authorities, legal experts, academics and activists were carried out, as well as with one of the primary lawyers in the forest case (Ritwick Dutta). Interviews were conducted in English or with the help of a translator (in Hindi or Oriya). National and international documentation was researched with special focus on the Godavarman and Niyamgiri cases at the Supreme Court through a textual analyis of petitions, official documents, and media coverage. Help from local friends and experts, and from ecological economists elsewhere in India, has been essential in the writing of this chapter. We have particularly profited from Samarendra Das's and Felix Padel's film and book (Padel and Das 2010) on bauxite mining conflicts in Odisha as well as the extensive literature on forest governance (Kohli *et al.* 2011, Lele 2012).

3.3 The Context. Land Wars in India

India is still a country with low income per capita, small flows of energy and materials per capita (Singh *et al.* 2012), a large indigenous (Adivasi) population of about 70 million, and high population density in the countryside and in the country as a whole. In India despite the fact that both imports and exports are growing, they remain small compared to domestic extraction with material imports accounting for only 6% of domestic consumption and export flows at around 4% of domestic extraction (ibid). This relatively small dependence on outside resources and perceived need for rapid economic growth necessitates a process of "internal colonization" (Shrivastava & Kothari 2012) and active calls for "sacrifice zones" in national discourse (Temper and Martinez-Alier 2007).

This has led to ecological distribution conflicts on water use, sand and gravel mining, open-cast mining for coal and metals, on biomass and nuclear risks. The issue at hand is sometimes better compensation packages yet often communities are raising serious objections to the notion of development itself, and championing a different system of values to that advocated by industry (Mishra 2010).

To understand these conflicts, that have been popularly dubbed "Land Wars", Odisha is as good a place as any to start. From protests against a Special Economic Zone[3] in Kalinganagar, where state repression led to the deaths of over 13 adivasis in January 2006, to resistance to aluminum plants in Lanjigarh and Kashipur, and to the struggle against the Posco steel projects and the Lower Suktel area in Balangir, Kotagarh in Phulbani, the mining-industrial belt in Jharsuguda, and Rourkela, virtually the whole state has turned into a battleground on the issue of development and displacement.

Odisha was among the first Indian states to institute neoliberal reforms to the electricity and other sectors beginning in the 1990s (Ramana *et al.* 2002), while the mining and quarrying sector has been the fastest growing sector in Odisha, at above 10% per annum growth since 1980-81 to 2006-7 and beyond (Panda 2008). Recent years have seen unprecedented levels of

[3]SEZs are manufacturing zones, often exempt from federal laws regarding taxes, quotas, FDI-bans, and labor laws to make the goods manufactured at a globally competitive price.

investment from both domestic and international companies hoping to profit from the mineral bounty. In 2009, Odisha was the Indian state with the 2nd most Foreign Direct Investment (FDI), after industrial Gujarat (Asher 2009).

But this growth has led to widespread displacement and little "development"[4]: in 2007 all the mineral rich districts of the state of Orissa were on the list of the 150 most backward districts of the country (Khatua & Stanley 2006; Centre for Science and Environment 2008, Fernandes & Mohammed 1997). Projects remain highly contested — as of July 2011, a total of 31 industry, mining and port projects in the state were awaiting environmental clearance with the Ministry of Environment & Forests (MoEF).

3.3.1 The Value of Forests

3.3.2 Some History

Forests are one of the most contested spaces in land conflicts in India. They experience pressure from growing demands from agriculture and extractive industries, combined with increasing demand for conservation as well and demand for rights from forest-dwelling and indigenous communities. Forest governance in India is a legacy of the British colonial policy of plunder, that devastated the rich forests that once covered the Subcontinent for timber for railways and shipyards and cleared them for plantations of tea, coffee, indigo and sugarcane. After independence, this extractive model of forestry was largely maintained, with the emphasis shifting from imperial to commercial and conservation imperatives as the justification for continued state control (Gadgil and Guha 1992).

The conception of forests as a "strategic national resource" can be evidenced by the National Forest Policy of 1952, which reads:

[4]According to Kumar (2006) an estimated 1.5 million people have been displaced by development projects in Odisha between 1951 and 1995, of which 42% were tribals. As per this estimate, less than 25% of the displaced tribals were ever resettled even partially. However he cautions that the figures have not been properly compiled and this does not include those displaces by smallscale irrigation projects for example. According to Kumar 87% of Scheduled Tribes in South Orissa live below poverty line.

> "Village communities in the neighbourhood of a forest will naturally make greater use of its products for the satisfaction of their domestic and agricultural needs. Such use, however, should in no event be permitted at the cost of national interests. The accident of a village being situated close to a forest does not prejudice the right of the country as a whole to receive the benefits of a national asset..."

Thus post-independence, the state took over 26 million ha between 1951 and 1988 (from 41 million ha to 67 million ha), designating them largely as reserve forests (RFs)[5]. These areas are controlled by the state and forest department bureaucracy, who maintain decision-making and ownership privileges over them, despite the fact that they are de facto intensely populated by indigenous peoples who depend on the forest for subsistence and their cultural identity, yet hold limited or no rights over the forestland they inhabit (Deb 2007).

The result was a progressive disenfranchisement of forest dwelling communities — including dwindling rights to biomass, severe impacts on their livelihoods and living standards, and often being labeled as encroachers on their own lands (Lele 2012). In Odisha, a state with a large adivasi population, the forest and revenue departments "own" 50 to 80% of the land in the State's Schedule V areas (Sarin 2010).

After the Chipko movement in the Uttarakhand in the Himalayas in the 1970s and 1980s, a strong movement arose in support of community forests, and Joint Forest Management. The Forest Conservation Act (FCA) made the States require the approval of the Central government and the Ministry of the Forests and the Environment (MOEF) to divert even the smallest patch of forest. Beginning in 1995, matters of forest policy and governance have been progressively transferred to the judiciary as the Godavarman case has expanded and clarified the scope of the FCA (Dutta 2011).

It should be noted that judicial activism and Public Interest Litigation (PIL) in India are somewhat unique, with some dubbing India's judiciary as the "most powerful court in the world" (Thayyil 2009). Thayyil situates this

[5]Total forest area in India in 2011 was 692, 027 km as per the definition explained below.

activist tradition from the court's opposition to abuse of powers by the executive during Indira Gandhi's political emergency (1975-77). This developed into a liberal interpretation of the rights chapter of the Indian constitution, with the aim of safeguarding and protecting the rights of India's marginalized and disadvantaged populations. Progressively, the court innovatively recognized the right to a safe environment and the right to livelihood as inextricably related to the right to life. However, as Lele (2012) notes, despite the court's avowed orientation to protect the rights of forest communities, the court's expanding scope over forest management leaned heavily on an economic calculus rather than a rights-based approach (at least until the April 2013 decision).

3.3.3 The Forest Case: Enter NPV

The Godavarman, or the Forest case, originated far from Odisha, in a dispute between an estate owner and the forest department in the southern state of Tamil Nadu. Filed as a PIL, the owner of the plantation was distressed by the illicit felling of timber on forests that had been taken over from his family by the government (Godavarman Thirumulpad vs Union of India, WP (Civil) 202 of 1995).

Over the past 18 years, over 2000 'interlocutory applications' (separate writs) from across the country have been filed into the forest case and a permanent bench convened that sits almost every week. The court also set up the CeC (Central empowered Committee) (2002) to advise the Court, as well as a committee to decide how the funds collected for compensatory afforestation (CAMPA) should be spent. The case has largely transferred the authority of the reformation of the entire country's forest governance to the court (Rosencranz and Lélé 2008, Thayyil 2009).

The genesis of NPV dates back to the late 1990s when the Supreme Court noticed that the funds for compensatory afforestation were not being used. Moreover, afforestation was not taking place on the ground. But, even in the few cases where this did happen, the court argued that the plantations raised under the compensatory afforestation scheme could never adequately compensate for the loss of natural forests due to the time needed to mature and the reality that plantations are poor substitutes for natural forests. The

court thus decided to debate the questions of whether "before diversion of forestland for non-forest purposes and consequential loss of benefits accruing from the forests should not the user agency of such land be required to compensate for the diversion? And whether this should be done through the payment of Net Present Value?" (CeC (Central Empowered Committee) 2002).

NPV is the present value (PV) of net cash flow from a project, discounted by the cost of capital. As the court clarified, NPV was to represent not the stock nor the replacement value of the wealth of the forests themselves (which in theory were already accounted for due to the need for compensatory afforestation); but rather the loss of "the discounted sum of rupee values of ecosystem goods and services that would flow from a forest over a period of time net of costs incurred." The following step thus involved the identification of the tangible and intangible forest goods and services into discrete units that could then be translated into monetary units.

3.3.4 Defining Forests

Previous to 1996, the FCA applied to lands officially recognized as forestlands under the Indian Forest Act, 1927. However, as part of the orders in the Godavarman case, in 1996 the Supreme Court (SC) expanded the scope of the term "forest" to include (as in FAO's definition) any "area having a tree canopy cover of more than 10% over an area of more than 0.5 ha, with forestry as the principal land use." This meant that large tracts of land, previously under community ownership or for common purposes such as grazing, were brought under centralized control, and made accessible to market forces, through payment of NPV (Das 2010).

In 2005, the court appointed an expert committee led by Prof. Kanchan Chopra, director of the Institute for Economic Growth at the University of Delhi (and first president of the Indian Society for Ecological Economics) to produce a report on the NPV of forests. The Committee was charged with identifying and defining parameters (biometric and social) and a practical methodology on the basis of which the economic value of forestland should be estimated in different bio-geographical zones of India.

The Chopra committee held public hearings and sought information and consultations from a wide range of stakeholders. It also drew on previous economic work on forests that tried to call attention to the non-market values lost when forests are destroyed undertaken by The Green Indian States Trust (GIST) sponsored by Pavan Sukhdev in 2004. This NGO did research on State-level 'Green Accounts' to encourage India's policy-makers to overcome their mental dependence on GDP growth (www.gistindia.org). Sukhdev would later acquire a deserved world reputation as leader of the UNEP reports "The Economics of Ecosystems and Biodiversity" (http://www.teebweb.org/).

In May 2006, the Chropra committee delivered its report (all following references to the Chopra recommendations refer to Chopra 2006). Yet despite commissioning the Chopra report, the court's Central Empowered Committee selectively adopted the propositions brought forward (all following references to the implementation refer to CeC, Central Empowered Committee 2006). The following section will focus on how judges, politicians and interested activists deliberated over the legal, economic, ethical and spiritual arguments and representations of forest valuation to see how forests have "moved through the commodity process through political struggle" (Castree 2003) in India. The outcomes to forest conflicts depend on imbalances of power regarding both the ability to impose a decision (legally or illegally) and the ability to impose the procedures to reach that decision (Martinez-Alier 2002).

3.3.5 Pricing

The committee identified seven aspects that it considered to be either a "good or service", while the CEC added values for flagship species and bioprospecting. Fig. 3.1 compares the final NPV from the CEC report with the calculations of the Chopra committee (in USD per ha over 20 years).

As can be seen in Fig. 3.1, in the final calculation of forest "services" as per the CEC, the largest share (33%) is reserved for flagship species such as the tiger, elephants, etc. Flagship species are distinguished as ambassadors of conservation due to their charismatic qualities. Yet the emphasis on flagship species has been broadly criticized, as such species are not always critical to ecosystem functioning in contrast to keystone species. Their high valuation

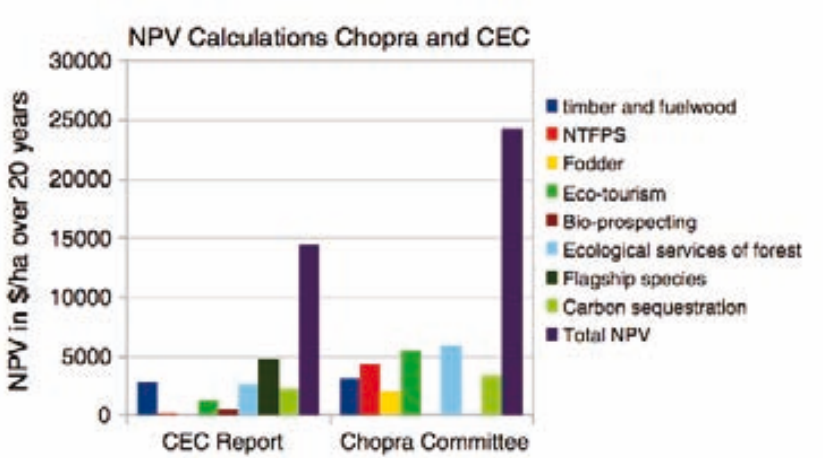


FIGURE 3.1: NPV calculations Chopra committee and the CEC report.

is thus based more on the Willingness To Pay (WTP) of tourists (Andelman and Fagan 1999, Entwistle and Dunstone 2000). Meanwhile, "animals, insects and species of plants that may not be charismatic like 'flagship' species (lion, tiger, leopard, elephants)... (were) given zero value[6].

One significant share of the NPV is that related to carbon sequestration (over US$ 2000 per ha). The GIST report took the monetary value of CO2 at US $ 20/tonne, arrived at on the basis of the EU's ETS system. Yet the "price" of CO2 goes up and down depending on the strength (or weakness) of the international reduction commitments, the allocation of allowances, and the state of the economy, and thus is not at all a proper measure of the usefulness of forests as carbon sinks.

Finally, global values such as the NPV from ecotourists, calculated at Rs 65,113 (US$1350) per ha, are in stark contrast to the NPV of non-timber forest products (NTFP) calculated at only Rs 7631, equivalent to about 140 US$ per ha. This figure appears low, particularly if one compares this with annual value of equivalent income of extracted NTFP of 25$/ha in the Western Ghats Forests (Murthy *et al.* 2005). The Chopra committee had calculated

[6]Rohini Mohan. Q& A with Rittwick Dutta. (June 11, 2011) Tehelka . http://tehelka.com/if-you-take-an-elephants-corridor-for-a-billion-will-you-give-another-forest/ , accessed April 2013

over 4000 USD for NTFP (see Fig. 3.1). The CEC did not consider many locally relevant values: "For the purpose of valuation of fuelwood, the value of the firewood used collected/pilfered by the local residents and headloads supplied free of charge has not been considered" (CeC (Central Empowered Committee) 2006).

The under-representation of the needs of those with low purchasing power in valuation exercises has been often highlighted (Martinez-Alier 2002). The poor sell cheap, so that the "lost" opportunity cost is greater for foreign tourists who can "bid higher" for forest services, in the process reproducing unequal access to public goods.

3.3.6 Distribution

The court also upheld the strong centralized control of forests at the expense of the individual States or impacted communities by establishing that NPV was to be collected not because of "proprietary rights", but rather because of the "lost ecological services of forests, which belonged to the country as a whole, being a gift of nature for the entire nation" explaining that "ecology knows no boundaries and can have an impact on the climate."

The Chopra committee forcefully criticized the underlying assumption behind this, arguing that positioning the "whole country" as the stakeholder to be compensated left aside the critical dependence of millions of Indians and the losses they suffer from forest diversion (Chopra 2006). The GIST report showed that although the value of forest services such as fresh water, soil nutrients and non-timber forest products officially reflected in India's GDP is only 7%, the benefits from these ecosystem services account for 57% of the income of India's rural poor people (Dasgupta 2007). This finding inspired the notion of the "GDP of the poor" in the TEEB reports.

Contrary to the Chopra committee recommendations, the higher attention paid to "national" vs. local environmental problems can be seen as part of a movement in environmental policy that shifts control from South to North, or from the local to the center (Sachs 1995, Shiva 1993). This dynamic was present here, as forests services are reclassified primarily as "national resources", in the same way that classifying the atmosphere and biodiversity

as a "global commons" serves to override the claims of those who rely on the local commons by asserting that everyone has a right to them, and that through "offsetting" (or payment of NPV), corporations have equal rights of access (Hildyard 1995).

The disregard for the rights of communities was reflected most egregiously in terms of actual compensation for their loss. The Chopra committee proposed a distribution among the major stakeholders to compensate for lost opportunity costs with a corresponding allocation as per Tab. 1.1. The committee further proposed that the amounts accruing as compensation to local level stakeholders should be deposited in a fund called the Local Forest Fund, to be administered by the District Collector (a local administrator from the civil service). Yet this recommendation was not incorporated by the Supreme Court and monies from CAMPA were to be distributed between the central and state governments with communities receiving nothing.

3.3.7 Discounting the Future

Another point of contention was the setting of the discount rate[7], with the definition of a 'just' discount rate the object of a 'bargaining' process reflecting a conflict of values and interests. While Prof. Partha Sen was of the view that the social discount rate should ideally be zero so as to give equal weight to the consumption of all generations, including the unborn, for the purpose of the report, he advocated a social rate of discount of 2%. In the end, the Chopra committee advocated a discount rate of 5% over 20 years, while business lobbies, employing a paper published by the Asian Development Bank, argued for a social discount rate in India of 12%. The CEC finally decided on a social discount rate of 4%, arguing that "One cannot apply that rate for social time preference in evaluating the benefits from an environmental resource such as forests. In project evaluation, the horizon is compatible with the life of the project whereas in forest matters, the horizon spans over several generations." (CeC (Central Empowered Committee) 2006).

[7]For the purposes of investors, interest rates, impatience and risk necessitate that future costs and benefits are converted into present value in order to make them comparable with each other. The discount rate is a rate used to convert future economic value into present economic value.

Discounting is based on optimistic expectations of rising per capita income. While one could well argue that India has good reason to be optimistic about the prospect of economic growth (as conventionally counted), the current rates of resource exhaustion indicate decreasing availability. This trend could have impelled the Chopra committee to go further, and beyond instituting simply a "low" social discount rate, they may well have employed the Krutilla principle (Fisher and Krutilla 1975, Krutilla 1967) by assigning non substitutable, non reproducible environmental assets a value growing over time at a pace close to the discount rate itself.

3.4 Abstraction and Displacement

Another issue raised was the site specificity of the NPV. This is where issues related to placeness, identity and culture become relevant. The Chopra committee recommended that whenever a tract of forest land is to be diverted the value of NPV and the nature of rights, privileges and concessions of stakeholders on it should be determined, and public hearings be organized to apprise all parties. The CEC argued instead that this was not practicable and that "the process would be time consuming... and beyond the capability of the Range Forest officers." The CEC set rates for forest diversion based on the 'class' of forests (from very dense to open), with prices ranging from Rs 4.38 lakhs per ha to Rs 10.43 lakhs per ha (from 8000 to 19,000 USD).

The ability to equate one patch of forest with any other patch of forest is key to the commodification process, to permit what Castree (2003) refers to as spatial abstraction or Robertson (2000) describes as the producing of "landscapes that are conceived of as movable and consumable commodities." Through NPV, one can say that forest products anCFd services in India have become fully substitutable by financial capital as funds in a bank. Such abstraction operates to preclude spaces for democracy and the expression of plural values, excluding communities from consultation regarding individual patches of forest (as in theory they have been represented by their "revealed preferences" already included in NPV.)

Moreover the Chopra committee was of the opinion that biodiversity hotspots and protected areas such as National Parks, Wildlife Sanctuaries

Table 3.1: Distribution of NPV benefits per stakeholders. Elaborated from Chopra, 2006

	NTFP	Fuel-wood	Fodder	Watershed	Biodiversity	Eco-tourism	Timber	Carbon
Local	100%	100%	100%	50%	45%			
State level				50%	45%	100%	100%	90%
National					10%			10%

and the preservation of endangered species, are in principle "priceless", arguing that "it is also difficult to capture cultural values through economic tools, other than those directly related to ecotourism... Services such as those of "sacred groves" or areas having similar cultural values, should not be subjected to a valuation exercise." Nevertheless, the CEC set the NPV for National Parks at 10 times the NPV for the appropriate forest class. This soon led to a highly contested case whereby diamond mining was permitted to continue after payment of NPV in the protected Panna National Park where tigers breed (Narain 2008).

We now turn to the Niyamgiri case to see how NPV was initially applied in a judicial context in a specific case of worldwide fame, and how economic valuation finally clashed with other values. This case brings to the surface one fundamental principle of ecological economics, namely incommensurability of values.

3.5 Niyamgiri: Valuation Languages

The Niyamgiri case can be seen as emblematic of the growing clash between "ecosystem people" and the state over access to the land and the resources in the subsoil needed to fuel industrialization in India (Shrivastava and Kothari 2012).

In 2003, Vedanta Resources, a UK-based mining company signed an MoU with the Government of Odisha (GoO) to construct a 1 MTPA alumina refinery and coal thermal plant (75 MW — half a million TPA of coal) at Lanjigarh in Kalahandi district. In September 2004, the Ministry of Environment and Forests (MoEF) gave environmental clearance to the company on the basis of the company's assertion that it would not divert forestland. It also proposed to extract bauxite from the area adjoining the refinery, which

is estimated to have approximately 73 million tonnes of mineable ore from the adjoining Niyamgiri hills in Kalahandi and Rayagada districts in Orissa (see Fig. 3.2).

The proposed mining site in this case, the Niyamgiri mountain, is a slope forested with sal trees (Shorea robusta) and the habitat for diverse species of plant and animal life as well as for the means of living for the Dongaria Kondh and Kutia Kondh tribes. These are Scheduled Tribes, which are also notified by the government as 'Primitive Tribal Groups' and thus eligible for special protection. At least 1453 Dongaria Kondh (20% of the total population of the community numbering 7952 as of the 2001 census) live in villages in and around the Forest Blocks of the proposed mining lease area. The two communities regard the Niyamgiri hills as sacred and believe that their survival is dependent on the integrity of its ecosystem (Saxena *et al.* 2010).

In 2004 three environmentalists petitioned the Indian Supreme Court to challenge the clearances granted to Vedanta's Langijarh alumina refinery. The case was then entered as an interlocutory application within the Godavarman forest case mentioned previously. The petitioners alleged that the company had provided wrongful information to the effect that the refinery would not require forestland. The CEC was sent to undertake a fact-finding mission and in 2005, it issued a damning report (CeC (Central Empowered Committee) 2005). The committee noted the lack of in-depth studies about impacts of the mine on the water regime, flora, fauna and on the Dongria Kondh tribes living at Niyamgiri Hills. Its report also pointed out that the area came under Schedule V of the Indian Constitution, which prohibits the transfer of tribal land to non-tribals. Furthermore, the report accused Vedanta of circumventing the law by not disclosing the requirement for forestland. The CEC recommended the revocation of the environmental clearance of the refinery project and a ban on the mining operation at Niyamgiri (Geetanjoy 2008).

Had the Supreme Court taken immediate action the story might have ended there. However, the court then referred the case to the MoEF, which in turn engaged the Wildlife Institute of India to examine the project's expected impacts.

Meanwhile, Vedanta tried to get clearance to set up the open cast mine in the Niyamgiri hills by blasting the top of the mountain with the aim of extracting 3 MTPA from the total bauxite reserves of 73 million tons (23-25 years life span). This bauxite would be processed in the adjacent refinery, producing 1 MTPA of alumina and 2 MTPA of waste (red mud).

The total forest land sought to be diverted for mining in the Niyamgiri Hills was 672 ha (660.7 ha for mining and 11.2 ha for a safety zone). Yet while the arguments continued in the Supreme Court, the company continued with the construction of the refinery in 2006, causing the displacement of over a hundred tribal families. As the case was being heard, the project's proponent came forward and denied that the mining component was an integral part of the project, saying that it was a separate project requiring separate clearances. This had the effect of delinking the two projects, otherwise construction of the refinery would have been rendered illegal. However, after completing the construction of the refinery, the company and the GoO, in a complete volte-face, argued that the mining component was essential for the refinery, and without speedy clearances the company would suffer major losses.

Throughout the legal process various petitions were filed with the court, employing a range of litigation strategies. One of the strategies entailed a cost-benefit discourse, as described below. The cultural rights of the local tribe were also emphasized, as described later.

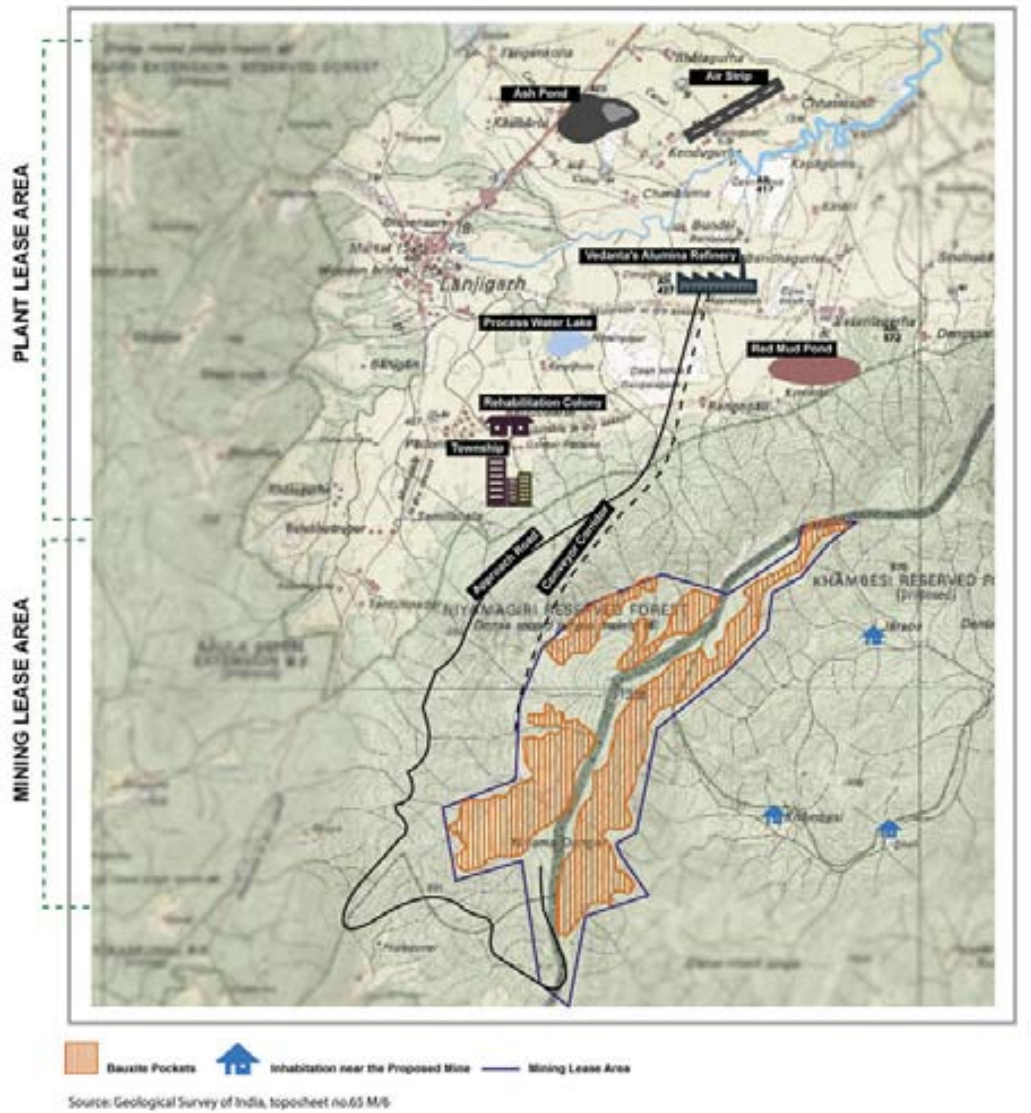


FIGURE 3.2: Map showing the location of Odisha and the Lanjigarh refinery.

3.5.1 The Valuation Game: The Activist CBA

Submitted as part of objections on the report submitted by the MoEF on 5 October 2007, there was a calculation of the NPV of the Vedanta refinery project undertaken by a local NGO that involved a "crude effort... to make an estimate of cost of those environmental externalities which can be calculated for the Niyamgiri mining and the Lanjigarh alumina refinery[8]."

Sometimes environmental activists insist on computing economic values for resources to argue for their preservation. Yet, the limits of such a reasoning are patent here. The only impacts the petitioners were able to price included NPV of forests at Rs 448 crores [9] (83 million USD$) and CO2 emissions, which were priced at the high price of $56/ ton for annual emissions of 250,000 tons of carbon dioxide. CO2 emissions accounted for costs of NPV 653 crores (120 million USD). Benefits counted included Wages and Salaries (Rs.160 crores, 29.4 m USD) and Royalties and Cess (Rs. 192 crores, 35.3 m USD) for a total Cost/Benefit ratio of 1101 to 352 crores, or 3:1.

Costs were larger than benefits. One could argue about the values given, the discount rates, and also the omissions, as for instance the profits (after tax) made by the firm and deemed to go abroad. The analysis, such as it was, remarked that the vast majority of socio-environmental costs were "incalculable", this included environmental impacts such as the red mud "cocktail of deadly heavy metals and caustic soda" that could leach into groundwater or spread as dust; the risk of a breach of the red mud dam into the Vamshadhara river; and emissions of sulfur dioxide and other gasses, as well as social impacts "that cannot be translated into monetary terms" including the rise in HIV cases and how the influx of illegal liquor would lead to violence, drunkenness and the breakdown of tribal social structures. Finally, the report mentioned how the Niyamgiri Hill has "incalculable" religious and cultural value to the Dongria Kondh. Yet it should be noted how in conducting the CBA, these "incalculable" values are de facto converted to zero.

The activist CBA purported to show that the project should be rejected on economic grounds. Moreover it compared the national aluminum company

[8] You may find an online version here: http://www.freewebs.com/epgorissa/, document #70.

[9] A crore is a unit equal to ten million , it is equal to a hundred lakh.

NALCO to Vedanta: "NALCO is a public sector company, and its dividend goes to the Government of India, one may still consider the costs paid by the Schedule Tribe as a sacrifice made for national interest, especially since aluminum is a highly strategic metal used extensively in defense purpose... However Vedanta is interested in exploiting Orissa's bauxite deposits not for meeting India's demands but for the purposes of export to other countries."

3.5.2 The 2007 Judgment

On 23 November 2007, the Supreme Court of India pronounced its judgment (SC 2007). The Court's judgment ignored the CEC report and the illegalities in the clearance procedures, and found, instead, a legal loophole for the company by inviting Sterlite (a Vedanta subsidiary), to apply for mining, if enough payment was forthcoming to offset the negative environmental impacts in the name of the national interest. This included 5% of net profit for health, irrigation and agricultural development in the area and NPV of Rs. 55 crores and Rs. 50.53 crores towards a Wildlife Management Plan, and Rs. 12.20 crores for tribal development as well as expenses towards compensatory afforestation. (Total 117.73 Crores, equivalent to approximately 21.8 million USD) (SC 2007). This figure should be seen in light of the total planned investment in Odisha by Vedanta, at over 9.2 billion USD.

The 2007 court judgment framed the decision as one that called for a "delicate balance between conservation and development". Going on to say that "On the one hand, public interest lies in industrialization which would lead to prosperity of the area, and in infrastructure development, creation of new job opportunities. This would help in bringing these underdeveloped areas closer to the average rate of growth of GDP. On the other hand lies the need for conservation."

As Padel and Das (2010) write, the 2007 hearing focused exclusively on compensatory measures, with environmental, social and cultural concerns left by the wayside. In fact, when the petitioners tried to present objections on behalf of the Dongria Kondh, the judge Arijit Pasayat did not allow Mr. Sanjay Parikh to speak on behalf of the tribal people of Lanjigarh, stating that "tribal people have no place in this case(p. 184)".

In April 2009, the MOEF granted environmental clearance for the mine, however final forest clearance remained outstanding. Meanwhile, protests by the Dongria Kondh continued, with plans to blockade if the company attempted to enter the site. The conflict became a global cause celebre.

On the 16th of August, 2010, the Saxena Committee, appointed by the MoEF to look into forest rights, tribal and cultural issues related to Niyamgiri, issued its report, concluding that: "This Committee is of the firm view that allowing mining in the proposed mining lease area by depriving two Primitive Tribal Groups of their rights over the proposed mining site in order to benefit a private company would shake the faith of tribal people in the laws of the land. Since the company in question has repeatedly violated the law, allowing it further access to the proposed mining lease area at the cost of the rights of the Kutia and Dongaria Kondh, will have serious consequences for the security and well being of the entire country." (Saxena *et al.* 2010).

The Saxena Commitee stated that there had not been prior consultation and agreement of tribal groups as demanded by the law, and moreover Vedanta had already infringed the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA), that had recently come into effect from the 1st of January 2008. Section 5 of the Act confers on each holder of forest rights, the duty and power to protect the natural and cultural heritage together with the wildlife forest and biodiversity. It also empowers them to stop any destructive activity that endangers the forests.

Thus in August 2010, the MOEF under Jairam Ramesh followed the Saxena Committee report's recommendation and withdrew forest clearance. The environmental clearance was later also withdrawn in July 2011. The Orissa Mining Corporation and Sterlite appealed this decision, and the case was sent to the newly formed Green Tribunal, with the decision given in April 2013, as explained at the beginning of this chapter.

3.6 Discussion: Sacredness and Sacrifice

'Niyam Raja is our supreme god. His name means Lord of Law, he made all things... Niyamgiri mountain is the most important

place for Dongria Kondh people, it is like Niyam Rajah's temple, that is why our people worship nature, they have to protect nature.'

- Jitu (2008)[10]

'Our tribal people worship at the Niyamdanga hills not at the adjoining Niyamgiri hills as is being propagated by the NGOs. So where is the question of our worship place being destroyed coming from? We tribals worship mostly in our houses,'

- Jitu (2010) [11]

Most normative theories of decision making view it as a process that requires trade-offs between values, through compensating for a disadvantage with a benefit on some other value. In contrast, a sacred value may been defined as "any value that a moral community implicitly or explicitly treats as possessing infinite or transcendental significance that precludes comparisons, trade-offs, or indeed any other mingling with bounded or secular values" (Tetlock *et al.* 2000). Some values such as human life, health, nature, love, honor, justice, or human rights, are seen as absolute and inviolable and thus trading them off with other values (e.g. money) is considered taboo (Tetlock 2003). There are multicriteria methods (Munda 2008) that allow comparison of alternatives under incommensurability of values.

For the Dongria Kondh, the Nyamgiri mountain range is sacred and considered the resting place of the god Niyam Rajah[12]. "Niyamgiri means the mountain (Giri) that upholds the Earth and the law of the Universe (Niyam). These mountains are the ancestral domain of the Dongria, Kutia and Jharania Kondh; the mountains not only provide them with life and livelihoods,

[10] http://www.hindu.com/2008/05/15/stories/2008051559410300.htm

[11] http://content.ibnlive.in.com/article/29-Aug-2010india/volteface-vedantas-opposer-turns-soft-129818-3.html

[12] According to the Litigation strategy document: The issue of which we will file a Writ will be on the issue of the religious practices of the Dongarai Kondhs which will be threatened if mining is allowed on the sacred mountains. Further, it will be in violation of article 25 of the Constitution, which guarantees the Right to Religion and religious practices (personal communication from Rittwick Dutta).

they are also worshipped as the upholders of the Earth and the laws of the Universe." (Writ Petition No. 549, 1995). The petition goes on to explain that due to the belief that the hilltop is the abode of the gods, it is considered "taboo" and is traditionally left intact, and no chopping, felling, or hunting is permitted.

In India, sacred spaces are a key part of the preservation and conservation of unique landscapes and ecosystems, as in many parts of the world. According to Deb (2007), sacred groves are representative of the biophilia of ancient human cultures which have evolved institutions from an urge to protect their resource base for long-term use. The protection of such sacred spaces is often operationalized through restraint, manifested in taboos to prevent over-exploitation of resources. The Dongria's taboo on cutting trees on top of Niyamgiri is a classic example of this restraint (Padel and Das 2010).

As the quotes by Jitu (an English speaking tribal youth) and the petitioners above show, the question of where the god Niyam Rajah in fact lived became a point of contention in the legal case. This question of where one's god resides may be considered a proxy to the question of where culture resides, the embededness of place and culture, and whether the loss of cultural heritage can and should be compensated for. According to Schlossberg (2004) this recognition of cultural difference and ways of relating to nature is not only key but is in fact a precondition before one can even talk about distributive environmental justice.

In this case, we see how the culture of the Dongria Kondh was itself on trial: On one side the petitioners argues that "the Dongaria Kondhs have been therefore protesting against the intrusion into their cultural space." (Writ Petition 1995 No. 549) On the other hand, the GoO attempted to diminish indigenous values and culture (SC 2005).

> 'It is easy for nonresident urban environmentalists and advocacy NGOs to romanticize tribal way of life and culture in the sylvan backdrop of forest and biodiversity. However, a reality check would reveal a life of abject poverty and deprivation bordering on dehumanizing conditions.' (P.6-7)

> 'To preserve the primitive tribes as a museum specimen is never the objective of tribal development. The practice of shifting cultivation is extremely harmful for the hills and is against the conservation of forest and environment. Preserving the tribal culture and custom, never means to allow them to do this destructive and subsistence agriculture practice and allow them to lead a life in illiteracy, poverty and hunger in perpetuity.'

The statements above can be seen as an attempt to separate the Dongria from the landscape, rather than see culture and environment as mutually constitutive, with culture creating the landscape and vice versa.

This strategy to delocalize or disembed cultures and culture loss also figured significantly in the Exxon Valdez case during the setting of the valuation of damages by the court, when anthropologist Paul Bohannon argued (testifying on behalf of Exxon) that culture resides in the mind and that therefore remuneration for lost cultural resources becomes a moot point (Kirsch 2001). This led the judge to reject the plaintiff's argument that the subsistence culture of the Alutiq people had been damaged, arguing that culture is "deeply embedded in the mind and the heart" and is therefore undiminished by external events such as environmental disaster.

The refusal to recognize culturally specific claims of loss was echoed by Ramesh, the Minister of Environment, in the Niyamgiri case, who was at pains to highlight that: "There was no emotion, no politics, no prejudice in this decision... It was not because Niyamgiri is considered sacred [by the Dongria Kondhs]. It is a decision on a purely legal basis." The decision was taken merely on procedural elements of justice.[13]

3.6.1 Cultural Politics as Resistance

In response to this, social movements engage in cultural politics and place-based strategies to defend their cultural identity, highlighting the link between culture, nature and territory, and how they are mutually constitutive.

[13] Vedanta's mine clearance rejected, The Hindu. Aug. 25, 2010. http://hindu.com/2010/08/25/stories/2010082550410100.htm Accessed April 2013.

This includes a definition of "biodiversity" as "territory plus culture" (Escobar 2001) in contrast to a "hegemonic" perspective of biodiversity, based on utilitarian values and "flagship species". To this end, the petition states that it is imperative to consider the religious practices and beliefs (of the Dongria Kondh) in detail, since these practices have been among the key factors for the existence of the very high biodiversity in the Niyamgiri hills. Such disputes over recognition of values, can be considered what Escobar (2006) refers to as a cultural distribution conflicts. He accepts that there are of course economic and also ecological distribution conflicts. Escobar (2006) adds cultural distribution conflicts, defined as those arising "from the difference in effective power associated with particular cultural meanings and practices...whose norms and meaningmaking practices define the terms and values that regulate social life concerning economy, ecology, personhood, body, knowledge, property, and so forth."

The study of cultural distribution conflicts further looks at how cultural differences create or propagate inequalities in social power, usually through the imposition of a particular set of cultural norms as 'natural' and universal so as to examine the distributive effects of cultural dominance and struggles around it. This highlights how processes such as valuation construct nature itself because cultural meanings define the practices that determine how nature is appropriated and utilized.

Such a perspective supports Spash's contention (2011) that the exact form in which the discourse of environmental values is conducted by different groups does actually matter and choice of value cannot be reduced to mere "pragmatic decisions" leading to the adoption of the dominant form of power discourse in society — money. To paraphrase TEEB, "Money may be the universal language that ministers understand" (ten Brink 2011), but that does not mean that communities should frame their demands in the languages of ministers. In fact, in India politicians of prime ministerial caliber have supported the Dongria Kondh, getting outside the economic box, recognizing that these conflicts are not about negotiation for a "better deal" but about fundamental differences in cultural values. As Levien (2013b) argues in his analysis of land wars in India, there are two broad categories of resisters to land dispossession — those who are fighting for higher compensation and those who refuse to give their land at any price. For the latter, no trade-offs are possible.

3.7 Conclusions

Examining forest valuation in India and lessons from the Niyamgiri case we find that economic valuation fails here both as a means for conservation as well as for a tool for environmental justice.

While in principle one may appreciate the contention that money valuation increases the social visibility of environmental products and services, the first section has demonstrated some of the problems in operability of NPV. There is simply no correct and possible way to value all aspects of our environment, so some values get left out, complexity is obscured, while valuations are plagued with arbitrariness regarding what to value and the discount rate. The empirical record further supports the contention that NPV compensation has not slowed forest diversion in India.

Thus the naive initial enthusiasm on the part of environmentalists seduced by the promises of the Chopra committee that "forests will finally get the right price tag" (Ghosh 2006), soon turned to acrimony as they saw how the tool was wielded: "If you can pay, you can cut the forest, destroy the wildlife. No forest is so priceless it cannot be cut, or land so inviolate it cannot be had. Not by the poor, but by the rich" (Narain 2008).

The response as regards NPV was equally scathing at other levels, with a Parliamentary committee on the CAMPA bill stating that "The existing system of forest diversion is non-transparent and undemocratic and... has not served as an effective method of protecting forests. On the contrary, it enables the powerful to buy the right to destroy the most pristine forests simply because they have the financial resources." [14]

The second section highlighted the way in which discourses about sacrifice, public good and maximization of welfare in a cost-benefit paradigm attempt to frame the distribution of the costs and benefits of forest diversion

[14] Department-Related Parliamentary Standing Committee On Science & Technology, Environment & Forests One Hundred And Ninety Fourth Report On The Compensatory Afforestation Fund Bill, 2008 (Presented To The Rajya Sabha On The 22nd October, 2008). http://16 00.47.5:8080/newcommittee/reports/EnglishCommittees/Committee%20on%20S%20and%20T,%20Env.%20and%20Forests/194%20Bill%20Report.htm. Accessed April 2010.

as essentially technical or managerial in nature, leaving aside the fundamentally political content of such decisions, and foreclosing democratic processes, as well as recognition of the diversity and incommensurability of values. Development and displacement are not merely technical, politically neutral decisions, the economic costs of which can be compensated for, but rather they reflect the power of strong groups and regions to impose sacrifices on the weak.

In this case, the Indian constitution provided some protection, whereby the rights based approach based on the Forest Act, meant for first time that the economic, religious and cultural rights of local communities have been used as a basis for rejecting forest clearance.

A recourse to cultural politics may prove more advantageous to opponents of open cast mining than an economistic argument that places them in an inferior position based on potential willingness or capacity to pay. Following the ruling of the the Supreme Court in 2013, it was decided to ask the forest dwellers to decide if mining in Niyamgiri hills will affect their religious and cultural rights as protected by the FRA. Following this, the Odisha government drew a list of 12 affected villages in Rayagada and Kalahandi districts, to hold palli sabha (referenda in their local councils). In July 2013, all 12 villages unanimously voted to reject the mining project in the first ever environmental referendum in India.Vedanta has lost this battle, but the rejection of mining in Niyamgiri means Vedanta's gaze has now shifted to neighbouring districts that hold large bauxite deposits to feed the refinery. Whether the communities there will also be granted the same right to decide remains to be seen.

Chapter 4

Stop that train! Ideological conflict and the TAV

Keywords: Territory, Strong Sustainability, Discourse, Degrowth, Transport Infrastructure, Cost-benefit Analysis, Citizen Science

4.1 Introduction

The early 1990s saw the development of high speed train lines (Treno Alta Velocità, or TAV) across Italy as massive sums of public money were invested in order to provide the country with a railway network that could compete at the European level. Not only is this part of a national railway development plan, it is also one of the priority infrastructure projects of the European Union (EU), as the Turin–Lyon segment will form the intersection of two main axes connecting northern Europe to the south, west and east of the region. It is a key element of "Corridor n°5" on the west-east axis that will link Lisbon to Budapest initially and to Kiev eventually, completing the European railway network by developing passenger and goods transport.

The Susa Valley, between the French area of Maurienne and Turin in Italy (Fig. 4.1), is a highly urbanized area. Until recently divided administratively into Lower and Upper Valleys, the economy of the former Lower Valley area has shifted from agriculture to industry, mainly steel, services and trade. The

FIGURE 4.1: Location of the crossing of the TAV Turin-Lyon between France and Italy. Source: Google Maps

Upper Valley area's economy is based on tourism, as well as on more traditional activities such as dairy production and livestock grazing. (Leonardi 2007). Now these communities have been joined with a third area, Val Sangone, to form the Val di Susa and Val Sangone mountain community, which has 114,223 inhabitants.

The development of transport infrastructure in the beginning of the 1990s coincided with the decline of industry, particularly in the Lower Valley. To boost the local economy, Susa Valley officials began to invest not only in industry and transport, but also in the development of the local territory, especially mountain tourism and skiing activities, as the area has a rich historical and cultural legacy of popular celebrations and a scenic protected area. These local development plans based on traditional activities (handicrafts, agriculture) and nature tourism were highly incompatible with the planned development of industrial and transport infrastructure that threatened to transform the Valley into a transit corridor. It is not surprising then that a conflict between national and local development plans rapidly erupted, dividing the country into Pro TAV, and No TAV groups.

The community of the Susa Valley is a historically united population, renowned for its anti-fascist resistance and struggles dating from the 1980s against large-scale infrastructure projects (Leonardi 2006). The first local committee, "Habitat" was born in 1991 and the first coordinated group of civil society organisations and local institutions was created in 1994. The decades-long struggle of the people of Susa Valley is very complex and cannot be reduced to a 'classic' case of NIMBYism. From this perspective, citizens are portrayed as overly emotional, uninformed, and unscientific in their opposition, motivated by narrow, selfish interests, and obstructive of policies that would provide for the collective good (McAvoy 1998). Proponents of this view see policymaking as "corrupted by self-interested or irrational citizens who abuse the democratic process and lead policymakers away from optimal solutions to social problems"(McAvoy 1998). Consequently, they argue that collective reliance on bureaucratic decision making, guided by policy experts can produce better results than "continuing to suffer under a democratic process that leaves us at the mercy of uninformed citizens"(Beckmann 1973, Ophuls 1977 in McAvoy 1998).

In contrast to viewing the No TAV struggle as a classic case of NIMBYism, democracy analysts such as Robert Dahl (1989) anCharles Lindblom (1992) propose a different view, rejecting both the idea that citizens are unsophisticated and myopic in their policy preferences, and the view that policy experts are neutral with respect to their choices. These authors point out that experts tend to be confident that technology will work as designed to, and will be immune to mechanical or design problems. Perhaps more importantly in the case of the TAV though, policy experts fail to recognise the implicit value choices that are embedded in technical decision making, and are ill-equipped to appreciate the importance of assessing uncertainties and trade-offs in making policy judgements. In such cases "partisan probing"(Lindblom 1990) - the consideration of multiple and particular perspectives - is recommended, rather than insulated decision-making. From this perspective, and no doubt from that of members of the No TAV movement, incidences of NIMBYism represent essential articulations of citizens' concerns for more effective decision making and conflict resolution.

The No TAV movement against high speed has grown to become one of the strongest in the country, successfully blocking the implementation of the

project for nearly two decades by presenting obstacles for Pro TAV advocates. The struggle against the Treno Alta Velocità (TAV) Turin-Lyon has become one of the most important social movements in Italy in the last 20 years. This case study looks at the TAV conflict through a lens of ecological economics and political ecology, drawing on both scientific sources and "activist knowledge". As background to the TAV project, this chapter presents a brief description of the infrastructure plan and its evolution through the years. The roles of various actors and their arguments are then examined to better understand the context and dynamics of the conflict, and to identify the influence of values regarding health, environment and ecology, safety, speed, cost, territory, transport, economy and quality of life.

4.2 The Political Ecology and Ecological Economics of the TAV

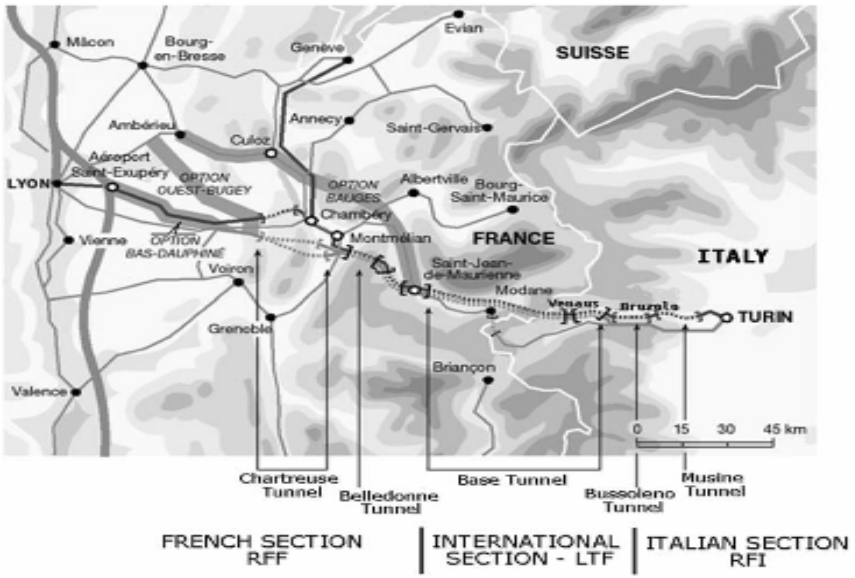
The potential for mutual benefit from combining political ecology and ecological economics approaches has long been recognised by academics of both fields. Political ecologists have integrated concepts from ecological economics such as complexity and non-linearity, resilience and non-equilibrium theory, to better understand the dynamics underpinning environmental transformation (Sneddon *et al.* 2006). Meanwhile, ecological economists recognise the value of political ecological analyses of "the necessary underpinnings for systemic institutional change... for a new sustainable configuration of institutions, infrastructures and power relations into which society might grow"(McGonigle 1998). In applying a dual theoretical perspective from the compementary fields of political ecology and ecological economics, this chapter aims to arrive at a deeper understanding of the Pro vs. NO TAV conflict.

Political ecology, defined as the study of ecological distribution conflicts (Martinez Alier, 2002), is concerned with "conflicts over access to and control of natural resources, particularly as a source of livelihood, as well as the costs of environmental destruction"(Escobar 2008). The TAV conflict, a prime example of a local struggle in defense of territory against translocal forces, benefits from being viewed through a political ecological lens, as it highlights the political and economic roots of the conflict, the role played by

corporate, state, and international authorities and 'the undesirable impacts of policies and market conditions, especially from the points of view of local peoples, marginal groups, and vulnerable populations' (Robbins 2004). Here, the field's concern with how power manifests itself in the form of discursive interactions is also relevant, as discourse combines clusters of well-entrenched concepts, ideologies, signifying practices and narratives (Barnes and Duncan 1992) that circulate through the global media to influence the understanding of the general public, ultimately situating and controlling perceptions of environmental problems and their solutions (Adger 2001, Peet *et al.* 2011). Narratives, as "commonly heard environmental explanations" that dominate discourses, act to subtly to shape and concretise society's understanding of events or problems in ways that can be both politically effective and conversely dangerously constraining (Forsyth 2003). As such, discourse is able to both represent, and mask power relations. Another way in which political ecology provides a useful approach is through its emphasis on the role of scale in understanding environmental conflicts. As Bryant and Bailey assert, "the existence of a whole host of environmental problems at different scales cannot be adequately understood without recognizing simultaneously that different actors contribute to, are affected by, or seek to resolve environmental problems at different scales" (1997). This is indeed a salient point as the success of resistance against the TAV project is widely attributed in the literature to the ability of TAV opponents to connect with past movements, as well as with new ones, with researchers/experts, local administrations, other social sectors, and of course other movements against globalization from below (Della Porta 2008), effectively 'jumping scales', operating beyond the specific context of the conflict to effect change (Smith 1992 in Kelly 1997)

Insights from the field of ecological economics are salient here too. Also a transdisciplinary field, born in same era and of a similar alternative productive rationality, ecological economics aims to transcend the 'normal' boundaries of scientific disciplines, to integrate and synthesize many different disciplinary perspectives in pursuit of its goal to achieve an ecologically and economically sustainable world (Hadorn *et al.* 2006). A number of themes from ecological economics are pertinent in looking at the case of the TAV, namely: the physical study of the economy via a social metabolic approach looking at for example material flows and life cycle analysis; concern with environmental sustainability of the economy, in particular notions of the substitutability of

FIGURE 4.2: The 3 sections of the main project for TAV Turin-Lyon as of 2009. Source: Appiotti, Marcincioni, 2009



manufactured capital captured in debates over weak vs. strong sustainability (Neumeyer 2003); interest in the assessment of negative "externalities" (S.p.A.sh 2000); the use of policy tools and methods for ranking alternatives in the presence of incommensurable values (Munda and Martinez Alier 1999); and also themes concerned with institutions, participation and deliberative democracy (Vatn 2005 Zografos and Howarth 2008). Combined, these areas of work in both political ecology and ecological economics have produced a body of work that poses a significant challenge to the central claims of ecological modernization advocates, that environmental sustainably and economic growth can be achieved through increased marketization of resources, advances in scientific and technological innovation, and institutional reflexivity (Memon *et al.* 2011, Redclift and Woodgate 2000).

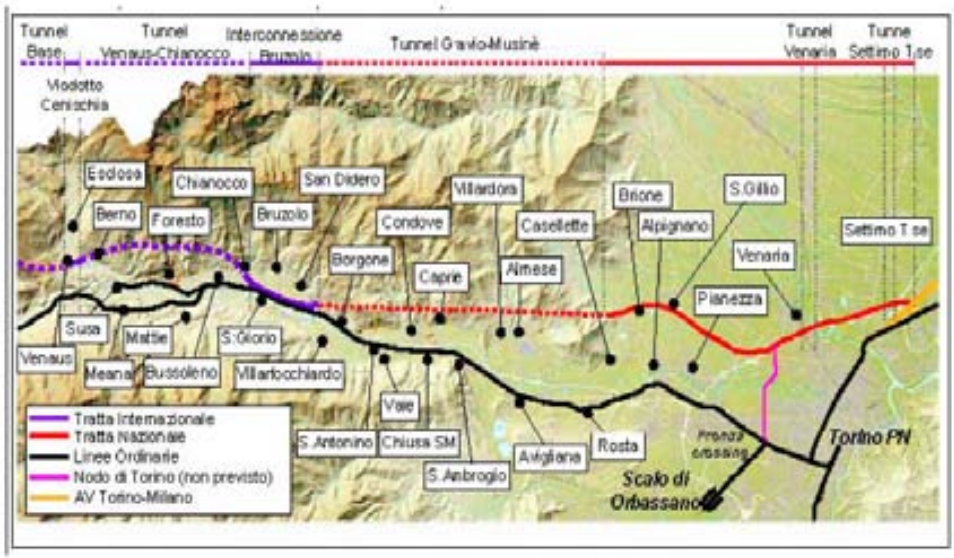
4.3 The Infrastructure Project

The high-speed line is divided into 3 segments (Fig. 4.2): The French one managed by Réseau Ferré de France (RFF) would go from Lyon to St Jean de Maurienne via Chambéry. Completion of the section between Lyon and Chambéry is foreseen as sometime in 2035. The international section, with Lyon Turin Ferroviaire (LTF), an Italo-French company in charge, would connect France, by a 57km tunnel to Susa, Italy. The Italian section (Fig. 2.3), under the control of the Italian railway network company Rete Ferroviaria Italiana (RFI), will connect Susa to Turin via a series of tunnels openly-dug or concealed with man-made hills. Apart from 2-3km of surface rail in Susa, the majority of the line will pass underground, through one main tunnel connecting Susa to Orbossano, another linking Orbossano to Settimo, and numerous other trenches and viaducts, The director of the Turin Lyon Observatory, Mario Virano estimates that 90% of the Italian section will be underground, and construction should be completed by 2023, with the line fully operational by 2030.

The TAV project proposals have evolved and expanded for almost two decades. Over the years, emphasis has shifted away from passenger comfort and convenience toward increased transport of goods across Italy and Europe, which is now the main driver of the construction of the TAV Turin-Lyon. On February 29th, 2001 France and Italy ratified an international agreement for the construction of the Lyon-Turin railway connection. On May 5th, 2004, another agreement was made regarding equal investment (to be supported by EU funding) in the international project by these two countries. In December 2008, new funding from the European Commission was allocated for feasibility studies and construction. Although numerous changes and proposals have been made, plans for the line have remained basically the same.

The TAV Turin-Lyon Observatory, created in 2005 to assess feasibility and evaluate alternative proposals, met numerous times in 2007 and 2008 to discuss the potential of the existing line, and the exploration of possible alternatives to the TAV Turin-Lyon project. The planning agreement it presented, recommended a slight reduction of land use for the construction of the line and changed the entrance and exit of the international tunnel, enlarging it by some kilometres to end up with a 57 km tunnel. The new path would go

FIGURE 4.3: TAV line from Venaus to Turin as of 2009 showing the Susa valley municipalities. (Leonardi, 2007)



from Lyon to Settimo and then join the existing TAV Milan-Turin. Mainly, the document draws "orientation indications" for improved use of the existing line, for the "united" management of the implementation of the new line, and for the organisation of the project design and construction, highlighting the necessity to draw project guidelines and "respect the commitment taken towards the community and its participation" (Accordo di Pracatinat 2008, Verbale Palazzo Chigi 2008).

Later, on July 29th, 2008 the Ministers' Council resolved to: create a working group within the Observatory representing the Ministry of Infrastructure and Transport, the Piemonte region and the Agency for Mobility to define the intervention and improve local transport; plan a similar process (for October 2008) for goods transportation on railways; update the so-called "Dossier de Bruxelles" for the European Union on the basis of the "Pracatinat document"; begin planning for the new Lyon-Settimo-Turin line; and define responsibility in the Observatory for monitoring the project and its

governance according to guidelines for resource coordination. At the moment construction of the Tav Turin-Lyon is set to commence at any time, with geological soundings nearing completion. In response, civil society mobilisation has begun, and the area where works are concentrated (Bussoleno and Chiomonte) has been occupied by protesters since June of 2011.

4.3.1 History and Dynamics of the Project

In line with the analysis of Leonardi (2007), five distinct periods can be identified in the TAV conflict. The first from 1990-1995 marks the beginning of the conflict when the TAV Turin-Lyon project was developed along with other High Speed Train projects in Italy. Both promoters and opponents from local and regional levels gathered in groups to express their views. The first national march against High Speed happened in 1995.

The second period between 1996 and 1999 was characterised by the development and reinforcement of the No TAV movement. The Institutional Committee was founded in 1996 to put into practice the theory of participative democracy. Composed of local administrators and organisations' delegates, it was designed for the exchange of information and for decision-making, especially in crisis moments. (Leonardi 2007). The Provincial and the Regional Government reiterated their will to implement the project in the face of the No TAV protests and the uncertainties of the National Government, as reflected in an announcement in 1999 by the Minister of Environment that there would not be a TAV Turin Lyon.

The third period, 2000-2003 saw advances made by promoters for the TAV Turin Lyon: preliminary projects were proposed, changed and passed, and the EU categorised the TAV Turin-Lyon as a priority infrastructure project. Strong protests resulted and the No TAV movement grew. The main contested issue was the assessment of impacts and the externalities of a new line.

The fourth period, 2004-2011 corresponds to the escalation of the conflict, in which promoters reinforced their position and unity while the No TAV movement mobilised in response to the initiation of geological soundings without local consultation. In 2005 around 50 000 inhabitants of the

valley occupied the excavation site and set up permanent pickets, paralyzing all work until the demonstration was broken up by the army. As a result of the mobilisation, the Observatory undertook an environmental impact assessment to examine possible health and environmental risks. However, beyond the perception of risks, the two sides continued to disagree fundamentally on what kind of development they envisioned. Despite a financial scandal in 2005 within the TAV S.P.A, the EU granted 671 million euros in funding for the TAV Turin-Lyon for 2007-2013.

The commencement of the fifth and current period, from May 03, 2011 was marked by a political meeting of local and national leaders in favour of the project, to the exclusion of opponents and other critics. This meeting signified a re-launch of the project with work set to re-commence in early June of 2011, stimulating another cycle of mobilisation, violent repression, and an intensified criminalisation of the No TAV demonstrations that has seen numerous clashes between police and protesters, and arrests as recently as February 2012.

4.4 Main Actors and Policy Context

Over the years the debate between the project's proponents and opponents has grown more polarised. On the Pro TAV side were the province and city of Turin, the Piemonte Region, the National government, the Ministry of Environment and the Ministry of Transport and Infrastructure, banks, firms, the Italian and French Railway Companies, the Province and City of Turin, and the majority of the national mass-media. The No TAV movement was initially comprised of: the Comunità Montana Bassa Valsusa (The Mountain Communities of the Susa Valley which as mentioned previously has since been joined administratively with the former Upper and Lower Valleys of the Val di Susa), other local municipalities; residents associations, the local Green Party, and the Italian Communist Party. No TAV movement members now count among them environmentalists, administrators from all political parties, youth from self-managed social centres and from the Scouts, religious delegates, researchers, and other men and women of all ages and backgrounds. It has a horizontal structure characterised by the diversity of its members.

The TAV Turin-Lyon Observatory was founded in 2005 at the height of the conflict by the Italian government, to research project externalities and the development of project alternatives with civil society participation. Its members come from the Ministries of Environment, Infrastructure, Internal Affairs, and Health, the Intergovernmental Commission on Tav Turin Lyon (CIG), the Piemonte Region, the Turin Provinces, the Susa Valley Mountain Communities, the RFI, and the LTF. Officially, it aims to encourage dialogue between members, address and resolve conflict, and provide technical assessment of the environmental, social and economic impacts of the international and Italian segments of TAV Turin-Lyon. However the main activities of the Observatory have focused on improvement of existing rail infrastructure and on the planning of a new line. As such this body is rejected by the No TAV movement, which suspects that emphasis was only placed on the improvement of the existing line to distract attention from its implicit support for TAV construction. The work of the Observatory has in fact, from the viewpoint of No TAV members, fuelled protest and reinforced mistrust.

Initially, the TAV project was presented by its supporters as one of modernisation that would lead to faster and safer passenger travel, however, this emphasis shifted from that of passengers to goods transport under the indirect but important influence of EU transport policy. Pivotal in this regard was the implementation of the Regulation Concerning a European Rail Network for Competitive Freight. Adopting the terminology of 'high capacity' instead of 'high speed', the stated chief objective became one of improving the accessibility and therefore the competitiveness of the Turin region and the country as a whole, in the European economy (Torino Internazionale 2004). Linked to the policy discourse of competitiveness is a related discourse of sustainability.

Significantly, the Convention on the Protection of the Alps (the Alpine Convention, 96/191/EC), obliges signatories to "reduce the volume and dangers of intra-Alpine and transalpine traffic to a level which is not harmful to humans, animals and plants and their habitats, by switching more traffic, in particular freight traffic, to the railways and in particular by providing appropriate infrastructure and incentives" calls for the promotion of rail transport, and the construction and development of "large transalpine rail axes". Similarly the EU Marco Polo programme (commencing in 2003) and its successor Marco Polo II (2006), call for the promotion of intermodal transport, and

more generally the reduction of road transport through the by promotion of alternatives such as short sea shipping, and rail and river transport in logistics chains. More recently, the Regulation concerning a European Rail Network for Competitive Freight requests Member States to establish international market-oriented Rail Freight Corridors to meet challenges including: the integration of European rail infrastructures through co-operative investment and traffic management; achieving a balance between freight and passenger traffic, "in line with market needs and ensuring that common punctuality targets for freight trains are met"; and improved intermodality between rail and other transport modes (Regulation EC 913/2010). In this Regulation the overlap in discourses of competition and sustainability is apparent, whereby the regulation states that: "Within the framework of the European Union new Strategy for jobs and growth, the creation of an internal rail market, in particular with regard to freight transport, is an essential factor in making progress towards sustainable mobility." Moreover, it asserts that competitiveness with other modes of transport, and international and national rail freight services, depends on the ability to "benefit from a good quality and sufficiently financed railway infrastructure, namely, one which allows freight transport services to be provided under good conditions in terms of commercial speed and journey times and to be reliable", and thus provides services in line with contractual agreements. More recently, the 2011 White article (EC 2011) on transport stresses the need to optimise the performance of multimodal logistic chains, including by making greater use of more energy-efficient modes, calling for a reduction of more than 50% of road freight by 2050, facilitated by the development of efficient and green freight corridors. To this end, the length of the existing high-speed rail network is to be tripled by 2030, with a European high-speed rail network to complete the construction of a single European transport area by 2050, to "ease the movements of citizens and freight, reduce costs and enhance the sustainability of European transport."

4.5 Pro vs. No TAV: Rationales

4.5.1 Pro TAV: Competition, Environment and Safety

In this policy context, TAV proponents base their arguments on those of the economic, environmental and improved safety benefits that the project will bring, both to the region, and the country as a whole. The Lyon-Turin Ferroviare, the French-Italian bi-national company conducting the pre-project studies and investigation works for the Franco-Italian section, and in charge of the construction of the 57 km tunnel connecting Saint-Jean-de-Maurienne with the Susa Valley, claims that the new line will ultimately solve Europe's most pressing transport problem, providing the crucial missing railway link that is needed to connect the southern part of the Alps, establishing 'economic balance', by facilitating trade, and consolidating the competitiveness of southern European countries including France, Portugal, S.p.A.in and Italy. In addition to improved trade and competitiveness, arguments are also made on the basis of increased employment, claiming that several thousand construction jobs will be created. The LTF estimates that after work begins in 2013, 3500 people will be employed on the Franco-Italian section[1], with an estimated breakdown of 2000 of these on the Italian side and 4.000 on the French side over a period of about 10 years, totalling approximately 1.5 billion euros in workers' salaries (Meletti, 2011). The tourism sector in Peimonte, the region through which the TAV will pass, has been highlighted as a major economic beneficiary of the project, highlighted as the industry with the most potential for growth. Supporters argue that Piedmontese wine and gastronomy, ironically referred to as key to attracting "slow food" tourism, particularly stands to benefit from the increased access offered by a high speed rail connection to the region[2].

In terms of environmental arguments, citing obligations under the Alpine Convention to limit environmental nuisances and risks due to the saturation of road traffic, the LTF warns that "the rapid development of goods transportation on lorries and the pollution caused by road traffic have become real causes for concern", and states that meeting commitments made under

[1] http://www.ltf-sas.com/pages/articles.php?art_id=236
[2] http://www.pmcomm.com/mediterranean/italy/piedmont.htm

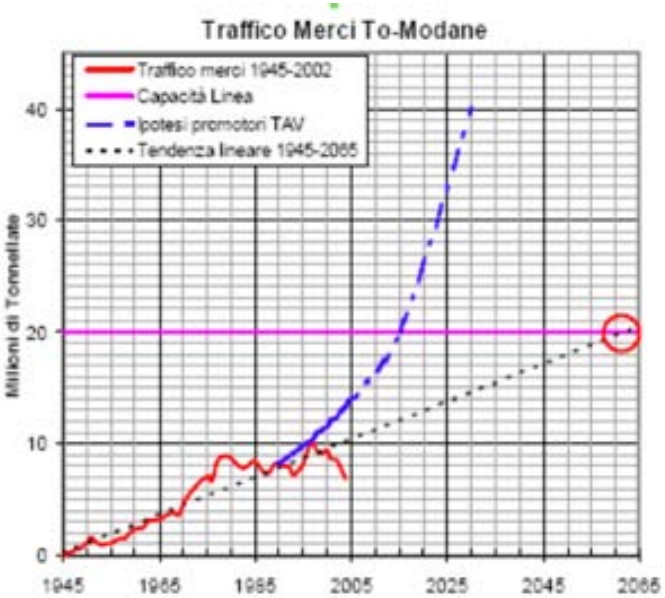


FIGURE 4.4: Goods traffic through Modane by train per year in millions of tonnes between 1945 and 2002 (in red), present line capacity: 20Mt (in purple), Pro TAV hypothesis (in blue), and linear tendency for 1945-2065 (in black). Source: Allasio, 2006

the convention necessitates effective implementation of "the measures agreed upon as part of the collective commitments." Other supporters have proclaimed the ecological advantages of reduced noxious emissions compared to air and road transport. The Turin–Lyon line would reduce CO_2 emissions (AA. VV., 2002) they argue, as road and air transport is reduced with the shift to high speed rail, powered by electricity instead of fuel. However, the main argument of the Pro TAV supporters is the potential benefit from resolving the bottleneck in road transport anticipated with increased demand (Fig. 2.4) resulting from predicted annual GDP growth of 2% until 2020 (Cowi *et al.* 2006).

Finally, improved safety forms the basis of the third main argument of TAV supporters. The LTF website for instance cites a number of deaths as specifically attributed to shortcomings in existing tunnels and access roads, listed as: 39 deaths in Mont Blanc in 1999, 12 in Tauern, 11 in Gothard

in 2000, and 2 in Fréjusin 2005. Accidents such as these they argue, will only become more frequent with the increase traffic of large goods vehicles transiting through the Alps, which LTF estimated soared from 70 million tons in 1984 to 159 million in 2007. This volume, LTF predicted in 2008, would increase by at least 50% by 2022[3].

4.5.2 No TAV Arguments: A Diversity of Approaches

In the early stages of the mobilization, from around 1990 until 1999 (Caruso and Fedi 2008:30-41), the main actors involved in the movement were local environmental organizations, and university professors and professionals working on the environmental impact assessment, and in the transport and planning sectors. In this phase the activities of the No TAV movement were concentrated around the goal of informing citizens and local institutions of the potential negative environmental impacts of the infrastructure project. Since that initial phase the environmental arguments employed by No TAV have developed to address a range of concerns that go well beyond issues of air pollutants and carbon emissions. Among the issues raised are hydrogeological: the highly technical level of digging required due to the length of tunnels, and the type and quantity of rocks to be extracted that would require transport and treatment are highly problematic. It has been estimated that the main tunnel alone (between France and Italy) would create about 7.7 million tonnes of material for extraction, corresponding to a mass the size of 3 Kheops pyramids (Tropeano 2011). These processes imply indirect material flows, which in the case of rocks containing dangerous substances such as asbestos would require transport and treatment locally and beyond. Construction is also seen to pose a threat to watercourses and the natural water cycle in the Valley. Excavation would potentially modify vital underground watercourses, drying out mountain springs as they had during the construction of highway tunnels and the hydro-electric power station in the Upper Susa Valley. Moreover, TAV opponents argue the deviation of underground and superficial watercourses would divert water more rapidly to the plains, increasing the risk of floods in the lower part of the Valley. (Pavia 2006; ARPA 2005, pp.22-23). No TAV also opposes the project on the grounds of

[3] http://www.ltf-sas.com/pages/articles.php?art_id=256

the risks to health as a result of the release of uranium and asbestos during excavation. The extraction of uranium from the Ambin mountain range could for example expose workers and the local population to radiation and therefore to tumours and leukaemia (Pavia 2006). Other studies by Sienna University's Geo-technological Centre show that over one million cubic meters of materials containing asbestos would need to be extracted from the tunnel passing under Mount Musiné (Maccheri M *et al.* 2003). Admittedly it would be possible to safely treat asbestos, but such procedures would increase the cost and the duration of the project and would still not completely rule out all danger.

In addition No TAV opposes the Turin-Lyon line on grounds that it would pass through a highly valuable environmental area containing a vast and interesting variety of ecosystems. In the province of Turin, 24 out of 69 Sites of Communitarian Interest (SIC) proposed by the Piemonte Region during the development of the European Natura 2000 Network (ARPA 2005) are situated on Val di Susa territory, as are two special Nature Reserves and one Provincial Park. The construction of the tunnel between the two nature reserves of Foresto and Chianocco and the Orsiera-Rocciavrè Park would jeopardise the terrestrial and aquatic fauna of these protected areas, with extensive fencing blocking the movement of animals, as had been the case with previous highway construction (ARPA 2005 p. 23). Local flora too would (this part of the Alps alone is home to 47 of the 120 species of orchids present in Italy) suffer intense noise and vibration, and be at risk of spring and groundwater aquifer pollution. The tunnel would ultimately compromise the monitoring and conservation of the protected areas. In recognition of these risks, the management office of the park and reserves in 2005 voted in favour of a motion stating their disagreement to the implementation of the TAV Turin-Lyon.

TAV opponents moreover argue that these environmental changes would modify the morphology and appearance of the landscape, pointing to the issue of quality of life. The S.p.A.ce needed for the construction yards and the storage of extracted materials they argued, would necessitate the loss of cultivable lands, prairies and woodlands (AA.VV 2002, ARPA 2005 p. 23), highlighting the issue of "landscape value", and how non-economic values not directly related to human health or environmental contamination are usually

absent from decision making processes. The quality of life of the local population would be seriously affected as construction yards produced dust, dirt and an increase in traffic and noise. The vibrations alone from mining activities could cause cracks in houses (AA.VV. 2002). Concerns was also raised over the level of noise from the line once completed, with evidence showing that a high-speed train produces the same level of noise as a landing plane, and that such sudden and repeated noise can generate panic attacks, discomfort or aggression, altered behaviours, stress and insomnia (Saponetta 2001). Avoidance of such impacts would require living at a minimum distance of 500m from the source, but for an area like the Susa Valley already crossed by numerous railways and highways, this would mean the forsaking of numerous villages and much farmland. Moreover, as the Valley is surrounded by high, narrow mountain chains, the echo would amplify the noise, dispersing it across nearby mountainside villages (Chiocchia G *et al.* 2002).

In contrast to Pro TAV arguments that favour the project due to its potential for alleviating pressures of goods transport on road infrastructure and reducing CO_2 emissions in the face of predicted increases in demand, No TAV members argue that according to the Rebound Effect (or Jevons's Paradox), any environmental benefits from newer TAV technology would be cancelled out, as increased material flows would actually be encouraged with its implementation (Greyl *et al.* in Healy *et al.* (eds.)). The rebound effect warns that improvements in efficiency can lead to increased resource use, as in the case where improved fuel efficiency in cars contributes to increased car use as the cost of driving goes down per km. The increased capacity available on the TAV, should it lead to lower transport prices as hoped by proponents, could lead to increased international trade with negative environmental impacts. Furthermore, research has emerged that casts doubt on Pro TAV assumptions regarding the economy of CO_2 emissions associated with high speed railway transport. Federici (2006) for example, argues that the amount of infrastructure and power needed to implement and maintain this type of transport would actually release 26% more CO_2 than a classical train and 270% of that of a truck. He also projects that the extra 1.6 billion tonnes of merchandise per km per year that would come from existing road transport would lead to the release of an additional 9.6 kg of CO_2 into the atmosphere per tonne of merchandise transported on the Turin-Lyon line. Rounding off

the No TAV argument on environmental grounds is the observation that, although high-tech new trains are promoted as sleek and eco-friendly, extending the use of existing trains could generate less emissions than manufacturing new high-tech trains to replace the old ones before they have outlived their usefulness. Underpinning this view is a wariness of misleading assessments that only account for direct, operational energy costs and CO_2 emissions, disregarding the indirect, upstream and downstream impacts over the entire life cycle of large-scale transport infrastructure (Ulgiati 2011). As Ulgliati indicates, these impacts are heavily affected by assumptions about infrastructure, machinery, electricity mix, and intensity of ridership, all factors that are highly uncertain and subject to the fluctuations in the global economy, and energy markets. For this reason opponents to the TAV have called for life-cycle analyses to be conducted to reveal the true environmental impacts of retiring old trains and infrastructure to build new lines and trains. (Greyl *et al.* in Healy *et al.*).

No TAV environmentalism is not a post-modern one, centred on protection of wilderness (Martinez-Alier 2002) or an imperative to protect an otherwise pristine ecosystem. In contrast, as Dansero and Scarpochi (2010) write, "the analysis of the No Tav movement highlights that the protest arose from the awareness of the local environment as already disrupted, damaged and menaced by previous developmentalist narratives such as the massive Fordist industrialization of the 50s and 60s." Had the conflict been framed as a matter of choice between one environmental "good" vs. another - carbon emissions reductions vs. wilderness and landscape value for example - the mobilization would have revolved solely around ecological arguments. The broadening of the discourse has in praxis necessitated a diversification of No TAV strategies whereby No TAV has for instrumental purposes, adopted the economistic discourse of opponents in order to discredit their strongest line of reasoning, undertaking a modified cost-benefit analysis (CBA) to demonstrate that the project is neither sustainable nor desirable even in economic terms. In this CBA by Rémy Prud'homme, (2007) himself a member of the No TAV movement, and an economist, Prud'homme took into account socio-economic and environmental indicators (time economies, decreased pollution, CO_2 emissions, reduced number of road accidents) to calculate the benefits of the TAV compared to road transport. He calculates that time savings would mean benefits of 88 million euros annually, while the positive externality of

the reduced atmospheric emissions would be worth 4 million euros annually and the avoided C02, at 25 euros a tonne, would be worth 10 million euros. In total he calculates that all the benefits would account for 136.7 million euros per year, with the bulk of this due to economic gains (106.7 million euros) due to time savings and with the rest (29 million euros) due to avoided environmental externalities and reduced accidents. He calculated these benefits over a period of 45 years with a discount rate of 4% and the assumption that traffic would increase at a rate of 2% a year[4]. To calculate the project costs however, he calculated the investment and maintenance costs of the line, estimating that the first five years of construction will cost 4.16 billion per year, then 427 million euros per year thereafter for its maintenance and running. Arriving at an estimation whereby the costs exceed the benefits by 25 billion euros over 45 years, he concludes that the project would not even cover its infrastructure costs and would create debts and deficits for both the Italian and French governments. It should be noted that in this calculation Prud'homme does not quantify or take into account any negative externalities caused by the TAV project enumerated above, such as noise pollution or loss of landscape value. A more complete CBA could go further to try to quantify these costs to get a more realistic view of the social and environmental costs.

In contrast to Pro TAV concerns almost exclusively related to road safety and the dangers posed to road passengers by a higher volume of road traffic, the safety concerns of No TAV are much broader. These relate to the potential for negligence in following safety measures in the construction and maintenance of the TAV, and the threat such negligence would pose to workers' security. A second area of concern relates to passenger security and the likelihood of accidents along a 57 km long tunnel, the avoidance of which would require very high standards of safety measures (AA. VV. 2002). The security argument is particularly relevant following accidents in the Mont Blanc tunnel in 1999 and in 2005.

In addition to arguing like the Pro TAV along lines of environment, economics and safety, No TAV has developed a line of argumentation that is

[4] Admittedly, alternative assumptions about the money value of negative externalities and a different discount rate would produce a CBA with very different results. This highlights the vulnerability to political manipulation that cost-benefit analyses can be subject to, and why social groups often argue in favour of more participatory inclusive decision-making mechanisms such as multi-criteria assessment.

procedural, and therefore unparalleled by arguments coming from within the Pro TAV camp. In building its procedural argument, No TAV points to the high costs of the project (compared especially to the costs of implementation in other countries – see Tab. 2.2), due not only due to the size and technical complexity of the project, but also due to the abuse of power and lack of tranS.p.A.rency inherent in decision making, and the nature of Italian contracts and financial architecture. A key argument of the No TAV committees for example, is directed at the financial model applied to the majority of Italian infrastructural projects: the general contractor model. This is a model based on the use of public money for infrastructure projects that ensures that money ultimately ends up in the hands of private companies, with no guarantees over the control of such investments. This is a result of the common practice of subcontracting, by which means public money is disseminated to a myriad of private actors. This makes the monitoring of investments and the control of implementation by public administrators and citizens nearly impossible. This practice has also resulted in the accumulation of debt by local administrations, leading to an incredible waste of public money on projects that are never realised. In the Italian context this also means easy funding for illegal actors and a loss of public money through corruption due to the high level of collusion between institutions, mafia and private actors. In the specific case of Turin-Lyon TAV, billions of Euros have been invested over the years on the development of numerous projects that were not implemented. In 2010, the news article "Il fatto quotidiano" published an estimate quoting a historical cost of over 20 billion Euros, a figure that does not take into account environmental and social costs (Cavallito 2010).

TABLE 4.1: Construction costs in Italy, S.p.A.in and France, by M. Moretti (FS S.p.A..) in 2007, showing the length of rail lines and the average cost per km for France, S.p.A.in and Italy. Data in blue denotes existing lines, while data in red represents lines in development or under construction. (Cicconi 2008)

	France		Spain		Italy	
	Length (km)	Average Cost / km (M €/km)	Length (km)	Average Cost / km (M €/km)	Length (km)	Average Cost / km (M €/km)
Operational Lines	1548	10	1030	9	564	32
	South East		Madrid-Barcelona		Florence-Rome	
	Atlantic		Madrid - Seville		Rome-Naples	
	Rhone-Alps				Torino-Navara	
	North Europe					
	Paris Interconnections					
	Mediterranean					
Lines in Development or in Construction	990	13	1490	15	647	45
	East Europe		Toledo-Madrid-Seville Connection		Navara-Milan	
	Perpignan-Figueras		Madrid-French Border		Milan-Bologna	
	Rhine-Rhone		Malaga-Costa del Sol		Terzo-Valico	
	Nimez-Montpellier		Valladelid-Madrid		Milan-Venice	
	South Atlantic		Madrid-Alicante-Murcia			

The financial scandal surrounding TAV S.p.A illustrates the extent to which the project operation financial model promoted for the TAV implementation in Italy contributed to the public deficit and was unsustainable. In 1991, the national railway company released funding to TAV S.p.A. in the form of an "allowance for projecting, constructing and for the economic exploitation of the high-speed line" in Italy. The State Council ordered TAV S.p.A. (40% of which was held by FS S.p.A, and the remainder held by privately owned companies) to raise private funds for investing in the undertaking of the project. TAV S.p.A. had mismanaged the TAV Turin-Lyon project however and could not come up with the necessary private funds. Instead public money from European funding was diverted through FS S.p.A. until 2005 when the European Union discovered the fraud through a TAV-related infraction procedure. The Italian State was forced to reimburse the money, a sum of about euros13 million accumulated from 1994- 2005, assuming it as a public debt. Opponents of the TAV Turin-Lyon continue to protest the fact that although the Italian State eventually took responsibility for the debt, and its citizens paid for it, TAV S.p.A. is still promoting the same financial model under the authority of the RFI (Cicconi 2008, Venosi 2005).

Local and citizen participation regarding the TAV was further curtailed through the implementation of the Legge Obiettivo, the Strategic Infrastructure Act (Law no. 443/2001), passed in 2001 via legislative decree. The law aimed to simplify the decision-making procedures regarding 80 infrastructural projects considered to be of national interest, including the TAV, with the aim of "speeding" the process along. The effect was to exclude the municipalities from any true input into decision-making, particularly those opposed, allowing the project to be approved by the Prime Minister by decree. Furthermore, through the law, the EIA process became a mere charade, as the law prescribes that the EIA be completed before the start of the construction works, rather than before the approval of the project (Troccia 2009). This precluded citizen involvement and participation in the process, making a mockery of the Aarhus Convention (Directive 2003/35/EC) on public participation in decision-making and access to justice in environmental matters. The Environmental Impact Study conducted by the RFI in 2011 moreover was found by the Osservazioni delle Associazioni Ambientaliste (2011) to be lacking in both scientific and technical credibility, merely describing existing technical and scientific documentation, and containing miscalculations

on civil works and air pollution that belied a hurried job by persons not even familiar with the necessary content of an environmental impact study. The Osservazioni concluded that the study was overall insufficient - in terms of its depth, methodology and a lack of tranS.p.A.rency with the project failing to justify the public expense of 10 billion Euro, making it the costliest infrastructure project of its time (Osservazioni delle Associazioni Ambientaliste, 2011).

The above assessment is telling: not only did No TAV criticize the level of correctness of the CBA, they questioned it at every level, so that even a CBA that would have appeared to support the project would be rejected as well. For No TAV, in their rejection of economism from the beginning, nothing less than a democratic, collective and "territorial" definition of what is (or should be) a "cost" or a "benefit" was at stake. The productive response to this critique has found its expression in the development of participatory democratic models in Val di Susa, best embodied by the presidi, (protest sites or, in German, Besatzungen) — free buildings where the population still organizes its resistance. It was here in these "permanent garrisons" that the practice of popular assemblies was instituted, whereby decisions on tactical strategies and plans are taken through consensual, deliberative methods (Caruso and Fedi 2008 p37, Della Porta and Piazza 2008 p81, Troccia 2009).

These protest sites however progressively became socializing places: there, still today, people eat together, play cards or board games, watch movies, organize concerts and various activities (theatre, singing shows, farmers markets, etc.). Nowadays, in the presidi is all but rare to find discussions and seminars about de-growth, green economy, participatory democracy, food sovereignty or energetic self-sufficiency. A confirmation of this can be found in the words of Paola Meinardi, a long-term activist interviewed in 2007: "New sociality? Yes, this is true. Completely. New aggregation, new sociality. Common meals, common projects... This is the presidio, after all: it's a place to be together, to create new ideas. Apart from discussions about the High Speed Train (that we often do), there is a lot of energy: instead of going to the pub or watching TV at home, people just come here, drink a glass of wine or a bottle of beer and plan things, think, talk and socialize. It's nice. The sociality has really changed, completely".

This newly created sociality, apart from leading to an escape from alienation and a revitalized process of democratization, is also part of a reimagining of the territory and the community that falls under a degrowth perspective (Kallis 2010), arguing for more localisation and conviviality, and speed and distance reduction. The degrowth movement contests the dominant cultural and development-based model, in essence arguing that the positive impacts of high speed travel are a myth and that "keeping speed under control is crucial, not only for reducing nuisances and encouraging alternatives to the automobile, but also, perhaps most importantly, for encouraging density, proximity, and diversity, thereby creating economic and social relations that are less damaging to the environment (Heran 2008).

4.6 Pro vs. No TAV: A Closer Look

While Pro TAV arguments are generally based on the benefits of increased competitiveness in European markets and on economic and ecological advantages of rail transport, No TAV arguments are founded on politics, environment and health, transport needs and infrastructure costs, territory and quality of life. It is important to stress however, that these two kinds of knowledge do not belong to the same register and do not establish a symmetrical relationship. On the contrary, they are enacted by discursive devices which are irreducible to each other given their uneven access to power. This is the reason why the notion of 'political discourse', as applied to environmental politics (Hajer and Versteeg 2005), is particularly useful to grasp the nature of the TAV struggle. As Hajer and Versteeg argue, political discourses show how language is embedded in power relations and how environmental knowledge cannot be conceived as 'innocent', but should rather 'be seen as yet another attempt to discipline society' (2005 p.180). In Foucauldian terms, knowledge becomes a direct tool of governing through its link to a specific regime of truth, whose function is to activate a clear distinction between what is true (and therefore legitimate) and what is false (and therefore illegitimate).

From this point of view, although not internally monolithic nor indifferent to changes over time, I argue that the conflicting ideological references of proponents and opponents can be tendentially separated into two different sets,

whose line of demarcation is set in motion by a very particular power/knowledge dispositif, that we might define as an Infrastructural Dispositif. Such a device is inscribed in a regime of truth verified by the principles of market laws. From this perspective, the dominant rhetoric is based on a dogmatic equation which is as indisputable as undemonstrable at an empirical level. This equation is the following: infrastructure (in this case the High Speed Train Lines) = modernization = economic growth. To realize the strength of this dogma it is sufficient to recall the results of a study on the media coverage of these issues between 2005 and 2006: the only argument employed by high profile ProTAV analysts and authoritative journalists was one of adherence the above mentioned dogma (Calafati 2006).

As with every governmental device, this Infrastructural Dispositif produces and activates a "normal" figure of subjectivity, to which individuals and populations are incited to conform. In this case, the figure of "good citizen", attentive to his/her private affairs but without concern for the public sphere, politically "chooses" (through elections every couple of years), supports and fictitiously counterbalances vertical and executive decision making processes promoted by the dispositif. It is exactly this submissive and dormant subjectivity that the population of the Susa Valley seems to have refused. A key role in this process has been played by an extraordinary diffusion of technical knowledge. Among activists a common joke states that the highest worldwide concentration of transportation experts is found in the Susa Valley (Margaira 2005). Patiently produced and then meticulously shared, this oppositional knowledge has allowed protesters to technically penetrate and politically disarticulate the regime of truth based on the market upon which the Infrastructural Dispositif is grounded.

This notion of political disarticulation is pivotal in assessing a further difference between Pro and No TAV positions. In fact, their positions can be seen as reflecting a much larger debate on substitutability between the economy and environment, a debate captured in terms of "weak" versus "strong" sustainability. Weak sustainability (WS) can be interpreted as the view that what matters for future generations is only the total aggregate stock of 'man made' and 'natural capital' (and possibly other forms of capital as well) but not natural capital as such (Neumeyer 2003). WS implicitly assumes that investments in manufactured capital or human capital are perfectly adequate substitutions for natural capital, so that countries with a history of resource

depletion and ecosystem damage may actually appear "sustainable" (Ayres *et al.* 1998). WS also addresses the role of environmental indicators in relation to GDP, viewing an overall reduction in carbon emissions per unit of GDP as "sustainable". From the Pro TAV point of view then, the environmental destruction anticipated in implementing the TAV will be justified by the creation of modern, large-scale infrastructure that will bring jobs and prosperity to the region, particularly since it is anticipated that each tonne transported will have a lower environmental impact through reduced CO_2 emissions.

In contrast, the essence of strong sustainability (SS) is that natural capital is regarded as non-substitutable, both in the production of consumption goods and as a direct provider of utility. The SS paradigm aims to maintain life opportunities through conservation of the stock of human capital, technological capability, natural resources and environmental quality. This requires the independent maintenance of minimum amounts of a number of different types of capital (economic, ecological, social) in real physical/biological terms, as natural resources are seen as essential inputs in economic production, consumption and welfare that cannot be substituted for by physical or human capital. Acknowledgment of environmental integrity and the `rights' of nature is another driver of the SS approach, but key is the understanding that some environmental components are unique and that some environmental processes may be irreversible (Ayres *et al.* 1998).

A SS perspective is advocated by No TAV supporters, as evidenced in their arguments based on foreseen (and unforeseen) impacts on environmental and human health and security, preservation of ecosystems and quality of life. In other words the Pro TAV vision of sustainability is one of carbon and energy efficiency; while the No TAV vision argues for an absolute dematerialization of the economy. This unbridgeable difference does not presume that No TAV activists disregard or refuse to engage knowledge produced by the Pro TAV side. On the contrary, every single Pro TAV study has received extensive consideration and has been collectively discussed and politically criticised. This element of the No TAV struggle should not be overlooked: showing how misrepresentative Pro TAV knowledge is even on its own terms does not imply acceptance by No TAV of the broader conditions upon which the Pro TAV argument is constructed. Quite the opposite is in fact true: having experienced several years of conflict, No TAV activists have quite simply

internalized the basic rules of self-governance. For them, every scientific issue can be measured in political terms. Hence, in strategically taking into account WS arguments, they do not limit themselves to the critique of their effects, but rather disarticulate the very assumptions that structure their logic.

The commensurability between ecological services and monetary values, a fundamental element of WS, is thus exposed in an act of political demystification. From a proper No TAV perspective, the relationship between economy and ecology is not pre-given, but open to discussion and to different, contextual outcomes. What is perpetually questioned, however, is the primacy of economic growth over other variables of concern for the community. This is why, even when 'using' WS knowledge, No TAV activists are still faithful to a genuine SS approach. It is this faithfulness, arguably, that precludes the adoption by No TAV activists of a "multi-level multi-criteria approach" as suggested by Marletto (2010) in addressing the conflict, as this would presuppose a sort of commensurability amongst conflicting paradigms ('competition', 'sustainability' and 'degrowth'), a presupposition that the NO TAV movement flatly refuses.

4.7 Conclusion

It is clear from the description of this conflict that there is, as is generally the case in environmental conflicts, an imbalance in the weight of power between the TAV proponents and opponents. The Pro TAV side has from the beginning had superior economic and political power and the ability to effectively influence decision-making. It has also benefited from prejudices developed in the course of the conflict that has at times portrayed the No TAV group as a 'classic' NIMBY movement, or at worst, a 'criminal' movement of radical, and even violent opponents, justifying military interventions against peaceful demonstrations. The Pro TAV side is furthermore bolstered by support from mainstream politicians and public opinion who argue in favour of developing green transport and increasing Italian integration within the European Community and economy. Furthermore, while the Pro TAV argument was to an extent destabilised by the financial scandal surrounding TAV S.p.A., the overall impact was negligible, and apart from causing some hesitation on

the part of the French government and the European Commission, did not, and has not influenced allies' support for the project. In light of this very apparent imbalance of power, the success and longevity of the mobilization of No Tav is nothing less than remarkable, and as such warrants examination.

One of the prime strengths of the movement is that apart from reacting and opposing to the implementation of a project, it has been able to channel its energy into pro-active and propositional activities. The link between NO TAV movements and a recently burgeoning degrowth movement is evidence of this creative potential (Della Porta 2008) expressed by the struggle. To avoid a sort of self-seclusion in exclusively local issues (a fatal risk many territorial movements run into), NO TAV had somehow to move beyond itself, and did so in a variety of ways. Tactically, by opening new sites of struggle in the valley (protests against the Beltrame steel plant and the enlargement of the Frejus tunnel); strategically, by establishing alliances with other local movements throughout Italy within the Patto di mutuo soccorso, an organization based on principles such as mutual aid, information sharing and active solidarity; intellectually, by broadening its horizons to incorporate new ideas (e.g., degrowth) and by organizing international conferences such as the "Big Backyard", the annual event which activists refer to as the Susa Valley's Social Forum.

The act of broadening the critical horizon is recalled with great clarity by Marco Cedolin, journalist and activist: "This newly construed people, that has transformed itself through scientific and technical knowledge, cannot avoid analysing the rest of its world from this different, more politicized perspective. So it will problematize projects and procedures that were previously well outside its sphere of interest, and in the end, getting out of its micro-cosmos, it will put into question the general model of development which has generated an aberration such as the TAV" (Cedolin interviewed in Leonardi, 2007).

It is important to underline that the degree of self-awareness shown by activists with regard to these processes is strikingly high. Commenting on the first public meeting attended by Serge Latouche in the valley (Vaie, October 24th, 2006), Fulvia Masera, long standing activist and editor of NO TAV monthly chapter Sarà düra!, writes: "The French [thinkers, and particularly

Latouche] started from degrowth as a theory and then, on these bases, criticized the TAV. We, people from the Susa Valley, started by criticizing the TAV and then realized to be putting in place good practices such as those proposed by degrowth"(Masera reported in Leonardi 2007).

As much as the NO TAV movement is interested in degrowth, the Italian degrowth movement (Rete per la decrescita) is interested in the NO TAV struggle. For example, an article published in La decrescita, issued in January 2006 read: "This is the reason why the NO TAV message is so important: it shows an extreme capacity of innovating from below commons' management. Such a capability is embedded in struggle and embodies a widespread and self-organized participation which is able, such is its strength, to re-orient institutional actions [...] Local networks are alive and well in Susa Valley: this experience extends beyond mere – although fundamental – 'resistance' to the war on the environment declared by economic interests. It actually promotes new proposals and projects to govern the valley in a different way" (Amura, Ferraresi, Calori, Secchi reported in Leonardi 2007).

As Greece teeters on the brink of insolvency, the strength of the No-TAV argument has gained renewed legitimacy. They point to how debt has been used to modernise transport and communications solely to fulfil European Union strategic goals, and how today we see in many of Europe's peripheries some of the most modern infrastructures in the world – and also some of the most highly indebted nations: "An age of mass unemployment co-existing with shiny airports, high-speed trains and new highway networks is beginning across swathes of Europe."(Manolopoulos 2011). The social(ized) costs of TAV are summed up nicely in a recent campaign that shows that (at current cost estimates of 5,000 euro per cm): 4 inches of TAV track equals a year of retirement, 3 meters of track a kindergarten, a hospital 500 meters.

The environmental and social benefits of localization are key here, but opponents to the TAV also point out how "low-speed and low-cost transportation modalities are presently being displaced by high-speed modalities, thereby decreasing the availability of alternatives. Moreover, lack of suitable investment is turning local transport into a low-quality and unsafe mode of transport that discourages its use. This privatisation of the Italian railway has meant that the number of night and regional trains (in particular connecting Southern Italy with the rest of the country) have been cancelled in

favour of modalities such as privates automobiles and high-cost trains, for those who can afford it." The pursuit of "high-speed" thus not only favours the political and economic interests of few politicians, private businessmen and the wealthy at the expense of the public interest, it has ironically contributed to unemployment (a key Pro TAV justification for the project) with the reduction of affordable passenger rail services.

Thus today, anti-TAV politicians decry TAV as an obsolete project dating from a time when "Europe still believed in that kind of expansion." The critique of the growth economy inherent in the movement thus simultaneously shows how the overflow of debts and public cuts make ever more evident the economic folly of the project. At the same time, even the premise of the "need for speed" itself is in transport is questioned: the alternative notion proposed by activists calls for a "low-speed life", as in another widespread slogan: "Who goes slowly, goes far and safe. We don't want the high speed train". In positing strong sustainability, degrowth and participatory democracy as the only logical response to the current social and economic crises, No TAV presents their vision as truly forward-thinking, in turn framing the proponents of the Pro TAV "outdated" economic development model as anti-modernist.

The Vedanta Refinery

A Dongria woman, Lanjigarh, India

A protest in Kalinganagar, Orissa, India

Orma Patoralists, Tana Delta

Maize preparation, Tana Delta

Orma Woman collecting wood, Tana Delta

Right: Orma Women collecting wood, Tana Delta

Chapter 5

Who gets the HANPP (Human Appropriation of Net Primary Production)? Biomass distribution and the "Sugar Economy" in the Tana Delta, Kenya

Keywords: Wetlands, RAMSAR Convention, Land Grabbing, Irrigation, Pastoralists, Property Rights, Customary Rights, Bio-Fuels, HANPP (Human Appropriation of Net Primary Product), EROI (Energy Returned on Energy Input) Virtual Water, GDP of the Poor, Resilience

5.1 Introduction

Growing acquisition of farmland is being driven by several broad processes (GRAIN 2008, World Bank (WB) 2010, Zoomers 2010), including the food crisis of 2008, rising meat consumption in Asia, biofuel targets, demand for wood and chapter, and new long-term investment opportunities as a response to low interest rates, among others. In this article however, we focus on the connection between purchases of land and the emerging 'biomass-economy', analysing biomass distribution in a region targeted for land-grabbing in order

to understand the process from both bio-physical and political ecological perspectives.

The bio-economy or 'sugar economy' refers to the vision of significantly increasing biomass as a feedstock for exosomatic [1] energy and industrial products. This includes increased agro-fuel production, as well as projected use of agricultural 'wastes and residues'. It also hinges on hopes of bio-technological advances in second-generation bio-fuels. The bio-economy can also be viewed more broadly - as the push to commoditise the biomass resources that are currently not yet in the market and to increase the biomass that comes to the market.

Yet while The Economist (2009) glibly asserts that 'there is plenty of biomass to go around',this article uses a conceptual framework of 'social metabolism' and 'colonisation of natural systems' for describing society-nature interactions (Fischer-Kowalksi & Haberl 2012), namely, to interrogate current biomass use and distribution at different scales and among actors. Is there enough biomass to go around? What are the current uses and distribution of biomass resources at global and local levels? What new conflicts are we seeing over plant matter, both crops and 'waste residues' ? And in a future bio-economy, more biomass, for whom? And finally, how much biomass will be left behind in nature available to preserve biodiversity?

In this article we narrow the focus down to a case study in the Tana Delta, Kenya, one of the new commodity frontiers (Moore 2000) in the recent large-scale land acquisitions, employing an indicator derived from social metabolism analysis- the Human Appropriation of Net Primary Production (HANPP) (Vitousek *et al.* 1986, Haberl 1997, Haberl *et al.* 2009) This allows us to examine biomass flows in the Delta, combining a biophysical perspective with a political-ecology analysis of the interests, stakes and power politics in the delta, to answer Bernstein's four fundamental questions of agrarian political economy: Who owns what? Who does what? Who gets what? And what do they do with the agrarian surplus? (Bernstein 2007).

[1] In human thermodynamics exosomatic energy, as contrasted with endosomatic energy (bodily metabolism), is the useful energy throughput outside human bodies.

The Tana Delta, on the east coast of Kenya near Somalia, comprises riverine forests, wetlands and rangelands and is home to a range of indigenous pastoralist, farmer and fisher communities, whose traditional multi-user livelihood strategies have helped preserve exceptional local biodiversity. (Fig. 5.1) Currently, there are eight planned development projects in the delta- six of them related to plantation crops, primarily fuel crops such as jatropha, oil seeds and sugar cane, as well as titanium mining and gas and oil exploration. Of these, sugarcane represents the largest area, with the Kenyan coast being dubbed a new 'sugarcane belt'. Planned sugar projects on the coast include the Tarda project (20,000ha), MAT International (110,000ha) and another from Kwale International Sugar Company Limited (Kiscol) (8,000ha).

Looking at old and new agrarian conflicts in the Tana Delta, we ask: What can the history of the delta tell us about future potential for conflict and differentiated impacts on the people and local environment? What will the impacts of new land deals be on local food availability? And what alliances are being made to protect the biodiversity and keep livelihoods intact?

The first section introduces the conceptual tools and theoretical framework, expanding on the concept of the 'sugar economy' as a socio-metabolic transition (Haberl 1997, Sieferle 2001) and material and energy flow analysis (MEFA) as valuable instruments in gauging sustainability and potential sites of conflict over biomass. The second section contextualises the case study of the Tana Delta in Kenya as a site of conflict over biological resources through an analysis of property rights and historical dynamics. The third section presents the results of the analysis of biomass distribution. The fourth and fifth sections offer discussion of the results and the conclusions.

5.2 The Biomass Economy and HANPP

Bio-economy describes the idea of an industrial order that relies on biological materials, processes and services (ETC 2010) in a post-petroleum era in which industrial production is fuelled by sugars extracted from biological feedstocks. The switch to agrofuels is one important element in this new vision, but investment and corporate interest are also focusing in on the enabling technologies of the switch to synthetic biologies and nano-technologies

that will allow the development of second-generation biofuels from lignocellulosic materials such as wood. For example, according to an "Implementing Agreement on Bioenergy" policy chapter (2004):

> 'Although grain, sugar, and oil crops will continue to be important biomass resources, the use of lignocellulosic biomass is essential in the longer term. Lignocellulosic feedstocks such as woody biomass, corn stover (dried leaves and stems), or other energy crops will substantially expand the supply of biomass available for conversion and will help reduce the potential for food/fuel conflicts.'

The spectre of the biomass economy is integral to the current rise in farmland grabs: 86 % of global biomass is located in the tropics and subtropics (ETC 2010). Moreover, as the WB article points out, these same countries have the highest 'yield gaps' of productive capacity not yet utilised (WB 2010).

Whether these 'cellulose dreams' (the techno-fix) will come to fruition remains to be seen, but the spectre of the biomass regime foreshadows an important,socio-metabolic shift of human relationships with the earth. The study of socio-metabolic transitions shows how land and energy use and resource extraction and consumption transform over time, fundamentally reorganising the relationship with the natural environment. Haberl, Erb and Krausmann (2010) discern three fundamentally different socio-metabolic regimes: hunter-gatherers, the 'controlled solar energy system' (Sieferle 2001) of agrarian societies, and industrial society, dependent on fossil fuels. The biomass economy is based on the idea of an impossible return to a metabolic regime based on solar energy flow after we have consumed a good chunk of the fossil fuels in the 'subterranean forest' that will provide humankind with an industrial standard of living.

Secondly, the bio-economy can be viewed not only as a techno-fix but also as a new 'spatial fix' (Harvey 1982) to a series of intersecting capitalist crises of accumulation we are currently facing- a fiscal crisis of the state, a lack of food and energy security, and climate change. The bio-economy is being

posited as the long-awaited revolution in the new creation of 'ecological surplus' (Moore 2009) on the horizon. At the same time as it is seen as the way to transcend ecological limits, the whole rhetoric of the bio-economy is doused in 'green' imagery and hubris- representing the transition from black carbon to green carbon- as Frow *et al.* write :'as potentially environmentally sustainable commodities, the enthusiasm for plant derived products tantalizingly might offer a way out of the zero-sum game between economic growth and environmental protection.' (Frow *et al.* 2009).

However, the attempt to commodify new frontiers and the enclosures this entails will be met by counter-movements opposing the expansion of the market (Polanyi 1944). Thus the trend we are seeing and will continue to see is more conflicts over these sites of biomass production (GRAIN 2008). Compared to an average annual expansion of global agricultural land of less than 4 million ha, 45 million ha worth of large-scale farmland deals were announced even before the end of 2009 (WB 2010). While most of these are not yet under production and many perhaps never will be, the expansion of cultivated area is projected to increase rapidly. Apart from agro-fuels, population growth until 'peak population' is reached around 2050, the shift to meat-intensive diets, the increasing demand for chapter pulp and for wood in general, are the driving forces of the present land grab.

To understand the aetiology of these looming conflicts, this chapter uses a perspective combining political ecology and ecological economics. Political ecology can be defined as the study of conflicts over access to natural resources and services and over the burdens of impacts that arise because of inequalities in power, property and income among human groups (Martínez-Alier 2002). Political Ecology sees 'access to resources' as multi-faceted and contested and 'conflicts over resources' as being produced from broader processes of change within specific historical contexts (Blaikie and Brookfield 1987, Peluso and Watts 2001). Thus political ecology attempts to look past simplistic explanations for resource conflict based on scarcity (Homer-Dixon 1999) by clearly contextualising the object of study in a wider systemic understanding of economic power.

Ecological economics, meanwhile, builds upon a thermodynamic foundation of economics, attempting to place the economy within the natural world

and demonstrate the impact that economic throughput has on natural capital and biological processes. M'Gonigle's (1999) exhortation to unify political ecology and ecological economics points out that the 'biocentric' perspective seeks to discover principles that are more than purely human constructions as reference points of social accountability. In particular, the task is "to situate human actions within the processes of the natural world, and to legitimise them to the degree that they can co-exist in balance with that world."

Following M' Gonigle, some authors have moved forward with synthesising political ecology and social metabolism analysis (Martinez-Alier *et al.* 2010). For example, conflicts over tree plantations have been covered by Gerber *et al.* with 'the objective to show that the metabolism of a given plantation can highlight the material causes of the resistance and that the latter is often expressed in non-monetary languages of valuation such as livelihood or sacredness.' (Gerber *et al.* 2009).

Social metabolism focuses on how social systems reproduce themselves biophysically (such as population, built infrastructure, artefacts and livestock) through a continuous energetic and material exchange with its natural environment (and other social systems). Social metabolism can be quantified in terms of energetic and material flows per time period, usually a year, and such flows can be expressed per capita or by unit area.

HANPP (Vitousek *et al.* 1986, Haberl 1997, Haberl *et al.* 2009) is one social metabolism indicator used by social ecologists to measure the human 'domination of the earth'. The inelegance of its acronym and its somewhat complicated (and contested) methodology have meant it has not yet achieved the wide usage accorded to its better known relation, the ecological footprint; however, the expansion of biomass harvesting and investment in future plans for exploitation signal the indicator's growing importance. The higher the HANPP, the less biomass is available in principle for species that constitute 'wild' biodiversity.

The HANPP indicator is calculated by seeing how much of the net primary production (NPP) biomass flows created through solar energy are appropriated by human activity, and how much is left in the ecosystems for other species. In this way, HANPP has been likened to a way to measure the

'scale' of human activities compared to natural processes, i.e. of the 'physical size of the economy relative to the containing ecosystem' (Daly 2006). As humans pass from hunter-gatherers to agriculture and then to industrial societies, they increase the degree of human presence on their surroundings. Later, HANPP decreases to some extent in some industrial economies, as fossil fuel reserves have replaced the need for fuelwood and as imports of biomass (as feedstuffs) increase in importance.

The sugar economy would see a reversal of this timid declining trend of HANPP. Further growth of biomass energy use would result not only in increased competition between food and energy supply, but also in further increases in HANPP with possible adverse ecological effects. 'Research can demonstrate that a transition from fossil fuels back to an area-related energy system (with agro-fuels) is not feasible at present population densities because of the low Energy Return on Energy Input (EROEI and the increase in the HANPP that it would imply.' (Haberl *et al.* 2011).

Global calculations, as well as some localised studies, have been undertaken for HANPP (Singh & Grubunhel 2003, Singh *et al.* 2010). The novelty of this chapter rests primarily in that it is concerned with the distribution of the human appropriation of primary production between two competing groups sharing the same territory and their distinct strategies for appropriating biomass through agriculture, grazing and other methods. So, we are not only concerned about the competition for biomass between humans and 'wild' biodiversity. We also want to show how there are distributive conflicts among humans about getting a share of the HANPP. This is less trivial than it may sound, because human activities do not only increase the HANPP, they might also increase the NPP (for instance, by the use of fertilisers or by irrigation).

Like a large part of humanity, the inhabitants of the Tana Delta continue to rely almost entirely on local biomass production for their energy needs. In this way, their consumption can be seen as a type of 'GDP of the poor' (Sukdhev 2008). How does the ability to appropriate biomass outside the market relate to the well-being of the distinct groups? Finally, the study of HANPP and its distribution among the tribal groups also offers insight into the conflict between them, as pastoralists and agriculturalists.

HANPP is also a measure of sustainability and sustainable resource use in a spatially demarcated area. Since we are interested in the ecological resilience of the delta, it gives an indicator of the environmental pressure exerted upon the delta. Some studies have tried to establish the HANPP as an indicator of pressure on biodiversity (Haberl *et al.* 2007b). We also build a scenario of what the new HANPP will be under the sugar scenario. We will thus have a model of the competing claims for the HANPP among different groups (human and animal) within the delta and their relationships to each other.

5.2.1 Methodology and data

Two field trips were undertaken to the delta in August of 2008 and in July of 2010. Structured and semi-structured interviews were carried out with government officers and workers, and environmental NGO workers based in Kenya, Malindi and in the delta, Tana and Athi Rivers Development Authority (TARDA) employees and villagers from Luo, Orma, Wardei and Pokomo communities. Surveys about biomass use, purchased products and household stocks were administered to eight Pokomo households, eight Orma households and one Wata household in July 2010. These results were then cross-referenced with literature, information from local government offices and census and agricultural data to arrive at the biomass flow cross-estimates.

To understand resource conflict in the delta we analyse it as a process of accumulation through biomass appropriation, employing a methodology developed by the Institute of Social Ecology in Vienna (Schandl *et al.* 2002, Singh *et al.* 2010) to create a model of how the actors in the Tana Delta Irrigation Project (TDIP) area appropriate biomass. Local level biomass studies also give 'insights into the functioning of the subsistence economy normally underrepresented in national studies as well as insights into cultural coping strategies for dealing with land use change and industrialization' (Schandl *et al.* 2002).

The calculations suffer from several limitations, including the difficulty of accounting for all movement in and out of the systems boundaries, for example livestock. For simplicity we count only the livestock resident in within the

system boundaries although will sometimes graze elsewhere, while cattle elsewhere will graze within the boundaries. Secondly, it is not possible establish all the possible environmental and land changes induced through plantation expansion and the scenario should be viewed for illustrative purposes of how the methodology could be applied with an initial base-line study and post land transformation.

5.3 The Case Study: The Tana Delta and TDIP

The Tana is Kenya's mightiest river. It flows over 1,000 km from the foothills of Mt Kenya to empty into the Indian Ocean in Kenya's remote east. At its base lies the Tana Delta, one of the most important wetlands in 130,000ha, of which 69,000 are regularly inundated (Hughes 1984, 1990). The range of habitats within it, including riverine forests, grasslands, savannahs, bushland, lakes, mangroves, dunes, beaches, and estuaries, mean it is a hotspot for biodiversity, supporting over 350 bird species, buffaloes, hyenas, hippopotami, the Nile crocodile and elephants. The Tana is also home to two endangered primates- the Tana River Red Colobus and the Crested Mangabey Monkey (Hamerlynck *et al.* 2010).

In the bio-economy, any land or water body that can sustain plants gains enhanced value as a potential site for biomass production. This is particularly true of areas that can be irrigated, as they can potentially produce significantly larger volumes of biomass. "The Tana River flood plain, with its high water table and frequent flooding, is by far the most productive habitat along the north Kenya coast (Andrews 1975) and it holds 50 % of the potential irrigable area in the country."

There are two primary ethnic communities living in the delta, the Pokomo, Bantu-speaking Christian sedentary farmers and the Orma, Kushitic speaking Islamic, primarily nomadic, pastoralists. The remaining inhabitants include the Wardei pastoralists, Luo fishermen and other tribes. The Pokomos practice flood recession agriculture along the low lying fertile flood plains adjacent to the banks of the river, which flood seasonally, and grow maize and bananas and other vegetables for subsistence and mangoes and rice as cash crops. (Terer *et al.* 2004)

The delta is an important dry season grazing areas for the pastoralists. The Environmental Impact Assessment (EIA) for the Tana Integrated Sugar Project (HVA International, 2007) estimates that the delta hosts about 60,000 heads of cattle during the dry season, while 20,000 heads of cattle graze permanently in the area. In contrast, different NGOs give figures ranging from 200,000 to 350,000 cattle present in the delta during the dry season. Because livestock travel from as far away as Somalia and Ethiopia to the delta and the influx is highly dependent on climactic fluctuations, further research is needed to arrive at more precise estimations. In general, pastoralists in the delta maintain a higher standard of living than the agriculturalists. They oppose any project that could threaten their livestock and reduce grazing areas. The Pokomo, in contrast, are more sympathetic towards agricultural development projects but are wary due to unfulfilled promises in the past.

The environmental conservation group Nature Kenya, one of the main defenders of the delta, drafted a petition for the high court of Kenya, with members from both communities listed as petitioners, They highlight eight proposed projects are noted as forming part of the 'scramble for the delta'. These include shrimp and prawn farming by Coastal Aquaculture Limited; the acquisition of 50,000 ha for oil seed farming by British company, G4 Industries, (irrigated crambe, castor & sunflower); Bedford Biofuels jatropha plantations over an area of 90,000ha in local ranches adjacent to the delta; a proposed swap with the government of Qatar, allowing them 40,000 ha (of which 16,200 lies in the delta) of fruits and vegetables for export[2]; exploration for titanium by Tiomin Kenya Limited in the Kipini area from the sand dunes. And finally, the Tana Integrated Sugar Project), which was granted 40,000ha, up from the 28,000 it owned previously, and MAT International, which is also interested in sugar-cane plantations (30,000 ha of which would be in the delta and 90,000 ha outside). If all these projects were to go ahead, at least 100,000 ha of the delta would be turned into monoculture plantations.

This chapter focuses primarily on the impacts of the TISP project, a joint venture between Mumias, one of the most important sugar producers in Kenya, and the Tana and Athi Rivers Development Authority(TARDA). According to the EIA the project will cover 22,000 ha of the floodplain. The project was conceived to coincide with the expiry of Kenya's right to limit

[2]Both the Qatar project and the G4 industries project have since been shelved.

importation of duty free sugar from the COMESA [3] region as of January 2012. Mumias hopes to produce in the delta the most inexpensive sugar in the continent at $160 a tonne, whereas currently the most efficiently produced sugar costs $200 a tonne (Mugambi 2009). The project would also produce ethanol for fuel and co-generation of electricity (HVA 2007). There are 18 villages with an estimated 25, 000 people, split more or less evenly among pastoralists and farmers that stand to be impacted by the project. Gamba village, formerly inhabited by Wardei pastoralists who had been squatting there, has already been evicted (Schade 2011.)

5.4 The Tana Delta as Commodity Frontier

> *'Tana River has also become an axis of regional contraband and illegal trade, especially in firearms, and cross-border movements of refugees, bandits and mercenaries.'*

(Kagwanja 2003).

Co-existence in the delta between the communities is uneasy, sometimes leading to violence. The last flare-up of tribal conflict occurred in 2000-01 between the Pokomo and the Wardei-Orma, but these tensions are not new, nor can they be convincingly explained merely by resource scarcity, overpopulation or the tragedy of the commons (Hardin 1968). Along this line, a recent Vision chapter (2005) for the district states:

> 'A key challenge in the management of land in this district is rampant conflict over access to and use of land between the farming sedentary communities and the pastoral mobile cattle keepers. As population pressure increases, resources that were traditionally set aside for either farming or pasture are increasingly being used or both causing long running conflict.'

A review of the historical relationship between the communities allows a more nuanced perspective on recent conflicts. The testimony of a visitor

[3] The Common Market for Eastern and Southern Africa

to the region in 1893 highlights that these tensions are not new or simply attributed to increasing resource scarcity; rather, they are based in power relations in the delta:

> The Pokomos however cultivate only sufficient to supply their own wants, as they have always existed in a state of insecurity and fear on account of the raids of their more powerful neighbours, the Swahili and the Somali. The Swahili call all of the Pokomo as far as Ndera their slaves and take whatever they want from them by force. The Gallas (Ormas) treat the unfortunate Pokomos similarly...The Pokomo ...have no idea of offering any resistance to such high-handed freebooting, having been accustomed to it for generations. They look upon it as 'fate'.

(New York Times 1893)

As in many places throughout Africa, property rights in the delta are often complex and overlapping, with concurrent systems of private, public, and common land and different rights to access, usufruct, leasehold and freehold. Much of the land in the delta is trust land, whereby the land is held in trust and administered by the county council for the 'benefit of the persons ordinarily resident of that land'. This trust land may be set aside for purposes deemed to benefit the residents, or transferred to the government (Okoth-Ogendo 1991). Yet there are many instances where this 'trust' is abused.

Apart from property rights over land, there are access rights to water. For example, among the Orma, wells are owned by the person who first dug the wells, and then their patrilineal descendents (Ensminger and Rutten 1991). While the Pokomo lay claim to the land along the river banks to practice agriculture, the Orma stake their claim over the river waters and oxbow lakes.

Some theorists (influenced by Coase 1960) hold that clearly defined property rights should reduce conflict by creating shared expectations and through the creation of markets for damages. However, in practice, property rights are not easy to 'clearly define'. Regarding property rights to water, 'when a fixed expectation comes up against a fluctuating resource, that in itself can

be a source of conflict' (Meinzen-Dick and Nkonya 2005) This is why rights of access to water are often ambiguous and based on principles open to negotiation rather than clearly defined rules. The attempt to formalise rights that were previous customary thus can be a source of conflict in itself (ibid).

Thus one of the triggers for the flare-up of inter-tribal violence in the Delta in 2000-01 was the actions of the land adjudication commission, began in 2000, which favoured a liberal land policy based on individual ownership. This policy created a sharp split between the Pokomo and the Orma/Wardei. The Orma/Wardei accused the government of fuelling ethnic conflict by imposing a neo-liberal land tenure system on an area where land is communally owned, without adequate consultation.

> 'This communal system provided two sets of rights :On the one hand was the right of ownership that the Pokomo were entitled to, as the 'indigenous' people to the area by the virtue of having been there before the arrival of the Orma. On the other hand, there was the right of access which the Orma were entitled to, and which the Pokomo guaranteed and defended. Traditionally, the Pokomo and Orma observed specific customary rituals and practices that allowed the Orma herders to gain access to water-points and pasture on the banks of the Tana River, especially during dry season. After elders from the two communities performed these rituals the latter set of rights became accessible to the Orma. These customary practices defining these rights emerged over the years, revealing a long interactive and integrative history of the two communities.'
>
> (Kagwanja 2003)

In the Kenyan case, writers such as Okoth-Ogendo (1986) have argued that positive impacts of tenure reform have been completely offset by the emergence of economic disparities, redistribution of political power, and the disequilibration of socio-cultural institutions that have occurred in rural society as a consequence.

The year 2001 was also dry one, adding fuel to the fire. Thus, while politically Tana has for long been considered frontier land, in many ways it is

also an ecological frontier where the inhabitants, and wildlife of the delta have adapted their lives to the extremes of drought and flood. Until now, such variability has made the implantation of capitalist agricultural development difficult.

The long rainy season floods fail on average in 2-3 years out of 10, and the short rainy season floods fail once in every 2 years. The erratic rainfall (500-800 mm per year) makes agriculture a risky enterprise in the Lower Tana, in the sense that sole dependence on agriculture can be tricky and thus locals have adopted a variety of livelihood strategies they can fall back on in drier years when yields are lower. That said, in many years there exists high food insecurity and food aid is regularly dispensed (Eijk 1998).

The floods and the droughts that assail the region are also a product of anthropogenic change wrought by deforestation and dams upstream: humans have influenced the severity of both these events within the Tana Catchment (Ongweni *et al.* 1993). Bearing in mind the highly variable climate in the region, the current project proposals for the delta seem to suffer from an 'optimism bias'- overlooking costs and overestimating benefits. Eijk (1998), studying the Hola scheme further upriver, noted how 'the unrealistic, over-optimistic planning of local and expatriate agencies with regard to irrigation development in the Lower Tana area favours foreign consultancy firms and their local counterparts.' The author further asserts that development planning in Africa is mainly part of the art of government, in which planning goals are used as 'carrots rather than as realistic predictions'.

5.4.1 Past Projects

The Tana River region is testament to a long history of failed projects to 'develop' the area, with investment from the World Bank (WB) and the government yielding few benefits for locals. The Kiambere dam, completed in 1993, provided 140 megawatts of electrical power to Kenya's growing urban population. However, over 6,000 persons were displaced without any compensation, with those families losing over 82 % of their money-equivalent income (Kagwanja 2003). While the waters of Tana River were supplying the country with electricity from before independence, most communities of Tana are still without.

The Tana River Primate Reserve (TRPR) was another IMF/WB funded project that caused heated resistance. Based on the 'fortress conservation' logic of the incompatibility of human and animal co-existence (Neumann 1998), the local Pokomo were displaced from their ancestral territory to make way for a reserve for the Mangabey and Colobus monkeys. As the Lonely Planet guidebook shares in a quirky aside, things came to a head when 300 naked Pokomo women stormed the research centre in protest. Recently, the WB was ordered to pay Sh634 million (4.8 million GBP) compensation to the displaced after the high court in Mombasa found that the WB and the Global Environmental Facility (GEF) failed to meet its promises to provide 15 acres per household, a house, compensation for lost trees and crops and SH 50,000 (380 GBP) per family. Plans to build houses, schools, mosques and churches also never materialised (Daily Nation 2010).

The TRPR logic is based on the conception of Africa as a zoo or thematic park for foreigners and scientists, a common complaint in a country where 7 % of the land, an area the size of Denmark, is designated as National Parks and protected by armed guards from the Kenya Wildlife Service (KWS) to create in the words of Peluso (1993) 'a mythical nature devoid of humans for tourist consumption.'

The next project was the Bura Irrigation Scheme, implemented in 1978, with the original aim of settling around 5,000 farmers in 23 villages to grow cotton and maize on 6,700 ha of land. An additional 4,500 ha of irrigated forestry were to provide for the fuelwood of the estimated 60,000 settlers. The Bura scheme was crippled by corruption and mismanagement. The wrong choice of the pumps was made whereby components and spare parts came from different continents. Siltation destroyed the pumps and the dredgers were rendered useless (JBIC 2001). In a country with per capita income of about $ 350 (220 GBP) per year at the time, the project spent an incredible $ 35,000 GBP for every settler (Horta 1994). Yet today, the settlers are poorer than before and the area is a wasteland, overrun by the invader bush mathenge.

5.4.2 The TDIP and the Mumias Project

The most recent white elephant'project was the Tana Delta Irrigation Project (TDIP) rice scheme, managed by the Tana and Athi River Development Authority (TARDA). The TDIP represented a switch in policy from irrigation schemes with settlement and freeholders to new plans for 'economically motivated' commercial estates with a few out-growers. These new estate schemes, while unlikely to have the same impact on unemployment and landlessness as settlement, were thought to be more likely to produce an economic return. Yet only a few months after starting full operations, the TDIP rice scheme collapsed due to flooding after the El Niño rains in 1997 (Luke, Hatfield, Cunneyworth 2005.)

The TDIP scheme removed 2,500 acres (1,042 hectares) of either utilised or available cultivable floodplain land lying within Pokomo-demarcated lands as part of the project's total of 10,000 acres and also converted former grazing lands. The affected communities list a number of unfulfilled promises by TARDA, including not paying for crops in a timely fashion and not building promised schools and hospitals. Moreover, after the construction of the embankment, TARDA claimed the land as their property. The communities are still in court trying to reclaim the land that was expropriated from them. Despite the fact that the case is still pending, the new Mumias sugar project is planned on the same disputed area.

The Mumias Project involves recuperating the rice scheme, and growing sugar in an estate over 16,000 ha and another 4,000 ha for out-growers, as well as a livestock component. Mumias has plans to install an 8,000 tons-per-day sugar mill and distil 23 million litres of agro-fuel ethanol per year from molasses, a cane by-product. It would also produce 34 megawatts of electricity per day from bagasse. Map 1 shows the TDIP area in pink and the projected expanded area of the sugar plantation in yellow.

Because numerous studies have been undertaken in the TDIP area, we use the area delineated by the original TDIP project (covering some 5000 ha) as the system boundaries of our biomass calculations. Six villages are commonly associated with this TDIP Polder 1 area, with land falling within the traditionally-demarcated boundaries of three of these - Kulesa, Wema and Hewani -incorporated into the project, whilst the other three villages

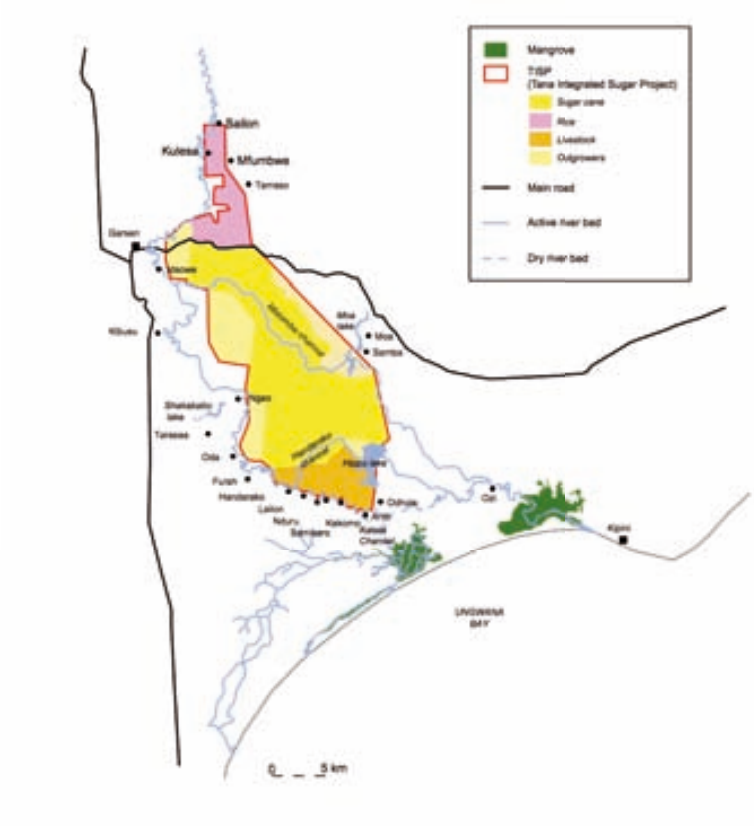


FIGURE 5.1: The Tana Integrated Sugar Project. Map by Oliver Hamerlynck and Stephanie Duvail

- Bfumbwe, Sailoni and Baandi - border the project area, and have traditionally utilised 'common property' resources within the project area, and continue to do so - typically the floodplain forests, and available grazing areas. In 1990 the population inside the TDIP was estimated at approximately 5,000 people, with a population growth rate of 13 % every five years (HVA International 2007). All the villages are inhabited by Pokomo cultivators, with the exception of Baandi, which is inhabited by traditional Orma pastoralists.

5.5 Results: the HANPP

This section presents the livelihood strategies and biomass appropriation of two traditional villages in the TDIP area - one agriculturalist and one traditionally pastoralist that currently also practices farming. The data demonstrates the diverse and contrasting ways that the local communities appropriate biomass in the delta to sustain their livelihoods.

The ability to profit from biomass is based on political economic and natural factors. Relative prices of products, Price elasticity for goods, market linkages, ecosystem functioning ... arguments about productivity. Data shows that pastoralism, long considered an "underproductive" activity may be the most profitable and beneficial means of biomass apropriation in certain environmental contexts (Krausmann et al. 2008).

It also shows how success in harvesting biomass is linked to economic well-being. Apart from bringing differences between villages to light, the data also presents issues of productivity, incorporation in the market economy, food security and dependency. We use a methodology for HANPP derived from the Institute of Social Ecology but modified, because we do not calculate potential production before human modification but only look at actual production and distribution, but the amount of NPP co-opted by humans or the HANPP of harvest[4].

5.5.1 Biomass use among the Pokomo

Vumbwe is a Pokomo village, settled in the current location after the floods of 1961. It is a community of 20 Pokomo households (312 people) and seven Wata households (24 people). Eight Pokomo households and one Wata household were surveyed about their farming practices, household consumption and time use. This data was cross-referenced against GPS measurements of land

[4]HANPP can be expressed in absolute numbers as kilograms carbon per year (kg C/yr), as kilograms dry matter biomass per year (kg DM/yr) or as energy flow (Joules per year, J/yr). As a rough proxy one may assume that 1 t DM is equivalent to 0.5 t C and that the calorific value of dry matter biomass is around 18.5 Megajoules per kilogram (MJ/kg, 1 MJ=106 J).1 kg dry matter biomass = 0.5 kg C = 18.5 MJ.

use and the literature and average biomass uses were calculated for a range of consumption activities per person in GJ, illustrated in Fig. 5.2.

All the Pokomo families surveyed practised farming- with an average of 2.2-3 acres (1 ha) per family, ranging from half an acre to 4 acres per household[5]. Two thirds had a small number of chickens and 45% had beehives. Almost all families also practiced fishing, with fish being an important source of protein in certain seasons. Two of these used fish traps, which they left in the oxbow lakes, and sold fish[6]. In Vumbwe, other livelihood strategies were charcoal making (30%), wage labour (30%) and small businesses such as a local kiosk (30%). No fertilisers were applied, but two families did use a small amount of pesticides on vegetable crops produced for sale only.

Two farmers in the village practiced irrigation (with a diesel powered pump) and the same two households own generators. Two other households have solar panels. The remainder of the village relies entirely on firewood (an average of 6 tons per HH/yr) and charcoal for heating and cooking and paraffin for lighting[7]. A third owns a bicycle and half of the households have a radio.

The primary crops planted by all surveyed included maize, usually planted over half the field area, and often intercropped with cowpeas, with another half acre cowpeas and green-grams; some grow vegetables such as Skuma (kale), tomatoes, onions, and bananas as cash crops. Average maize yields for 2009 were 1.5 tons of maize per ha (almost seven 90kg bags per acre). This was considerably higher than most reports of local yields, for example the EIA mentions yields of only 2-3 bags per acre compared to up to 15 bags in other parts of the country. Eijk (1998) found a similar phenomenon of understating yields in his field research:

> 'Project staff had erroneously assumed that the yields in flood-fed fields were considerably lower than in irrigation schemes. Only

[5]The average for the Tana Delta district is 2 acres (Tana River District Development Plan; (2002-2008).

[6]Hughes (1984) estimated that the average family in the Bura Scheme uses 6.14m3 solid volume of wood per annum. (Development schemes on the River Tana.)

[7]This is indicative of the district as a whole whereby 98.8 % of the households rely on charcoal or firewood.

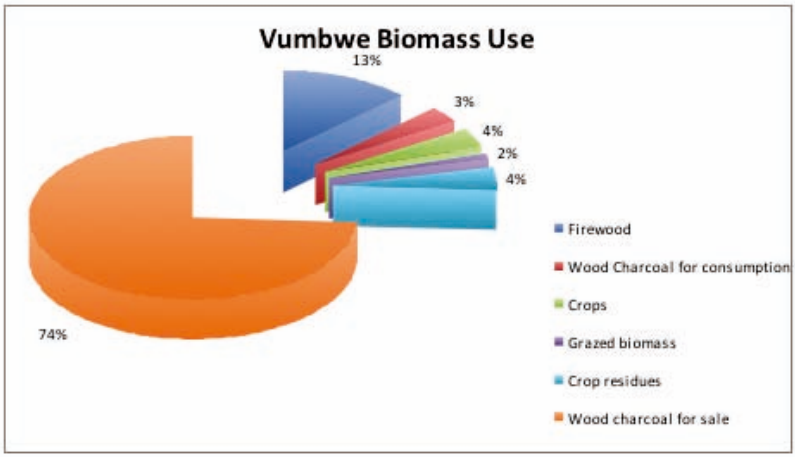


FIGURE 5.2: Biomass use amongst the Pokomo

> when in 1984 the agronomy unit of LTVIP started to take samples in the farmers' flood-fed fields, it became clear that the yield levels of these plots had been grossly underestimated. In their eagerness to promote irrigation schemes Kenyan and Dutch staff members alike had painted a bleak picture of the local farming system. Although total or partial crop failure definitely occurs once in a while, the farmers harvest a good crop in seasons with adequate depth and timing of flooding.'

Most families also have mango trees from which they sell mangoes, but most mangoes rot on the trees due to lack of marketing outlets. Women and young children in most families practice gathering of greens such as water lilies and other wild plants. Two women interviewed described themselves as midwives and also collected a range of medicinal forest products. According to Medley (1993), the Pokomo make use 98 plant species locally, accounting for 52% of known species in the area. Vumbwe village makes use of forests 65 (46ha) and 68 (43ha) and the Gubani woodlands.

The Crops they grow provided 2 GJ of energy per year per person, approximately two thirds of energy needs, with the remainder perhaps coming

from fish, small amounts of meat, and purchased products (primarily rice, sugar, wheat flour & oil).

The primary extraction of biomass among the village was due to the production of charcoal, accounting for 75% of extraction (Fig. 5.2). Several sources confirmed that about half of the households in Vumbwe produce charcoal for sale with an average of 40-60 (50 kg) or 12 bags per week being produced by the village. This equals approximately 20 tons of wood extracted for charcoal consumption per week. Charcoal is harvested in the delta primarily from along the floodplains where the tree growth is lushest. The Pokomo engage in this trade more so than the Orma, particularly in certain seasons when the opportunity cost of labour is low (Ensminger 1984).

In Vumbwe village, there are 26 members of the Wata tribe who belong to one family, with 8 households between them. The Wata are the smallest and one of the most marginalised tribes in Kenya. They are traditionally hunter-gatherers. Parker and Amin (1983) believe that the Wata were the most likely source of much of East African ivory dating back 1,200 years ago. We interviewed one male household head of 49 years. He was the only one interviewed who engaged in every livelihood activity on the survey including farming, livestock-keeping (goats), beekeeping, fishing, gathering, business, hunting, charcoal-making and wage labour (at Tarda). He can produce up to 20 bags of charcoal per week when he has an order. If there is no order he produces at least 5 bags. He estimated 30 minutes of work per 50 kg bag. Each bag sells for 175-ksh, as an average between wholesale and market prices. Thus he can make 87.500 ksh (665 GBP) annually for a declared 250 hours of labour - a return of 350 ksh (2.66 GBP) per hour.

According to the respondent, despite it being illegal, they continue to hunt large animals, hunting 4-5 small animals and one large mammal such as a hippo, giraffe or buffalo per year. The meat is shared out among the hunters, with the surplus dried and sold in the village and surrounding areas.

5.5.2 Biomass use among the Orma

Baandi village is a community of 204 houses, comprising 1,000 people and the only Orma village within the TDIP. The village has existed on a permanent basis in close proximity to Hewani village since 1988, after the villagers were forced to leave their previous permanent village, Gardeni- a few hundred metres further south- due to flooding. The Orma residents of Baandi distinguish themselves amongst pastoralists as being 'permanent' within the Tana River delta and have been thus praticing agriculture with pastoralism since their settlement in the delta.

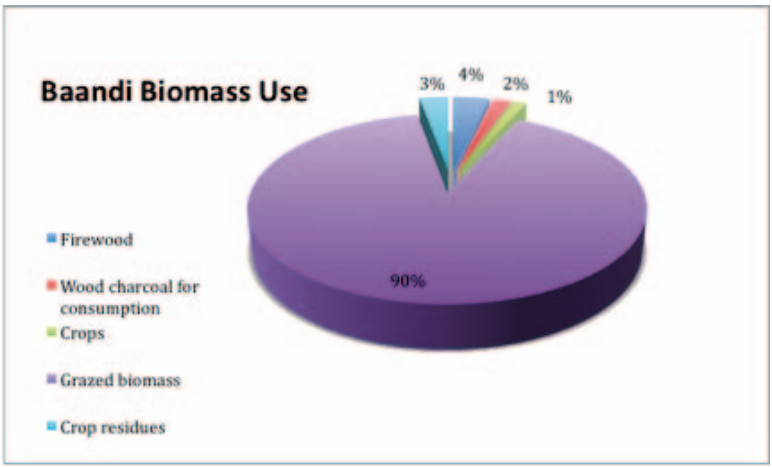


FIGURE 5.3: Biomass use amongst the Orma

Bandi makes use of forest 64, plus two others outside the project area, one to the north and one to the east of the village. I calculated a median of 15 heads of cattle per household (an average of 72) although other studies mention that Orma villages have an average of 100 per household (Luke 2008). Households also have significant stocks of sheep and goats. However, because of the wide variation in holdings (represented by the large difference between median and average), it is difficult to estimate livestock numbers with certainty. According to several people interviewed and local district livestock officers, only 50-60 % of Orma own cattle, of the local Boran breed. One household we interviewed had 500 head of cattle while another had none.

The Orma pastoralists of Baandi traditionally moved out of the sodden Tana delta during the long rains (March-April), utilising outlying grazing areas until stocks were diminished and returning to the delta as the long dry-season progresses (August-September). They then remain in the delta until the following year's long rains return. However, as the rains and flooding have been reduced, many years they can keep their cattle in the delta all year long and not have to move them out.

Mean weight for a cow is 200-250kg. Milk provides about half a litre per person daily (20 % of caloric needs and the excess is shared or sold. The Tana Delta District exports only 3,500 kg of meat and 2,500 l of milk monthly according to the district Livestock Officer. Approximately 1,000 heads of cattle and 1,000 shoats are exported each month. The Orma rarely slaughter their cattle, with the major product from cattle that is consumed locally being milk. Approximately 4.7 million litres of milk were produced in the year 2000, with production peaking during the wet season (Irungu 2000).

Reported yields for maize were in fact higher for Baandi than for Vumbwe, yielding 32 GJ per ha as opposed to 21 GJ/h. One possible explanation for this is that while none of the respondents in Baandi reported using fertilisers or manuring, they did report that they graze their cattle in the fields after harvest to remove plant residues and they then leave the manure behind. Despite this, crops account for only 2% of extraction of biomass of the Bandi village (Fig. 5.3).

90% of biomass extraction was grazed biomass to sustain cattle and shoats (sheep and goats), accounting for 9 tons pp. Fuel-wood use is half as much in Baandi (440 kg/pp/yr) than Vumbwe (860 kg/pp/yr). This is because their diet is much more dependent on milk for calories and protein. However, the Orma also use wood for their houses, with an average size house comprising 1,100 twenty-five kg poles (Ensminger 1984), and for fences for cattle kralls (enclosures for cattle). Agricultural residues represent 32% of biomass extraction, mostly consumed by cattle. 2% (GJ) was also attributed to charcoal consumption.

The process of nomadic pastoralists settling leads to dietary changes and consequent changes in biomass use. As Ensminger (1984) writes :

> 'The area around permanent settlements is fairly quickly overgrazed, livestock produce less milk; formerly the dietary mainstay. These lower production yields necessitate that sedentary households be drawn into the market economy in order to purchase supplemental foodstuffs. It is for these reasons that the processes of sedentarization and involvement in the market economy are so closely linked. This change in diet from milk to cooked grains and tea accounts for a great deal of the increased fuel use by sedentary households.'

A further shift of pastoralists from livestock keeping to farming will lead to increased pressure on forest resources unless alternate fuels are promoted.

Another important flow for the local Orma is food aid, which in 2009 was distributed to 25% of the population of the Garsen district. The Orma receive more food aid than the Pokomo. According to the Red Cross, they distributed over 143 223 MT of cereals, as well as pulses, oils and blends. A high percentage of this must also contribute towards animal feed as the allowance equals 2.5 GJ/pp/yr, which represents almost 70% of an average annual caloric intake of 3.5 GJ/pp.

5.5.3 TARDA

In 2009, TARDA rehabilitated a part of its project destroyed by the El Niño floods with a 400 million KSH economic stimulus program from the government. The project was operated as an "estate system" with all production, harvesting and sales, etc., conducted by TDIP Office, while the community members guarantees weeding, bird and wildlife scaring etc. through casual labour contracts. TARDA planted 550 acres of land to maize under a rainfed system, with the intent to make the transition into rice cultivation. The yield was extremely low, at only 5.6 bags (90kg) per acre (14.4 bags/18.5 GJ/ha). The Tarda production manager attributed this to low rainfall and the wrong seed being delivered. In the current season, yields were triple the previous season. Fertilisers DAP was applied at 100 kg/ha, as well as pesticides. Approximately 400-500 employees were employed monthly, primarily as 'scarers' (dissuading wild animals from eating their crops) during the harvest season,

at a rate of 250 ksh for an 8 hour day (1.9 GBP)9. While the yields were from 2.5 to 4 times the magnitude those achieved by the Pokomo and Orma farmers respectively, the maize grown by Tarda never made it to market. The maize was meant to be delivered to the National Cereals Board but was improperly dried in storage and developed Aflatoxins and had to be discarded. An audit carried out in 2010 regarding the Emergency Food Program points to a long list of mismanagement issues on the part of TARDA such as overpaying for basic machinery. Yields were considerably lower than expected and point to the mismatch between projected productivity and actual productivity in large-scale operations.

5.5.4 Sugar Scenario

To compare biomass distribution among users in the delta, in the current scenario and in the sugar scenario in the TDIP area, we have contrasted the biomass per capita data based on the population in the TDIP area with local HANPP data from global series (available in a 10x10 scale) elaborated by Haberl *et al.* (2007a) to come up with a schema of current biomass use.

Finally, as a conceptual exercise, we have created a scenario of what the land use, biomass production and HANPP will look like if the Mumias sugar project is to go forward. This data is summed up in Tab. 5.1. The global data was cross-checked with other local biomass productivity studies (Glenday 2005) and with survey data from interviews and regional data from local officials.

In the scenario, we consider that the land allotted to Tarda within the TDIP area (4046 ha), minus the land that is currently built-up (124 ha) or forest and woodland (1241 ha), is cleared and turned over to sugarcane. Whereas, currently the Pokomo cultivate 660 ha and the Orma 90 ha in the TDIP10, with over 3058 ha being available for grazing or other land uses, in the scenario, after land use changes, only 382 ha of non-forestland will be available for both communities and wildlife.

Regarding the production and appropriation of biomass in the sugar scenario, assuming the projected yields of 150 tons of cane per ha are achieved,

	Land use (ha)		Biomass Use per user (in '000 tonnes of Dry Matter)		HANPP (%)	
	Current	Sugar scenario	Current	Sugar Scenario	Current	Sugar scenario
Pokomo	606		18,4		7,7	
Orma	90		10,0		4,2	
Tarda	222	3594	2,5	258,8	1,1	72,2
Biomass for other species/ unaccounted for	3058		30,5		12,8	
NPPh	918		61,5	289,1	25,7	80,7
NPP remaining in Ecosystem	4299	382	114,5	69,2	74,3	19,3
Total NPPact/Total land area	5341	5341	238,9	358,316	100,0	100,0

TABLE 5.1: Current and Potential Biomass Production ('000 TDM), Land use and HANPP

this translates to 69 TDM/ha/yr. This leads to increased biomass production, from 154, 000 TDM to 358, 000 TDM - an increase in NPP of above ground (ABG) biomass production of 2.3 times over previous levels, due to inputs, including fertilisers and irrigation.

The current HANPP shows that currently only 26% of biomass is being appropriated. In the sugar scenario, while biomass production increases, over 80% of this is appropriated by TARDA alone, with less than 20% of available biomass remaining for the two communities, other species and left behind as forestland.

Furthermore, this increased hanpp does not account for the increased pressure on forests. The EIA estimates that due to population growth alone, an additional demand of 1 million kg of fuelwood per year will be needed across the entire project area (HVA 2007). This will be considerably more due to the projected influx of settlers. Furthermore, charcoal harvesting will probably increase as the Pokomo seek ways to complement seasonal labour from the plantations. Unless a forestry component is put into place, the result will inevitably be 'development induced desertification spread as concentric rings around the schemes' (Johanssan 1991) and conflict between the traditional population and new migrant workers.12

Calculating the new HANPP distribution between the Pokomo, Orma and other communities in the scenario would be mostly speculative, although it is likely that in fact most villagers would lose their land entirely and become day labourers, and that keeping even half of the livestock would become unfeasible.

Yet, while this scenario is illustrative, It should be kept in mind that the level of analysis covers a relatively small area of only 5,000 ha and what should be done is to calculate the actual and potential biomass distribution across the enitre delta area. The prime floodplain grazing land of the delta is the safety net for pastoralists from the Somali border to Malindi. Given that the area is also being targeted for the establishment of extensive Jatroph biofuel farms by Bedford Biofuels (Canada, 50,000 ha) and G4 Industries (UK, 28,000 ha) that will reduce the grazing land on the terraces surrounding the delta and thus potentially further increase pastoralist pressure on the central wetlands. Still, should these new projects and rehabilitations become operational (even for restricted time periods until government subsidies or donor funds run out again), they will result in increased abstraction of water which will further upset the flooding regime, may reduce the flows necessary to the survival of the riverine forests in the delta and lead to further transformations of the remaining areas and the productivity of the land there, with all consequent social and ecological feedback processes that cannot all be foreseen.

5.6 Analysis

5.6.1 Sustainability and Distribution

The data presented has only hinted at some of the environmental problems such as land and forest degradation at the local scale that may be associated with increased flows of biomass.

While material flow analysis can give a perspective on the productivity and efficiency not encapsulated by purely monetary analyses, here is where some of the limitations of biophysical indicators begin to express themselves. MFA data does not offer an integrated analysis of the local economy :economic, political and cultural elements cannot be expressed in tons of dry matter.

Moreover, biophysical data is not a clear indication of the sustainability of extractive and agricultural flows. The relationship between more biomass and other measures of sustainability/livelihood impacts is not linear. Just as the correlation between species diversity and HANPP is difficult to gauge because HANPP may favour some species at the expense of others, contrasting uses of HANPP will favour some groups at the expense of others.

For example, HANPP does not tell us the relative sustainability of local practices of livestock grazing and charcoal burning. While local reliance on traditional breeds is considered relatively unproductive and large herds are viewed as the result of the pastoralists' 'irrational' attachment to their animals rather than economic gain, this is not always the case. For example, a study of the Borana system in Ethiopia found it very productive compared with Australian commercial ranches; the Borana produced nearly four times as much protein and six times as much food energy per hectare. Their major concern was not the number of cows owned but the number of people supported by the rangeland (Cossins 1984).

Moreover, the effect of grazing grassland productivity and grazed ecosystems is generally not well understood. Studies show that grazing may both enhance ('compensatory growth') or reduce productivity ('degradation') (Haberl *et al.* 2010). Flows demonstrating the proportion of annual primary production available to livestock and the proportion actually consumed, combined with tolerance levels of different plant communities to exploitation, are called for to understand the impacts of pastoral land uses.

Although commercial charcoal production on public lands has been illegal in Kenya since 1986 as an effort against deforestation, enforcing this ban is difficult in a country where 85% of the population depends on charcoal, and in 2002 the government estimated that 2.4 million tonnes were consumed countrywide. Here different environmental narratives between the state and local users can be heard. According to local charcoalmakers, the trees they burn were cut by Tarda when they cleared land and being too big to be collected, would otherwise rot in situ. While decried as wasteful, the EROEI of charcoal seems favourable when compared to that of biofuels. While 60% of the original energy is lost in the conversion process from wood to charcoal, the resulting fuel has twice the energy of the parent material, is less polluting and is more convenient to use and cheap to transport. By contrast, for electrical

generation from fossil fuel, up to 75% of the energy may be lost in production and distribution.

Finally, HANPP data tells us nothing directly about water availability, the primary limiting resource in the delta. Further research should complement biomass accounts with virtual water export calculations, as the land grab is concurrently a water grab13. Despite the fact that in the current debates about the impact of foreign investment in agricultural land,the consideration of water has been peripheral. A recent review of land deal contracts by Cotula (2011) observes that land leases in semi-arid countries would be worthless if they did not ensure access to sufficient water, and while the report by the World Bank (2010) explicitly states that its estimates of farmland 'available' for investment are based on suitability for rainfed production alone, it appears evident that investors will look for irrigable land. The specific ways in which water underpins land productivity in the semi-arid and sub-humid African savannahs needs to be better understood, particularly due to the impacts upon existing local water resource users.

5.6.2 Complementaries

The flow of energy and the cycle of nutrients in the delta demonstrates how the balance between different land uses is a crucial element of the maintenance of socio-environmental stability (Cusso *et al.* 2006, Hamerlynck *et al.* 2010) and how interactions between multiple uses of nature contribute to increased productivity. As a means of insuring against the constant threat of drought, famine, epidemics and stock-raids, the communities developed inter-and intra-communal and external linkages.

Pastoral land use practices (adoption of cultivation, abandonment of nomadism, permanent settlement, landscape fragmentation) affect the distribution and diversity and viability of nutrients, vegetation, biodiversity and landscapes in ecosystems. Backflows into the system such as manure create nutrient cycles that improve biodiversity. Farmers also benefit through increased soil fertility that is distributed during the annual flooding and that contributes to the high productivity of floodplain agriculture.

In the delta, human-wildlife relationships are antagonistic at times and mutually beneficial at others. Farmers spend a significant amount of time in the field as 'scarers', preventing primarily baboons by day and buffaloes at night, from eating their crops. Wildlife also injure and kill many livestock (HVA 2007). Villagers are sometimes paid off for these damages by the KWS- a type of Payment for Environmental Services.

Meanwhile, the picturesque town of Moa has an oxbow lake that supports 300 (Luo) fishermen, largely due to nutrient flows from wildlife, such as :

> hippos...that have a significant effect on aquatic nutrient concentrations in that they feed on terrestrial vegetation at night and defecate in the water, which can figure some 1000 kg/ha/year of dung. The transformation of plant material into mineral rich cow dung in its turn favours next year's aquatic plants and fish production.'

-(Marchand 1987)

MEFA can track the cycles of residues and wastes that are not apparent in typical financial accounting. This includes nutrient cycling, such as the dung of hippos and crop wastes that are sown back into the soil. Such an analysis cautions that while the development of cellulosic technologies will permit using crop residues, removal of such 'waste' residues from the field must be balanced against impacting the environment (soil erosion), maintaining soil organic matter levels, and preserving or enhancing productivity (Wilhelm *et al.* 2004).

Some articles have explored the relationship between NPP and biodiversity (Haberl *et al.* 2007b). The species-energy hypothesis (Wright 1983) states that the number of species is positively related to the flow of energy in an ecosystem, although a direct correlation has not been firmly established. However a certain level of NPP can be considered a necessary, but not sufficient condition for the maintenance of certain types of biodiversity. Then as the HANPP increases, biodiversity will decline, leading Vitousek *et al.* (1986) to propose HANPP as an indicator of pressure on biodiversity. Yet the diversity of the biomass itself is of course equally important, particularly

for species that are as picky in their diets as are the Red Colobus Monkeys, which eat only very select leaves. While the Colobus do not consume human food, they are an edge species, preferring forest edges over mature forests. Similarly, the semi-terrestrial Tana Mangabey are well adapted to a landscape mosaic with alternating fields, forests and bush (Hamerlynck 2010). According to a recent study, one of the biggest causes of human-wildlife conflict between primates and humans is the encroachment of the invasive species Mathenge (Prosopis juliflora), a shrub that has taken over large swathes of the delta since it was introduced as a fuel-wood crop under the Bura scheme (Johanssan 1991). It has now become a serious pest in the entire delta, causing significant damage to livestock as well.

5.6.3 Alliances and resistances

Pastoralists are particularly vulnerable to sugar cane and bio-fuel development and the possible growth of the bio-economy. This is because they occupy both the marginal and 'waste lands' that are being targeted by crops such as jatropha, as well as the irrigable dry season grazing areas favoured for sugarcane plantations; two crops that imply vastly different labour and social organisations and impacts. Governments are also seizing this opportunity to encourage more intensive cattle-raising with imported breeds, simultaneously achieving goals of settling nomadic communities dependent on grazing (Scott 1998) and at the same time increasing the presence of the state in frontier regions (Kajwanga 2003). As a result, in many places, pastoralism is under threat of losing significant land areas to other forms of resource use, which are perceived by governments to be more productive.

One of the lasting impacts of projects in the Tana Delta has been the creation of deep resentment in the local communities against development/-conservation projects and their implementing agencies such as TARDA and KWS (Hamerlynck *et al.* 2010), with the TRPR case representative of the often opposing positions of conservationists and local communities in Africa.

Historically, conservationist groups have been critical of overgrazing and overstocking of cattle by pastoralists. The antagonism between pastoral communities and environmentalists can also be attributed to the fact that in East Africa, wildlife conservation has robbed pastoralists of a significant part of

their traditional range. This is because pastoralist survival strategies create ecosystems well suited to grazer ecology and because herders didn't subdivide the savannas (Homewood and Rogers 1991). As a result, pastoralists are now surviving on a small fraction of their traditional grazing areas, and are highly critical of attempts by conservation interests to claim the remaining pastures for wildlife preservation (Cooke 2007). But in the current situation we are beginning to see strategic alliances arising. In the fight against the sugar company, environmentalists and pastoralists have entered into a temporary marriage of convenience. Here we see the combination of two streams of environmentalism aligning to mutual benefit :the cult of wilderness with the environmentalism of the poor (Guha and Martinez-Alier 1997).

Nature Kenya is the Kenyan branch of the East African Natural History Society and the oldest conservation organisation in Africa. Their conservation programmes aim to promote sound management and sustainable utilisation of natural resources at important biodiversity sites. Its activities in defence of the Delta so far include submitting statements and comments to various Environmental Impact Assessment reports and surveys; commissioning a cost-benefit study that focuses on the environmental values of the delta; the production of an advocacy film, Is Tana Sugar Really Sweet?; and advocating for a conservation and development master plan developed by the government in consultation with local people and all interested parties to safeguard local livelihoods and wildlife, while permitting sustainable development projects in designated areas. There is also a proposal to protect the delta under the Ramsar convention. Alliances have been formed with several local communities that are in danger of being evicted in order to mount a court case.

Economic pressures in the delta mean the Orma are also engaging in a range of other strategies, including developing market linkages with women entrepreneurs trading livestock products such as milk and 'labania' cheese. Pastoralists are marking off corridors to save from land grabbers- in essence 'grabbing' the corridors for themselves as a grazing/land protection strategy (Nunow 2010).

5.6.4 Global Implications

The world's total NPP is 172 x 109 dry tonnes/year (Openshaw 2010). Of this total, only a fraction is extracted (20-40 %, depending on the methodology) (Imhoff *et al.* 2004, Vitousek *et al.* 1986, Haberl *et al.* 2007a) and only 7% of used biomass extraction is traded. From 1962 to 2000, global aggregate exports of biomass grew by a factor of 4.7, crops by a factor of 3.9, animal products by a factor of 2.8 and wood and forest products by a factor of 7.8 (FAO 2005). The rate of increase since 2000 has been even faster. This growing spatial disconnect between the site of production and consumption inevitably leads to a process whereby local land use and local human needs decrease in importance as determinants of land use decisions (Erb *et al.* 2009).

However, if we want to use HANPP as an indicator of environmental space, similar to the ecological footprint in the context of biomass trade, one must also consider the upstream flows generated by imported products. This concept has been called embodied hanpp or eHanpp. For example, Haberl at al (2010) estimate that one litre of biodiesel requires the appropriation of 7 tonnes of eHANPP.

Once we consider embodied HANPP (eHanpp), international net transfers become more significant, amounting to 1.7 PgC/year or 12% of global HANPP (Erb *et al.* 2009). Most of this does not cross borders, but is due to upstream processes of traded commodities. Of this, 88% is supplied by low-density countries with an average population density of 14 inhabitants per km2, including both industrialised and developing countries, while 75% of the international net flow of embodied HANPP is consumed in high-density countries with an average population density of 161 km218. Currently, biomass flows are dominated by only a few participant countries, with many economies existing at subsistence level and not trading. The transfers are characterised by exports from sparsely populated regions and imports from dense countries. Interestingly, development status does not seem to play a role in this dynamic. For example, among the top HANPP importing countries, including Japan, South Korea, China, Saudi-Arabia and Egypt, we see both high and low-income countries that have been connected with land purchases. The primary exporters remain the Neo-European countries such as the United States, Australia, Canada and Argentina (Erb *et al.* 2009).

5.7 Conclusion

The acquisition of land by foreign land users, either through land leases or land purchases, is leading to the creation of new geographies of investment, production and consumption and the displacement of environmental burdens. This spatial displacement has been denoted 'tele-connections', defined as 'the correlation between specific planetary processes in one region of the world to distant and seemingly unconnected regions elsewhere' (Erb at al. 2009).

This chapter has employed an analysis of biomass production and distribution to approach the question of whether massive quantities of biomass can be harvested sustainably without eroding and degrading soils, destroying biodiversity, increasing food insecurity and disrupting the livelihoods of marginalised peoples. Some possible insights we will explore in this section include: the relative (un)sustainability of the current land uses and potential future land conversion and issues of distribution; benefits and complementarities of current multiple land use systems; and strategic alliances that may develop in opposition to and as a result of increased agricultural intensification.

In the Tana Delta today the biomass appropriated by humans remains largely in the area except for the charcoal sold to traders and some meat exports and cash crops, such as mangoes and bananas. In a sugar economy, biomass production would increase, the proportion appropriated by humans would increase even more, the Orma and the Pokomo would be dispossessed, less biomass would be available for the local 'wild' biodiversity, and a much larger proportion of the NPP would be exported as sugar or ethanol or even as electricity from bagasse. Many of the internal social conflicts can and should be interpreted with help from the methods for the study of social metabolism, bridging the divide between ecology and political economy in a (relatively) new political ecology.

The new bio-economy, and particularly the new sugar economy, foresees highly increased production of biomass-yet more productivity does not mean more for everyone among the human species and across species. The reassignation of rights to biological productivity and the incorporation of farmers and pastoralists into new agrarian structures transforms not only social

relations and accumulation strategies, but also reproduces nature with profound impacts on ecosystem energetics and corresponding livelihood strategies. This chapter has focused on changes on biomass production and use in the Tana delta as an enquiry into the question of biomass for whom, and at what environmental cost.

The World Bank Land Grabbing report (2010) classes much of Sub-Saharan African under a 'suitable land available, high yield gap' typology, arguing that cultivation in these areas could be massively intensified. According to the report moreover, more than half of the land area that could potentially be used for expansion of cultivated area is in ten countries, of which five are in Africa. The report does not indicate whether the projects it tracks are in fact to be under rain-fed or irrigated farming. Under the WB logic, closing the yield gap through transfer of land to more 'efficient users' (efficiency being measured in economic terms, disregarding the EROI), is the answer to the scramble for biomass resources. This chapter has attempted to delve into some of the impacts on human livelihoods and biodiversity conservation at a local scale that such transfers will entail.

Moreover, this chapter calls into question the barometer of 'productivity' as defined by the WB study and similar studies-based on monoculture and simplified energy-material relationships rather than on multi-use relations with complex feedback processes and complementarities. The concept of yield gap denies that existing land use may well be the most productive, equitable and sustainable, and that increased yields and intensification come at the cost of externalities and decreased energy-efficiency. The provisioning ecosystem services of increased productivity (food fibre and fuel provisioning for the global market) come at the expense of other environmental services not valued by the market that benefit local communities (Costanza *et al.* 1997, Hamerlynck 2010). Furthermore, grand schemes to transform the African Bush into bountiful Edens consistently ignore the embarrassing failures of past experiences.

Further research into the distributional impacts of changes in the distribution of biomass at local and global scales that land grabbing will lead to is called for. This chapter has first analysed the 'old' conflicts between agricultural and pastoralists in the Tana delta in terms of appropriation of

biomass for subsistence and other purposes. It has then traced possible scenarios of sugar cane production aimed at external markets, resulting in increased biomass production (because of irrigation and fertilisers) and also increased human appropriation of such biomass. Behind the statistics of social metabolism there are local groups of people. And there are also new social alliances such as those in the making between conservationists and pastoralists, between the cult of wilderness and the environmentalism of the poor.

The chapter aims to contribute to work on local social metabolism analysis in the context of land grabbing leading to increased biomass production. What is needed are further analyses combining biophysical, economic, political-ecological, cultural, and geographical theories of land use that can elucidate trade-offs between local human subsistence needs, biomass availability for other species, carbon sequestration, bio-energy/production and biodiversity and trade-offs between productive and other, priced and non-priced eco-system services transferred spatially through biomass trade (Haberl *et al.* 2010).

Chapter 6

Grabbing-back the Land: resistance to land-deals, failed projects and global activism

Keywords: Trans-national Advocacy, Land Grabbing, Flex-Crops, Biomass, Financial Activism, Information Politics, Identity, Pastoralism, Repression

6.1 Introduction

The villagers of Mukaya Payam, a community of some 30,000 people in South Sudan, only found out three years after the ink had dried on the contract that their land had been sold out from under them, leased to an American company for a period of 49 years, further extendable to 100 (Simon Wudu 2011).

According to the US-based Oakland Institute, it was actually one of their briefs that tipped the community off. In it, they exposed the Nile Trading Development, Inc. (NTD) land deal, and made thecontractavailable on the Institute's website. The deal, the biggest in the country at 60,000 ha, also included unencumbered rights to exploit all natural resources in the leased land (Oakland Institute 2011a). The lease is for a cooperative venture with 60% of profits for NTD, and 40% for the Mukaya Payam Cooperative. The odd

thing is that the Mukaya Payam Cooperative is a fictitious entity that never existed; and the deal was signed by influential elites claiming to represent the community. Furthermore, the stated lease area exceeds the county's own boundaries. By the time the ruse was discovered, NTD had already subleased the land three times through three separate (but affiliated) companies.

Once aware of the deal, the community mobilized against it, launching a joint protest in July 2011, and publicly rejecting the lease. In early August, Payam Parliamentarians, Payam Chiefs, and local government officials traveled to Juba to voice their concerns to the state governor and the President of the Republic of South Sudan, where they stated their disavowal of the lease agreement penned 3 years earlier. Uniquely, the government appeared to side with the community, rather than the company, although there has been no proof that officials have publicly terminated the lease agreement.

The story of Muyak Payam (Tab. 6.1 Case 12), despite its apparent happy-ever-after ending, raises some troubling questions- How did that project succeed in being stopped? What was the actual the role of the Oakland Institute (OI) report? And what would have happened if OI hadn't intervened? How many other Muyak Payams are there that we have no record of?

This paper attempts to grapple with some of the unexplored questions around resistance to the global "land grab" through an analysis of the multi-scale politics taking place, to examine the contextual and strategic factors that can help explain differences in resistance outcomes to contribute to answering the questions: when, why and how have social movements managed to stop or slow down unwanted land deals?

6.1.1 Background

Landgrabbing is not a new phenomenon, and the current land rush bears eery similarities to the scramble for Africa at the time of the Berlin Conference of 1885. That scramble was fueled by oil palm, sugar plantations and rubber, led by European metropolitan traders and financiers (Hobsbawn 1987, Alden-Wily 2012) and facilitated by new fuel source coal-fired steamboats. What is new perhaps is the rate, speed and intensity of the dispossessions, their overlap with global crises of food, energy, finance, climate, biodiversity

loss and geopolitical shifts away from traditional colonial centers of power (McMichael 2012, Margulis *et al.* 2013).

In 1911, Rudolf Diesel predicted that vegetable oils for engine fuel (like groundnuts from Senegal) could become as important as fossil fuels. One hundred years later, the current manifestation of the land-rush is being driven by the emergence of a global food/fuel complex, changing consumption and population patterns, as well as by both symptoms of and responses to, the intertwined energy, climate, financial, food and biodiversity crises (GRAIN 2008). Some expressions of these include the deepening financialization of the global food system; the growing importance of the bio-economy and "flex-crops"; and the entry of new players in biomass trade leading to a new more poly-centric world order (Margulis *et al.* 2013).

These elements are leading to changes in international governance around agriculture and the global food regime (McMichael 2012), transforming the terms of engagement for civil society groups (CSOs) involved in land and agrarian issues, creating both new opportunity spaces and new challenges. Against the background of such changes, this paper examines how associated movements and organizations have been contesting land-grabs across scales, with the aim of exploring how contentious action can successfully reverse or slow down the expansion of corporate enclosures.

After a conceptual and methodological discussion, the second section of this paper examines the dynamics of political contention against "landgrabbing" at the trans-national level, using GRAIN as a specific example. I examine how this organization and other Trans-national Advocacy/Agrarian Networks (TANs) are challenging the development trajectory promoted by more powerful actors through activism around land-grabbing, and show the the achievements and limitations of their campaigning in terms of framing land-grabbing and opening political and procedural space.

While some advances in commitments within a right-based framework at supra-national governance levels have been made, enforcing such rights on the ground remains very much a result of the material conditions, power relations and political processes in specific countries and contexts. To this end, in the third section, I turn to a comparative analysis of on the ground mobilizations, responding to calls for greater scrutiny of political resistance from

below to land-grab deals (Borras and Franco 2013) and for more rigorous scrutiny of failed projects (Edelman *et al.* 2013). I undertake comparative analysis of 17 cases where contestation has led to project suspension or cancellation, discussing the valuation languages deployed, the factors for success in resistance tactics and possible convergences, alliances and frictions between actors. Section 5 concludes with some insights on what these experiences mean for political praxis and strategy.

6.1.2 Methodology

This research is based on extensive participant observation with GRAIN, WRM and other TANs as part of the EJOLT project, drawing on their "activist knowledge", as well as an exhaustive literature review of grey and academic literature, two field trips to the Tana Delta (in 2008 and in 2010), and numerous interviews and discussions with activists from GRAIN, Nature Kenya, other organizations and affected communities. The overview of cases relies on the EJatlas, www.ejatlas.org, a global database of ecological conflicts (described in Chapter 7). This paper is thus written from a position of engagement and solidarity, yet following Edelman (2009) also attempting to probe some of the weaknesses, dilemmas and challenges that can contribute to improved strategizing.

This chapter employs a political-ecological perspective linked with social movement theory (SMT) to analyze the political dynamics surrounding material and discursive struggles against the land rush. We bring to the fore how discourses, identities, coalitions, action-forms and strategies are deployed against asymmetries of power, resource distribution and risk. This chapter also draws on theories of political opportunity structures as well as Keck and Sikkink's (1999) work on how advocacy groups engaged in trans-national mobilizations move from access, to presence, to influence, by framing issues to causing behavior changes in target actors.

Researchers are generally more interested in examining processes over the evaluation of outcomes. There are multiple reasons for this, chief of which is the difficulty of establishing causal relationships between movement activity and specific outcomes (Giugni 1999). Further complicating the task is the range of impacts that can be analyzed. Beyond concrete substantive gains,

impacts can include procedural changes in the policy process, as well as political and cultural changes in society at large. Such spillover effects, as well as internal changes and evolution within the movements themselves are all elements of successful outcomes (Tilly 1978, Tarrow 2005). Finally, along with sensitizing, procedural and substantive impacts we should also consider structural impacts of contentious actions (Giugni 1998).

There is evidence that current large-scale leasing is "triggering heightened awareness and demand around majority rural land rights, aided by greater popular empowerment and challenges to undemocratic or unjust political norms"(Alden-Wily 2011). While many rigorous studies have recently examined conflicts and contestations over land deals in specific contexts, focussing on differentiation among communities (Burnod *et al.*), trans-national governance (Margulis *et al.* 2013), gender issues (Martiniello 2013) and how communities are either opposing, mobilizing for improved incorporation or acquiescing to intensifying land-based agrarian change (JPS 2012 passim), until the present, not much comparative work has been done across locations.

To fill this gap in the research, here we apply a comparative mutlti-scale method of analysis - a statistical political ecology (Temper *et al.*, forthcoming) - that allows us to tease out some general patterns of such resistance, as well as to understand relations between actors across scales and interlinked financial, commodity and governance chains. The aim is to explore the role of civil society organizations in preventing land deals and the determinants for successful outcomes.

6.2 Land Grabbing: Focus on Biomass Conflicts

I will not delve into the task of precisely defining the contested term 'land-grabbing' here, although a key discussion point of this paper is on its political power as a mobilizing frame despite (or because) of the difficulty in defining the precise contours of the phenomenon. For the purposes of this chapter we examine cases that entail land acquistions by large-scale producers and/or speculators for crop/agro-forestry/CDM projects that have entailed some form of extra-economic force and have led to either human rights abuses,

violations of established user or legal rights or have been considered to be counter the public interest, and have led to local (or national) contestations to the projects. All the cases examined date from 2007 onwards and in the majority of the cases the "land grabbing" frame has been applied as a discursive device or mobilizing frame by some actors.

While some authors (Zoomers 2012, ILC, Borras *et al.* 2012), have argued for a broader definition of land-grabbing to include acquisitions for tourism, mines, SEZs, dams, etc. In this essay, we exclude conflicts over access to and control over land for non-biomass projects, despite these also being agrarian conflicts. This is because we consider that land-grabbing and the rise of what has been termed "flex crops and commodities" (flexible uses across industrial feed, fuel, feed, wood and paper pulp complexes) (Borras *et al.* 2013) needs to be viewed as part of an accelerating transformation of global biomass metabolism and related production, trade and consumption patterns over the past 10-20 years. Key driving forces here include the economic growth in Asia along with the "meatification" of the diet of the emerging middle class there (Weis 2013), as well as responses to climate change that have led to a revaluation of land-based carbon (biomass) for fuels as well as for (carbon) conservation. These transitions are leading to substantial changes in the extraction and provision of natural resources at the global scale including biomass. Biomass includes timber, paper pulp, fishmeal and other fish products, agricultural products for food or feed. We leave fisheries conflicts aside in this paper.

The exponential increase in demand for biomass is leading to intensification of activity in regions already exporting significant amounts to the global market, such as some countries of South-East Asia and Latin America (Erb *et al.* 2009). But we are also seeing the entry of new players: countries engaged in or targeted by land-grabbing that have previously not participated in global biomass trade at a significant scale. This includes both some importers, for example developing high-density population countries, including China and India, accounting for nearly one third of the world's population, who were previously self-sufficient but are now rapidly increasing biomass imports; as well as new exporters, including Sub-Saharan African and some Asian countries, who had not as of yet been integrated into biomass trade (ibid). Given the scale of these transformations, evidence-based analysis of

how land access conflicts and social resistance over the expansion of the agricultural frontier will play out is urgent.

We refer in the following sections to three strategies that contentious groups employ to achieve their objectives: discursive or symbolic strategies, political and institutional strategies, and economic and financial strategies.

6.3 Trans-national Activism against Land-Grabs: GRAIN's articulation

6.3.1 Discursive Strategies: Framing debates and getting issues on the agenda

GRAIN is a small international non-profit organization, we would call it an EJO (environmental justice organization), present in all continents with a main base in Barcelona that "works to support small farmers and social movements in their struggles for community-controlled and biodiversity-based food systems through independent research and analysis, building alliances and networking at local, regional and international levels." This small EJO had a role in debates on agricultural biopiracy and peasant rights to seeds in the 1980s and is credited as the first organisation that in 2008 drew the world's attention to rapidly increasing investment in farmland with their report Seized! The 2008 Landgrab for Food Financial Security, where they situated the new global land grab as part of the conjuncture of the economic, climate and ecological crisis linking it to the industrialisation and financialisation of the food and farming system.

The role GRAIN played at this point responded to a "diagnostic purpose" falling under what Benford and Snow (2000 p623) refer to as "frame articulation: the process of connecting and aligning events so that they create a new angle, vantage point, or interpretation." The narrative they constructed resonated with the public and captured important political space. By situating the phenomenon at the intersection of multiple crises and environmental justice issues it has also facilitated "frame extension", which opens the potential for broad alliances. Activist coalitions on the issue have quickly coalesced

into a "thematic advocacy alliance" (Borras *et al.* 2008) making use of networks around the intersection of climate and food issues, indigenous peoples rights, and agrarian justice.

The politically loaded term "land-grabbing" has proven extremely hard to shake off, despite attempts by actors such as the World Bank to rename the phenomenon in an effort to neutralize the debate through terms such as "land acquisitions" (Deininger *et al.* 2011). Further, information compiled by GRAIN (a database of 100 and then 400 documented land deals) has been picked up by other organizations, in particular the Land Matrix International Land Coalition (ILC) (Anseeuw *et al.* 2012), the World Bank (Deininger *et al.* 2011), as well as by academics, local groups and by the media.

Framing is most successful in advocacy when it follows a set of rules: "identify an injustice, attribute the responsibility for it to others, and propose solutions to it" (Tarrow 1998). In transnational advocacy the story must resonate across places and cultures and speak to universal values and interests. GRAIN's framing focused on how a new form of extra-territorial control was leading to a new type of neo-colonialism. Yet this "simplification" also served to de-emphasize the role of domestic capital and obscured the role of continuities from the past such as elite capture and corruption.

For example, the "meta-narrative" created by GRAIN, does not hold up to scrutiny when examined across all locations. While GRAIN's study highlighted the role of various Middle Eastern countries; such as Qatar, Kuwait and the United Arab Emirates; who were buying land in Cambodia to produce food (particularly rice) for export to assure their own food security; according to Baird (2014) the picture on the ground in Cambodia was more complex. He argues that it was Cambodian elites who were playing the key role in land acquisitions, in collaboration with regional and global capital, and that land prices in Ratanakiri, and Cambodia more generally, actually collapsed in 2008, and that land grabbing was already occurring in the 1990s driven by Asian money laundering.

Some scholars, in a critical-but-comradely fashion, have furthermore questioned the usefulness of databases and the creation of "killer facts" that can be harvested from data such as GRAIN's (Edelman 2013, Oya 2013). While such critiques provide salutary warnings for nitpicking academic scholars (such as

the authors and many of the readers of the present paper), GRAIN's strategy has been extremely successful when viewed through the lens of the organization's own social movement objectives and their stated aim to "identify and expose developments in global agribusiness" (GRAIN 2013).

6.3.2 Political Strategies: Governance and Procedural Change

Following the food crisis, food and agriculture has climbed back onto the agenda of global governance processes, implicating organizations ranging from the UN Food and Agriculture (FAO) Organization, the Committee on Food Security (CFS), to the World Bank, the G8 and G20 summits, the European commission (through biofuels and land policy) and the African Union (Margulis *et al.*. 2013).

Borras, Franco and Wang (2013) have grouped engagement with such governance processes into three competing tendencies: "regulate to facilitate land grabs" (the position adopted by the World Bank and the G8 governments that hold that proper governance, clear property rights and free markets can create a win-win situation), regulate to mitigate negative impacts and maximize opportunities for mutual gain (the position adopted by the ILC and some NGOs such as Oxfam that view the land rush as inevitable and are tactically trying to take advantage of renewed interest in rural development, while honing in on localities where "best practices" are not being adhered to), and thirdly, regulate and roll-back (represented by groups such as Via Campesina and GRAIN), who take an anti-capitalist stance and propose a vision of an alternative food system based on food sovereignty.

This third (and most radical) tendency is unsurprisingly the weakest as far as mobilizing resources. Yet despite this, considerable gains have been made with rural social movements being recognized for representing their interests through process such as the CFS and recently in the Voluntary Guidelines process, that has also been lauded for its human righs-based approach (McKeon 2013). However, engagement, inclusion and access in these processes come at a price for TANs.

For its part, GRAIN's non-participation in the process is due firstly to the acknowledgment of the drain on time and human resources that participation

entails, based on years of experiences with FAO negotations on seed rights and other issues. But they also define it as a strategic decision based on an assessment of where the real power lies - "FAO processes are not a factor at the national or local level. Bilateral trade agreements , regional treaties such as COMASA, global corporate agricultural investors and their institutional supporters such as the Bill and Melinda Gates Foundation's Alliance for a Green Revolution in Africa (AGRA). These are where the real decisions are made." (personal interview)

GRAIN's non-participation could also be seen as representative of long-standing "inside-outside" strategies. "Insiders" engage with institutionalized participation processes in an effort to influence them. Outsiders put pressure on these and other processes through mobilization, in an effort to amplify the voices of dynamic social movements on the outside to help create the space for innovative policy ideas on the inside (Bond 2008).

Yet, this does not preclude alliances and "sandwich strategies" with the second tendency, as Borras and Franco (2010b) suggest. In fact, Oxfam is one of GRAIN's primary funders. And GRAIN considers that through exposure and granting access to Oxfam to communities on the ground, they have not only increased visibility of those cases, but are also contributing to "radicalizing" Oxfam itself (personal interview).

The premises behind a Code of Conduct, as well as the solutions promised, have been questioned by both GRAIN (2013): "you wouldn't regulate slavery so why regulate land-grabs" as well as by scholars (Borras and Franco 2010b). Yet how the tenure guidelines will be interpreted on the ground is still an arena for contested interpretations. As Li (2011) points out, the rights-based approach is still limited to naming and shaming, enforcing them is "the result of hardfought struggles that settle the matter on the terrain of politics, where social groups with different interests confront each other" (Li 2011). Many countries have neither the legal nor procedural mechanisms in place to protect such rights even if they were enshrined through "soft law". While in countries where national laws such as land ceilings on foreign investment are in place, they have often proven ineffective (Mora ND).

For these reasons, the following sections examines other avenues of potential regulation or mechanisms that contentious actors are deploying to

"roll-back" landgrabs, including financial activism, regulatory structures at the local level, the targeting of specific corporate actors, and direct action and disruption.

6.3.3 Economic Strategies: Regulation and Divestment

As the distance from farm to plate grows along global commodity chains, and increased speculation on food and other "soft" commodities is further repackaged into complex investment vehicles such as futures and derivatives; it becomes harder and harder to pin-point the precise impact of each investment and to identify the actors involved. This process, termed "distancing" by Clapp (2014) complicates the task of disentangling the growing role of financial investors, including banks, financial services firms, and large-scale institutional investors in the food system (McMichael 2013), and has created distinct new challenges for TANs hoping to "follow the money".

For example, to unravel the financial story behind one company - Sen-Huile Senanthonal (Tab. 6.1 Case 11) - took GRAIN and partner organizations six months of research, the need to hire profesional investigators and pay bribes for infomation. Despite this, questions about the ultimate ownership of the project remain unanswered. Another report tracking Dutch involvement in potential "land-grabs" concluded that while direct Dutch involvement was limited, indirect involvement in the sense of credit to and investment in companies was substantial and that investors and lenders were only dimly aware of this dimension of their operations.

In 2009 GRAIN published, "The New Farm Owners", that looked deeper into the webs of financialization behind the deals. In 2011, another report specifically on the role of pension funds in such projects explained why they are a clear target: "Pension funds are supposed to be working for workers, helping to keep their retirement savings safe... For this reason alone, there should be a level of public or other accountability involved when it comes to investment strategies and decisions. Pension funds may be one of the few classes of land grabbers that people can pull the plug on, by sheer virtue of the fact that it is their money. This makes pension funds a particularly important target for action by social movements, labour groups and citizens' organisations" (GRAIN 2011).

Soon after, a Friends of the Earth Europe (FoE) report, analysed the activities of 29 European financial institutions, showing how they were all involved in the direct or indirect financing of landgrabbing. The report estimated that by 2017 institutional investors would increase their agricultural investment portfolios by 500 percent. In response, several fund managers, including BNP Paribas, Amundi and Lyxor in France, and Germany's Commerzbank and DZBank, closed or overhauled exposure to agricultural products with "soft-commodity[1]" exposure. Barclays announced it was quitting speculative trading in grains and soft commodities for "reputational reasons". As of 2013, 11 European banks had pulled out of financial investment in agricultural commodities. Yet, at the same time, there has been some backtracking with Deutsche Bank reversing its stance (Clapp 2014).

In the US, a campaign targeting the California teachers' retirement system led to the decision to invest no more than $150 million in commodities, rather than an original planned $2.5 Billion (GRAIN 2011). Vanderbilt University also withdrew its $26 million investment in EMVest, following an Oakland Institute (2011b) report on its activities in Mozambique, later publicized in TheGuardian(UK). Nevertheless, GRAIN's divestment call had less impact than desired, with labor unions, employee-benefits planning bodies and pension managers failing to fully embrace the campaign. Surely the opacity of investment streams has a role in this.

At the European scale, groups such as FoE have targeted theMarkets in Financial Instruments Directive II, demanding that MiFID "take into consideration the rights of people and countries to food sovereignty" (FoE 2012) and include disclosure and incentives for financial market participants to integrate sustainability criteria in their risk assessment. The new act, enacted in January 2014, places limits on the number of contracts on agricultural commodities that banks and other finance companies can hold and was hailed as a partial victory. Yet how the directive will be implemented is still open, as limits will be set at national rather than community levels. Because trade and investment law tends to be incorporated and applied more evenly in national laws than international human rights law (Edelman *et al.* 2013);

[1] Tropical agricultural commodities such as coffee, cocoa, cotton, grains, oilseeds, orange juice, and sugar.

depending on how they are adopted these limits may have a greater impact on rolling back land deals than the "soft law" approach outlined above.

6.4 Successful Grassroots Mobilizations

Table 1 presents 17 cases of mobilizations against land deals that led to either (temporary) suspension or cancellation of the project.

The question of why some communities mobilize and others do not and how they pick their strategies and tactics, will be shaped by terms of incorporation into the project, as well as the history, politics, economics and culture of the region. Beyond, these local responses are differentiated between and among communities and different actors that have their own long-standing conflicts and tensions, overlapping land and resource claims and political and class differences.

Local mobilizations assemble diverse groups of actors, who form temporary coalitions that have been able to command a response from government or corporate actors using a varied repertoire of legal, political and direct action tactics. Grievances are expressed employing a range of valuation languages, not always mutually exclusive, including environmental costs in money terms, conservation and ecological values, livelihood needs, indigenous rights protected by conventions such as ILO 169, international human rights, sacredness of particular territories, nationalism against foreign companies, and still others. Resistance will be enabled due to intersecting socio-political and bio-physical factors.These include factors such as the organization of the planned project (eg: estate model v. contract farming), labour demand per unit of area and the seasonality of work depending on the crop, etc. and current land ownership patterns. For example Gerber (2011) argues that smallholders have both the reasons and some of the economic resources to resist land-grabbing that the landless sharecropper or plantation worker lack. This points to a link between the agrarian question in its initial sense (the persistence of the peasantry against enclosures, displacement and capitalist proletarization) and resistance to the modern land-grabs. Contrary to accepted wisdom, Alden-Wily (2011) argues that "the existence of formally

recognized property rights can actually speed up land acquisition, whereas competing and multiple claims can create a platform for resistance."

Forms of action will also be shaped by the physical properties of the natural resources themselves. For example, in protests against tree plantations, it is a common action to pull out the trees (Gerber 2011); in conservation "green grabbing" conflicts, tactics often entail "everyday resistance" such as continuing previous livelihood activities. Jatropha may elicit less fierce community opposition than sugarcane because it allows for intercropping, can be compatible with grazing, is less water intensive than sugar and other biofuels, although its claim to thrive without irrigation has been mostly discredited (Ariza *et al.* 2010).

Finally, outcomes and response on the part of the state or corporate actors will also be conditioned on such contextual factors. "When the land is needed but the labour is not" (Li 2011), there may be less need to obtain active consent, making repressive reactions more feasible (Gerber 2011).

Table 6.1: Suspended and Cancelled Land Deals

			TYPE OF CONVERSION		CONCESSION SIZE (HA)/ MODEL	EJOS (TRANS-NATIONAL, NATIONAL, LOCAL)	MOBILIZING GROUP (ELITE ALLIES)	CURRENT STATUS/RELEVANT LEGISLATION
NAME OF CONTACT			From	To				
1. Mumias-Tarda, in Tana River Delta, Kenya	Domestic & State	Foreign (Italy)	Farmland, grazing & Forest	Flex-crop (sugar for food & ethanol domestic market)	30,000/Estate with out-grower component	Biofilia International (UK), Royal Society for the Protection of the Birds (RSPB) Nature Kenya (NK), East African Wildlife Society (EAWLS), Kenya Wildlife Service	Farmers, Fishermen, pastoralists, scientists/professionals, conservationists	Court decision, violence. Ramsar convention
2. Kenya Jatropha Energy Ltd, Nuwe Initiative Industriali SRL, Dakatcha, Kenya	Foreign (Italy)	Mangrove Forest	Biofuels (jatropha)	Biofuels (jatropha)	50,000	Action Aid (AA), Arocha International, BL RSPB, Arocha Kenya, NK, EAWLS, Site Support Group for the Dakatcha Woodlands	Farmers, Fishermen, pastoralists, scientists/professionals, conservationists	Court decision, Court refused license
3. G4 Oil seed farming project in Tana River Delta, Kenya	Foreign (UK)	Grasslands	Biofuels (oilseeds)	Biofuels (oilseeds)	20,000/Estate	BL RSPB, NK, EAWLS, KWS	Farmers, Fishermen, pastoralists, scientists/professionals, conservationists	Company pulled out RE Directive Ramsar convention
4. Bedford Biofuels Jatropha, in Tana Delta, Kenya	Foreign (Canada)	Pasture-lands (ranches), wildlife corridor	Biofuels (jatropha)	Biofuels (jatropha)	10,000 (planted out of 160,000 concession)	BL RSPB, AA, Peoples Solidarity, Nature Canada, NK, EAWLS, KWS, Lower Tana Delta Conservation Trust	Farmers, Fishermen, pastoralists, scientists/professionals, conservationists	Cease-trade order investors pulled out
5. SEKAB/ Eco-energy Tanzania (Sekab)	Foreign (Sweden)	Forest and Farmland (transformed)	Flex-crop (sugar for food & ethanol domestic market)	Flex-crop (sugar for food & ethanol domestic market)	200,000/Non-contiguous mono-crop outgrower component	Swedewatch, WSWF Sweden, Action Aid	Farmers, pastoralists	Withdrawal of investment, change of company, suspended, RE Directive
6. Biodiesel Kilwa Jatropha Project, in Tanzania Dutch investment bank Kempen & Co & Electo Energie BV	Foreign (Netherlands)	Village lands & tropical Forest	Biofuels (jatropha for export)	Biofuels (jatropha for export)	34,000 acquired out of total 81,000 concession	WWF, Resource Extraction Monitoring UK (REM), FOEI, Groenlinks & Livable Amsterdam, Land Rights Research and Resources Institute, Independent Monitor of Forest Law Enforcement and Governance in Tanzania, Tanzania Forest Conservation Group, Tanzania Bio-energy Forum	Farmers, Local government/political parties	Withdrawal of investment, filed bankruptcy (2010), potential new investors RE Directive
7. New Forests Company, Uganda	Foreign (UK)	Forest and Cropland	Tree plantations (pine & eucalyptus) & CDM		27,000	Oxfam, Uganda Land Alliance, Ugandan Joint Christian Council	Farmers, Indigenous groups	Suspended, restarted operations following CAO-IFC arbitration

8. Sugarcane plantation in Mabira Forest Reserve, Uganda	Domestic	Forest	Flex-crop [sugar]	14, 600/Estate	*Uganda Land Alliance, Anti-Corruption Coalition of Uganda [ACCU], National Association of Professional Environmentalists (NAPE), Greenwatch, the Advocates Coalition for Development and the Environment (ACODE), The Environmental Action Network (TEAN),* Environmental Conservation Effort, East African Bicycle Organization	Indigenous groups, citizens *Local government(s)/political parties, scientists/professionals, Religious groups, conservationists, National Environment Management Agency, the National Forestry Authority, King of Buganda, Govt. of Norway, EU, World Bank*	Cancelled by govt., deaths, repression, criminalization of activists
9. Al Tamimi Khaled Dousse (Bin Taleb Group), Niger	Foreign (Saudi Arabia)	Farmland	Irrigated food Crops	15,922	*Rural Code officer*	Farmers ., *Local government(s)/political parties,*	Cancelled by Govt. **Rural Code**
10. Biofuel Africa Ltd., Northern Region, Ghana	Foreign (Norway)	Grazing and farmland	Jatropha	38, 000	**RSPB,** *Action-aid Ghana, RAINS, African Biodiversity Network, GAWU*	Farmers, Indigenous groups, Pastoralists, conservationists	Suspended Company filed for bankruptcy following
11. Sen Huile Sen Ethanol Biofuels, Tempieri Group, Senegal	Foreign (Italy) & Domestic	Forest	Flex-crop (palm-oil)	20,000	**GRAIN, Recommon,** *Bidew Bou Bess (Senegalese rap group), National Council for Rural Cooperation, National Research Foundation, CICODEV,* Enda Pronat	Farmers , Indigenous groups or traditional communities, Women	Cancelled by govt. moved to new location, violence, deaths
12. Nile Delta Trading Company in Mukya Payam community, South Sudan	Foreign (US) & local elites	Multiple land uses	Crops, biofuels, forestry, CDM [Possibly mines and oil]	600,000	**Oakland Institute, Oxfam**	Farmers, *Mukaya Diaspora in Juba*	Cancelled by govt.
13. Daewoo Maize and Biofuel Project, Madagascar	Foreign (South Korea)	Farmland and Forest	Food, flex and Biofuels for export	1.3 m	***Collectif por la defense des Terres Malgaches TANY (Diaspora group based in France)***	Farmers, Landless peasants , pastoralists, *military, govt., conservationists*	Cancelled by new govt. (replaced by smaller deals)
14. ProCana Sugar Plantation, In Limpopo, Mozambique	Foreign (UK)	Forest [Limpopo National Park]	Irrigated Flex-crop [sugar]	Mono-crop with 10,000 ha outgrower scheme. Processing	***National Organization of Mozambican peasants, JA (Justiça Ambiental), Limpopo National Park Campooneses), Centro Terra Viva***	Farmers, Indigenous groups or traditional communities, Landless peasants, Pastoralists , *conservationists, Limpopo National Park workers*	Cancelled by govt.
15. Herakles Palm oil plantation, South-West Cameroon	Foreign (US)	Grazing and farmland	Food crops, agrofuels & forestry	73,086	**Oakland Institute, Greenpeace International, GRAIN, Save Wildlife Foundation, Corpwatch,** *Centre for Environment and Development (CED), Research de Lutte Contre La Faim,* Struggle to Economize Future Environment [SEFE]	Farmers, Indigenous groups, *Local government(s)/political, Local scientists/professionals*	Temporarily suspended after court decision, restarted, Repression. Criminalization of activists.
16. Heilongjian Beidahuang, Rio Negro, Argentina	Foreign (China)	Farmland and Forest	Irrigated crops for export [wheat, corn, vineyards, feed & wood]	320,000/subcontracting	*Greenpeace Argentina, San Javier Cooperative, Foro de Agricultura Familiar, Grupo de Reflexion Rural (GRR), Grupo Soberania Alimentaria del Foro Permanente por una Vida Digna,* Asociacion Ecologista Piuke de Bariloche, Asamblea de Organizaciones y vecin@s movilizados por la soberania Alimentaria Region del Alto Valee, Rio Negro	Farmers, indigenous groups, *Local government/political parties, Universidad Nacional de Comahue, Catholic Church, Universidad de La Plata*	**Stopped** by the High Court of Rio Negro **ILO 169**
17. Ecoamerica, San Martin, Peru	Foreign (South Korea)	Multiple land types	Crops, Forestry, Livestock [export]	72,000	**WRM,** La Federacilon Indigena del Pueblo Shawi de San Martin	Indigenous groups or traditional communities	Suspended, court case **ILO 169**

6.4.1 Discursive Strategies: Counter-EIAs, Memes and Identity

6.4.1.1 Information Politics

Information politics is the ability to quickly and credibly generate politically usable information and move it to where it will have the most impact (Keck Sikkink 1999).

The first step in confronting injustice is to present the "facts" of the matter, often backed up by scientific research. Almost all of the cases studied began with the publishing of the contracts so the terms could be examined, such as in Mukaya Payam (Tab 6.1, case 12); as well as the production of detailed reports or "counter EIAs" that contested and clearly delineated the rights abrogated, examined the contracts and documented visible and potential environmental, social and economic impacts. A WWF study (2009) disclosed that the EIA of the Bioshape project (Tab 6.1, Case 6) in Tanzania had failed to mention that the concession falls within the Namateule/Namatimbili Forest biodiversity reserve that houses seven threatened vertebrate species. Bioshape was exposed for expecting to earn up to $6.7 million in profits from logging valuable miombo hardwood timber to partly subsidise its biofuel project (Valentino 2011). The High Conservation Value (HCV) Resource Network (2012) similarly debunked the Herakles Farm assessment for the Roundtable on Sustainable Palm Oil standards (RSPO), forcing Herakles Farms to withdraw its RSPO membership in August 2012 (RSPO 2012, Chatterjee 2012, Tab 6.1, Case 15).

A somewhat newer strategy was economic valuation studies, adopted by the Royal Society for the Protection of Birds (RSPB) and allied groups contesting both the Mumias project in Kenya (Mireri *et al.* 2008, Tab. 6.1 Case 1) and the Mabira Project in Uganda (Tab. 6.1 Case 8). Both studies demonstrated that the economic value of the ecosystem services exceeded that of the potential project.

Not less convincingly, a report by two Cameroonian NGOs, the Centre for Environment and Development (CED) and Reseau de Lutte contre la Faim (RELUFA) calculated that the government of Cameroon could generate 13 times more employment and significantly larger tax revenue than the Herakles

project (Tab. 6.1 Case 15) if it were to require local bread-makers to use 20 percent locally produced flour (derived from sweet potatoes, corn or cassava), using just 15,000 hectares of land.

Such technical arguments, through the presentation of "objective" economic or scientific data, tend to be effective precisely because of their "apolitical nature" allowing environmental activists to "disguise" themselves as technical apolitical experts, to their advantage (Peluso *et al.* 2008). While The Economist magazine responded favourably to the economic valuation of the Tana Delta (Anonymous, 2009), current NGO enchantment with ecosystem valuation can be a "double-edged sword" as it may "crowd out" other valuation languages (Rodriguez-Labajos & Martinez-Alier 2013). Further, establishing many risks scientifically is difficult, and giving economic values to them is not easier, which means such strategies can be vulnerable to criticism and manipulation (Temper and Martinez-Alier 2013).

6.4.1.2 Symbolic Politics

Symbolic politics is the ability to call upon symbols, actions and stories that make sense of a situation by appealing to diverse audiences. This is where the use of "missile" concepts and memes become relevant, as well as discourses over sacredness, biofuels, jatropha as a miracle crop, water scarcity, indigenous and pastoralist identities, and indeed the imagery of the "land-grab" itself.

How different actors deploy such concepts can lead to 'friction' (Tsingd 2005) between transnational and local groups. While local actors focus more on the legal and political rights of affected communities or identity politics, a common line of attack from Northern and particularly European activists has been a greater emphasis on biofuels and on the carbon balance, transforming the framing of the issue in a way that resonates with Northern audiences. For example, WWF Sweden calculated that the releases from one district alone of the wooded mangroves in the Rufiji delta in Tanzania would equal 4 to 20 years of greenhouse gas emissions from road transport in an attempt to discredit Swedish biofuels policy and claims of "carbon neutrality" (Ness *et al.* 2010, Tab. 6.1 Case 5).

On the other hand, Boamah (2011) writing on the Ghana case (Tab. 6.1 Case 10) refers to the anti-biofuel discourse as a "populist" one based on a false "food-versus-fuel" dichotomy and accuses both national and transnational environmental groups such as Action-Aid, of ruining opportunities for employment creation and income generation in economically deprived rural areas through the use of crisis narratives and visual images of lands stripped naked and stories of chiefs who signed away their lands "by thumbprint". The campaign peaked with the issue of an order from Ghana's EPA for the suspension of the project (ibid). According to him, projects attacked for growing biofuels are now growing food for export on the same appropriated land (Boamah 2014).

While Borras, Franco and Wang (2013) argue that the biofuel framing needs to be re-assessed given the emergence of the flex-crop phenomenon, we see that at the local level, the biofuels framing can still have mobilizing potential; a Nature Kenya campaign attacking EU biofuels policy asked "Why 'feed' a car in Europe when hunger at home is still a reality?" despite the fact that the planned Mumias project stated aim was sugar for food, with ethanol production planned only from bagasse (Agencies 2011).

6.4.1.3 Identity Politics

Identity politics can be considered a form of symbolic politics that draw upon particular collective identities at particular moments to confer legitimacy, appeal to a broader base of support, and shape justice claims (Fraser 2003). Such identifications can be fluid and multiple and run along racial, ethnic, occupational, gender and other lines. In contrast to scientific technical arguments, identity politics appeal to the lived experiences, shared values and common knowledge of people.

Indigenous communities impacted by projects will often invoke territorial rights, and in some countries appeals are made to the right to previous consultation under Convention 169 of ILO. When a Korean company, ECOAMERICA, applied for the registration and titling of more than 72,000 hectares of land registered by two Shawi and one Kechwa communities in the Amazon of Peru (Tab. 6.1 Case 17) the communities demanded recognition of the sacred character of their ancestral land that was being sold for 80 cents a hectare

"without understanding the significance of the spiritual life of nature, of the trees, of the animals that the Shawi indigenous people protect"(WRM 2011).

While the indigenous movement is perhaps the most successful example of global identity-based activism, an ascendant mobile pastoralist identity is also gaining discursive and material ground as "custodians of the commons"(Upton 2014). In the past, pastoralist land practices were portrayed as environmentally destructive and they were particularly prone to land loss through conservation-based exclusion (Neumann 2002). Yet new scientific knowledge is recasting the impact of pastoralism on drylands as policy fashions turn towards devolution in resource management and a growing recognition of the efficacy of communal tenure (Upton 2014).

Pastoralists are attempting to exploit these shifts to gain recognition at the international level. At the same time, the increase in land pressure for agriculture has contributed to a softening of the traditional antagonism between pastoralists and conservationists: an alliance between two streams of environmentalism, the cult of wilderness and the environmentalism of the poor (Guha and Martinez-Alier 1997) to mutual benefit. This "marriage of convenience" was evident in the ProCana case (Tab. 6.1 Case 14), when the Limpopo National Park (LNP) and local residents became "unlikely bedfellows". Initial ambivalence due to overlapping land claims soon turned to discussions whereby LNP staff helped prepare leaders and host villages to confront ProCana and set up commissions to spearhead actions against the company (Milgroom, 2013).

Because pastoralism and wildlife both have first-order conflicts (fundamental incompatibility) with intensive agriculture, while they only have second-order conflicts (some constraints to compatibility) with each other (Aveling *et al.* 1997), we will likely see a strengthening of this alliance as they strategize towards restricting the conversion of lands from pastoral to agricultural uses, and a subsequent move away from "coercive conservation policies" (Peluso 1993) towards more of an environmental justice and human rights framing.

This coalition was also evident in Tana Delta (Tab. 6.1 Cases 1, 3, 4), with the local Pokomo farmers more receptive to the sugar-cane projects, demanding however terms of incorporation as titled smallholders rather than an estate system as planned; while the Orma and Wardei pastoralists were

vehemently opposed. Previous attempts at land titling in the year 2000 based on individual ownership had clashed with demands for collective access to land for use as pasture, hunting and gathering from Orma, leading to heavy clashes (Temper 2012a, 2012b). Recent renewed investment attention in the Delta resparked these tensions. In 2012, violence flared up again, also politically motivated, with ethnic clashes leaving over 50 people and hundreds of cattle dead (GRAIN *et al.* 2014).

The Mabira case (Tab. 6.1 Case 8), stemming originally from 2007 but revived several times since, provides another example of how identity can be used as a mobilizing tool, yet in this case with disturbing undercurrents of racial violence and discrimination. The decision of the Ugandan government to degazette and clear 7,100 ha, one-quarter of the Mabira Forest - the largest nature reserve in Central Uganda - and give the land to the Ugandan-Indian led Sugar Corporation of Uganda Ltd (SCOUL), led to an unprecedented mobilization uniting a broad coalition of actors. Yet behind what has been called "one of Africa's first grassroots modern ecological protest campaigns"(Child 2009), the agitation was partly fuelled by opposition to what was viewed as increasing domination of the country's economic assets by Indian-controlled companies (Honig 2014). When a demonstration of about 1,000 people againt Mabira turned violent after police fired live bullets into the crowd, a Ugandan-Indian was beat to the death by a frenzied crowd. These cases show how the emotional content of discursive and identity politics can drive activism but can also fuel divisive politics. Such tensions can then be exacerbated for political gain, leading to further entrenchment of ethnic violence and fragmentation.

6.4.2 Political Strategies: Elite Alliances, Government Cleavages and the Courts

Tarrow (1998) has identified four political opportunities that lead to successful mobilizations: access to power, shifting alignments, availability of influential elites, and cleavages within and among elites.

Land grabbing can occur with environmental objectives such as the setting aside of land for biodiversity conservation or so-called "green grabbing". But

commercial land acquisition also presents a major threat to conservation objectives. Thus we see that the involvement of environmentalist organizations and discourses over biodiversity in 13 out of the 17 cases surveyed, signaling a potential for alliances between an often influential conservation movement and agrarian justice movements. What could be less political than birds? Yet, "birders" tend to be extremely influential, as evidenced by the involvement of RSPB in the suspension of three projects in the Tana Delta and one in Uganda (Tab. 6.1 Cases 1, 3, 4 and 8), all important areas for birdlife. In the Tana case, Nature Kenya was able to position itself as the "spokesperson" for the Deltaic communities in dealings with the government and the courts. We see how his led to the privileging of certain positions over others, as can be evidenced by a somewhat comedic headline in the Kenyan Star that reads "Tana Villagers Oppose Sugar Project over Bird Concerns"(Gari 2011).

The church was active in both the Rio Negro case in Argentina and the Mabira case in Uganda (Tab. 6.1 Cases 16 and 8). In Mabira, perhaps the most influence came from unexpected quarters, when the World Bank united with popular forces by threatening to withdraw its $360 million dollar loan to finance the Bujagali Hydro-Electric Dam on the lower Victoria Nile if the forest was not preserved (Child 2009).

The state, rather than being viewed as a monolithic structure or simply as an agent of capital, should also be seen as a complex web of multiple and overlapping legal frameworks, institutional priorities, and a diversity of institutions and agencies with their own contending interests. Cleavages among organs of the state, whether at different scalar levels from the local to the national, or between the judiciary and the executive branch provide powerful opportunities for enforcement.

For example, in Niger (Tab. 6.1 Case 9), the Permanent Secretary for the Rural Land Code was able to enforce rights accorded under the code to intervene on behalf of local communities and legally stop the project. The successful campaigns and legal actions by Nature Kenya in the Tana River Delta (Tab. 6.1 Cases 1-4) were enabled by the political and legal "opportunity space" afforded by the new constitution, signed in 2010 that enshrined some rights to the environment. The first lawsuit succeeded in getting a court injunction that halted progress on the TDIP project from July 2008 to July 2009 but was eventually dismissed for technical reasons. In 2010,

they brought another case, and shifted to a human rights argument, based on Kenya's new constitution, that succeeded in halting all planned projects in the region until a comprehensive master-plan for land-use, development, livelihoods and ecological protection of the Delta could be carried out in consultation with all stakeholders. In Rio Negro, a wide coalition of environmental organizations, citizens, and government officials legally opposed the Project, filing for protection against the Rio Negro Executive branch. The Provincial Court of Justice upheld the appeal, nullifying the project on the grounds that it would endanger uses of the soil, water resources and the port and that it thus infringed Rio Negro Provincial Constitutional Laws (Mora ND).

6.4.3 Economic Strategies: the Corporate Boomerang Effect and Viability

Companies are often more legally bound to distant shareholders than they are to local stakeholders. Appealing to investors, often in conjunction with calling them to task to previous commitments can be a successful leverage tactic through what has been termed a "corporate boomerang" pattern (McAteer and Pulver 2009). Activism in the land-grabber's domestic country was key in at least six of the cases whereby in 5 cases we see how pressure in the home country contributed to either investors or the company suspending or abandoning the projects (G4, SEKAB, Bedford, Bioshape, NFC).

European companies were particularly vulnerable to such pressure, potentially because they also have to meet sustainability and operational standards set by the Renewable Energy Directive (RED). SEKAB for example was involved in the promotion of certification processes for biofuels globally, a fact deployed in campaigns from SWEDWATCH and WWF-Sweden that led to the company's downfall in Tanzania (Tab. 6.1 Case 5). SEKAB was furthermore 70% municipally owned company and thus directly accountable to Swedish taxpayers and local stakeholders.

NFC announced that the suspension of planting had "resulted from the negative publicity caused by an Oxfam report released in September which attacked the eviction of illegal squatters by the Ugandan government from NFC's plantations." (DeMan 2012, Grainger and Geary 2011).

Certain types of investors are more vulnerable to leverage tactics than others. Development finance institutions; agri-food companies with high visibility and strong brands; pension funds and other funds with high public visibility; and bio-fuel companies delivering to regulated markets are under greater public scrutiny. In contrast, large international raw material traders/processors, sovereign wealth funds, private equity funds and listed land aggregators, and individual investors are less vulnerable to pressure (De Man 2013).

The cases we study here also further support the view that as of yet TANs have not been able to engage with companies from the BRICs and MICs. Integrating actors from these countries as campaign targets is urgent due to the polycentric nature of the current land-grabs (Margulis *et al.* 2013). Yet while, India and Brazil have strong agrarian movements (Rowden 2011), only small steps towards building such South-South alliances and increasing capacity of local activists have been made. A first step was a conference organized by the Oakland Institute and the Indian Social Action Forum, Kalpavriksh, and PEACE in Feb 2013 that brought together Ethiopian and Indian land rights experts to discuss land grabbing and how the actions of Indian land investors in Ethiopia resonate with the undemocratic land acquisitions within India itself (Oakland Institute 2013).

It is probable however that the majority of projects that fail are not due to contestations, but rather to unrealistic expectations, bad management, and underestimating the complexity of unfamiliar legal, political and environmental contexts (Davidson 2013). Procana claimed it could produce four times as much ethanol per hectare as any other sugar producer in Mozambique (Tab. 6.1 Case 14). It raised $13 mn from investors, hoping to borrow the remaining $500 million (Hanlon, 2011), and soon had its license revoked by the government. G4 industries withdrew willingly from the project when confronted with higher transaction costs and outside pressure. In Ethiopia, the government projected in 2008 that within five years, commercial farmers would be producing food on about 900,000 hectares of land. While 400,000 ha have been given to the private sector, as of 2013, only about 10,000 hectares of land had been developed, with the 350$ million Karaturi Project and the Saudi Star Project only the most spectacular of these failures.

Boche and Anseeuw (2013) found a 63% failure rate for projects in four Mozambican provinces, during different phases of implementation and operation; with an even higher failure rate (77%) for biofuel projects. In Madagascar, more than half of the agro-fuel projects documented by WWF were in some state of suspended production or had been halted altogether (Neimark 2013).

6.4.4 Coercive Strategies: Disruption, Repression and Reversals

When milder forms of protest prove ineffective, groups will increase the contentiousness of their actions. A central debate in social movement theory is whether "disruptive or violent" actions lead to more successful campaign outcomes. Here Sharp's (1973) distinction between nonviolent protests that are mainly symbolic (e.g., demonstrations) from nonviolent actions that impose sanctions on the target (e.g., strikes, sit-ins, blockades, and civil disobedience) and violent forms of mobilization (such as arson) is also useful. Governments respond to challengers with toleration, concessions, repression or usually a combination of these.

Protest is effective in forcing concessions because it de-legitimizes existing policies and imposes costs on power-holders while state repression against non-violence carries a heavy risk of outrage and "backlash" as well as declining domestic and international support. Yet Tarrow (1998) argues that conventional actions are too easily ignored while violence divides potential supporters and generates strong repression. Thus, according to many theorists, the intermediate form of contention, non-violent disruption (strikes, blockades) is the strongest weapon of social movements and most likely to lead to concessions (Gamson 1990). State response to challengers will also be shaped by current geo-political realities, including level of dependence on foreign aid and investment that can increase the costs of repression (Franklin 2009); as well as strategic considerations. Granting concessions is likely to encourage future challenges by increasing potential challengers' estimate of the likelihood of success.

Mass protests were documented in four of the cases under study. In Uganda, as mentioned previously, three people died, and the leaders of the-Save Mabira Crusade were arrested. Museveni canceled the project, however, he tried to revive it again in 2009 and 2011 (Child 2009, Honig 2014).

In Fanaye, Senegal (Tab. 6.1 Case 11), an affected pastoralist attacked a Senethanol worker who was cutting trees down without a clearance. Following this, a violent confrontation broke out during a meeting of the rural council leaving two people were killed and over 20 wounded. The Prime Minister eventually cancelled the project. However, after Macky Sall entered office in March 2012, a new site was announced for the project in the special wildlife preserve of Ndiael in the Senegal River Delta. Following mass outrage, this was later reduced from 20 to 10 thousand ha, yet locals claim this still encroaches on pasturelands and oppose it. A protest in November 2012 was dispersed with tear gas (Koopman 2012). This case demonstrates how powerful domestic elite actors allied with the state can motivate even seemingly progressive governments to use repressive actions to quell dissent.

In response to mobilizations againt the Herakles Project in Cameroon (Tab. 6.1 Case 15), the state responded with a mixture of concessions (temporarily halting the Project), and repression. For example, judicial harassment continues against Nasako Besingi, from the EJO Struggle to Economize Future Environment (SEFE), who is being tried for "publication of false news via internet", after he lodged a complaint after being attacked by a group of men he identified as junior managers of HeraklesFarms. Apparently his complaint has now "disappeared from registers". Besingi isalso being prosecuted, along with five of his colleagues,for organising "anundeclared public meeting" when their office was raided by police while distributing anti-Herakles T-shirts to locals (World Organisation Against Torture 2014).

Madagascar represented the first case of successful social resistance against contemporary landgrabs when a mass uprising led to the installation of a new government that promptly cancelled many of the deals. Yet, after France and the U.S., and donors such as the World Bank and IMF, cut off investment and foreign aid, the new government found itself bankrupt. In response, it turned to new trading partners such as China, inking new deals for agricultural, industrial and mining development, and exporting valuable hard-woods such as rosewood and ebony and precious gems and minerals as quick sources

of foreign exchange (Neimark 2013, Schuurman and Lowery 2009, Douguet 2014).

It is known that for point resources, such as mines or fossil fuels, success in stopping a project is provisional. The copper or the oil is still there underground. While biomass projects are more mobile, we also see that many deals do not simply fail, they often re-emerge in other configurations. Success thus is always temporal.

6.5 Conclusion

The land-grabbing frame, despite its simplifications, has contributed to pushing land issues back onto the global agenda, and has provided a "master-frame" that many groups around the world fighting against dispossession are using to mobilize local and trans-nationally. The frame has been further extended to include other struggles against dispossession and enclosures, including water-grabbing, green-grabbing, meat-grabbing and so on. While there is the fear that the land-grabbing frame can become overly broad and lose power, this paper has shown how it has helped created trans-national coalitions, it has sometimes helped precipitate local resistances, it has fostered information sharing and exerted leverage across different levels of governance.

Local movements against land-grabbing have achieved the most success when they have been able to unite broad coalitions of groups with complex and multidimensional agendas, combining issues around development, social and agrarian justice, indigenous rights, livelihood and environmental protection, depending on their perceived interests. Where identity politics (such as claims to indigeneity) and environmental justice intersect with nature conservation, the strongest resistance has been mounted. The role of trans-national advocacy groups, such as in the Muyaka Payam case, where it seems that the OI report precipitated the local resistance, has been shown to be significant. As has been the role of conservationist groups at the national and trans-national scales.

We have seen that projects are suspended or stopped by governments: following 1) popular pressure and the airing of grievances, 2) due to non-performance; and 3) following a court ruling or intervention from another organ of government. When politically advantageous, governments will push land deals through, resorting to repression if necessary.

Other projects are stopped because the company either pulls out due to lack of investment related to pressure tactics from campaigns or to poor performance/increased costs. Activism against companies tends to be most successful when it impacts upon proit or future proit (often related to reputation with specific audiences), scaring investment and increasing risk for investors.

We have also seen how discursive practices and opposing positions within "local communities" can fuel ethnic conflict and violence at the local level.

Some questions that bear further scrutiny include why communities fail to protest despite adverse incorporation. How diverse business models are differentially received and whether certain crops, for example food for export or agrofuels, lead to greater contention, the role of scale in terms of project area in these contestations, and how the source of investment (foreign v. domestic v. state or a combination thereof) conditions the political opportunities and effectiveness of resistance.

A statistical political ecology such as that made possible by the EJOLT Atlas (www.ejatlas.org) and other inventories of conflicts can help elucidate such questions through systematic evidence-based comparative analysis. This paper is a preliminary exercise in such a method, however future research analyzing both conflictive projects and non-conflictive projects with a larger sample will yield further insights. At the same time, such research can put back the ecology in political ecology through the integration of GIS data such as HANPP, aridity, population density, soil data into the analysis, as well as biomass flows and consumption data, currently available at state levels.

There is a need, expressed by GRAIN itself, for monitoring and tracking the progress of land deals and for updated information. There is a huge academic literature yet as of yet, no systematic way to use this information to track progress on land deals. The Land Matrix, housed by the ILC, is useful but problematic due to reasons outlined by McKeon (2013). To further

support the strengthening of the food sovereignty master frame as a counter-hegemonic narrative, successful stories of real alternatives that have been proven to function in practice are also needed. Tracking and exposing the relatively high failure rate of biomass land-grabbing projects (in the face of local difficulties, violent repression of activists, excessive transaction costs and community opposition) will contribute to understanding the complexities of the drive for land grabbing projects and possibly to delegitimize them further. Alternatives are often born from resistance.

While the stated short-term objective of GRAIN and similar TANs is to bring landgrabbing "into the public eye", the long-term aim is a structural transformation of the global food system. Gauging progress towards this is not less difficult than counting failed projects. How a potential resurgent agrarian resistance will frame its campaigns; and on what terms local groups will mobilize for agrarian justice, environmental and social justice still remains very much in the process of unfolding.

Chapter 7

Mapping the Frontiers and Frontlines of Environmental Justice: The EJatlas

Keywords: Maps, Commodity Chains, Activist Knowledge, Social Metabolism, Environmental Justice, Ecologically Unequal Trade

7.1 Introduction

Engaged independent researchers have been warning about rising levels of violence against environmental activists, totalling hundreds of killings in the last years. In 2012 there were 147 reported death cases, or almost three per week (Global Witness 2012). A severe shortage of information makes it impossible to know the full scale of the phenomenon. Yet such cases represent only the tip of the iceberg of conflicts and protests over the extraction of natural resources, rights over carbon sinks, transport infrastructures, etc. happening across the world.

Recent Environmental Justice (EJ) scholarship has focused on how contemporary capitalism is reconfiguring the geographies of environmental justice[1](Sikor and Newell 2014). Yet this has only gone partway in responding to long-standing critiques from geographers that consider EJ literature as

[1]See for example the Special in Geoforum recently edited by Sikor and Newell (2014)

theoretically weak and dispersed (Holifield *et al.* 2009). For example, Swyngedouw and Heynen (2003) charge that the EJ focus on local case studies does not lend itself to generalization. Further, they contend that only analyzing dynamics at local scales risks overlooking crucial processes and relations generating environmental inequalities at broader regional, national, and global scales.

Clearly, these new terrains of conflict and resistance call for a deeper systematic evidence-based enquiry into the politics, power relations and socio-metabolic processes surrounding environmental justice struggles. It is to this end that a large-scale research initiative was created: to help explain the constituents and determinants of resource extraction and waste disposal conflicts in the world, and see whether and how engaged research can contribute to turning them into a strong force for social and environmental equity and democratization of decision-making. This article offers to the scientific community an explanation of the origins and motivation of that project, and in particular, of a tool created to systematise information about environmental justice conflicts: the Global Atlas of Environmental Justice.

In the following sections, I offer an outline of its theoretical framing, rooted in activist knowledge, the methodology and outcomes of the mapping process and a reflection on how this initiative is contributing to a paradigmatic shift in the landscape of EJ research. The final section presents the conclusions.

7.2 Background

7.2.1 The emerging global environmental justice framework

The Environmental Justice movement was born in the 1980s among Black and Latino communities in the US. It was later theorized, first by sociologist Robert Bullard (1990), largely in relation to concerns about the unequal distribution of social and environmental costs between different human groups according to distinctions of class, race/ethnicity, gender, age, and location (Bryant and Mohai 1992). EJ issues were often portrayed as a matter of socio-spatial distribution of "bads" (emissions, toxins) and "goods" (parks,

green spaces, services) and called attention to the link between pollution, race and poverty (Bullard 1993).

Over time, the view of EJ has broadened beyond the distribution of environmental hazards, first by activists and then by academics (Martinez-Alier *et al.* 2014), extending the concept materially, spatially and politically (Walker 2009a; Walker 2009b; Schlosberg 2013, Bullard 2005). It has expanded to include multi-dimensional and interlinked aspects of justice related to distribution, recognition and participation (Schlosberg 2007).

The globalizing of EJ (Schlosberg 2004) has occurred horizontally; for instance, the US EJ movement inspired similar claims in Brazil (Acselrad 2010) and South Africa and Scotland (Dunion and Scandrett 2003). It has also occurred vertically, to encompass concerns beyond national borders, such as trade agreements, transfers of wastes, climate change and the Rights of Nature (Walker 2009, Schlosberg 2013). Trans-national EJ issues such as trade in toxic waste has been explored by Clapp (1994) and Pellow (2007); debates on climate change and climate justice by (Chatterton, Featherstone, and Routledge 2013) and Agarwal and Narain (1991), while the notion of an "ecological debt" from North to South, born in Latin America in 1991 (Robleto and Marcelo 1992), has now been further developed by authors such as Goeminne and Paredis *et al.* (2010; Rice 2009; Roberts and Parks 2009).

Further, the breadth of issues and contestations has moved beyond routine trans-national issues, highlighting how "environmental inequality is a global phenomenon routinely generated by the normal workings of international political economy"(Szasz and Meuser 1997). This in turn demands greater attention to the link between trade and environmental degradation and a "richer, multi-dimensional understanding of the different ways in which environmental justice and space are co-constituted" (Walker 2009a). As Robbins (2012) correctly points out, a mine, a dam, a road in the forest are not isolated objects but connected sites where value flows, where accumulation occurs and injustices expand. A trade perspective makes visible the spatial fractures (disjunctures) between the sites of consumption and production of environmental bads and goods through their localized effects (Giljum and Einsmenger 2004, Muradian *et al.* 2010). Mapping the interconnected sites of injustice and patterns of exploitation along these chains allows a deeper

analysis of how power produces and benefits from prevailing distributions of risk; and highlights the relational nature of risk (Robbins 2014).

Meanwhile the politics of EJ have taken on a trans-national and trans-disciplinary character (Sikor and Newell 2014, Routlegde 2003), as a dialogue between action or activist researchers and a growing network of activists, scholars, and non-governmental organizations that form part of what has been termed a new "global brand of environmental justice" (Agyeman 2014). This assemblage offers an opportunity for the innovative approaches to research and engagement that some EJ schoars have called for (Sikor and Newell 2014).

7.2.2 Activist-led research, an epistemological need in EJ studies

"Environmental justice" is both a social movement and a research subject. EJ was from the start a community-led science: data gathering was carried out by the communities themselves, as a form of citizen science and popular epidemiology; citizens have monitored the places where they "live, work and play" and tracked public environmental health (Brown 1987). For example, the pattern of illness in the famous Love Canal case was discovered by Lois Gibbs with the help of local "situated knowledge" (Haraway 1988) about the underground stream beds or swales that ran through the area, when she discovered that the illnesses clustered along the swales (Gibbs 1982, Couch and Kroll-Smith 2000).

Many researchers in EJ studies engage with communities through processes of Participatory Action and Collaborative Research (Bacon *et al.* 2013). Yet while such forms of engagement attempt to more actively include communities in the process of knowledge production, social movements often remain as objects of study, rather than be recognized as producers of knowledge in their own right (Casas-Cortet al. 2008).

In contrast, in discussions related to socio-environmental conflicts, activists participate on equal terms with experts from the public administrations, universities or companies. In this respect, Martinez-Alier *et al.* (2014) demonstrate how concepts in political ecology are grassroots concepts, from 'biopiracy', to 'climate justice'. Activist work contributes to theory that in

turn is further used and enhanced by academics and by civil society groups. EJ can thus be considered a field of social praxis which draws from and integrates theory and practice in a mutually informing dialogue (Sze and London 2008).

In this light, the concept of activist knowledge, Escobar (2008) argues that social movements are important spaces of knowledge production and that movements are not only enacting politics through protest and cultural contestation, but are generating diverse types of knowledge. This destabilizes the boundary between activist and academic (or other expert) domains, calling for new forms of science production (Casas-Cortet al. 2008). This type of science raises the possibility for collaboration between environmentalists and scientists, developing 'science with the people' rather than for the people, especially in those fields characterized by "irreducible uncertainties and ethical complexities" (Conde 2014, Funtowicz and Ravetz 1994).

There are several reasons for the new global EJ framework to maintain a tight connection with such an engaged model of science. First, environmental problems are complex, interdisciplinary, and sometimes new, having been created by new technologies, industries and new forms of social metabolism (Ravetz and Funtowicz 1991). This leads to uncertainties and inevitable ignorance. For this reason, an important stream of research in EJ studies, led by scholars in Science and Technology Studies, focuses on the contestations between expert ''scientific'' environmental knowledge and local or indigenous knowledge, highlighting how the development and application of scientific knowledge is inherently a political process that expresses and exercises power (Jasanoff 2004a) in the service of particular social, economic or political ends (Vandergeest and Peluso 2011, Nadasdy 2011).

In debates over technology, and in situations of uncertainty, scientific knowledge is wielded by different actors in contestations over the nature of legitimate environmental knowledge. EJ struggles are often about one version of "knowing nature" that is imposed while other forms of knowledge are discounted or erased (Goldman *et al.* 2011). EJ activists aim to make issues of risk and the uncertainties of knowledge explicit and in the process to remove the legitimacy of specialists in defining, in isolation, the parameters of the problem and the arguments most relevant to decision-making (Firpo-Porto de Souza 2012). This manifests as a distrust not of science itself but

as a critique to the privileging of expert and technocratic perspectives over local experience without questioning the objectivity and neutrality of science . This can be summed up with the intertwined questions of "Whose knowledge?" and "Knowledge for whom?" (Haraway 1988, Escobar 1998, de Souza Santos 2007) In socio-environmental conflicts, no expertise can claim any monopoly on what is true, as the knowledge on these issues are based on a "plurality of legitimate perspectives" (Funtowicz and Ravetz 1993).

Second, in this battle for scientific legitimacy, EJ activists engage in a range of strategies of knowledge production or what Casas-Cortes *et al.* (2008) term "knowledge practices". This includes the collection and analysis of data on local health and the local environment, becoming experts themselves on relevant subjects to contest scientific knowledge, forming coalitions with scientists and building citizen–scientist collaborations to advance their claims and seek legitimacy for their views. Conde (2014) used the term "Activism Mobilising Science (AMS)" to denote the process whereby activists and scientists co-produce new and alternative knowledge, that gives the local organisations visibility and legitimacy empowers them to challenge the manufactured uncertainty produced by the state or companies.

Finally, the practices involved in activist research production, distribution and reception contribute to processes of re-subjectification and are conducive to re- generating instances of collective agency, bringing about an innovative sense of political participation and re-invigorating political imaginaries (Casas-Cort009). Through these processes, impacted communities transform from "vulnerabilized" to collective subjects (Firpo-Porto de Souza 2012). Campaign work may have deep-reaching and radically innovative policy implications that can shape and inform academic theory.

Academics also need to recognize their privileged position to expose the processes leading to and reproducing inequalities. Both research activists and activist scholars can straddle the line between the academy and activism, overcoming the dichotomy (Crampton 2009), while creating emancipatory theory and a new (critical) research praxis. As Boaventura de Souza Santos (2014) suggests in his work on different epistemologies, this kind of

research is not focused on a movement or a specific group of people, but together with them and based on an 'ecology of knowledges' and the "restitution of silenced histories, repressed subjectivities, subalternized knowledges" (Mignolo, 2007:451).

While needs of collaboration are often acknowledged both by scholars (Fuller and Kitchin 2004; Hale 2008) and activists (Seela 2010), so far, there was not a space of interaction that enabled collaborative research on EJ conflicts at a global scale. This is precisely what the research initiative described in the following section advocates for.

7.3 The EJOLT project

The project "Environmental Justice Organizations, Liabilities, and Trade" (EJOLT)[2]. Coordinated at ICTA-UAB, the project brings together 23 research and activist organizations from all around the world. The project runs between 2011-2015.

is a research initiative funded by the Seventh Framework Programme (FP7) of the European Commission. Its aim is bringing science and society together to catalogue ecological distribution conflicts and work towards confronting environmental injustices (Martinez-Alier *et al.* 2011). To fulfill this objective, EJOLT has developed means to facilitate two-way communication between activism and science in the development and use of concepts such as the Ecological Debt and Ecologically Unequal Exchange.

All research activities in the project are the result of a collaborative and collective effort between activists/academics and members of environmental justice organizations (EJOs). EJOs are civil society organizations locally or globally involved in conflicts over the unequal distribution of environmental entitlements, burdens of pollution and uneven access to natural resources and environmental services. They can be registered formal NGOs, local committees, as well as social movements, advocacy and action platforms, etc. They focus on the link between the need for environmental security and health and

[2] Find more information about EJOLT at www.ejolt.org

the defence of human and community rights. This is in fact a type of environmentalism different from the "wilderness conservationism". It comprises the "environmentalism of the poor" (Guha and Martinez-Alier 1997): the defence of the environment to ensure livelihood by those directly impacted by resource extraction and waste disposal conflicts.

Through the bottom-up methodology of the EJOLT project, there is an attempt to shift the mode of engagement in research to create a more relational-symmetrical approach to the co-creation of knowledge production. This exercise, besides the EJ literature described above, is embedded in a previously unexplored interface of several literatures ecological economics and social metabolism, social movement theory and political ecology, as well as critical cartography, expanded on in the following section.

The theoryof ecologicallyunequalexchange is a key explanatory theory regarding trade linkages in a socio-metabolic perspective: it positsthat more-developed countries externalize their consumption-based environmental costs to less-developed countries, which increase forms of environmental degradation within the latter (Hornborg 1998: 2005). In essence it demonstrates how wealthy countries have achieved economic prosperity through the over-utilization of the world's limited pool of natural resources and waste sinks and by shifting environmental degradation to the global commons and to the developing world. As Hornborg (1998) put it, a structural condition for the functioning of the metropolitan industrialized areas is favourable terms of trade to appropriate materials and energy, and also land and labour. Peripheral areas have physical trade deficits in volume, meaning exports are larger than imports, and they disproportionately suffer from negative environmental impacts, which do not include compensation for local or global externalities. This dislocation between those suffering the harms and those reaping the benefits of the global political economic system has been termed "environmental load displacement" (Muradian and Martinez-Alier 2001). Such asymmetries cause many complaints at the commodity extraction frontiers that we are inventorying and mapping.

Such geographically uneven and socially unequal metabolic processes are key to understanding environmental inequality. Methods from ecological economics and industrial ecology, such as material flow analysis, can elucidate

these metabolic patterns driving environmental change and give further insights into how uneven flows of matter and energy (Fischer-Kowalski 1997) and transformations in the extraction and provision of natural resources through different socio-ecological transitions (Fischer-Kowalski *et al.* 2007) lead to novel forms of social contestations.

Lines of enquiry from social movement theory (Della Porta and Ruch 2002, Tarrow 1991, Tilly 1993) that seek to explain why and how social mobilization occurs are also explored. The project aims to analyse current forms of collective action and learning across geographies, how it manifests itself, and what the determinants of the outcomes are at the global scale.

Finally, the atlas of environmental justice relies on a commodity perspective within a political ecology framework. Global commodity chains (LeBillion 2000, Mintz 1985) have been defined as a "series of interlinked exchanges through which a commodity and its constituents pass from extraction or harvesting through production to end use" (Ribot 1998:307-308). The embedded nature of power relations in the chain, who benefits and who loses, are key questions of political ecology in examining commodity chains.

The following section expands on the foundations, methods, and potential of this innovative tool.

7.4 The epistemology, methodology and structure of the EJOLT database

7.4.1 The need of a global scrutiny of socio-environmental conflicts: The Ejatlas

Struggles over the burdens of pollution and over the appropriation of natural resources and public space, arise from inequalities of power in the hegemonic organization of industrial social-metabolism and imbalances in terms of decision-making processes and institutional practices (Firpo-Porto and Pacheco 2009). Conflicts manifest when the local actors whose fundamental rights are affected, claim redistributions or recognition, which are often part of, or lead to larger gender, class, caste and ethnic struggles.

In this context, the EJOLT project has provided a tool that fills the gap of the need of advancing towards a global registry of EJ conflicts. The "Global Atlas of Environmental Justice: Mapping ecological conflicts and spaces of resistance" (www.ejatlas.org) documents socio-ecological (or socio-environmental) conflicts, defined as "mobilizations by local communities, social movements and EJOs against particular economic activities (or state policies), in which concerns about current or future negative environmental impacts are an important part of the grievances, along with social, psychological and political impacts."

While the historical EJ emphasis has been on urban exposure to toxics, EJatlas gives due focus to rural conflicts in which diminished or denied access to local environmental resources, their degradation and corporate enclosures dramatically affect local communities and their livelihood security. EJ for rural people and their communities has as much to do with whether they are able to exercise rights to own, access and use the natural resources on which their livelihoods depend, as it does with the quality of the resources themselves (IUCN 2007).

The unit of analysis is the project-based campaign or specific place-based struggle, which sometimes express in influential protest-events or broader campaigns. The observations depart from the specific offending economic activity to the related social struggles against the misdistribution of costs and benefits or lack of consultation/representation in decision-making. These contestations are visibilized through legal cases, campaigning, petitions, meetings, demonstrations, boycotts, strikes, threats, civil disobedience, collective violence, and other action forms (Tilly 1993).

The atlas emphasizes the spatial organization of the global economy and how apart from singular and historical patterns of social inequality and ethnic discrimination, environmental conflcts must be seen as produced through the insertion of countries and communities into the international economy. It thus contributes to the study of the complicated and interlinked transnational spatial patterns of injustice and resistance within a critical analysis of capitalism that cannot be gained except at broader geographic and political scales. Through the visual and interactive presentation of "maps of

grievances" and "place-based struggles" it helps make visible injustices enabled through processes of globalization that are rendered invisible through distance.

In this respect, The EJatlas can be considered part of a new wave of initiatives that use geo-spatial information and new spatial media to advance, legitimate and secure political claims (Elwood and Leszcynski 2012). Elwood (2010:352) refers to this as "knowledge politics": the ways in which individuals and institutions leverage digital spatial data and spatial technologies in negotiating social, political, and economic processes.

EJOLT's logo is the South-up map, a nod to the field of critical cartography (Crampton 2006, Wood and Krygier 2010) which aims to link geographical knowledge with power and in the process to invert it, by illustrating patterns of injustice and calling into question ingrained acceptance of a particular global order. The South-up map illustrates how the position of the North at the top of the map is arbitrary, and acknowledges how maps have historically been instruments of power serving as an indispensable tool for imperial expansion. As Nietschmann (1995:32) once said, "more indigenous territory has been claimed by maps than by guns". The corollary is then that the opposite is also true (Crampton 2006) and "a map can be a tool for liberation as much as for exploitation. New spatial media, critical cartography, participatory research, and activist-based knowledge represents new opportunities for activist, civic, grassroots, indigenous groups and scholars to leverage web-based geographic information technologies in their research and in their efforts to effect social change." (Elwood and Leszcynski 2012).

As Crampton (2009) suggests, these tools can help transcend the expert/amateur or expert/grassroot activist dichotomy, while creating a new spatial knowledge politics. These new politics aim at establishing recognition and authority through witnessing, peer validation and transparency of data sources rather than through academic peer-review. In Ejatlas in this first phase, data is not crowd-sourced but rather contributors are invited by a group of editors based on their expertise or after contacting us. Editors coordinate the work, double-check data provided and follow-up on the feedback and comments.

7.4.2 Process and Aim

In consistence with the above, mapping EJ can, as Kitchin and Dodge (2007) argue, be considered a process, rather than a fixed representational product, where a constant re-territorialization takes place, shapes and is shaped by knowledge and politics. This section explains how such process has been shaped in the case of the Ejatlas (Fig. 7.1).

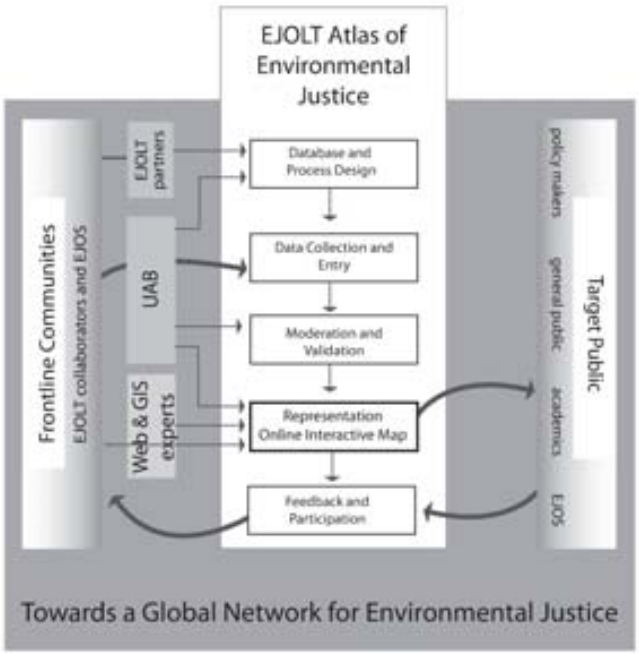


FIGURE 7.1: EJatlas project schematic

The Ejatlas aims to provide a tool for activism and advocacy: to help denounce cases of environmental injustice; to encourage dialogue and the interchange of experiences, ideas, data, and strategies of actions; to provide a resource with reports of concrete cases, legal disputes, and other relevant matters; to sensitize the media, opinion-makers and public opinion; to put

pressure on politicians and policy-makers to implement public policies conducive to EJ; to develop and strengthen strategies of international articulation on EJ, and to contribute to new processes of knowledge creation within an EJ perspective.

Finally, the database aims to develop a system whereby environmental conflicts can be described, analyzed, compared and interpreted and also where quantitative data can be gathered and whereby hypotheses regarding for example the frequency of participation of indigenous groups in such conflicts, the rates of success (by continent, by type of commodity) in stopping extractive projects can be tested.

7.4.3 The contributors

The Ejatlas mapping process draws on previous work from both activists and scholars for collecting information about environmental conflicts. These initiatives that of project partners including Fundacio Oswaldo Cruz (FIOCRUZ), who along with the Brazilian network of Environmental Justice built a map of ca 600 cases of conflicts in Brazil (Firpo-Porto, 2012, Firpo-Porto and Finamore 2012). The Centro di Documentazione sui Conflitti Ambientali (CDCA) in Rome has documented emblematic ecological conflicts since 2007. Partners including the Latin American Observatory of Mining Conflicts (OCMAL), GRAIN, World Rainforest Movement (WRM), and Oilwatch support and document community struggles globally against mining, for food sovereignty, against deforestation and tree plantations, and against fossil fuel extraction respectively. Kousis *et al.*'s (1998) study of environmental protest-case studies in Southern Europe and work done by Gerber (2011) and WRM (2003), on conflicts on tree plantations, also provided methodological insights about data collection on environmental conflicts. While providing extraordinarily valuable lessons the examples mentioned above are limited by either geographic or thematic boundaries. Only in some cases, the referred databases are opened for interactive public participation.

The project currently counts on a vast network of EJO and activists contributors. Apart from the official partners of EJOLT described above, the project counts on the collaboration of numerous Trans-national advocacy

networks that act as nodes for mobilization and research, both around thematic issues, such as International Rivers, Via Campesina, Oilwatch, 350.org, World Rainforest Movement, Climate Justice Action, Friends of the Earth International, Global Alliance Against Incineration (GAIA); and around corporate entities or specific projects, such as campaigns against Monsanto, Rio Tinto, Vale, Vedanta, etc.; as well as a wide range of activist-academic researchers working in different countries and at regional levels. Their data sources include field trips and first hand experience, official reports, EIAs, interviews with stakeholders, online research, academic papers, as well as "grey literature", which are then referenced in the corresponding box (see Tab. 7.1). Once entered, the data is accessible at any time by the same collaborator for further editing and updating.

7.4.4 Data collection and entry: The database form and moderation process

The database collection is supported by an online platform which is accessible after registration. Every case is described following a database form made up of about 100 fields (see Tab. 7.1), with a combination of multiple choice and free text boxes. Multiple choice fields include an "other" free-text option. Key fields are required. Entries are geo-located on a world map, with the most precise coordinates as possible and a scale of accuracy. The platform allows the use of points or polygons (for the submergence area of a dam or for a large tree plantation) or lines (for example, for pipelines) to delimitate the conflict location.

The database form departs from the source of ecological intervention of an activity of disruption or a government policy. The conflict type is classified under a list of ten primary types, according to the main material activity responsible for the disturbance (e.g. Biomass and Land Conflicts, Waste Management) as well as a secondary conflict type specifying the disruptive activity (e.g. deforestation, incinerators). This activity in turn creates or threatens various combinations of ecosystem offences, which lead not only to environmental, but to societal and health impacts as well and then to the related social struggles against the mal-distribution of costs and benefits, lack of consultation or representation in decision-making and lack of recognition

TABLE 7.1: The EJatlas database form

Basic Data	• Name of conflict • Location & area • GPS coordinates & degree of accuracy • type of population involved (e.g. rural, urban)
Source of Conflict	• Type of conflict: – First Level (e.g. Mineral Ores & Building Extraction, Fossil Fuels & Climate Justice) – Second Level (e.g. Building Materials Extraction, CDM, REDD projects) • Commodities involved (e.g. Sugar, Copper, Domestic waste) • Description of conflict
Project Details & Actors	• Level of investment in the project • Technical details (e.g. MW produced, tonnes production) • Companies & State enterprises involved (& home countries) • International and Financial institutions involved • Number of affected people • Environmental Justice Orgs. involved
The Conflict and the Mobilization	• Intensity (maximum historical conflict level) • History of mobilization in reaction to (e.g. preventative, post-impact) • Groups mobilising (eg. indigenous, women, union workers) • Forms of mobilization (eg. blockades, referenda, petitions) • Cross-involvement with other EJOLT conflicts
Environmental Impacts	• Examples: (Choose from Documented/Potential/No Data.) – Deforestation – Genetic contamination – Mine tailing spills
Health Impacts	• Examples: (Choose from Documented/Potential/No Data.) – Accidents – Malnutrition – Infectious diseases
Socioeconomic Impacts	• Examples: (Choose from Documented/Potential/No Data.) – Increase in corruption of actors – Loss of livelihood – Militarization and increased police presence – Land dispossession
Outcome	• Current status: e.g., Proposed, Under Implementation, Stopped • Conflict outcome e.g. – Repression – Land demarcation – New environmental impact assessment • Proposal of alternatives • Perception of success: was environmental justice served? – (Yes/No/Not sure) Briefly Explain.
Sources & Materials	• Relevant legislation • Academic sources • Journalistic sources • Multimedia sources
Contributor Data	• Author contact information • Contact information of local activists & Ejos • Other comments
Multimedia	• Upload of relevant photos, videos, PDFs.

of alternative territorial and social visions. This is schematized through sections analyzing the source of the environmental disturbance, the offence, the impacts and response from the claimants and the outcome.

Once the data is entered, it goes through a moderation process based at the ICTA - Universidad Autonoma de Barcelona to ensure quality control for clarity, completeness and reliability of the data and sources before being published online.

The platform allows users to browse conflicts by conflict type, country, company, and commodity as well as to filter across all relevant fields in the database. The audience can access the data and also leave a comment, adding pictures, videos and pdf documents on the case.The opportunity for constant interaction among Ejolt members, collaborators and the general public aims at strengthening and widening contacts and exchanges, as well as improving quality and exhaustiveness of the reporting.

7.5 Outcome and potential

7.5.1 Public reception and Press

The Ejatlas was launched on March 19th at the United Nations Environmental office in Brussels. Currently the Atlas contains over 1200 case studies (and growing, as research proceeds and new collaborations are established). Among the most represented types of conflicts in the Ejatlas are those about the industrial extraction of natural resources (oil & gas extraction, mining, deforestation etc.), water management and conflicts over waste disposal (e-waste, incinerators, landfills). It also includes other struggles against high speed trains, manufacturing and tourism projects, urban development schemes and CDM and REDD schemes.

To date, over 130,000 users have visited the webpage, with 500,000 pageviews of the atlas. Since the launch we have had over 130 press mentions in 21 countries including Science Magazine, LeMonde, the BBC, coverage from countries including Uruguay, Panama, Argentina, Madagascar, Belgium, Bulgaria, Italy, etc. From India, the Live Mint of the Wall Street

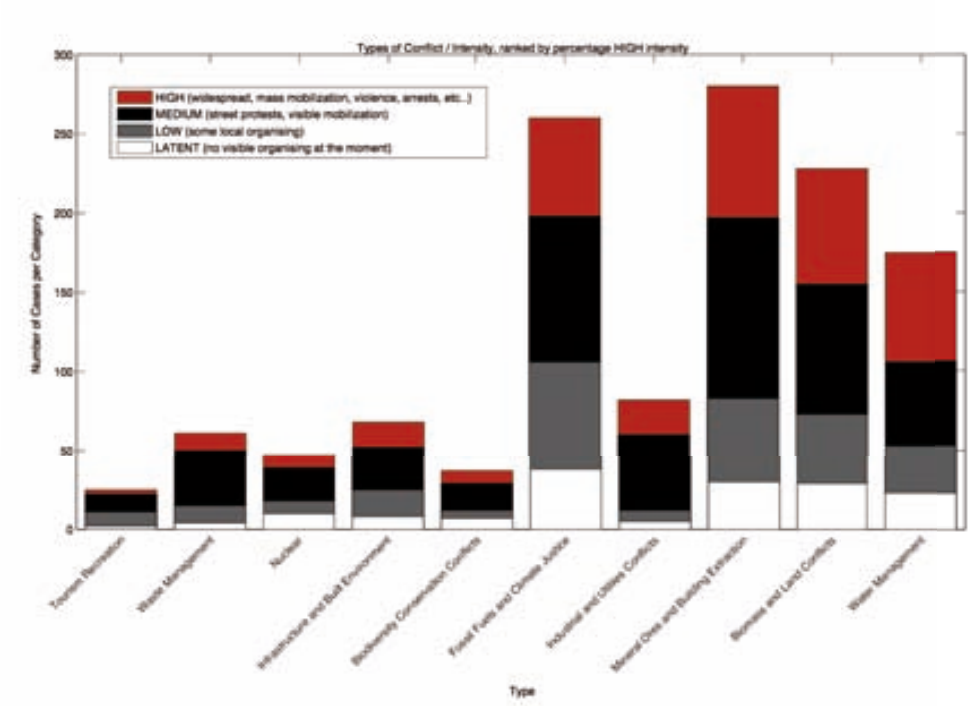


FIGURE 7.2: Number of reported conflicts of different intensities, sorted by conflict type.

Journal noted that the Atlas shows how the increasing globalization of social networking, activism and accountability means human rights scrutiny of business is increasing[3].

Perhaps our best coverage has been from Colombia where top newspapers carried full-page spreads on the Colombian conflicts in the EJOLT Atlas. The launch coincided with a terrible drought in the country that brought to the fore problems of oil extraction, featured on the cover of La Semana with the title "Environmental Nightmare"[4]. An article in El Espectador, using

[3]http://www.livemint.com/Opinion/pdV0BTe4GLJH 21iKojD0gI/Mapping-human-rights-intolerance.html

[4]http://sostenibilidad.semana.com/medio-ambiente/articulo/mapa/30830

data from the EJOLT map pointed out the high incidence of environmental conflicts in areas inhabited by indigenous and Afro-colombian minorities.

The response from activist groups has been encouraging and often celebratory. The map of environmental resistance in Turkey was exhibited on a tree during the Gezi Park demonstrations in Istanbul in June 2013 (followed by an online map in Turkish[5]. It contributed to a critical discussion in Turkish media and civil society about the (un)usefulness of pharaonic projects and large infrastructure in the country (Ozkaynak *et al.* 2013). More cases are coming to us directly from the activists on the frontlines as the atlas becomes known and the inclusion of these cases has led to cases being brought to the attention of bodies such as the Arhus Convention[6] (for example the Ile-Alatau State National nature park case in Kazakhstan [7]). Meanwhile, we have had both corrections and requests for engagement with companies represented on the atlas. Initiatives to include it in curricula in high schools and higher education are also in the works.

7.6 Statistical Political Ecology: Towards a new paradigm for the study of environmental justice conflicts

7.6.1 Towards a research agenda

Beyond its pedagogical value and its potential to the movements themselves, the EJatlas, through the collection of a large dataset of geo-located "case studies" provides a tool for a "statistical political ecology" — comparative analysis of emblematic and historical cases across geographies and thematic issues and across spatial and temporal scales. It provides a means to understand commonalities, to get a glimpse of the great variety of roles that EJOs

[5]Available at http://www.direncevre.org/. More information at http://www.ejolt.org/2013/12/turkeys-map-of-environmental-injustices-is-now-online/.)

[6]http://aarhusclearinghouse.unece.org/news/1000793/

[7]http://ejatlas.org/conflict/protect-kok-zhailau-ile-alatau-state-national-nature-park-kazakhstan

play in environmental conflicts and constitutes a solid basis for case study selection or comparisons, queries, country and thematic based analysis.

In the aim to understand the broader trends and contours of the global EJ movement here I highlight four key areas for future research:

1. Embedded social metabolism: What are the shifting patterns of global socio-metabolic patterns (socio-ecological transitions) that are driving the environmental conflicts and the related networks of resistance. What are the related specific forms of "accumulation by dispossession" (Harvey 2003) and "accumulation by contamination" (D'Alisa and Demaria 2013) that such shifts in metabolism entail? How are these shaped by new political economies such as the "biofuel regime", climate change governance, changing agrarian regimes, land and water grabs, etc.? How is the rise of resource demand from new actors, such as the BRICs and MICs impacting environmental inequalities and environmental change (Muradian *et al.* 2012)?

2. Trade and Governance: how do labor processes of production and social processes of consumption become linked over extended geographies? How is global consciousness of the social life of goods raised or erased in emergent commodity chains? Is there upscaling of previously local struggles between citizens, governments, and transnational institutions and corporations to the international level? What is the role of different state, corporate and financial actors in these conflicts and how they are networked?

3. Deployment of Values and Science: How are environmental risks perceived and disputed differently across locations? How are different languages of valuation such as identity politics deployed? How are technocratic discourses such as that of ecological modernization combined with arguments about identity and culture and to what effect ?

4. Action forms & outcomes: How do levels of contention and corresponding state response/repression vary between countries? How and why do new action forms appear and diffuse across space (eg: Walter and Urkidi 2013)? How does legal opportunity contrast with political opportunity?

> What role do cleavages within the state play in the resolution of conflicts? Which sustained actions achieve their goals and why? What leads to a successful environmental mobilization? Is there evidence to support that coalitions between local and international activists lead to greater results? Between trade unions and environmental movements (Barca, 2012)? What are the issues that unite and divide communities? And what is the emerging shape of EJ alliances?

This research agenda will constitue an important step to understanding how inequalities are shaped through socio-metabolic transformations in the economy and how they are contested, and to what outcomes. Further specific questions will surely emerge in a process of co-design with partners and other stakeholders, building on the need to understand environmental changes as social processes embedded in specific social and ecological systems (Mauser *et al.* 2013).

7.6.2 Expanded methodological toolkit for the study of environmental justice conflicts

The rich empirical data contained in the atlas can be applied to a multi-methodological toolkit that can help address the questions addressed above.

This includes historical and political analysis at the nation-state level. Perez-Rincon (2014), for example, gives a broad overview on socio-environmental conflicts in Colombia, due to the increasing "reprimarization" of its economy with the mining sector leading the trend and specialization of export products, such as coffee, palm-oil and sugar. Further work is being done on social metabolism in Turkey (forthcoming) and Madagascar (Douguet-Raharinirina 2013).

Geo-spatial analysis tools such as point sampling in GIS can extract social, environmental and biophysical indicators from raster and vector data at specified points, enabling further classification of conflict locations along factors such as land-use types, geological data, population density, rates of land degradation and deforestation, or any available spatial data.

This type of conflict analysis combined with biophysical indicators allows integration of analysis across the natural and social scientific interface. The type of conflicts in a given territory should be seen as an expression both of the material and energy flows in the given region of study, and also as part of processes of socio-ecological transition, for example from agrarian based economies to industrial and post-industrial societies.

Network analysis can be applied to analyze the role diverse actors play in the conflicts, for example, showing how assemblages of activists converge and coordinate against corporate entities across disparate locations (Kumar 2014) as well as the density of connections between activist, corporate, financial and state actors. Nodes in a network can be connected by various types of ties at the same time including amongst others material and energy flows, financial transactions, information, and social interaction (Schiller *et al.* 2014).

Further work will entail large-scale comparative analysis using applications such as multivariate analysis to understand dynamics into the determining factors for different outcomes. Our investigations up to this point have only been interpretative and hypothesis generating as we continue to expand the universe of cases.

7.7 Challenges

The blurring of the boundaries between academia and the world beyond can sometimes lead to undermining the system which maintains academic's power as it can be seen to compromise the pedagogical authority of education (Fuller and Kitchin 2004). This paradox has been an important question within the process of co-production of knowledge in EJatlas. This has led to a key challenge to combine activist knowledge and scientific rigour and peer-review processes in the work we do, with the ultimate goal of empowering movements and activists, increasing their legitimacy and for their work being recognized as scientifically valid.

Because the atlas aims to respond to multiple objectives at the same time, the process has been a negotiated one that has aimed to take into account activist needs, academic questions and public access to relevant information

but that invariably experiences both tensions and contradictions. The process of determining appropriate parameters for the form was thus complicated by the multiple interests of the various partner stakeholders as well as the diverse audiences for whom the research was intended. Questions that were debated included the breadth and scope of the database form, the fields to be included to exhaustively describe a socio-environmental conflict, and how to balance statistical and qualitative representation in the form. Other issues involved who contributes the "crowd-sourced" information, how to define a conflict, and the selection criteria for the cases.

While the Atlas aims to portray important and emblematic conflicts by geographical zone and by thematic area, due to the bottom-up methodology employed and the variable quality of information available, the methodology for representation differs somewhat across regions, sometimes based on existing networks or on informal canvassing of relevant environmental organizations/activists within the country, or perhaps on the urgency of tracking particularly impacting public policies and investment trends.

In contrast, in the US a survey was administered to the over 200 EJ leaders, activist groups and scholars by collaborators at the University of Michigan's School of Natural Resources and Environment to select the 40 most influential cases in recent American history[8].

To increase transparency, forthcoming featured maps will include a methodological description for the selection process for the cases displayed. Further, we are cognizant that issues such as selection bias of the cases should be taken into account when undertaking secondary quantitative and meta-data analysis.

While country coverage might be unequal, this should not be considered a reflection of on the ground realities but rather due to available and reliable sources. Many cases are only known locally and reported in the national language and EJOLT tries to make them more visible. The aim is to present perhaps 2000 of the most representative and significant environmental conflicts, as chosen by the activist experts, scholars and on-the-ground journalists in each location/field. Emphasis on certain geographical zones at the outset

[8] http://www.ejolt.org/2013/08/support-mapping-environmental-justice-conflicts-in-the-united-states/

should hopefully be reduced as an expanding group of collaborators aims to fill in the "x blank spots on the map".

The process of the design and creation of the EJatlas is a collaborative, iterative process in participatory GIS that is still unfolding (Kitchin *et al.* 2013). The EJatlas can be considered what has been termed by Gibson-Grahamas a "hybrid research collective" effort. The central role of "performative epistemology of research" is to bring to the forefront of research efforts the hidden and alternative understandings of the world, and while doing so, making them "potential objects of policy and politics"(Gibson-Graham 2008).

Finally, in order to ensure an enriching feedback process and collaborative mapping effort, we are currently conducting a survey among collaborators to improve the website, the form and the process of the Ejatlas. This will help in designing future steps and adjust mapping design to current needs and priorities.

7.8 Conclusions

This paper has introduced the EJatlas mapping process and its methodology and offered an explanation of how itcontributes to both the praxis and theory of environmental justice and geographical scholarship. One of the major strengths of the project is its effort to be as participatory as possible, and to ensure at the same time good standards of accuracy in the data collection through the collaboration between activists, who are the experts in these struggles, researchers, and activist-researchers, accompanied by a process of review and quality control.

Through cooperation with the EJOs and their networks we hope to further develop and contribute to the concept of a global EJ movement that is already growing, and that will continue to cohere globally, to formulate more strategic positions and be more inclusive, at the same time as it takes on local nuances. We hope to be able to describe these processes and to analyze new concepts coming from the grassroots movements, and to roughly map the patterns in the participation of women, of indigenous peoples, of

labour unions and religious groups, and their different ways of intervening in conflicts of environmental injustice. We believe the number of conflicts is mounting, especially along the commodity extraction frontiers and along the creation of new commodities, i.e. the new investment fields such as increased financialization in land-based investment, ecosystem services, etc. We aim at research, exchange and dissemination of information and not at finding better conflict resolution or better Corporate Social Responsibility. Beyond research in political ecology, the map aims to be socially and politically relevant by "naming and shaming" the actors behind injustices and to serve as a tool for activists by illustrating critical environmental issues and informing public debate over the distribution of risks, burdens and benefits, the claims of local communities.

We consider that the EJOs and their networks are one of the main forces working to make the world economy more socially and environmentally equitable, because they are at the same time defending the remaining pristine ecosystems and subsistence economies on earth, and also impacting the costs of "business as usual": corporate practices whereby environmental externalities can be successfully "cost-shifted" (Kapp 1950) onto the most vulnerable populations.

The globalizing of the EJ frame also aims to highlight that the conflicts are not NIMBYs (Not in My backyard), but often NIABYs (Not in Anyone's backyard) or even NOPEs (Not on Planet Earth). Stopping a project in one location should not mean that the same practice can be brought elsewhere. Mobilizers show that opposition is not only related to the location per sut about the whole idea of development, exploitation, extraction. Thus the EJ movement must demand greater social governance over multi-lateral trade, lending institutions and regulatory bodies, as well as the promotion of greater corporate and government accountability (as opposed to responsibility) through legal mechanisms at national and international scales. The recognition of global chains of responsibility is a precursor to recognition of the ecological debt that many are claiming.

Our hope is that EJatlas can serve as a tool for developing a "statistical political ecology", which can benefit from case studies but also go beyond

them, for fruitful comparisons across time and space. And that it may support the voices from the EJ movement that argue that "greening the economy" will not address social and environmental injustices, and that only a radical reduction and restructuring of global social metabolism, eradication of impunity, combined with a community-based definition of needs and priorities can begin to address the joint challenges of the environmental and social crises.

Chapter 8

Conclusions

> *A sacred mountain in India defended against "beheading" for bauxite by a "primitive" tribe.*
>
> *A movement in Northern Europe that has mobilized "against speed" and becoming a "way-point" in the creation of a new infrastructural "asset class".*
>
> *A borderland in the semi-arid region of Kenya, where pastoralists and farmers confront the forces of a new food regime based on flexibilization.*

The stories in this thesis span continents, from Asia to Africa to Europe, and touch on commodities ranging from bauxite, to biofuels, to train transport. We could add oil, fracked gas, municipal waste and many other commodities and stories from Canada to Nigeria that I have been exposed to during this project (see documentary annexes).

Yet despite their differences, these conflicts are all key battlegrounds in a global struggle over environmental change and the emerging shape of global social metabolism. New forms of control over land and associated resources generate social processes operating across spatial scales, which create necessary conditions for conflict.

In this thesis I have examined how groups use contentious agency to push back against the forces of capital accumulation with the aim to understand

why groups choose particular discourses and forms of action, and why they fail or succeed in their projects. Particular attention was given to the diverse politics of knowledge employed, the forms of mobilization and engagement with governance mechanisms, and how in some cases this has led to broader processes of social change and the enacting of ecological democracy from above and from below.

I have firstly relied on empirical data from 3 case studies, one in India, one in Italy and one in Kenya and applied different methodologies to explore the actors, discourses and strategies in these local contexts, framing the enquiry on a novel interaction of socio-political, bio-physical and geographical factors to understand enabling conditions for ecological resistance movements. I have then turned to comparative analysis to understand global to local dynamics, and finally I have presented a framework that constitutes a major contribution to the theoretical framework of the analysis of ecological conflicts through a statistical political ecology.

The first part of this concluding chapter summarises the thesis and tries to spell out the main lessons learned. It intends to highlight the thesis' contribution to the fields of ecological economics, political ecology, agrarian studies and social movement theory and introduces the concept of the "environmentalism of the dispossessed" to highlight some key features of an emerging stream of environmental movements today.

8.1 Key findings from the case studies

8.1.1 Summary of the chapters

Chapters 3-5 focussed on specific case studies of environmental justice. They can also be seen to represent processes of empowerment over the spatialities of environmental justice, as defined by Schlosberg (2007). The first case focuses on recognition, demonstrating how local indigenous forms of knowing (sacredness, and other world-visions) have been legally recognized through the Forest Rights Act; the second centers claims for participation or procedural justice and demonstrates how local groups have been able to enact new forms of participatory democracy in the face of the exclusions they have been

confronted with, and the third case examines spaces and ways to understand maldistribution of environmental access to resources.

In Chapter Three I examined an emblematic struggle against mining in Niyamgiri, Orissa, India. By analyzing two processes of forest valuation (one by the courts and one by activists) and how they were deployed I arrived at the following key findings:

- The spatial abstraction necessary to set economic values on nature precludes spaces for democracy and the expression of plural values. The technical and political process of setting prices deepens and reproduces structural inequalities with negative distributive effects.
- Cultural attachments and heritage cannot be adequately recognized in such exercises, they become "incalculable" and thus their value becomes reduced to zero.
- Given these limitations, we warn social movements of some of the dangers of these processes in an attempt "to save nature" and argue that a recourse to cultural politics and rights-based appeals may prove more effective. We consider that this case may be considered what Gomez-Baggethun and Ruiz-Perez (2011) have called the "tragedy of well-intentioned valuation"; which is when "scientists and environmentalists engage with monetary valuations to improve environmental protection, but end up doing the methodological or discursive lift for a commodification that eventually degrades the socio-environments at stake" (Kallis et al. 2013)
- This chapter highlights the role of judicial means of redress in struggles for justice, demonstrating how the courts offer both possibilities as well as limitations depending on the political institutional structure they are operating in.

The fourth Chapter examined the resistance to the TAV project in Italy. The objective was to show how a local conflict can move past a defensive "militant particularity" through processes of re-subjectification and how these

mobilizations can then serve to reveal and politicize the socio-ecological crisis of neo-liberalism. An understanding of the larger political economic dynamics has in this case led to the adoption of a new radical transformative agenda that has been shown to have significant mobilizing power to connect with other movements.

Key findings include:

- The foreclosing of participation for those in the No TAV movement has catalyzed a new form of participatory democracy on the territory.
- The adoption of a strong sustainability perspective such as that advocated by No TAV supporters; in contrast to the Pro TAV vision of sustainability of carbon and energy efficiency, can provide the basis for radical ecological projects that envision an absolute dematerialization of the economy.
- The acquisition and deployment of highly oppositional technical knowledge has led to the creation of new subjectivities and a politicized perspective that entails a new vision of development and territorial identity. In this case, this has led to a new sociality that has been able to channel its energy into pro-active and propositional activities. One manifestation of this creative potential can be evidenced by the link between NO TAV movements and a recently burgeoning de-growth movement (Della Porta 2008). In this case, we can say that the NO TAV movement has helped open possibilities for other similar struggles to emulate it.
- This paper highlighted the role of direct action, in this case land occupation, as a tactic. This choice of action form holds significant power - but also holds the threat of criminalization and repression, as the state's backlash against the NO TAV activists reveals.

The fifth chapter analyzed biomass distribution in a region targeted for land-grabbing in order to understand the process from both bio-physical and political ecological perspectives. The case study in the Tana Delta displays many of the dynamics present in global conflicts over land-grabbing. I provided a historical contextual analysis, explaining the land use changes that

the territory has already undergone and how the project is implanted within an area that is already ecologically modified and how this has led to the exacerbation of already existing conflicts between pastoralists and farmers.

The contributions of this chapter include:

- Positioning the advent of the biomass economy within a global socio-metabolic transition and a discussion of what such a transition may mean for both local and global political ecologies. I show that the advent of the "sugar economy' based on biofuels can be seen as part of a global socio-metabolic transition that is repositioning the role of "surface" energy, as opposed to the "subterranean forest" regime the fossil fuel economy entails (Sieferle 2010).
- A discussion of the limitations of biophysical indicators for understanding how environments are reproduced, which calls for linking insights from ecological economics and political ecology, particularly through analysing the political dimension of social metabolism.
- A novel application of HANPP methodology for analyzing the potential impacts of land-grabbing on intertwined biophysical ecological and social processes to answer questions such as: what can the history of the delta tell us about future potential for conflict and differentiated impacts on the people and local environment? What will the impacts of new land deals be on local food availability for humans and other species?
- Demonstrating how the re-assignation of rights to biological productivity and the incorporation of farmers and pastoralists into new agrarian structures transforms not only social relations and accumulation strategies, but also reproduces nature with profound impacts on ecosystem energetics and corresponding livelihood strategies. The provisioning ecosystem services of increased productivity (food fibre and fuel provisioning for the global market) come at the expense of other environmental services not valued by the market that benefit local communities.

Chapter six, through a comparative and multi-scalar analysis, discusses the determinants of successful outcomes in land-grabbing conflicts. It argues

that the land-grabbing frame, brought to public attention thanks in large part to the work of the EJO GRAIN, has provided a "mobilizing frame" that has catalyzed resistance trans-nationally as well as in local struggles.

Major findings include:

- Local movements against land-grabbing have achieved the most success when they have been able to unite broad coalitions of groups with complex and multidimensional agendas.
- The role of environmentalist discourses is deployed as a key "apolitical" strategy by groups across scales. Identity politics are both a powerful tool for mobilization as well as a divisive force that can lead to local ethnic conflict.
- The role of trans-national assemblages of contention have led to increased leverage and spurred a "boomerang effect"; in some cases leading to project suspension. Yet despite the polycentric nature of the land-grab, trans-national advocacy continues to retains it's North-South character until the present.
- Successes should always be viewed as temporal, many projects reemerge in other locations, with new investors or in other forms.

Finally, chapter seven outlines the praxis and theory of the Global Atlas of Environmental Justice and introduces a new paradigm in the analysis of ecological conflicts termed "statistical political ecology". Its contribution entails:

- The development of a new method for analyzing the global and interlinked aspects of localized environmental struggles, that allows going beyond dynamics at local scales to understand crucial processes and relations generating environmental inequalities at broader regional, national, and global scales
- Contributing to a discussion on the praxis of environmental justice research, highlighting both the challenges and complementaries of collaborative research with EJ activists based on "activist knowledge".

- The atlas aims to become a tool that can serve the activist community, contribute to a global trans-national and integrated vision of environmental injustices to reveal processes of ecologically unequal exchange and the accumulation of ecological wealth and debt. I aim to continue to improve this tool through reflexive processes of co-design with the community and EJO stakeholders.

8.1.2 Environmentalism of the Dispossessed

One of the main tenets of this thesis is that conflicts over the shape of capitalism, and the "misadventures of capitalistic nature" (O'Connor 1993) are increasingly playing out over battlegrounds related to the use and access of environmental resources, including land, water and others.

Transformations in the ways social movements frame their struggles and the ways networked actors influence environmental politics locally and globally in an age of ecological and economic crises calls for new theoretical tools.

The term "environmentalism of the dispossessed" borrows from Harvey's concept of accumulation by dispossession (ABD), encompassing a broad understanding of what entails dispossession, including dispossession of rights to the environment through both successful "cost-shifting" (Kapp 1988) or "accumulation by contamination" (Demaria F. and D'Alisa 2013); as well as through processes of direct expropriation. Dispossession includes not only material dispossession but the dispossession of cultural knowledge and meaning (McMichael 2010).

While the interests of capital and corporate actors are often the driving force of these processes, in all the cases we have seen the necessary role of the state in facilitating processes of dispossession through "extra-economic" coercion. Extra-economic political interventions extend beyond mechanisms such as "eminent domain" and brute force, and can happen through processes that are considerably less transparent, for example through legislation that inscribes private rights to surplus value (Glassman 2006), such as granting companies rights to limited water sources through "water grabbing" as in the Tana Delta; the granting of "licenses to pollute and dispossess" through

mechanisms such as carbon trade quotas; fishing quotas, etc. all of which can be gathered under the rubric of extra-economic dispossession .

In the original conception of ABD, a key feature entailed a process through which, as in the original enclosures, people have their collective control over common resources reduced, and thus need to sell more of their personal time as wage-labor in order to provide for themselves. Yet contrary to the classical Marxist perspective that sees proletarianization as the driving force of processes of ABD; we adopt a perspective from the eco-feminist tradition that point out how productive and reproductive (household) labour and subsistence economies are also integral to the processes of capitalist production and accumulation (Salleh 2010, Katz 2001). In this way, capitalism receives a subsidy precisely by not integrating (or commodifying) these non-capitalist processes of production and social reproduction.

This more ecological-eco-feminist reading of ABD (Salleh 2010) gives greater emphasis to the increased investment needed in social reproductive labour of reproducing the household when natural resources are expropriated or enclosed. For example women have to walk several hours longer in a day to find fresh water; or that their care work will increase because family members are falling sick.

This further expansion of the heterogeneity and complexity of processes of accumulation leads to a 'variety of such struggles.. that... is simply stunning', as Harvey puts it, so much so that it is often 'hard to even imagine connections between them' (2003: 166). However in this conclusion we will attempt to survey some of the elements of local and transnational activism that incorporate concerns over forms of primitive accumulation, accumulation by dispossession, and accumulation by extra-economic means. While counter-movements fighting for environmental and social justice practice different forms of politics that will vary across locations and forms of dispossession, we draw from the cases examined to illustrate some of the emerging characteristics these struggles are assuming as well as the potential political possibilities such movements may offer for creating global solidarities that can confront processes of accumulation and dispossession.

8.1.2.1 Legitimacy and crises of capitalism

Environmental justice struggles at their core are about how claims for multivalent justice are deployed in an ultimate battle for legitimacy. One key question then, in light of the growing scale and the expansion of forms of social resistance to ecological dispossession we have surveyed, is whether capitalist production of nature is suffering from a crisis of legitimacy?

This question was foreshadowed already by O'Connor in 1993, who argued that "today's environmental problems represent not only a major economic crisis of supply, they also represent a crisis of legitimacy for the market system (O'Connor 1993). Recently, Levien (2013a) has taken up this argument within the specific Indian context and has extended the concept of ABD through the theorization of "regimes of dispossession". He argues that the success of current struggles against Special Economics Zones (SEZs) can be attributed to the fact that the current neo-liberal regime of dispossession has been proven to be based on corruption; profit-seeking and can no longer viably be understood to represent the public or national interest. The resistance is also driven by the non materialization of benefits from previous development projects that have derailed the promise of the hegemonic development narrative. According to Levien, when the state's justifications for expropriation "do not resonate, and material concessions prove inadequate or unacceptable, we can expect anti- dispossession struggles to multiply and become more powerful." (Levien 2011).

In the TAV case in Italy, I have similarly shown how the effect of the recent economic crises and the deteriorating economic situation in the country; the slashing of public funds; and the imposition of austerity measures from the European "troika" in the absence of public support, has served to further catalyze resistance to what has been termed "useless and imposed investments" by a growing movement that is spreading throughout Europe and beyond. The Italian state, responded to protests by declaring the TAV to be a site of "strategic national interest", opening the way for the militarization of the valley and criminalization of the activists. The effect of such repression, that can also be seen in reaction to the waste crisis in Campania (D'Alisa et al. 2010), has further delegitimized the state and shown that it is either unable or unwilling to coherently address the complex, multi-faceted aspects

of these contestations. Faced with the failure of representative democracy, citizen movements enact alternative forms of participation. It has also engendered a deeper questioning of the equation of capitalist economic growth and public "well-being".

Meanwhile, as seen in Chapter 6, the "delegitizimation" of both the economic and ecological logics of the corporate land-grab "food regime of dispossession" is precisely what GRAIN is aiming to achieve. While they claim that they are winning the ideological battle in the global media; at a country by country level we unfortunately cannot say the same.

While many of these movements are anchored in personal experience, they are increasingly framed towards opposition to the global processes of accumulation and concentration of the power of capital, and the foreclosing and dispossessing of alternative practices and futures that capitalist expansion entails (McMichael 2008).

As Martinez-Alier points out, even when they behave as environmentalists, the poor often do not always self-identify as such. Meanwhile, the environmentalists of the dispossessed may not self-identify as "anti-capitalist", yet their discourses often entail a rejection of the capitalist mode of production.

This manifests as engagement with capitalist logics through diverse forms of negotiation and claims-making. On one hand, direct challenges to the idea of "market environmentalism" is one defining feature of the surveyed struggles: we see discourses that counter economic valuation as a means to save nature as in Niyamgiri (Chapter 3), or against "high speed" train travel as a solution to the global warming impacts of transport (Chapter 4), or against the bio-economy that posits biofuels as the solution to the combined climate and energy crisis (Chapter 5 and 6).

On the other hand, we see a complementary strategy whereby some groups foreground how their reproductive and regenerative work sustains the basis for capitalist markets. For example, we have seen how groups organize around "identity politics" and claim recognition of the contribution of their livelihoods through representing themselves as the stewards of social and natural "capitals". Small farmers point out to the environmental movement that their agricultural reproductive mode of production actually "cools down the earth." (Martinez-Alier 2011). The waste-pickers documented in "Delhi

Waste Wars" (see annexes) highlight their contribution to reducing the waste stream as well as reducing carbon emissions. Pastoralists as well as indigenous groups increasingly make use of such "eco-political" capital to defend their livelihoods and press for justice.

While they engage in such conversations, sometimes using language based on capitalist valuation of nature and "human and natural capital", this does not signify that they are buying into the ideology of commodifying nature to save it.

By challenging capitalist market logics and simultaneously proposing concrete alternative "life-projects" (Blaser et al. 2004), activists aim to make more explicit and blatant the contradictions between the norms and practices of the modern world-system and the values of the majority of the population. This has enhanced the anti-systemic potential of social movements at a time when globalized capitalism is in unprecedented crisis (Smith and Duncan 2012).

Along with the de-legitimization of the capitalist development project, the ontologies of movements for degrowth, environmental justice, the commons, indigenous cosmo-visions and food sovereignty that we have surveyed in this thesis thus not only provide a critique and unveiling of the false promises of corporate-led development, they also posit a practice and a future beyond - a decolonization of the imaginary, in the terminology of Serge Latouche (2009) that offers the capacity to refract their struggles through questions of development, sociality, citizenship and co-production of sustainable living patterns.

8.1.2.2 Ecological Disruption

Another insight that we can gain through the stories we have heard is that the environmentalism of the dispossessed (EOD) is not about trying to return to a mythical Garden of Eden or only about the preservation of traditional ways of life. In the past, many radical environmental movements relied on narratives that divided modified urban spaces and wild nature. Such constructions serve to separate humans from nature while simultaneously "constructing nature in need of human control" (Di Chiro 1996).

In contrast, the movements documented are rooted in an awareness that the ecosystems they depend on are disrupted places, "co-produced ecologies", that are often facing simultaneous ecological assault from many sides.

The cover of this thesis shows Lanjigarh, the site of the planned bauxite mine in Chapter 3. The battle over the mountain was won, but the refinery whose chimney is rising in the background was already built, and Vedanta seeks a license to raise output six times the current production of 1 Million Tonnes Per Annum to 6 MTPA, despite the fact that they had been facing an acute shortage of bauxite that caused them to shut down the plant and are presently importing the raw materials from other states and countries to feed the plant. The CEO has brushed off the fact that a recent Gram Sabha has opposed Vedanta's expansion plans.

Whether the expansion goes through or not, it is difficult to cast the Dongria Kondh as living in a "primitive" world with such an installation on their doorstep. Further, it calls for understanding how the impacts of the refinery extend outwards, through Orissa and beyond. On one trip to Niyamgiri, we were stopped by a blockade protesting the truck-fulls of bauxite coming through, raising dust on the unpaved road and choking them. The 'victory' of the Dongria has been turned into this village's undoing.

The NO TAV protesters are against the TAV precisely because they recognize their ecosystem as being a disrupted one. They claim that the valley is already saturated due to the numerous large-scale infrastructure projects that have been implemented over the recent years and have scarred the territory. They are not claiming to preserve a wilderness; they are fighting against becoming such a transit area, on the route from "here to there" through which global commodity chains flow.

The Tana Delta is another example of a multi-use ecosystems with overlapping and cumulative pressures: dams being built upstream, small arms trade from failed states, oil exploration and climate change all co-produce local environmental and social relations. To properly understand the conflicts it is necessary to understand the livelihood practices, the way different groups use and value, and the responsibilities they hold to the ecosystems they depend on, and also how these have been transformed over time.

This calls for studying both the existing dynamics of resource use and how changes in environmental entitlements transform livelihoods and reproduce nature. For example, the act of simplifying complex forms of property rights there, such as the Malka institution , that enabled the Orma to pass through Pokomo farms with their cattle (Duvail et al. 2012) so they may be subsumed under neoliberal private property regimes, leads to new tensions, conflicts and ecological feedback processes.

These sites form part of dense networks of interwoven socio-spatial processes that are simultaneously global and local, human and physical, cultural and organic. Swyngedouw and Heynen (2003) emphasize the role of socio-environmental change in the production of new natures in the city; but their analysis can also extend to many rural conflicts - few spaces left can still be considered to be entirely "outside of capitalism".

The case of Delhi Waste Wars (see annexes) is perhaps the most emblematic of a livelihood-motivated environmentalism that aims to defend access to a "reproduced nature" that has passed through and been excreted through the urban metabolic flow (ibid); yet is currently being re-valued as a new resource flow for capital accumulation in light of growing resource scarcity and ecological modernization methods that aim to increase the profitability of waste management (Demaria and D'Alisa 2013).

8.1.2.3 A Global Materialist Perspective

A synthesis of ecological economics and political ecology aims to illuminate understanding of the ecological embededness of social conflicts through material-energy flow analysis. These conflicts call for a materialist analysis of social relations that engage with ecological processes, both across the micro scale - in the local political ecologies; as well as in the macro-scale, addressing growing monocultures and shrinking (bio) and cultural diversity, markets and material flows, core/periphery distribution conflicts, and externalization in a world systems framework (Hornborg, McNeill, and Alier 2007).

Local movements may be motivated by material demands and personal experience such as those of the Environmentalism of the Poor; however groups are also claiming for justice and proposing new alternatives due to impacts

and processes occurring at much broader scales. The Degrowth movement, the global movement for Food Sovereignty and indigenous activists and their allies (see annex for Unistoten video) are not mobilizing due to concern for their own livelihood and security alone - they are often motivated by what could be termed "global materialism"(or conversely global anti-materialism). This is a concern that environmental pressures wrought by capitalism; its crises; and its "spatial and temporal fixes" are threatening the material basis of the entire planet. Thus, the environmentalism of the dispossessed is motivated by a new planetary consciousness and understanding of the interlinked nature of geographies of environmental injustice.

The increasingly interlinked and globally integrated nature of contemporary EJ struggles can provide a powerful answer to Havey's critique that place-based movements enact "militant particularisms" (Harvey 1996: 400-401) that are unable to "transcend the narrow solidarities and particular affinities shaped in particular places" and to confront the "fundamental underlying processes... that generate environmental and social injustices": that is, the asymmetrical power relations embedded in "unrelenting capital accumulation".

Latin American political ecologists, such as (Escobar 2008) and (Leff 2012), posit that an effective grassroots political strategy should entail the re-appropriation of knowledge and space through the reinvention of cultural identities and through the reshaping of territories. Yet this does not imply that real world projects to erect 'strong' boundaries around places need not necessarily be seen as regressive. As Castree (2004: 163) argues, contemporary efforts to defend territories, resources, knowledges, communities and cultural artefacts can be open and inclusive and "that it is perfectly possible for inward looking localisms to be founded on an explicit and conscious engagement with extra-local forces. That is, the trans-local can be strategically harnessed for purely local needs (as captured in the following reversal of a hackneyed phrase 'think locally, act globally') and this is not at all paradoxical."

A cogent example of how local movements are expanding their discourse and tapping into broader and structural critiques is embodied by the Fracktivist movement. While born over a concern over gas extraction taking place

literally "in their backyards" in primarily middle class communities in America,Combes describes (in Temper et al 2013) how part of the struggle keeps a local defensive attitude, deepening the mobilization and promoting dissemination to the general public while another line is focused more on proactive work to broaden the mobilisation to support global energy issues.

Another relevant example is how anti-incineration movements, with a genesis in local place-based mobilizations, have amplified their discursive frame in recent years through the formation of coalitions with waste-picker and recycling movements. This allows them to tap into wider debates about climate change and resource use generally, rather than a focus on the politics of consumption.

The Vedanta case, outlined in Chapter 3, also give interesting clues into the articulation of multi-scale movements for environmental justice. (Kumar 2014) has previously highlighted the tensions between local and international EJOs around the Niyamgiri conflict in India. Yet the historical development of the activism around this case shows how activism born in one location can exert influence and reappear in sometimes unexpected quarters.

When the case was resolved against the company, released resources of the trans-national UK-based social justice group Foil Vedanta went into contesting other sites in Vedanta's supply chain. A video released in In May 2014 by Foil Vedanta showed Vedanta boss Anil Agarwal mocking the Zambian parliament and bragging that he makes $500 million per year from Konkola Copper Mines (KCM), after having bought the company for $25 million, against a $400 million asking price. The video caused outrage in Zambia, where KCM has failed to pay taxes, and is indebted to contractors. As a result, a few days later hundreds protested in the streets of Lusaka demanding that Vedanta pay taxes and improve the conditions for workers. The Zambian government is now undertaking an audit of the companies financial records. This story demonstrates how even small radical resource-strapped groups can leverage knowledge and social media to effect change by turning the capitalist production-consumption exchange system in on itself.

Further coordination is needed to take advantage of how the capitalist organization of production and the markets defined by the companies themselves can act as forces that unite those resident at the point of extraction

and the consumers of commodities. As Turner and Brownhill (2004) write: "When residents of oil producing communities stop production at the same time as consumers boycott oil companies by refusing to buy their products, the two groups engage in a simultaneous global "production-consumption oil strike?.The EJatlas is a contribution to this globalized vision of material flows, commodity chains and distributed impacts.

World system theorists such as Wallerstein (2000; quoted in Glassman 2006: 614) have noted that "capitalist power was and is trans-national; enacted through forms such as global commodity chains that cannot be completely controlled by a given state." The rejoinder to this was the activist slogan of the anti-globalization movement: "Our resistance must be as transnational as capital".

There is some indication that the necessary link called for by Harvey between 'struggles over accumulation by dispossession and struggles over expanded reproduction... which are organically linked within the historical geography of capitalism' (Harvey 2003: 171) may be finding further points of cohesion through ecological contestations.

8.1.2.4 Contentiousness and politicization

Actors employ a range of tactics to confront processes of dispossession, contamination and other forms of environmental processes that negatively affect them to the benefit of others. I have shown how their tactics will be shaped by the nature of the processes of dispossession and entail physical, political and legal means against the coercive forces of the state and corporate actors.

Certain forms of dispossession may privilege more overt forms of resistance. Through the Ejatlas (see appendix for a screenshot), I further aim to test whether contention is increasing in environmental conflicts generally; and future research aims to examine which types of activities and actors engender more contentious actions.

The reason for the increasing intensity of resistance at the point of enclosure derives from the fact that the ecological contradictions that are being thrown up now seem to be more "existentially threatening" and frightening

than previously (Levien 2013b). Levien refers specifically to land issues in India, yet we see that such struggles manifest over multiple processes of (environmental) dispossession, that also threaten either people's material, but also symbolic existence. This includes the mining wars in places such as Peru, where struggles are often over contamination of water sources, as well as activism against climate change in the global North.

Movements are succeeding in stopping or significantly stalling dispossession and the projects that are premised upon it. In the EJatlas, by the end of October 2014, 17% of the 1250 cases have been qualified as successes by the contributors. The definition of success will depend on movement aims. Understanding how movements frame this objectives and the determinants of success is a future agenda based on the EJatlas data. In many conflicts, the mobilizers have no interest in the forms of development proposed for their land and are fighting to stop the project; others are fighting to be incorporated into it on better terms, while still others are fighting for environmental remediation.

The cases in this thesis and gathered in the atlas provide evidence against the supposed "post-political" turn in environmental politics as argued recently by authors such as (Swyngedouw 2007) and Zizek (1992). While these authors have tended to adopt a nation-centred account of the political, as noted by Routledge (2003), environmental politics are often taking specific forms that are not immediately recognized as being political. Firstly, because they are not engaging with party politics the way movements did in the past. For example, while many authors equate neoliberalism and capitalism as the driving force behind dispossession (McMichael 2010); authors such as Acosta (2011) and Svampa (2013) point out that even post-neoliberal leftist politicians in Latin-America are adopting what she terms "the commodities consensus" to describe current economic policies in countries such as Argentina, Brazil, Bolivia and Ecuador that escaped the neoliberal "Washington Consensus" imposed by the World Bank and the IMF, but are now trapped in a neo-extractivist model.

Regardless of the specific ideological characteristics of each government; and despite their hostility against neo-liberal structures of power, these countries continue to rely on and expand extractive growth models based on the appropriation and excessive exploitation of non-renewable natural resources

for export. According to her, the escalation of socio-environmental conflicts is one of the consequences of this, accompanied by the emergence of new forms of mobilization and civic participation focusing on defending the commons, biodiversity, and the environment.

Rather than simply being "defensive and reactionary" as some authors have claimed (Agyeman 2005), EJ movements claims for justice should rather be viewed as confrontational and oppositional (Robbins 2014) in contrast to consumer based "post-political" approaches to environmental governance. One way to gauge their pro-active and propositional nature is through by the introduction of new forms of governance across multiple scales as well as new forms of participatory democratic decision-making.

An example of the former includes the Yasuni initiative to leave oil in the soil (Martinez-Alier and Temper 2007) that aimed to design a mechanism for financing a transition to a post-fossil fuels economy from the bottom-up, respecting the principles of climate justice and rejecting false solutions like carbon trading that in practice "displaces" environmental burdens through a "global ecology" approach (Sachs 1995) that benefits Northern polluters.

The Yasuni proposal emphasizes structural changes to the economy, focuses on restorative rather than retributive justice and on sovereignty and direct action as a blueprint for an alternative to development. It aims to shift the terms of the climate debate towards new models and away from carbon counting. "Far from being a movement of simple refusal, the original Yasuni initiative encompasses a broader questioning of extractivism, a striving to strengthen community livelihoods, and a collective investigation of the possibilities of post-petroleum civilization, and coordinates with efforts developing different approaches to energy. (Hildyard & Lohmann, 20133).

While an example of the latter includes the spread and diffusion of popular consultations as regards mining projects in Latin America (Urkidi and Walter 2011). In both these examples, we see a process of transformation of the scale of governance, in the first case, upwards to the International level, at the second, downwards to the local (municipal) level.

in the first case, upwards to the International level, at the second, downwards to the local (municipal) level.

8.2 Final Thoughts and Future Research

This thesis has contributed to the understanding of how communities in different locations and across scales are mobilizing to defend the environment and has shed light on the discourses, strategies and action forms they employ and to what effect. It further has made a major contribution to the study of ecological conflicts by offering a framework for improved comparative analysis that can easily integrate geographical and social data through a "statistical political ecology". It contributes to extending both the theory as well as the research praxis of ecological economics, environmental justice studies and political ecology. The work represented by this thesis extends beyond the academy and also speaks to and provides strategic input and practical tools (such as the EJatlas) for social movement organizations, as well as to policy makers.

Future research will deepen this work, particularly in regard to the methodological tool-box and research agenda outlined in Chapter 7. Other future research plans include deeper engagement with eco-feminist perspectives to examine the role of women in defending the basis of social reproduction in the communities. A further line of enquiry (broached in the Corridors of Resistance film in the annexes) entails deeper examination of the potentialities and limits to rights-based approaches

Finally I aim to further develop and refine the concept of the environmentalism of the dispossessed to explain the motivations of environmental movements today. It's defining characteristics include: the use of politics to challenge state power based on a structural critique of capitalist accumulation; a conception of the environment as being co-produced and contingent rather than being conceived a singular "nature"; informed by an increasingly "global materialist" perspective of how local processes are embedded within global social metabolic flows; and increasingly willing to use disruptive and contentious tactics to respond to the ecological dispossession.

Viewing local environmental mobilizations within such a framework acknowledges their power to contest hegemonic ways of relating with nature; and at the same time offers the potential for dissolving boundaries between environmental, social justice, labour, feminist and indigenous movements as

well as geographic boundaries that can contribute to a transformative vision of relations of production, as well as social reproduction.

Appendix A

Documentaries

Video Documentaries included:

Delhi Waste Wars (16.32) http://vimeo.com/32400188

An EJOLT Video. Directed by Leah Temper and edited by Siobhan McKeown (e:d.i.t)

A battle is brewing in Delhi, India over access and control to garbage. For decades, informal waste-pickers and recyclers have turned garbage into cash. They cost the government and taxpayer nothing, yet they significantly reduce the waste sent to already overflowing landfills, improve recycling rates and "cooling the earth" by reducing carbon emissions. But recent government plans to privatize trash collection have put the livelihoods of the waste-pickers under threat. Meanwhile, new plans to build incinerators funded by carbon credits mean the resources the recyclers depend on may soon go up in smoke.

This documentary takes a street-eye view, charting the wastepickers´ struggle for their rights and recognition, and gaining a local perspective on how to create a truly sustainable waste management system in one of the world´s biggest and most densely populated cities.

Life After Growth (25.05)

http://vimeo.com/10871269

Directed, Written, Shot, and Edited by Leah Temper and Claudia Medina

IT'S TIME TO RECLAIM THE ECONOMY

The economic crash of 2008 revealed not only the frailty and vulnerability of the economic system, it also showed the false basis that the growth economy is built on – the financial bubble grows bigger and crashes bigger, but we don't seem to be getting any happier. To the contrary, we suffer from greater job insecurity and environmental chaos threatens.

The prescription from the mainstream economists is more growth – but is this just taking more of what ails us? Has growth become uneconomic? Is there another way?

This film is part of an ongoing project to document the rise of a new movement – calling not for more economic growth, but LESS. The degrowth movement, or "mouvement por le decroissance", argues that through a voluntary reduction of the economy we can work less, consume less and live better, fuller lives.

Many have been pointing out that our current economic system is leading us to an environmental
and social catastrophe. "Life After Growth" begins to point to the people and communities who are looking for ways out. These are the pioneers who are rethinking the role of economics in our lives, and are engaging in different types of economic activity, right now.

The D word is still taboo in many circles – politicians are loath to go against the growth orthodoxy that our society is based on. But everywhere people are engaging in degrowth type activity - the beginning of a wave that is laying the groundwork for a post-capitalist future...

Because it's not the size of the economy that counts, it's how you use it!

Corridors of Resistance (26.01)

Directed and shot by Leah Temper, camera by Fiona Becker, Edited by Siobhan McKeon

This film documents the Unistoten Resistance and Action Camp in North-Western British Colombia, Canada. The Wetsuweten clan has been reoccupying and establishing themselves on their ancestral lands since 2010 to stop up to 7 pipeline projects meant to carry fracked gas and tar sands oil from inner BC to the coast and eventually to Asia. They are part of a the "Blockadia" movement that aims to shut down the planned "carbon corridor".

The Wetsuweten tribe emphasize a responsibility and relationship-based approach to the defense of nature and the territory and demonstrate how they have been reanimated through living processes at the Unistoten Camp, for example through their reimagined Free Prior and Informed Consent protocol.

Trailer for Degrowth: A Vocabulary for a New Era (3.09)

This short trailer was made along with Claudia Medina to promote the upcoming book "Degrowth, A Vocabulary for a New Era" by Giorgos Kallis, Giacomo D'Alisa and Federico Demaria. It features footage shot by myself and Claudia Medina.

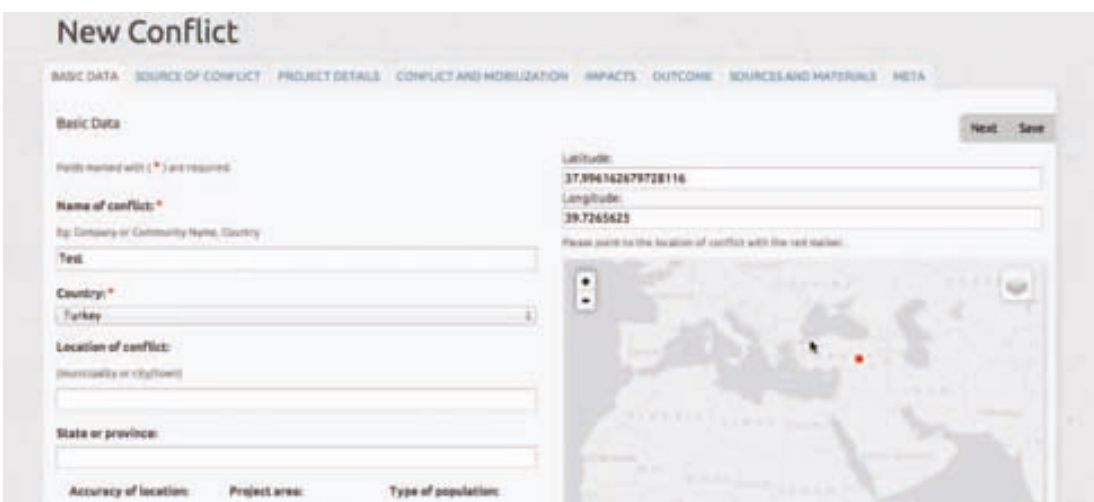
Appendix B

The EJatlas

Environmental Justice Atlas
database form

go to www.ejatlas.org

for any further query, please write at ejoltmap@gmail.com



Page 1 - Basic Data

Name of conflict* Eg: Company or Community Name, Country	
Country*	Drop down menu
Location of conflict (municipality or city/town):	
State or Province	
Accuracy of Location	HIGH local level MEDIUM regional level LOW country/state level
Project Area (in hectares and in this format: 1,000)	
Type of population	Unknown Urban Semi-urban Rural

Page 2 - Source of Conflict

Type of Conflict 1st level* (Please pick one based on the activity most responsible for the environmental disturbance)	● Nuclear ● Mineral Ores and Building Extractions ● Waste Management ● Biomass and Land Conflicts ● Fossil Fuels and Climate Justice/Energy ● Water Management ● Infrastructure and Built Environment ● Tourism Recreation ● Biodiversity Conservation Conflicts ● Industrial and Utilities Conflicts
Type of Conflict please pick all relevant	✓ Uranium extraction ✓ Nuclear power plants ✓ Nuclear waste storage ✓ Mineral ore exploration ✓ Mineral processing ✓ Tailings from mines ✓ Building materials extraction (quarries, sand, gravel) ✓ Ship-breaking yards ✓ Waste privatisation conflicts / waste-picker access to waste ✓ Incinerators ✓ Landfills, toxic waste treatment, uncontrolled dump sites ✓ Land-grabbing for large scale land based investment ✓ Plantation conflicts (incl. pulp) ✓ Logging and non timber extraction ✓ Deforestation

	✓ Agro-toxics ✓ GMOs ✓ Agro-fuels and biomass energy plants ✓ E-waste and other waste import zones ✓ Aquaculture and fisheries ✓ Intensive food production (monoculture and livestock) ✓ Oil and gas exploration and extraction ✓ Shale gas fracking ✓ Gas flaring ✓ Oil and gas refining ✓ Coal extraction and processing ✓ Climate change related conflicts (glaciers and small islands) ✓ REDD/CDM ✓ Windmills ✓ Mega-project solar plants ✓ Geothermal energy installations ✓ Water access rights and entitlements ✓ Desalination ✓ Interbasin water transfers/transboundary water conflicts ✓ Dams and water distribution conflicts ✓ Water treatment and access to sanitation (access to sewage) ✓ Transport infrastructure networks (roads, railways, hydroways, canals and pipelines) ✓ Ports and airport projects ✓ Pollution related to transport (spills, dust, emissions) ✓ Urban development conflicts ✓ Tourism facilities (ski resorts, hotels, marinas) ✓ Establishment of reserves/national parks ✓ Wetlands and coastal zone management ✓ Biopiracy and bio-prospection ✓ Invasive species ✓ Manufacturing activities ✓ Metal refineries ✓ Chemical industries ✓ Other industries ✓ Military installations ✓ Thermal power plants ✓ Other
Other Types of Conflict Please insert other types of conflict which are not in the list above	

Description * Please describe the project and the point of conflict here in ~500 words.	
Specific Commodity*	■ Aluminum/Bauxite ■ Asbestos ■ Asphalt ■ Carbon offsets ■ Cellulose ■ Charcoal ■ Coal ■ Coffee ■ Copper ■ Corn/Maize ■ Cotton ■ Crude oil ■ Cut flowers ■ Diamonds ■ Electricity ■ Ethanol ■ Eucalyptus ■ Fish ■ Fruits and Vegetables ■ Gold ■ Iron ore ■ Jatropha ■ Land ■ Lead ■ Lithium ■ Live Animals ■ Manufactured Products ■ Meat ■ Natural Gas ■ Palm oil ■ Pine ■ Rare metals ■ Recycled Metals ■ Rice ■ Rubber ■ Sand, gravel ■ Shrimps ■ Silver ■ Soybeans ■ Steel ■ Sugar ■ Uranium

	■ Wheat ■ Zinc ■ Water ■ Biological resources ■ Domestic municipal waste ■ E-waste ■ Industrial waste ■ Chemical products ■ Pesticides ■ Titanium ores ■ Timber ■ Tourism services ■ Cement ■ Ecosystem Services ■ Other (please specify below)
Other commodities	

Page 3 - Project Details and Actors

Project details (Please insert specific details on the relevant quantitative data eg tons of mineral extracted per year, kwh of electricity, etc...):	
Level of investment (Please enter in USD and in this format: 1,000,000,000.00)	
Directly Affected people (It may also be a range)	
Company names or State enterprises	
Relevant government actors	
Home country (The country/-ies where the company/-ies main office is/are)	
International and financial Institutions (Insert please the full name and avoid acronyms)	
Environmental justice organisations and other supporters (Please insert also their websites)	

Page 4 - The Conflict and the Mobilization

Status of the conflict* Please pick according to the highest intensity based on degree of mobilization and level of conflict	➢ High (Widespread, Mass mobilization, Violence, Arrests,...) ➢ Latent (No visible organizing at the moment) ➢ Low (Some local organizing) ➢ Medium (Street Protest, Visible Mobilization) ➢ Unknown

When did the mobilization begin?	◆ In reaction to the implementation ◆ Latent (no visible resistance) ◆ Preventive resistance (precautionary phase) ◆ Mobilization for reparation once the impacts have been felt ◆ Unknown
Is this conflict directly related to any other EJOLT ecological conflict? Please enter the name of the conflict as per the Ejolt inventory	
Start of the conflict* (YYYY/MM/DD)	(YYYY/MM/DD)
End of the conflict (YYYY/MM/DD) (leave blank if ongoing)	(YYYY/MM/DD)
Groups mobilizing (check all that apply)	• Artisanal miners • Farmers • Fishermen • Indigenous groups or traditional communities • Industrial workers • Informal workers • International ejos • Local ejos • Landless peasants • Local government/political parties • Neighbours/citizens/communities • Pastoralists • Social movements • Trade unions • Wastepickers, recyclers • Women • Ethnically/racially discriminated groups • Recreational users • Local scientists/professionals • Religious groups • Other (please specify below)
Other groups mobilizing	
Forms of mobilization (check all that apply)	➔ Artistic and creative actions (eg guerilla theatre, murals) ➔ Blockades ➔ Boycotts of official procedures/non-participation in official processes ➔ Community-based participative research (popular epidemiology studies, etc..) ➔ Creation of alternative

	reports/knowledge ➔ Development of a network/collective action ➔ Development of alternative proposals ➔ Involvement of national and international NGOs ➔ Land occupation ➔ Lawsuits, court cases, judicial activism ➔ Media based activism/alternative media ➔ Objections to the EIA ➔ Official complaint letters and petitions ➔ Public campaigns ➔ Referendum other local consultations ➔ Sabotage ➔ Shareholder/financial activism. ➔ Street protest/marches ➔ Property damage/arson ➔ Strikes ➔ Threats to use arms ➔ Occupation of buildings/public spaces ➔ Hunger strikes and self immolation ➔ Arguments for the rights of mother nature ➔ Appeals/recourse to economic valuation of the environment ➔ Boycotts of companies-products ➔ Refusal of compensation ➔ Other (please specify below)
Other forms of mobilization	

Page 5 - Environmental impacts	Observed or Documented	Latent, Potential or Uncertain	No Data
Air pollution			
Biodiversity loss (wildlife, agro-diversity)			
Desertification/Drought			
Fires			
Floods (river, coastal, mudflow)			
Food insecurity (crop damage)			
Genetic contamination			
Global warming			
Loss of landscape/aesthetic degradation			

Noise pollution			
Soil contamination			
Soil erosion			
Waste overflow			
Oil spills			
Deforestation and loss of vegetation cover			
Surface water pollution / Decreasing water (physico-chemical, biological) quality			
Groundwater pollution or depletion			
Large-scale disturbance of hydro and geological systems			
Reduced ecological / hydrological connectivity			
Mine tailing spills			
Other Environmental impacts	*OTHER IMPACTS*		

Page 6 - Health impacts	Observed or Documented	Latent, Potential or Uncertain	No Data
Accidents			
Exposure to unknown or uncertain complex risks (radiation, etc...)			
Malnutrition			
Mental problems including stress, depression and suicide			
Violence related health impacts (homicides, rape, etc..)			
Health problems related to alcoholism, prostitution			
Occupational disease and accidents			
Infectious diseases			
Deaths			
Other environmental related diseases			

Other Health impacts	*OTHER IMPACTS*		
Page 7 - Socio-economic impacts	Observed or Documented	Latent, Potential or Uncertain	No Data
Increase in Corruption/Co-optation of different actors			
Displacement			
Increase in violence and crime			
Lack of work security, labour absenteeism, firings, unemployment			
Loss of livelihood			
Loss of traditional knowledge/practices/cultures			
Militarization and increased police presence			
Social problems (alcoholism, prostitution, etc..)			
Specific impacts on women			
Violations of human rights			
Land dispossession			
Loss of landscape/sense of place			
Other socio-economic impacts	➢ *OTHER IMPACTS*		

Page 8 - Outcome

Current status of the project development *	× Proposed (exploration phase) × Planned (decision to go ahead eg EIA undertaken, etc) × Under construction × In operation × Stopped × Unknown
Conflict outcome / response (check all the outcomes that apply)	➢ Compensation ➢ Corruption ➢ Criminalization of activists ➢ Deaths ➢ Environmental improvements, rehabilitation/restoration of area ➢ Institutional changes ➢ Land demarcation

	➢ Court decision (victory for environmental justice) ➢ Court decision (failure for environmental justice) ➢ Court decision (undecided) ➢ Migration/displacement ➢ Moratoria ➢ Negotiated alternative solution ➢ New legislation ➢ Project stopped ➢ Repression ➢ Strengthening of participation ➢ Technical solutions to improve resource supply/quality/distribution ➢ Under negotiation ➢ Violent targeting of activists ➢ Fostering a culture of peace ➢ Application of existing regulations ➢ New Environmental Impact Assessment/Study ➢ Other (please specify below)
Other outcomes	
Development of Alternatives (What are the proposals being brought forward and by what ejos)	
Do you consider this an Environmental Justice success? Was environmental justice served? *	Yes No Not Sure
Briefly explain*	

e 9 - Sources and Materials

Relevant legislation & public policies	
References (Academic papers, publicated book, documentary movies, etc)	
Links to websites, newspaper articles, etc	
Related Media (video doc, photos, etc)	
Other documents (here you may upload a photo, video, pdf, etc.)	
Other comments (Please feel free to add here whatever further comment or additional information you might have)	

Page 10 – Contact Data

Contributor: Your Name/email/organization *as you want it to appear on the Atlas (this data will be public. Leave it blank if you don't want to make any data public)*	
Meta Data (any commuication with the editors should be inserted here)	

Bibliography

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